

MEMORANDUM

Agenda Item No. 8(N)(1)

TO: Honorable Chairman Oliver G. Gilbert, III
and Members, Board of County Commissioners

DATE: November 20, 2024

FROM: Geri Bonzon-Keenan
County Attorney

SUBJECT: Resolution authorizing rejection of all proposals received in response to a competitive request for proposals and award of a competitive designated purchase pursuant to section 2-8.1(b)(3) of the County Code by a two-thirds vote of the Board members present; authorizing award of Contract No. EVN0001090 in an amount not to exceed \$64,771,337.00 for the purchase of fare collection equipment for an initial six-year term; authorizing the County to execute same for and on behalf of Miami-Dade County and to exercise all provisions of the contract, including any cancellation or extensions, pursuant to section 2-8.1 of the Code, and Implementing Order 3-38; and authorizing the use of \$44,720,435.00 of Charter County Transportation Surtax Funds for this project which was added to the People's Transportation Plan 2024-2028 five-year implementation plan

Resolution No. R-1023-24

The accompanying resolution was prepared by the Transportation and Public Works Department and placed on the agenda at the request of Prime Sponsor Commissioner Eileen Higgins.



Geri Bonzon-Keenan
County Attorney

GBK/ks

MDC001

Memorandum



Date: November 20, 2024

To: Honorable Chairman Oliver G. Gilbert, III
and Members, Board of County Commissioners

From: Daniella Levine Cava
Mayor

A handwritten signature in blue ink that reads "Daniella Levine Cava".

Subject: Recommendation for Approval to Reject All Proposals and Award a Competitive Designated Purchase for Fare Collection Equipment and Authorizing the Use of Charter County Transportation Surtax Funds for Such Purpose

Executive Summary

This item is seeking approval to reject all proposals received in response to a competitive Request for Proposals (RFP) and award a competitive designated purchase contract for the acquisition of fare collection equipment, inclusive of fare gates, ticket vending machines, and fareboxes as well as automated internal equipment monitoring technology, and a farebox backend system for the Miami-Dade County (County) Department of Transportation and Public Works (DTPW). Further, the resultant contract will provide warranty, maintenance, parts, and repair services for the equipment. This equipment provides a modern comprehensive solution for DTPW's transit system and will replace the County's existing fare collection equipment, which was originally installed in 2009. Due to its age, the existing equipment fails frequently and availability of parts has been limited, causing both fare gates and fareboxes to be out of service. However, we expect the lifespan of this new equipment to last more than 20 years. Further, the resultant contract will provide warranty, maintenance, parts, and repair services for the equipment through the length of the contract.

The RFP for the purchase of Fare Collection Equipment initially included multiple phases as follows: Phase 1 – South Dade TransitWay Fare Collection Equipment Implementation for the Bus Rapid Transit (BRT) Stations which must be completed no later than December 2024; Phase 2 – Bus Farebox Replacement which must be completed with a prioritization of any buses identified by the County as operating on the South Dade TransitWay; and Phase 3 – Metrorail Station Fare Collection Equipment Replacement. Additionally, as expansion into other Strategic Miami Area Rapid Transit (SMART) Program corridors occurs, this contract will allow DTPW to purchase new equipment to provide a consistent, cohesive customer experience for patrons of the transit system.

An item recommending award of a competitive contract was initially presented to the Transportation, Mobility, and Planning Committee (TMPC) in June 2024 and received a favorable recommendation. Following the TMPC meeting, DTPW was advised by the Federal Transit Administration (FTA) that to utilize federal funds for Phase 1, the purchase would have to be completed under the federally procured construction contract, *Contract No. CIP155-DTPW19-DB, South Corridor Bus Rapid Transit Project*, previously approved by the Board of County Commissioners (Board) under Resolution No. R-890-20. Accordingly, to leverage the use of federal funds, the Phase 1 equipment purchase is being extracted from this contract award as further detailed in the Background section below. As a result of this change in scope, the contract is being presented as a designated purchase pursuant to Section 2-8.1(b)(3) of the County Code.

The equipment under this contract is being engineered to facilitate agnostic backend software integration, enabling system interoperability. The initial deployment in the South Dade TransitWay will include integration to the existing fare collection software system using EASY Card fare media as well as provide other payment options and administrative functionalities. However, this software system was last upgraded in 2016 and is in need of replacement to address technology limitations to enhance the user experience, address Payment Card Industry (PCI) compliance, and deliver an overall more secure platform. A competitive solicitation is expected to be advertised this year for replacement of the software system.

Recommendation

It is recommended that the Board approve this request to reject all proposals received in response to the RFP and award of a competitive designated purchase pursuant to Section 2-8.1(b)(3) of the Miami-Dade

County Code, by a two-thirds vote of the Board members present and award *Contract No. EVN0001090, Fare Collection Equipment*, to Genfare, LLC (Genfare) for DTPW, in the amount of \$64,771,337 for an initial six-year term.

The contract includes two, four-year option to renew (OTR) terms, which will require Board approval before the OTRs are exercised. The previous contract, *Contract No. 8481-2/22*, was awarded by the Board on May 6, 2008 pursuant to Resolution No. R-498-08, in the amount of \$61,200,238. The allocation under the new award is higher due to the addition of software licenses and ongoing maintenance and technical support services for the new stations in the South Dade TransitWay as well as increases in equipment and labor costs over the last 16 years.

Background

The fare collection equipment included under the resultant contract will provide the following benefits:

- Improved customer experience
- Improved reliability
- A new, secure technology
- An equipment monitoring system to notify DTPW of equipment malfunctions to expedite repairs
- Integration with DTPW's future fare collection application
- Modern and consistent aesthetics for transit stations

DTPW's existing fare collection system is provided by Cubic Transportation Systems and is inclusive of equipment and fare collection backend software. This system was implemented in 2008 under *Contract No. RFP8481-2/22* for the provision of hardware and software and subsequently upgraded in 2016 under *Contract No. L8481-0/27* to migrate system software to the cloud. DTPW in-house staff maintains and repairs the existing equipment, including management of a spare parts inventory. DTPW's fleet of approximately 850 buses is equipped with Genfare Odyssey Fareboxes that interface with Cubic Driver Control Units. These units have been in service since January 2009.

Due to the age of the system, the equipment is experiencing frequent failures and requires repair, thus taking station lanes or buses out of operation, directly impacting service delivery to patrons. Additionally, when failures occur during active bus routes, operators may let passengers board without collecting fares, which can lead to lost revenue. Malfunctioning gates also contribute to fare evasion. DTPW's existing inventory of parts is expected to allow the current equipment to be serviced while the new equipment is installed. However, obtaining additional parts for the outdated equipment beyond the installation period will be problematic as much of the system has reached the end of its useful life and parts are no longer being manufactured. Accordingly, this contract is critical for continuity of transit operations.

A RFP was issued under full and open competition on September 8, 2023. On the closing date of November 16, 2023, the County received four proposals, of which none were from local firms. Evaluation meetings were conducted between November 21, 2023, and December 18, 2023. Genfare was the highest-ranked proposer and was recommended to enter into negotiations, which commenced on January 5, 2024, and concluded on April 30, 2024. The terms of the contract were extensively negotiated, culminating in favorable provisions for the County, including contract terms and conditions to mitigate risk, a defined scope of work, a comprehensive functionality matrix, a streamlined implementation plan, enhanced service-level agreement provisions, a project resource plan, and a performance-based payment schedule to ensure that the project remains on schedule and payment is associated with completion of work.

As a result of the FTA guidance received, DTPW has revised the scope of the resultant contract to remove the equipment and associated installation of fare collection equipment for the South Dade TransitWay. This removal is a material revision to the originally advertised solicitation, thus resulting in a designated purchase. Because a competitive process as described above was already completed to select a vendor for this

purpose, repeating the competition is not practicable and it is in the best interest of the County to proceed with this award via a designated purchase. The equipment and installation for the South Dade TransitWay as well as integration with the existing fare collection backend software system is being completed via *Contract No. CIP155-DTPW19-DB*, utilizing Genfare as a source of supply and services. This change does not impact the project schedule and payment will remain performance-based, including the assessment of liquidated damages if applicable. The use of federal funds results in a reduction of \$8,909,945 from this contract award and reduces the use of People's Transportation Plan (PTP) funds. No additional allocation of funds is being requested under *Contract No. CIP155-DTPW19-DB* for fare collection equipment as the purchase and installation of such equipment was already contemplated under the initial contract award.

The contract contains two, four-year OTR terms to be exercised in the County's sole discretion. Due to the pace of technological changes, the contract contemplates the potential of completing a technology refresh (i.e., equipment upgrade and/or replacement) as part of the renewals. Per Board policy, DTPW will carefully evaluate the marketplace in advance of each OTR to determine if it is appropriate to renew the maintenance of the current equipment, proceed with a technology refresh, or issue a replacement solicitation. Accordingly, each OTR would be presented to the Board prior to being exercised.

The allocation for the purchase of major hardware for the initial six-year term breaks down as follows:

- Phase 1: Ongoing monitoring system software license, on-site maintenance, and technical support for the six-year term at a total cost of \$13,847,903.
- Phase 2: Replacement equipment for the complete fleet of Metrobuses includes approximately 900 fareboxes, backend farebox management and monitoring system software licenses, installation, training, warranty, on-site maintenance and technical support at a total cost of \$22,388,609.
- Phase 3: Replacement equipment for Metrorail Stations includes approximately 270 fare gates, 120 ticket vendor machines, monitoring system software licenses, installation, training, warranty, on-site maintenance and technical support at a total cost of \$20,834,825.
- Additional items and contingency includes development of software integration for the future Fare Collection Application, allowable cost adjustments under the contract based upon consumer price index escalations for labor and fixed increases not to exceed 3% per year for equipment, contingency to cover unknown site conditions and additional work during the installation, and funds for the purchase of additional equipment which may be needed as stations are modernized and reconfigured, as well as replacement parts inventory to be used upon expiration of the warranty period at a total ceiling amount of \$7,700,000. This allocation will only be used as needed.

Thus, the contract amount for the initial six-year term is summarized as follows:

- \$57,071,337 total for Phases 1, 2, and 3
- \$7,700,000 for additional items and contingency

Scope

The scope of this item is countywide in nature.

Fiscal Impact/Funding Source

The fiscal impact for the initial six-year term is \$64,771,337, inclusive of the contingency as may be required to allow for any additional work and unforeseen site conditions, allowable pricing adjustments under the contract, additional spare parts as needed during the initial term, and the development of integration to the future fare collection application. Prior to exercising the two, four-year OTR terms, a subsequent resolution will be presented to the Board for approval.

Department	Allocation	Program	Adopted Budget	Funding Source	Contract Manager
DTPW	\$64,771,337	2000004398 New Fare Collection System	FY24-25 Adopted Budget & Multi-Year Capital Plan; Volume 2, Page 189	PTP Funds / DTPW Operating Funds	Alonzo Joseph
Total	\$64,771,337				

This item is placed for Board review pursuant to Miami-Dade County Code Section 29-124(f). The Board may only consider this item if the Citizens' Independent Transportation Trust (CITT) has forwarded a recommendation to the Board. If the CITT has not forwarded a recommendation and 45 days have not elapsed since the issuance of this recommendation, a withdrawal of this item will be requested. Of the total amount requested, \$44,720,435 is PTP funds and \$20,050,902 is DTPW Operating.

Track Record/Monitor

Vanessa Stroman of the Strategic Procurement Department (SPD) is the Procurement Contracting Manager. Alonzo Joseph of DTPW is the Chief of Contracts and Procurement.

Delegated Authority

If this item is approved, the County Mayor or County Mayor's designee will have the authority to execute the agreement and exercise all provisions of the contract, including any cancellation or extension provisions, pursuant to Section 2-8.1 of the County Code and Implementing Order 3-38.

Vendor Recommended for Award

Pursuant to Resolution No. R-477-18, the highest-ranked proposer is recommended in accordance with the method of award per the solicitation and is non-local.

Vendor	Principal Address	Local Address**	Number of Employee Residents	Principal
			1) Miami-Dade 2) Percentage*	
Genfare, LLC	800 Arthur Avenue Elk Grove, IL	None	0	John Nurkin
			0%	

*Provided pursuant to Resolution No. R-1011-15. Percentage of employee residents is the percentage of vendor's employees who reside in Miami-Dade County as compared to the vendor's total workforce.

**The contract requires Genfare to provide two on-site technicians for the term of the contract, which will be hired upon award. Accordingly, the County Code's First Source Hiring Referral Program is applicable, and as such, the relevant program provisions are included in the contract.

Vendors Not Recommended for Award

Vendor	Local Address	Reason for Not Recommending
INIT Innovations in Transportation, Inc.	No	Evaluation Scores/Ranking
Scheidt & Bachmann USA, Inc.	No	
Vix Technology (USA), Inc.	No	

Due Diligence

Pursuant to Resolution No. R-187-12, due diligence was conducted in accordance with the Strategic Procurement Department's Procurement Guidelines to determine vendor responsibility, including verifying corporate status and that there are no performance and compliance issues through various vendor responsibility lists and a keyword internet search. The lists that were referenced included convicted vendors,

debarred vendors, delinquent contractors, suspended vendors, and federal excluded parties. There were no adverse findings relating to vendor responsibility.

Pursuant to Resolution No. R-140-15, prior to re-procurement, a full review of the scope of services was conducted to ensure the replacement contract reflects the County's current needs. The review included conducting market research, posting a draft solicitation for industry comment, and holding meetings and drafting sessions with the user department. The scope of work was amended to remove the provision of Fare Collection software, which will be procured under a separate solicitation.

Applicable Ordinances and Contract Measures

- The two percent User Access Program Fee was not included in the contract.
- A 2.90% Small Business Enterprise Construction subcontractor goal and Local Preference were applied.
- The Responsible Wages Ordinance applies.



Jimmy Morales
Chief Operating Officer



MEMORANDUM

(Revised)

TO: Honorable Chairman Oliver G. Gilbert, III
and Members, Board of County Commissioners

DATE: November 20, 2024

FROM: 
Glen Bonzon-Keenan
County Attorney

SUBJECT: Agenda Item No. 8(N)(1)

Please note any items checked.

- ☐ "3-Day Rule" for committees applicable if raised
- ☐ 6 weeks required between first reading and public hearing
- ☐ 4 weeks notification to municipal officials required prior to public hearing
- ☐ Decreases revenues or increases expenditures without balancing budget
- ☐ Budget required
- ☐ Statement of fiscal impact required
- ☐ Statement of social equity required
- ☐ Ordinance creating a new board requires detailed County Mayor's report for public hearing
- ☐ No committee review
- ☒ Applicable legislation requires more than a majority vote (i.e., 2/3's present ☒, 2/3 membership ☐, 3/5's ☐, unanimous ☐, majority plus one ☐, CDMP 7 vote requirement per 2-116.1(3)(h) or (4)(c) ☐, CDMP 2/3 vote requirement per 2-116.1(3) (h) or (4)(c) ☐, CDMP 9 vote requirement per 2-116.1(4)(c) (2) ☐) to approve
- ☒ Current information regarding funding source, index code and available balance, and available capacity (if debt is contemplated) required

Approved _____ Mayor
Veto _____
Override _____

Agenda Item No. 8(N)(1)
11-20-24

RESOLUTION NO. R-1023-24

RESOLUTION AUTHORIZING REJECTION OF ALL PROPOSALS RECEIVED IN RESPONSE TO A COMPETITIVE REQUEST FOR PROPOSALS AND AWARD OF A COMPETITIVE DESIGNATED PURCHASE PURSUANT TO SECTION 2-8.1(B)(3) OF THE COUNTY CODE BY A TWO-THIRDS VOTE OF THE BOARD MEMBERS PRESENT; AUTHORIZING AWARD OF CONTRACT NO. EVN0001090 IN AN AMOUNT NOT TO EXCEED \$64,771,337.00 OR THE PURCHASE OF FARE COLLECTION EQUIPMENT FOR AN INITIAL SIX-YEAR TERM; AUTHORIZING THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE TO EXECUTE SAME FOR AND ON BEHALF OF MIAMI-DADE COUNTY AND TO EXERCISE ALL PROVISIONS OF THE CONTRACT, INCLUDING ANY CANCELLATION OR EXTENSIONS, PURSUANT TO SECTION 2-8.1 OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA AND IMPLEMENTING ORDER 3-38; AND AUTHORIZING THE USE OF \$44,720,435.00 OF CHARTER COUNTY TRANSPORTATION SURTAX FUNDS FOR THIS PROJECT WHICH WAS ADDED TO THE PEOPLE'S TRANSPORTATION PLAN 2024-2028 FIVE-YEAR IMPLEMENTATION PLAN

WHEREAS, this Board desires to accomplish the purposes outlined in the accompanying memorandum, a copy of which is incorporated herein by reference,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that:

Section 1. This Board finds it is in the best interest of Miami-Dade County to reject all proposals received and award Contract No. EVN0001090 to Genfare, LLC as a competitive designated purchase, in substantially the form attached and made a part hereof, for the purchase of fare collection equipment in a total amount not to exceed \$64,771,337.00 for the initial six-year

term for the Department of Transportation and Public Works. Due to its volume, the appendices to the contract are not attached, but a complete set of the contract, including all appendices, is available upon request from the Strategic Procurement Department.

Section 2. This Board authorizes the use of \$44,720,435.00 of Charter County Transportation Surtax Funds for the Department of Transportation and Public Works included in the FY25 Adopted Capital Budget and included in the 2024-2028 Five-Year Implementation Plan of the People’s Transportation Plan.

Section 3. This Board authorizes the County Mayor or County Mayor’s designee to exercise all provisions of the contract, including any cancellation and extension provisions pursuant to section 2-8.1 of the Code of Miami-Dade County, Florida and Implementing Order 3-38.

The foregoing resolution was offered by Commissioner **Eileen Higgins** , who moved its adoption. The motion was seconded by Commissioner **Raquel A. Regalado** and upon being put to a vote, the vote was as follows:

Anthony Rodríguez, Chairman	aye		
Kionne L. McGhee, Vice Chairman	aye		
Marleine Bastien	aye	Juan Carlos Bermudez	aye
Kevin Marino Cabrera	aye	Sen. René García	aye
Oliver G. Gilbert, III	aye	Roberto J. Gonzalez	aye
Keon Hardemon	aye	Danielle Cohen Higgins	aye
Eileen Higgins	aye	Raquel A. Regalado	aye
Micky Steinberg	aye		

The Chairperson thereupon declared this resolution duly passed and adopted this 20th day of November, 2024. This resolution shall become effective upon the earlier of (1) 10 days after the date of its adoption unless vetoed by the County Mayor, and if vetoed, shall become effective only upon an override by this Board, or (2) approval by the County Mayor of this resolution and the filing of this approval with the Clerk of the Board.



MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

JUAN FERNANDEZ-BARQUIN, CLERK

By: Basia Pruna
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency.

A handwritten signature in dark ink, appearing to read "B. Libhaber", is written over a horizontal line.

Bruce Libhaber

FARE COLLECTION EQUIPMENT
CONTRACT NO. EVN0001090

THIS AGREEMENT for the provision of fare collection equipment, made and entered into as of this _____ day of _____, 2024 by and between Genfare, LLC , a limited liability company organized and existing under the laws of the State of Delaware, having its principal office at 800 Arthur Avenue, Elk Grove Village, Illinois 60007 (the "Contractor"), and Miami-Dade County, a political subdivision of the State of Florida, having its principal office at 111 NW 1st Street, Miami, Florida 33128 (the "County") (collectively, the "Parties").

WITNESSETH:

WHEREAS, the Contractor has offered to provide fare collection equipment, on a non-exclusive basis, that shall conform to the Scope of Work, Miami-Dade County's Request for Proposal ("RFP") No. EVN0001090 and all associated addenda and attachments, as applicable, and the requirements of this Agreement; and

WHEREAS, the Contractor has submitted a written proposal dated November 16, 2023 (the "Contractor's Proposal"), which is attached as Appendix C; and

WHEREAS, the County desires to procure from the Contractor such fare collection equipment and associated services for the County, in accordance with the terms and conditions of this Agreement (the "Project");

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APPENDICES:

- A TECHNICAL SPECIFICATION
- B MILESTONE PAYMENT SCHEDULE
- B-1 MILESTONE COMPLETION REPORT
- B-2 PRICE SCHEDULE
- C GENFARE PROPOSAL
- D GENFARE SUBSCRIPTION AND SERVICES AGREEMENT
- E. IT SECURITY MATRIX
- F COUNTY/CONTRACTOR QUESTIONS, COMMENTS, RESPONSES
- G CONTRACT DATA REQUIREMENTS LIST

In consideration of the mutual covenants and agreements herein contained, the Parties hereto agree as follows:

ARTICLE 1 DEFINITIONS

The following words and expressions used in this Agreement shall be construed as follows, except when it is clear from the context that another meaning is intended:

1. The words "Article" or "Articles" to mean the terms and conditions delineated in this Agreement.
2. The word "Contract" or "Agreement" to mean collectively the 1) the Agreement (Including Appendices), 2) Technical Specification (Including Exhibits), 3) the Contractor's Proposal, Price Schedule, and all other appendices and attachments hereto.
3. The words "Contract Manager" to mean the Chief Procurement Officer, Strategic Procurement Department, or the duly authorized representative designated to manage the Contract.
4. The word "Contractor" to mean Genfare, LLC and its permitted successors.
5. The words "County Data" to mean all data provided by the County or users of the Fare Collection Equipment, whether proprietary or nonproprietary to the County, that may be entered into or stored on or within the Fare Collection Equipment, or Licensed Software, or Developed Works.
6. The word "Days" to mean calendar days.
7. The word "Deliverables" to mean all documentation and any items of any nature submitted by the Contractor to the Project Manager for review and Acceptance pursuant to the terms of this Agreement.
8. The words "Developed Works" to mean all rights, title, and interest in and to certain software component(s) and services developed by the Contractor and its Subcontractors that are not commercially available as of the Effective Date of the Agreement, which are required to meet the requirements of the Scope of Work, and include interfaces or integrations, specifically for the County.
9. The words "Governmental Approvals" to mean applicable written permits, authorizations, and approvals issued by any office of Miami-Dade County, State of Florida, Federal Government, or any other government entity with jurisdiction within the area of the Work.
10. The words "Heightened Security Review" to mean any and all security screening conducted on County employees with access to Cybersecurity Products or any other additional security screenings or reviews the County Mayor or County Mayor's designee determines necessary to protect the security of the County's information technology networks, devices, programs, and data.
11. The words "Joint Venture" to mean an association of two or more persons, partnerships, corporations, or other business entities under a contractual agreement to conduct a specific business enterprise for a specified period with both sharing profits and losses.
12. The words "Licensed Software" to mean the software component(s) and services provided pursuant to the Contract, and which includes Developed Works as such are developed and provided to County.
13. The word "Phase" to mean the project breakdown as delineated in Appendix A, Technical Specifications, *Introduction and Scope*.
14. The words "Produced in the United States" to mean shall mean with respect to Cybersecurity Products, a product for which all development and production occurs in the United States.
15. The words "Project Manager" to mean the County Mayor or the duly authorized representative designated to manage the Project.

16. The words "Scope of Work" to mean the document appended hereto as Appendix A, Technical Specification, which details the Work to be performed by the Contractor.
17. The words "Work" or "Services" to mean the provision of the Contractor's obligations in accordance with the Scope of Work.
18. The word "Subcontractor" or "Subconsultant" to mean any person, entity, firm, or corporation, other than the employees of the Contractor, who furnishes labor and/or materials, in connection with the Work, whether directly or indirectly, on behalf and/or under the direction of the Contractor and whether or not in privity of Contract with the Contractor.
19. The word "Work" to mean all matters and things required to be done by the Contractor in accordance with the provisions of this Contract.

ARTICLE 2 ORDER OF PRECEDENCE

If there is a conflict between or among the provisions of the Contract, the order of precedence is as follows: 1) the Agreement (including appendices attached thereto); 2) Scope of Work (including exhibits attached thereto); and 3) Contractor's proposal.

ARTICLE 3 RULES OF INTERPRETATION

1. References to a specified Article, section or schedule shall be construed as reference to that specified Article, or section of, or schedule to this Agreement unless otherwise indicated.
2. Reference to any agreement or other instrument shall be deemed to include such agreement or other instrument as such agreement or other instrument may, from time to time, be modified, amended, supplemented, or restated in accordance with its terms.
3. The terms "hereof", "herein", "hereinafter", "hereby", "herewith", "hereto", and "hereunder" shall be deemed to refer to this Agreement.
4. The terms "directed", "required", "permitted", "ordered", "designated", "selected", "prescribed" or words of like import to mean respectively, the direction, requirement, permission, order, designation, selection or prescription of the Project Manager.
5. The terms "approved", "acceptable", "satisfactory", "equal", "necessary", or words of like import to mean respectively, approved by, or acceptable or satisfactory to, equal or necessary in the opinion of the Project Manager.
6. The titles, headings, captions, and arrangements used in these Terms and Conditions are for convenience only and shall not be deemed to limit, amplify, or modify the terms of this Contract, nor affect the meaning thereof.

ARTICLE 4 NATURE OF THE AGREEMENT

- A. This Agreement incorporates and includes all prior negotiations, correspondence, conversations, agreements, and understandings applicable to the matters contained in this Agreement. The Parties agree that there are no commitments, agreements, or understandings concerning the subject matter of this Agreement that are not contained in this Agreement, and that this Agreement contains the entire agreement between the Parties as to all matters contained herein. Accordingly, it is agreed that no deviation from the terms hereof shall be predicated upon any prior representations or agreements, whether oral or written. It is further agreed that any oral representations or modifications concerning this Agreement shall be of no force or effect, and that this Agreement may be modified, altered, or amended only by a written amendment duly executed by the Parties hereto or their authorized representatives.
- B. The Contractor shall provide the services set forth in the Scope of Work and render full and prompt cooperation with the County in all aspects of the Work performed hereunder.
- C. The Contractor acknowledges that this Agreement requires the performance of all things necessary for or incidental to the effective and complete performance of all Work under this Contract. All things not expressly mentioned in this Agreement but necessary to carrying out its intent are required by this Agreement, and the Contractor shall perform the same as though they were specifically

mentioned, described, and delineated.

- D. The Contractor shall furnish all labor, materials, tools, supplies, and other items required to perform the Work necessary for the completion of this Contract. All Work shall be accomplished at the direction of and to the satisfaction of the Project Manager.
- E. The Contractor acknowledges that the County shall make all policy decisions regarding the Scope of Work. The Contractor agrees to provide input on policy issues in the form of recommendations. The Contractor shall implement all changes in providing services hereunder as a result of a policy change implemented by the County. The Contractor agrees to act in an expeditious and fiscally sound manner in providing the County with input regarding the time and cost to implement said changes and in executing the activities required to implement said changes.

ARTICLE 5 CONTRACT TERM

- A. The Contract shall become effective on the date of on the date identified on the first page of this Agreement and shall continue through the last day of the sixth (6th) year, thereafter. The County, at its sole discretion, may renew this Contract for two (2), four (4)-year terms.
- B. The County may extend this Contract for up to an additional one hundred-eighty (180) calendar days beyond the current Contract period and will notify the Contractor in writing of the extension. This Contract may be extended beyond the initial one hundred-eighty (180) calendar day extension period by mutual agreement between the County and the Contractor, upon approval by the Board of County Commissioners (the "Board"). Pricing for the extended term(s) for any Licensed Software subscription provided pursuant to the terms of Appendix D, shall be the prorated value of the pricing for the term immediately preceding such extension. Notwithstanding the foregoing, to the extent that the County has completed an advanced payment for Licensed Software subscription provided pursuant to the terms of Appendix D, unless otherwise terminated in accordance with the terms of this Contract, the term of the Subscription to the Licensed Software shall continue through the end of the annual period for which payment has been completed and shall survive the expiration of the Contract.

ARTICLE 6 NOTICE TO PROCEED

A Notice to Proceed (NTP) for supply of the equipment, installation, integration, testing, and demonstration of the Work will be provided by the County per Phase as detailed in the Scope of Work after all the Contract Documents are properly completed and executed, approved by the Board of County Commissioners, and administratively executed by the County.

ARTICLE 7 NOTICE REQUIREMENTS

- A. All notices required or permitted under this Agreement shall be in writing and shall be deemed sufficiently served if delivered by: (i) Registered or Certified Mail, with return receipt requested; (ii) personally by a by courier service; (iii) Federal Express Corporation or other nationally recognized carrier to be delivered overnight; or (iv) via facsimile or e-mail (if provided below) with delivery of hard copy pursuant to (i), (ii), or (iii) in this paragraph. Each Party may modify its notice address or "Attn:" by providing written notice.
- B. The addresses for such notice are as follows:

- (1) To the County

- a) to the Project Manager:

- Miami-Dade County
 - Department of Transportation and Public Works
 - Attention: Jose Rodriguez
 - Phone: (786) 479-4154
 - E-mail: jose.rodriquez7@miamidade.gov

- and,

- b) to the Contract Manager:

Miami-Dade County
Strategic Procurement Department
Attention: Chief Procurement Officer
111 N.W. 1st Street, Suite 1375
Miami, FL 33128-1974
Phone: (305) 375-4900
E-mail: cpo@miamidade.gov

(2) To the Contractor

Genfare, LLC
Attention: Contract Manager
800 Arthur Avenue
Elk Grove Village, IL 60007
Phone: 847-593-8855
E-mail: Genfare.sales@spx.com

- C. Either party may at any time designate a different address and/or contact person by giving notice as provided above to the other party. Such notices shall be deemed given upon receipt by the addressee.

ARTICLE 8 PAYMENT FOR SERVICES/AMOUNT OBLIGATED

- A. The compensation for all Work/Services performed under this Contract, including all costs associated with such Work, shall be paid in the amounts stipulated by Appendix B-2, *Price Schedule*. The payments terms of Appendix B, *Milestone Payment Schedule*, shall apply. The County shall have no obligation to pay the Contractor any additional sum in excess of this amount, except for a change and/or modification to the Contract, which is approved and executed in writing by the County and the Contractor. All Work undertaken by the Contractor before the County's approval of this Contract shall be at the Contractor's risk and expense.
- B. Prices for materials and equipment shall remain firm and fixed for a period of twelve (12) months following the effective date of the Contract, pursuant to Appendix B-2, *Price Schedule*, (the "Fixed Pricing Period"). Following the Fixed Pricing Period, the Contractor shall receive annual price adjustments at fixed rates as stipulated by Appendix B-2, *Price Schedule*, except that the escalator for pricing of spare parts shall be 3% annually. No other adjustments during the Contract term to pricing is due under the terms of this provision, except as may be modified by a written contract amendment, in accordance with the Extra Work provisions of this Agreement. Adjustments to pricing for products and services for an extended term shall be amended in accordance with Article 9(C), *Pricing for Extended Term(s)*.
- C. Prices for Licensed Software and associated services for implementation of such Licensed Software shall be fixed and firm at the amounts stipulated by Appendix B-2, *Price Schedule*. Payments shall be based on payment milestones as described in Appendix B, *Milestone Payment Schedule*, without regard to the hours worked on such milestones by the Contractor. The County shall have no obligation to pay the Contractor for any additional sum in excess of the Amounts in Appendix B-2, *Price Schedule*, which may be amended via the Extra Work provisions of Article 40. Adjustments to pricing for Licensed Software and associated services for an extended term shall be amended in accordance with Article 9(C), *Pricing for Extended Term(s)*.
- D. With respect to travel costs and travel-related expenses, if applicable, the Contractor agrees to adhere to Section 112.061 of the Florida Statutes as they pertain to out-of-pocket expenses, including employee lodging, transportation, per diem, and all miscellaneous cost and fees. The County shall not be liable for any such expenses that have not been approved in advance, in writing, by the County. Notwithstanding the foregoing, it is agreed that the costs outlined in Appendix B, *Milestone Payment Schedule*, are inclusive of travel costs and travel-related expenses. Accordingly, such costs shall not be billed separately by the Contractor.

ARTICLE 9 PRICING

- A. Unit Prices

The unit prices set forth by Appendix B-2, *Price Schedule*, shall be the basis for the contract price for all units. Payment of each unit price will be based on actual measured quantities of the Work, or planned quantities as stipulated in Appendix A, *Technical Specification*, except where the unit is a lump sum, in which case payment will be based upon the lump sum price as stated upon the completion of the associated work.

B. Price Adjustments

The Contractor's representative price(s) for Item Nos. C1, 28(A); C2, 39(A), and C3, 29(A), of the Price Schedule, Appendix B-2, as a percent of installation costs, shall be inclusive of all direct wages, benefits, and other related amounts.

The initial contract prices for the labor portion of installation costs shall remain fixed and firm for a period of no less than twelve (12) months from the Contract's effective date. Thereafter, prices for labor may be adjusted, in accordance with the provisions below. The Contractor shall not be entitled to adjustment to the amounts payable under the contract for its labor, except as herein defined by this article.

Eleven (11) months into the contract, and every twelve (12) months thereafter, the County and the Contractor may negotiate price adjustments (decreases or increases). In the event of an adjustment down from a previous adjusted increase, under no circumstance will the labor amounts be decreased below the amounts approved at the time of award. Adjustments shall be based on changes in the Consumer Price Index for All Urban Consumers (CPI-U), Series ID: CUURS35BSA0, CUUSS35BSA0, Titled: All items in Miami-Fort Lauderdale-West Palm Beach, FL, all urban consumers, not seasonally adjusted, as published by the U.S. Bureau of Labor Statistics (BLS). The Base CPI Index for adjustments shall be the Index published by the BLS for the referenced CPI Series in the month and year when the solicitation was opened, and the Base Price shall be the contract's initial price(s).

The period used to calculate the initial adjustment will begin in the month when the solicitation was opened and will include as many months as have been published by the BLS at the time of the Contractor request for an adjustment. If granted, the initial price adjustment should be effective in the contract's thirteenth (13th) month.

Example (Initial Adjustment):

Solicitation's Opening Date: January 7, 2022

Initial Contract Price (Base Price):		\$100.00
	Current CPI Index (March 2023)	232.9450
Less:	Base CPI Index (January 2022)	<u>229.8150</u>
Equals:	Index Point Change	3.1300
	Index Point Change	3.1300
Divided by:	Base CPI Index	229.8150
Equals:		0.01362
Multiplied by 100:		1.3620
Equals:	Percent Change	1.37%
Percent Change:		1.37%
Multiplied by Price:		\$100.00
Applicable CPI Increase:		\$1.37
Adjusted Price According to CPI:		\$101.37

The Base Price and the Base CPI Index shall remain constant throughout the contract term and shall be the basis of all adjustments.

Example (2nd Adjustment):

Current CPI Index (March 2024) 240.1000

Less:	Base CPI Index (January 2022)	<u>229.8150</u>
Equals:	Index Point Change	10.2850
	Index Point Change	10.2850
Divided by:	Base CPI	229.8150
Equals:		0.04475
Multiplied by 100:		4.4753
Equals:	Percent Change	4.48%
Percent Change:		4.48%
Multiplied by Base Price:		\$100.00
Applicable CPI Increase:		\$4.48
Adjusted Price According to CPI:		\$104.48

Should the referenced index be discontinued by the BLS, or should its data be unavailable, the County will use the CPI for All Urban Consumers (CPI-U), Series ID: CUUR0300SA0, CUUS0300SA0, Titled: All items in South urban, all urban consumers, not seasonally adjusted. Price adjustments may also be negotiated based on other indexes published by the BLS (CPI or PPI) or other economic factors if these economic indicators are evidently proven to have directly affected the contract prices during the contract period.

Price adjustments must be requested by the Contractor. The County will review the Contractor's requests for price adjustment and will grant the price adjustment as requested, negotiate with the Contractor to determine the appropriate price adjustment, or reject the request in its best interest. If the County reasonably elects to reject the Contractor's request for an adjustment, the Contractor is not excused from continuing to perform under the Contract. Failure of the Contractor to perform under these circumstances may result in the Contractor being deemed in breach of contract and the County terminating its Contract with the Contractor in accordance with Article 68, *Termination and Suspension*, of the Agreement and Article 69, *Event of Default*.

Adjusted prices shall remain firm for at least twelve (12) months; thereafter, prices may be readjusted as prescribed above.

Any price adjustments authorized by the County shall be formalized by a written agreement to the adjusted payment amounts in the form of a Contract Modification or letter agreement, originated and published by the Strategic Procurement Department, and signed by the Contractor. Under no circumstances should the Contractor invoice the County a price that is higher than the price authorized through the contract award or an approved Contract Modification.

C. Pricing for Options to Renew

During the last two (2) months prior to the expiration of the Contract term whereby there is an available Option to Renew ("OTR") or approved extended term via an executed modification, the Contractor or the County shall upon the written request of either party, negotiate in good faith to determine an adjustment, if appropriate, up or down in the prices for the applicable products and services set forth in Appendix B-2, *Price Schedule*, for the extended term. The parties may remove existing or add new products and services as required to support the performance of the Work for the extended term. Such negotiations shall be concluded not less than fifteen (15) days prior to the Contract expiration date. The maximum price increase in any extended term, not to exceed 4 years, shall not be greater than 3% of the previous contract term, as set forth in Appendix B-2 for the first year. Annual price increases during an extended term for subsequent years shall be at a rate not to exceed 3%.

ARTICLE 10 VARIABLE QUANTITIES

The quantity of unit-priced items in this contract are estimated and may vary, as an increase or decrease to the number identified by Appendix B-2, *Price Schedule*, provided that County gives Contractor timely notice of such increase or decrease. For increases in the number of units, an impact to the Project Schedule shall be identified and substantiated by the Contractor and a reasonable extension shall be granted. With respect to any unit price item as to which an estimated quantity is set forth in payment provisions of the Contract, such unit price shall apply regardless of the actual quantity of such item ultimately utilized in, or required by, the Work; except that, if

the actual quantity for a unit price item differs from the estimated quantity in the payment provisions by more than fifteen percent (15%), then upon request by the Contractor or determination by the County, the County shall review whether application of the Unit Price would cause a substantial inequity to either party, and, if so, the Unit Price for such item will be equitably adjusted, upward or downward, as substantiated and determined to be fair and reasonable between the Parties.

ARTICLE 11 METHOD AND TIMES OF PAYMENT

- A. The Contractor may bill the County in accordance with the payment schedule established in Appendix B, *Payment Milestone Schedule*, upon Acceptance issued in accordance with Article 90. All invoices shall be taken from the books of account kept by the Contractor, shall be supported by copies of payroll distribution, receipt bills or other documents reasonably required by the County, shall show the County's contract number, and shall have a unique invoice number assigned by the Contractor. It is the policy of Miami-Dade County that payment for all purchases by County agencies and the Public Health Trust (the "Trust"), shall be made in a timely manner and that interest payments be made on late payments. All firms, including Small Business Enterprises, providing goods and services to the County, shall receive payment to maintain sufficient cash flow. In accordance with Section 218.74 of the Florida Statutes, and Section 2-8.1.4 of the Code of Miami-Dade County (the "Code"), the time at which payment shall be due from the County or Trust shall be forty-five (45) calendar days from receipt of a proper invoice. Billings from prime contractors under services and goods contracts with the County or Trust, that are Small Business Enterprise contract set-aside, bid preference or contain a subcontractor goal, shall be promptly reviewed and payment made by the County or Trust on those amounts not under dispute within fourteen (14) calendar days of receipt of such billing by the County or the Trust pursuant to Sections 2-8.1.1.1.1 and 2-8.1.1.1.2 of the Code. All payments due from the County or Trust, and not made within the time specified by this section shall bear interest from thirty (30) days after the due date at the rate of one percent (1%) per month on the unpaid balance. Further, proceedings to resolve disputes regarding improper invoices shall be decided in accordance with Section 2-8.1.4(6) of the code.
- B. In accordance with Miami-Dade County Implementing Order No. 3-9, Accounts Receivable Adjustments, if money is owed by the Contractor to the County, whether under this Contract or for any other purpose, the County reserves the right to retain such amount from payment due by County to the Contractor under this Contract. Such retained amount shall be applied to the amount owed by the Contractor to the County. The Contractor shall have no further claim to such retained amounts which shall be deemed full accord and satisfaction of the amount due by the County to the Contractor for the applicable payment due herein.
- C. Invoices and associated back-up documentation shall be submitted electronically the Contractor to the County as follows:
- Electronic submission to invsbup@miamidade.gov

Invoice shall include a Bill to Address, which is the County department being invoiced for the services as listed in the associated purchase order.

The County may at any time designate a different address and/or contact person by giving written notice to the other party.

ARTICLE 12 GRANT OF LICENSE

- A. Contractor shall own all rights, title, and interest in and to the Licensed Software and the related source code including copyright, trade secret, patent, trademark, and other proprietary rights as well as all customizations, enhancements, modifications, improvement, derivations, or other variations thereof. This Agreement does not transfer to the County under any circumstances any of the Contractor's ownership rights in the Licensed Software. Any Licensed Software, software maintenance, subscription services (i.e. SaaS or hosting) and/or related services that may be included in or required for the goods or services provided under this Agreement, shall be provided to County pursuant to the terms included as Appendix D, *Genfare Subscription and Services Agreement*.
- B. Ownership of County Data. The County shall own all rights, title, and interested in and to any County Data. The Contractor shall not sell or otherwise distribute the County Data without expressed written consent of the County, except to the extent required under Article 75, *Proprietary Rights*. Upon expiration of this Agreement, the Contractor shall provide all County Data to the County in a mutually agreed upon format within ninety (90) days.

- C. License. The Contractor hereby grants to the County and its full-time, part-time or contract employees a limited, nonexclusive, non-sublicenseable and non-transferable license for the term of the Agreement to access and use, solely in object code form, the Licensed Software for an unlimited number of County-defined concurrent end user accounts to Licensed Software, as may be further expanded via written amendment in accordance with this Agreement.
- D. Use of License. The Licensed Software is provided to the County solely for the County's governmental and business purposes, to the extent such purposes are described in this Agreement, and in compliance with applicable laws and regulations, including without limitation laws and regulations applying to privacy and personal information. County is solely responsible for ensuring that only authorized personnel have access to the Licensed Software. To the extent a sublicense is necessary in connection with making any functionality provided in the Scope of Services for the Solution available to the County, the Contractor will also provide for sublicenses to enable the County to fully utilize the Solution in accordance with the Agreement.
- E. License Restrictions. County will not and will not attempt to: (a) reverse engineer, decompile, disassemble, or otherwise attempt to derive the source code or structure of the software used in the Licensed Software; (b) provide, lease or lend the Licensed Software to any third party except as expressly authorized hereunder; (c) remove any proprietary notices, trademarks, or labels displayed on the Licensed Software; (d) create a derivative work of any part of the Licensed Software; or (e) use the Licensed Software for any unlawful purpose.
- F. Subscription-based Licensed Software. Contractor is supplying portions of the Licensed Software via Subscription-based license model and acting as an application service provider supplying the Solution to the County as a hosted service via the internet. Such Subscription-based License Software is specifically identified and the terms of which are subject to the Contractor's standard software services agreement attached as Appendix D.
- G. Perpetual Licensed Software. No perpetual licensed software is being provided by Contractor as part of this Agreement.
- H. In addition to the termination provisions contained herein, the licenses granted in Article 12 of this Agreement may be terminated, unless otherwise remedied by the County, if: (a) the Work, Services, or Licensed Software is sold or transferred to a third party or moved outside of the United States; (b) the Licensed Software is no longer used in connection with the Services or the Work; (c) County becomes insolvent or bankrupt or ceases to do business, or (ii) County breaches its obligations under the provisions of Article 12(E) of this Agreement.
- I. Contractor may suspend or limit the County's access to the Licensed Software provided that Contractor has a reasonable belief that the continued provision of the Licensed Software puts Contractor, County, or its systems at any operational or security risk provided that such limitation or suspension is limited to the time period reasonably necessary to mitigate such risk. During such period of time that access or use of the Licensed Software is limited or suspended, the Contractor shall not delete or alter any data contained in the Solution, and shall, upon request of the County, allow the County restricted access to the Licensed Software solely for the purpose of data retrieval or export as a result of a Sunshine Law request or shall provide such data to the County as is necessary to complete such request.
- J. Contractor's warranty and support obligations regarding the Licensed Software shall not apply to the extent the nonconformity results from: (a) modifications to the Licensed Software by anyone other than Contractor or its subcontractors, or by the County to the extent permitted by the Agreement; (b) use of the Licensed Software contrary to the terms of this Agreement or the instructions in any related materials; or (c) the combination of the Licensed Software with any third party hardware or software not expressly recommended or approved by Contractor. If Contractor determines that a malfunction or error is due to the hardware or software of County or a third party, Contractor will so inform County, and it will be County's responsibility to obtain and pay for any repairs, updates or modifications required.
- K. Contractor and its licensors are not responsible for: (i) the accuracy or integrity of any data submitted by County or its Permitted Users, as defined in Appendix D, (ii) the performance of County or its Permitted User's equipment, unless such equipment is provided by and under warranty by Contractor, (iii) delivery of services or connectivity provided by third parties to Customer and its Permitted Users, even if such third parties were identified by Contractor, or (iv) any downtime, loss or corruption of data that occurs as a result of transmitting or receiving data via the Internet.

ARTICLE 13 INDEMNIFICATION AND INSURANCE

- A. The Contractor shall indemnify and hold harmless the County and its officers, employees, agents and instrumentalities from any and all liability, losses or damages, including attorneys' fees and costs of defense, which the County or its officers, employees, agents or instrumentalities may incur as a result of claims, demands, suits, causes of actions or proceedings of any kind or nature from a third party arising out of, relating to or resulting from the performance of this Agreement related to gross negligence, or willful misconduct of the Contractor or its employees, agents, servants, partners principals or subcontractors. The Contractor shall pay all claims and losses in connection therewith and shall investigate and defend all claims, suits or actions of any kind or nature in the name of the County, where applicable, including appellate proceedings, and shall pay all costs, judgments, and attorney's fees which may issue thereon. The Contractor expressly understands and agrees that any insurance protection required by this Agreement or otherwise provided by the Contractor shall in no way limit the responsibility to indemnify, keep and save harmless and defend the County or its officers, employees, agents, and instrumentalities as herein provided.
- B. Upon County's notification, the Contractor shall furnish to the Strategic Procurement Department, certificate(s) of insurance that indicate that insurance coverage has been obtained, which meets the requirements as outlined below:
1. Worker's Compensation Insurance for all employees of the Contractor as required by Florida Statute 440.
 2. Commercial General Liability in an amount not less than \$1,000,000 per occurrence, and \$2,000,000 in the aggregate not to exclude Products & Completed Operations. Miami-Dade County must be shown as an additional insured with respect to this coverage.
 3. Automobile Liability Insurance covering all owned, non-owned and hired vehicles used in connection with the work, in an amount not less than \$1,000,000 combined single limit per occurrence for bodily injury and property damage.
 4. Professional Liability Insurance in an amount not less than \$1,000,000 per claim and in the aggregate.
 5. Cyber Liability Insurance to include data breach and third-party liability, in an amount not less than \$1,000,000 per claim and in the aggregate.
- C. All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

The company must be rated no less than "A-" as to management, and no less than "Class VII" as to financial strength, by Best's Insurance Guide, published by A.M. Best Company, Oldwick, New Jersey, or its equivalent, subject to the approval of the County Risk Management Division.

OR

The company must hold a valid Florida Certificate of Authority as shown in the latest "List of All Insurance Companies Authorized or Approved to Do Business in Florida", issued by the State of Florida Department of Financial Services and are a member of the Florida Guaranty Fund.

- D. The mailing address of Miami-Dade County as the certificate holder must appear on the certificate of insurance as follows:

Miami-Dade County
111 NW 1st Street
Suite 2340
Miami, Florida 33128-1974

- E. Compliance with the foregoing requirements shall not relieve the Contractor of this liability and obligation under this section or under any other section in this Agreement.
- F. Award of this Contract is contingent upon the receipt of the insurance documents, as required, within ten (10) business days. If the certificate of insurance is received within the specified timeframe but not in the manner prescribed in this Agreement, the Contractor shall have an additional five business days to submit a corrected certificate to the County. If the Contractor fails to submit the

required insurance documents in the manner prescribed in this Agreement within fifteen (15) business days, the Contractor shall be in default of the contractual terms and conditions and award of the Contract may be rescinded, unless such timeframe for submission has been extended by the County.

- G. The Contractor shall assure that the certificate of insurance required in conjunction with this section remain in full force for the term of the Contract, including any renewal or extension periods that may be exercised by the County. If the certificate of insurance is scheduled to expire during the term of the Contract, the Contractor shall submit new or renewed certificate of insurance to the County before such expiration. If expired certificate of insurance is/are not replaced or renewed to cover the Contract period, the County may suspend the Contract until the new or renewed certificate is/are received by the County in the manner prescribed herein. If such suspension exceeds thirty (30) calendar days, the County may, at its sole discretion, terminate the Contract for cause and the Contractor shall be responsible for all direct and indirect costs associated with such termination.

ARTICLE 14 PERFORMANCE AND PAYMENT BOND

A minimum of ten (10) days' before Contractor commences any installation Work in any phase, as identified in Appendix A, which shall be generally regarded as contract work, or any materials are purchased from a supplier, Contractor shall execute, deliver to the County and record in the public records of the County, a performance bond and a payment bond equal to the total cost of the installation Work to take place on County-owned property, per Phase, if applicable. Each payment and performance bond shall be in compliance with all applicable laws.

Alternatively to the payment and performance bond described above, the Contractor may provide County with an alternate form of security ("Alternative Security") which meets the following specifications:

- A. The Contractor shall provide to County either a certified check that the County may deposit in a County-controlled bank account or an Irrevocable Letter of Credit, in accordance with Article 15, *Irrevocable Letter of Credit*, either of which shall be in a form and for an amount that is acceptable to the County and which shall remain in place until evidence reasonably satisfactory to the County is submitted to demonstrate that all contractors performing work and/or making improvements on County-owned property and all suppliers of materials have been paid and the Contractor has obtained Completion of installation; and
- B. Require that each prime contractor hired by the Contractor to perform work and/or make improvements on County-owned property shall provide a Performance Bond with a surety insurer authorized to do business in the State of Florida as a surety in an amount not less than 100% of his/her/its respective contract in a form acceptable to the County to insure that his/her Work shall be completed by the contractor or, on its default his/her surety, and shall name the County as an additional obligee; and
- C. Require that each prime contractor hired by the Contractor to perform work and/or make improvements on County-owned property shall provide a Payment Bond with a surety insurer authorized to do business in the State of Florida as a surety in an amount not less than 100% of his/her/its respective contract in a form acceptable to the County to secure the completion of the development free from all liens and claims of sub-contractors, mechanics, laborers and material men and shall name the County as an additional obligee and payee.

If the Contractor provides the Alternative Security, the Contractor shall also comply with the following obligations:

- A. The Contractor shall obtain a Conditional Release of Lien from each of its prime contractor(s) at the time each progress payment is made; and
- B. The Contractor shall obtain an Unconditional Release of Lien from each of its prime contractor(s) within five (5) business days after payment is made.

In the event the Contractor's contractor(s) claim non-payment(s), and/or, fail to timely provide Unconditional Releases of Lien within the timeframe stipulated under these terms, the Contractor reserves the right but not the obligation to:

- A. Reduce the amount(s) in question from the cash deposit(s) or security posted until the claim(s) is/are liquidated;

or;

- B. Appropriate funds for such payment(s) from any cash deposit(s) or security posted and make payment(s) directly to the claimant(s).

In either case, the Contractor shall within ten (10) business days of the County's notification deposit an amount equal to the reduced/dispensed amount in the County's escrow account or increase the irrevocable letter of credit so as to replenish the original amount of the cash deposit(s) or security posted.

All bonds provided by the Contractor or its prime contractor(s) must meet the following requirements:

- A. Be obtained from guarantee or surety companies acceptable to the U.S. Government and authorized to do business in the state where the work is to be performed. U.S. Treasury Circular Number 570, published annually in the Federal Register, lists companies approved to act as sureties on bonds securing Government contracts, the maximum underwriting limits on each contract bonded, and the States in which the company is licensed to do business. Use of a company listed in this circular is mandatory. Free copies of the circular may be obtained by writing directly to: U.S. Department of Treasury, Financial Management Service, Surety Bond Branch, 401 14th Street, SW, 2nd Floor, West Wing, Washington, D.C. 20226.
- B. Clearly state the rate of premium and the total amount of premium charged. The current power of attorney for the person who signs for the surety company must be attached to the bond. The effective date of the power of attorney shall not precede the date of the bond. The effective date of the bond(s) shall be prior to the issuance of the NTP. The County may negotiate the amount of the bond(s) depending on the phase of the Project.

Failure by the Contractor to provide the required performance and payment bond(s) or Alternative Security in the manner and within the time specified, or within such extended period as the County may grant based upon reasons determined adequate by the County, shall render the Proposer ineligible for award and the County may retain the ineligible Proposer's bid security.

ARTICLE 15 IRREVOCABLE LETTER OF CREDIT

- A. An Irrevocable Letter of Credit (LOC) will be accepted as a substitution of security for the performance of work, in lieu of providing Payment and Performance Bonds. The Contractor shall, within ten (10) business days after contract award and before the County issues the Notice to Proceed, provide to the County a LOC in the amount of 100% of the estimated value of installation Work per phase. The LOC shall be accessible such that the County may, at its convenience, withdraw funds from the LOC in the event the Contractor fails to execute its payment and performance obligations in a timely manner. The LOC shall be refreshed within five (5) days if drawdowns are made by the County, such that the amount of the LOC is continual at the amount equal to 100% of the cost of installation Work per phase. The LOC shall remain in full force for the contract term that terminates upon Final Completion of Construction, as the term may be extended by the County. On the first anniversary of the effective date and each anniversary date thereafter contained in the Notice to Proceed, the Contractor may cause the amount of the LOC to decrease to reflect 100% of the outstanding amount for Construction.
- B. The LOC shall be in an acceptable form to the County, and shall be issued by a major U.S. commercial bank or a U.S. branch office of a foreign bank, in either case, with a Credit Rating of at least (a) "A-" by S&P and "A3" by Moody's, if such entity is rated by both S&P and Moody's or (b) "A-" by S&P or "A3" by Moody's, if such entity is rated by either S&P or Moody's, but not both. Provisions of the LOC shall not limit, in any way, any liability of the Contractor to the County. The LOC shall be drawn on a financial institution which is federally insured and authorized to do business and with offices in the State of Florida.

ARTICLE 16 MANNER OF PERFORMANCE

- A. The Contractor shall provide the Work described herein in a competent and professional manner satisfactory to the County in accordance with the terms and conditions of this Agreement. The County shall be entitled to a satisfactory performance of all Work described herein and to full and prompt cooperation by the Contractor in all aspects of the Work. At the request of the County, the Contractor shall promptly remove from the Project any Contractor's employee, Subcontractor, or any other person performing Work hereunder. The Contractor agrees that such removal of any of its employees does not require the termination or demotion of any employee by the Contractor.

- B. The Contractor agrees to defend, hold harmless and indemnify the County and shall be liable and responsible for all claims, suits, actions, damages, and costs (including attorneys' fees and court costs) made against the County, occurring on account of, arising from or in connection with the removal and replacement of any Contractor's personnel performing Services hereunder at the behest of the County. Removal and replacement of any Contractor's personnel as used in this article shall not require the termination and/or demotion of such Contractor's personnel.
- C. The Contractor always agrees that it will employ, maintain, and assign to the performance of the Work a sufficient number of competent and qualified professionals and other personnel to meet the requirements to which reference is hereinafter made. The Contractor agrees to adjust its personnel staffing levels or to replace any its personnel if so, directed upon reasonable request from the County, should the County make a determination, in its sole discretion, that said personnel staffing is inappropriate or that any individual is not performing in a manner consistent with the requirements for such a position.
- D. The Contractor warrants and represents that its personnel have the proper skill, training, background, knowledge, experience, rights, authorizations, integrity, character, and licenses as necessary to perform the Work described herein, in a competent and professional manner.
- E. The Contractor shall always cooperate with the County and coordinate its respective work efforts to maintain the progress most effectively and efficiently in performing the Work.
- F. The Contractor shall comply with all provisions of all federal, state, and local laws, statutes, ordinances, and regulations that are applicable to the performance of this Agreement.

ARTICLE 17 RESPONSIBLE WAGES

The provisions of Section 2-11.16 of the Code of Miami-Dade County will apply. The rates paid by the Contractor shall be not less than those contained in the Wage and Benefits Schedule in effect as of Jan. 1 of the year the work is performed for the term of the Contract. Workers must be paid the appropriate base rate and fringe benefits on the Wages and Benefits Schedule for the classification of work actually being performed without regard to skill. If you do not find a wage classification in the Wages and Benefits Schedule that describes the work actually being done, you must contact the Miami-Dade County Internal Services Department, Small Business Development Division for a determination.

A copy of this Code Section may be obtained at www.miamidade.gov. A copy of Responsible Wages may be obtained online at <https://www.miamidade.gov/global/business/smallbusiness/responsible-wages-benefits.page> and is incorporated into the Contract by reference.

ARTICLE 18 SMALL BUSINESS ENTERPRISE PROGRAM

- A. A Small Business Enterprise (SBE) is a business entity certified by Miami-Dade County Internal Services Department, Small Business Development Division (SBD), providing goods or services, which has a valid business tax receipt issued by the County at least one year prior to certification, an actual place of business in Miami-Dade County, not a virtual office, and whose three-year average gross revenues do not exceed the following contracting participation levels:
 - (i) Micro Tier 1 - \$0 to \$750,000;
 - (ii) Micro Tier 2 - \$750,000.01 to \$2,000,000, or a manufacturer with fifty (50) employees or less (goods only), or a wholesaler with fifteen (15) employees or less (goods only), without regard to gross revenues; or
 - (iii) Tier 3 - \$2,000,000.01 to \$5,000,000, or a manufacturer with one hundred (100) employees or less (goods only), or wholesaler with fifty (50) employees or less (goods only), without regard to gross revenues.
- B. Pursuant to Sections 10-33.02 and 2-10.4.01 of the code of Miami-Dade County ("the Code") which governs the procurement of Construction, Architecture and Engineering Services, all privately funded design and or construction with a total value over \$200,000 must comply with the Code, which governs the County's Small Business Enterprise Program. A 2.90% SBE-Con subcontractor goal (based on the following trades: NAICS 237990 Other Heavy and Civil Engineering Construction NAICS 238210 Electrical Contractors and Other Wiring Installation Contractors).
- C. Contractor shall utilize County certified SBEs for the provision of products and/or services related to the Work. The Contractor shall project and appropriate a portion of the annual contract value to sourcing services from certified SBEs. The Contractor may

substitute certified SBEs throughout the duration of the contract, however, the value allocated to small and local business participation shall remain the same. If a certified SBE is not available that is capable of providing the identified items or services, the Contractor may seek an alternate source of supply and the allocated amount shall be transferred to another good or service.

- D. After award, any changes in SBE participation must be approved by SBD. The BMWS is the web-based system that firms must utilize to comply with SBE, Wage and/or Workforce programs, and Subcontractor reporting requirements (<http://mdcsbd.gob2g.com>).
- E. In accordance with Miami-Dade County Administrative Order No. 3-63, the Employ Miami Program applies to this contract. (<https://documents.miamidade.gov/ao-io/AO/AO-03-63.pdf>). In accordance with Miami-Dade County Code Sec. 2-11.17, the Residents First Training and Employment Program applies to this contract (https://library.municode.com/fl/miami-dade-county/codes/code_of_ordinances?nodeId=PTIICOOR_CH2AD_ARTIINGE_S2-11.17REFITREMPR&showChanges=true)

ARTICLE 19 OVERVIEW OF CONTRACTOR RESPONSIBILITIES

- A. Contractor shall complete the Project as specified in a timely manner, in accordance with all industry practices generally accepted as standards of the industry in the State of Florida, in a good and workmanlike manner, free from defects, and in accordance with the Scope of Work. Warranty work is subject to the provisions of Article 50, *Warranty*.
- B. The Contractor shall coordinate the Work performed by its Subcontractors and Suppliers and be fully responsible to the County for all acts and omissions of Subcontractors, Suppliers and their employees. Any provision of the Contract referring to the acts or omissions of the Contractor shall also refer to and include the acts and omissions of all Subcontractors and Suppliers.
- C. If any portion of the subcontracted Work is not performed in accordance with the Contract, or if a Subcontractor or Supplier commits or omits any act that would constitute a breach of the Contract, the Contractor shall cure the breach, and at the direction of the Project Manager, shall replace the Subcontractor or Supplier. The Subcontractor or Supplier shall not be employed again on the Work.
- D. Compliance with Requirements – The Contractor shall provide all materials and undertake all efforts necessary or appropriate (excluding only those materials, services and efforts that the Contract Documents specify will be furnished by the County or other persons) to complete the Project in accordance with the requirements of the Contract Documents, the Schedule, all applicable Laws, all Governmental Approvals, the County-Approved Quality Assurance & Quality Control Plans, Contractor's approved Safety Program (if applicable), and all other applicable safety, environmental and other requirements, taking into account Right-of-Way constraints, if applicable, and other physical limits resulting from constraints affecting the Project, so as to achieve Substantial Completion and Final Acceptance and to perform all required tests by the deadlines specified herein, and otherwise to do everything required by and in accordance with the Contract Documents.
- E. Professional Qualifications – Contractor shall perform the Work under the supervision of persons licensed to practice the applicable function/profession in the State of Florida (if applicable), by personnel who are careful, skilled, experienced and competent in their respective trades or professions, who are professionally qualified to perform the Work in accordance with the Contract, and who shall assume professional responsibility for the accuracy and completeness of the Work prepared or checked by them.
- F. Governing Dimensions – Before commencing any contracted work, Contractor shall verify all governing dimensions at the Worksite, examine all adjoining work and activities that may have an impact on Work, and ensure that the Contract Documents (and any other documents related to the Work) accurately depict all governing and adjoining dimensions.
- G. Means and Methods – Contractor shall be solely responsible for the performance of its Work in accordance with its own means, methods, sequences, and procedures, and for coordination of all portions of its Work in compliance with the Contract.
- H. Performance During Disputes – Contractor shall perform Work as directed by the County and shall comply with all provisions of the Contract. The Contractor's Work may be suspended in the event of a default by the County, that is demonstrated by the Contractor to have inhibited the Contractor's ability to perform the Work during a Dispute or is due to an uncured payment default by the County.

- I. Subcontractors & Suppliers – Contractor shall be responsible for the acts and omissions of its Subcontractors and Suppliers related to the Work under this Agreement.
- J. Assistance to the County – Contractor shall provide such assistance as is reasonably requested by the County in prosecuting and defending Environmental lawsuits in any and all matters relating to the Work, which is caused by the Contractor's negligent acts/omissions. Such assistance may include providing information and reports regarding the Work, as well as executing declarations and attending meetings and hearings. In no event shall the Contractor be required to provide legal services.
- K. Cooperation – Cooperate with the County and its Authorized Representatives, in their review(s) and/or inspection(s) of any portion or phase of the Work, and other matters relating to the Work.
- L. Mitigation – Mitigate Delay in all circumstances, to the extent reasonably possible, including the re-sequencing, reallocating or redeploying of its forces to other work, as appropriate.

ARTICLE 20 AUTHORITY OF THE COUNTY PROJECT MANAGER

- A. The Contractor shall be bound by all orders of the Project Manager to perform the Work, including the withdrawal or modification of any previous order and regardless of whether the Contractor agrees with the Project Manager's order.
- B. Where orders are given orally, they will be issued in writing by the Project Manager as soon thereafter as is practicable. If the Contractor determines the order of the Project Manager results in a change to the Contractor's costs or an adverse impact to the project schedule, the Contractor shall have the right to claim the change(s) as Extra Work, in accordance with the provisions of Article 40, *Extra Work*.

The authority of the Project Manager to issue oral directions are limited to the following conditions:

- Safety
- Emergencies, i.e. damages to property, error and omissions impacting the Work
- Code and legislative changes
- Differing site conditions

- C. The Contractor must seek to resolve every difference concerning the Agreement with the Project Manager. In the event that the Contractor and the Project Manager are unable to resolve their difference, the Contractor may initiate a dispute in accordance with the provisions of Article 46, *Dispute Resolution Procedure*.

ARTICLE 21 CONTRACTOR'S REPRESENTATIVE

- A. Contractor shall have a Representative (or Project Manager) with full authority to represent and act for the Contractor. Prior to the County's issuance of a Notice to Proceed (NTP), Contractor shall submit (for the County's review and acceptance) the name, qualifications and experience of its proposed Contractor's Representative.
- B. Contractor's Representative shall act for the Contractor in all matters concerning the Work, and, subject to all requirements of this Contract, shall have the following authority and obligations:
 - 1. Ability to so organize the Work, and the Work of its Subcontractors, to complete the Work in accordance with the Contract and the Contractor's bar chart, as accepted by the County Project Manager.
 - 2. Ability to delegate defined authority to other Contractor personnel (who thus also become Contractor's Representatives, as provided in this Contract, to the extent specified), subject to written notice to, and approval by, the Project Manager.
 - 3. During performance of the Work, Contractor's Representative shall be present at the Worksite(s) or have its fully-empowered delegate present at the Worksite, at all times that any Work is in progress or at any time any employee or Subcontractor of the Contractor is present at the Worksite.

ARTICLE 22 ACCESS TO THE WORKSITE(S)

- A. The County will, at all times during the term of the Contract, have access to the Work at the Worksite(s), and all documents on which the Work is based.
- B. At any time during the term of the contract, upon reasonable notice, the County may review the documents on which the Work is based, inspect the Worksite(s), and review, inspect and test all Work, equipment, software, and all other materials wherever located (collectively "Inspect" or "Inspection").

ARTICLE 23 SEQUENCE OF OPERATIONS

The Contractor must propose a sequence of operations that best suits the proposed Project plan and Schedule. The proposed sequence of operations can be further enhanced if agreed by both the Contractor's Project Manager and the County Project Manager.

ARTICLE 24 ALTERNATIVE CODES AND STANDARDS

Codes and Standards not in accordance with those contained in the Contract shall not be used unless accepted by the County Project Manager in writing. If the Contractor wishes to utilize codes or standards not specified in the Contract, Contractor shall submit for acceptance, sufficient information for the County Project Manager to determine Equivalency. Information shall include, but not be limited to, detailed comparison of the substitute standard/code, the rationale for Substitution, and whether it meets or exceeds the existing standard/code specified in the Contract.

ARTICLE 25 CONTRACTOR NOTICES TO THE COUNTY

All Notices to the County under this Contract shall be in writing to the County Project Manager for the subject matter of the Notice, with a copy to the Contracting Officer. No notice shall be effective unless it was delivered to the Project Manager and to the Contracting Officer as provided in this Contract.

ARTICLE 26 CONTRACTOR'S REPRESENTATIONS, WARRANTIES AND COVENANTS

Contractor represents, warrants and covenants for the benefit of the County that:

- A. Status – If it is a corporation, limited partnership, general partnership, and/or joint venture, it is duly organized, validly existing and in good standing under the Laws of its jurisdiction of formation and has full power and authority to own and operate its business and properties and perform the Work within the State of Florida.
- B. Review of Information and Inspection of the Worksite(s) – It has, in accordance with prudent and generally accepted engineering and industry practices:
 - 1. Reviewed all of the information provided in the Contract (including reports provided by the County);
 - 2. Inspected and evaluated the Worksite(s) and surrounding locations to the extent the Contractor deems necessary or advisable for performing all portions/phases of the Work under the Contract. These inspections and evaluations include without limitation:
 - a. The character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the Worksite(s), including review of the Contract Documents provided by the County.
 - b. Conditions bearing upon transportation, disposal, handling, and storage of materials, goods, and equipment.
 - c. The availability of labor, water, electric power, and roads.
 - d. Uncertainties of weather, or physical conditions at the site.
 - e. The conformation and conditions of the ground.
 - f. The character of equipment and facilities needed preliminary to and during Work performance; and
 - g. Conditions bearing upon security and protection of material, Goods, Equipment, and Work in progress.

- C. Physical Requirements – As a result of its inspection and examination of the Worksite(s), and other related and surrounding sites and conditions, it is familiar with and accepts the physical requirements of the Work.
- D. Feasibility – As a result of its review of all the information and its inspection and examination of the Worksite(s), it has evaluated the feasibility of performing the Contract within the Contract Time and for the prices listed in Appendix B and has reasonable grounds for believing and does believe that such performance, including achievement of Substantial Completion or Final Acceptance of the Project within the Contract Time, for the prices listed in Appendix B is feasible and practicable.
- E. Permits and Governmental Approvals – Based upon its review of the Contract Documents, it shall be able to obtain and keep in effect throughout the Contract Time all permits and other Governmental Approvals the Contractor is obligated to obtain in accordance with the Contract.
- F. Difficulty and Cost of Work – It has estimated the difficulty and cost of successfully performing the Work, and based upon that estimate has concluded that it can successfully perform the Work at the prices listed in Appendix B.

ARTICLE 27 STORM OR DISASTER SERVICES

- A. Contractor, by accepting the award of this Contract, recognizes and agrees that should a storm or other severe and catastrophic natural disaster affect the Miami-Dade-County area during the performance of the Work, Contractor shall make every reasonable effort to provide services contracted for during the Contract period, subject to the provisions of Article 39, *Force Majeure*. Work performed shall equal to the Contract prices and at the same or different locations from those covered by this Contract.
- B. For emergency services and conditions not addressed by this Contract, Contractor and County agrees to negotiate reasonable prices and terms with the County for any disaster-relief work required by the County. In all instances, Contractor agrees to negotiate reasonable time extensions for performance of disaster-relief work and Work impacted by storms or other severe and catastrophic natural disasters, and Force Majeure Events.

ARTICLE 28 EMERGENCIES

In case of an emergency or hazard to health or safety caused by Contractor or its Subcontractors requiring immediate curative action, the County will notify Contractor, and Contractor shall immediately take such action(s) as it deems necessary, notifying the Project Manager of the action(s) taken as soon as possible but no later than one (1) business day thereafter. If Contractor does not undertake immediate curative action, the County may without prior notice undertake such action as is necessary to correct the hazard or deal with the emergency, and the reasonable excess cost thereof shall be borne by the Contractor.

Cooperation and Coordination with Other Contractors and/or County Operations:

- A. The County reserves the right and may undertake or award other contracts for additional Work on or near the Worksite(s). Contractor warrants that it has carefully reviewed the Contract Documents and all other pertinent information made available by the County that relate to the nature and scheduling of other contracts that may be awarded, and to constraints related to the County operations, and in submitting its proposed/proposal and executing this Contract, has taken into account the need to coordinate its Work with that of other Contractors and/or the County Operations. It is the express obligation and duty of the Contractor under the Contract to coordinate its Work with the work of others.
- B. The following shall apply:
 - 1. Contractor shall not have exclusive access to or use of Work areas or the Worksite(s). The County may require that Contractor use certain facilities and areas concurrently with others.
 - 2. The County will endeavor to advise the Contractor of the other known parties, including the County Operations.

3. Contractor shall cooperate and communicate with any other Contractor performing Work that may connect, complement, and/or interfere with the Contractor's Work, and resolve any disputes or coordination problems with such Contractor.

ARTICLE 29 CLEAN UP

- A. Throughout all phases of contracted work, and until Final Completion of the Work, Contractor shall keep the Worksite, including storage and public areas used by Contractor, clean and free from rubbish and debris.
- B. Before completing the Work, Contractor shall remove from the Worksite any rubbish, tools, and equipment that are not the property of the County.

ARTICLE 30 DISPOSAL OF WASTE

- A. Unless otherwise specified in the Contract, Contractor shall make its own arrangements for disposing of waste and excess substances generated from Contractor's performance of the Work at a legal disposal site outside the Worksite(s), and shall pay all associated costs and obtain necessary permits, if any.
- B. Contractor agrees to indemnify and hold harmless the County from any dumping duty, loss or expense, including, but not limited to, reasonable attorney fees which the County may incur arising from any claim or demand alleging that the sale of the equipment covered by this contract at the price therefor stated herein violates the U.S. Antidumping Act, Title 19 U.S. Code Annotated, Section 160 et. seq.

ARTICLE 31 LAWS AND PERMITS

- A. The Contractor shall comply with all provisions of federal, state, and local laws, ordinances, rules, regulations and orders which would affect the Work as if it were being performed for a private corporation, except where different requirements are specifically set forth in the Contract.
- B. If the Work requires the Contractor to open, alter, remove, damage or otherwise affect property owned by a federal, state, or local government, the Contractor shall obtain in its own name any permit or license required to allow such property to be so affected. However, the Contractor shall not apply for any permit or license in the name of, or on behalf of, the County or take any other actions which would subject the County to any laws, ordinances, rules, regulations and orders from which it is exempt.

ARTICLE 32 PROJECT SCHEDULE

- A. The Contractor shall submit an updated Critical Path Gantt Chart project schedule to the County Project Manager for review and acceptance within fifteen (15) business days after issuance of the NTP for each applicable Phase. The project schedule shall include all work specified in the Scope of Work including, but not limited to, mobilization, lead times, inspections, installation, testing, system cutover, training, turnover of required documentation, and all expected activities of subcontractors, Contractors, suppliers and all other parties associated with the project.
- B. The Mandatory Milestones for completion are as follows:

Milestone No.	Completion from NTP for each phase	Description
1	Phase 2	All work required in accordance with Section 2.9, 2.10, 2.12 of the Technical Specification
2	Phase 3	All work required in accordance with Section 2.11, 2.12 of the Technical Specification

- C. The time to complete each Mandatory Milestone shall be the term stipulated in the approved Project Schedule, to be mutually agreed between the Parties.

- D. Regarding Phase 1, services shall be provided in accordance with Sections 2.8 and 9 of the Scope of Work, commencing upon the October 1 following the Subscription Start Date as described in Exhibit D under Contract No. CIP1-155-DTPW19-DB.

ARTICLE 33 PROJECT PROGRESS MEETINGS

- A. Regular progress meetings will be held by the Contractor during the Project at the frequency established as part of the Conceptual Design Review. The County has sole discretion in adjust the frequency of such meetings. The Contractor's Project Manager and other appropriate personnel shall attend these and all meetings called by the County to discuss Work under this Contract. The Contractor will be advised of times, dates and place of other Contract meetings.
- B. At these meetings, the Contractor shall provide the following:
1. A list of major subcontractors, sequence of critical Work, and the preliminary progress schedule for construction.
 2. Requirements for office, storage areas, construction areas, and temporary easements.
 3. Discussions of safety, first aid, emergency actions, and security.
 4. Housekeeping procedures.
 5. Implementation methods, quality control, and inspection and coordination of Work.
 6. The implementation sequencing of the Work
 7. Plans for coordination and notification for utility Work.
 8. Plans for coordination with the Work of other contractors and procedures for sharing access to the Work Site.
 9. Schedules of deliveries of major equipment.
- C. Any field explanations or interpretations provided by the County at this or other meetings will not amend, supersede or alter the terms or meaning of any Contract Document, and the Contractor shall not claim reliance on such explanation as a defense to any breach or failure by the Contractor to perform as specified in the Contract.

ARTICLE 34 MONTHLY PROGRESS REPORT

- A. Every month the Contractor shall submit to the County a monthly progress report one copy in electronic format, this report shall contain the following sections:
1. Executive summary.
 2. A Schedule Status Report, including a Work Schedule showing scheduled and actual progress to date for each Work element, derived from the Network Analysis, and containing a textual description of the progress of the Work. The report shall discuss the major steps of the Work, along with the planned and actual dates of progress and completion forecasts. The report shall focus on any out-of-schedule and/or problem items and shall present the Contractor's plan for correcting the deviations.
 3. Status of payments, retention and withholding.
 4. A forecast of the amounts of future Applications for Payment over the next six months.
 5. An updated Network Analysis, with all changes highlighted.
 6. An updated Work Schedule, with all revisions highlighted.
 7. An updated Submittal Schedule, with all revisions highlighted.
 8. An updated Schedule of Values, with all revisions highlighted.
 9. Status of action items resulting from meetings.
 10. Task activities planned for next month.
 11. Identification of any quality assurance problems.
 12. Solution Implementation critical issues.
 13. Copies of logs for incoming and outgoing correspondence and documents for the report period.
 14. Release of Liens from subcontractors, and suppliers.
- B. The exact format and detail level required for the Monthly Progress Report shall be established jointly by the County and the Contractor as part of Conceptual Design Review on a proposed format prepared by the Contractor and accepted by the County.

ARTICLE 35 NOTICE OF DISCOVERY OF DIFFERING SITE CONDITIONS

Contractor shall, before any of the existing conditions are disturbed, provide immediate oral and/or electronic mail notice of the discovery of such conditions to the County's Authorized Representative, followed by written notice to the County Project Manager of the discovery within forty-eight (48) hours thereafter, of any of the following subsurface conditions:

1. Type 1 Condition: Subsurface or latent physical conditions at the Worksite differing materially from those indicated in the Contract;
2. Type 2 Condition: Unknown physical conditions at the Worksite of any unusual nature that differ materially from those ordinarily encountered in and generally recognized as inherent in Work of the character provided for in the Contract.
3. Type 3 Condition: Substances that Contractor believes may be Hazardous Substances that are required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of Law.

If Contractor encounters substances or conditions during performance of the Work that it reasonably believes to be a Type 1 Condition or Type 2 Condition, Contractor shall not disturb the condition or interfere with the County's right or ability to investigate, but may continue Work in the area. The Contractor shall document and submit such conditions in a written field report (including photographs) within five (5) Days of the initial notice to the County and include a recommendation how to safely proceed with Work at the area.

If Contractor encounters substances during performance of the Work that it reasonably believes to be a Hazardous Substance, a Type 3 Condition, Contractor shall not disturb the condition and shall suspend Work in the immediate area of the suspected Hazardous Substances until the County authorizes it to resume. The Contractor shall document and submit such conditions in a written field report (including photographs) within five (5) Days of the initial notice to the County, and include a recommendation how to safely proceed Work at the area.

The County will promptly investigate the conditions, and if it finds the conditions do materially differ, or do involve previously unknown Hazardous Substances. The County may make an adjustment in Contract Time and/or prices listed in Appendix B as agreed upon.

ARTICLE 36 CLAIMS REGARDING DIFFERING SITE CONDITIONS

Contractor shall not be entitled to any remedy for an asserted Differing Site Condition if it does not give the County both:

1. Timely notice of the asserted Differing Site Condition, as required in accordance with Article 35 above; and
2. Submit a written field report (including photographs) within five (5) Days of the initial notice to the County as required in Article 35, *Notice of Discovery of Differing Site Conditions*, of this document; and
3. An opportunity to investigate prior to the asserted Differing Site Condition being disturbed.

ARTICLE 37 PROCEED WITH WORK

If a Dispute arises related to a claim of a Differing Site Condition, Contractor shall proceed with all Work to be performed under the Contract and shall not be excused from any provision of the Contract, including without limitation, the Scheduled Completion Date.

ARTICLE 38 DAMAGES FOR DELAY

- A. The Contractor is firmly obligated to meet the stipulated completion date(s), except as any such date(s) may be extended. Inasmuch as the damage and loss to the County which will result from the failure of the Contractor to meet such date(s), as extended, will include items of loss or damage which are not susceptible to accurate estimation.

Damages for delay, as Liquidated Damage, shall apply for each calendar day of unexcused delay in meeting the completion date for each Mandatory Milestone, in accordance with Article 32(B), *Project Schedule*. Liquidated damages shall equal \$4,000 for each

day of unexcused delay, for each Mandatory Milestone. The total amount of Liquidated Damages recoverable for each Mandatory Milestone (Phases 2 and 3) hereunder shall not exceed 50% of the Contract Price per applicable Phase. The amount of Liquidated Damages set forth represents a good faith estimate as to the actual potential damages the County would incur as a result of the delay in completion of the work or elements thereof. No liquidated damages will apply if County terminates Contractor's right to proceed. Contractor shall have no liability for any delays beyond its control. Liquidated Damages shall not apply to the extent that Contractor can reasonably demonstrate that Contractor delays did not impact any project schedules of other projects performed in connection with (or concurrent with) the performance of the work under this Contract and did not cause any cost or delay impacts to County. Liquidated damages shall be County's sole and exclusive remedy for any Contractor delay. No damages for delay will apply for missed milestones related to Contractor's integration with the third-party back-office solution (Fare Collection Application) prior to County's identification of such solution and agreement by the Parties on the integration schedule.

- B. Upon Substantial Completion of the Work per Phase, as reasonably determined by the County Project Manager, the Contractor shall be issued a Letter/Certificate/written notice of Substantial Completion pursuant to Article 44, *Substantial Completion*, and Liquidated Damages shall cease to accrue. After Substantial Completion, the Contractor shall be liable for any repairs or actions as stated in the applicable warranty and all actual damages incurred by the County as a result of the Contractor's failure to complete all Work (including Punchlist Work), by the Contract completion date for each phase, after the date of Substantial Completion, including any extensions of time. Actual damages shall include, but shall not be limited to, installation or re-procurement fees and costs incurred as a result of the Contractor's failure to complete all Work by the Contract completion date.
- C. The County shall have the right to deduct either Liquidated or Actual Damages, as they may apply, from any monies due or which may thereafter become due to the Contractor under this Contract or any other sums due or which become due to the Contractor under other contracts with the County.
- D. Additional Provisions
 - 1. County Project Manager will count default days in calendar days.
 - 2. County has the right to apply, as payment on such liquidated damages, any money the County owes Contractor.
 - 3. County does not waive its right to liquidated damages due under the Contract by allowing Contractor to continue and to finish the work, or any part of it, after the expiration of the Contract, including granted time extensions.
 - 4. The requirements of this article may not be waived, compromised or settled without the express written consent of the Board of County Commissioners.
 - 5. Liquidated damages are the only form of monetary damages for delay that may be incurred under the Contract, prior to Substantial Completion. Notwithstanding any other provision contained herein to the contrary, the parties otherwise waive and release each other from all consequential damages.

ARTICLE 39 FORCE MAJEURE

- A. Upon providing the County notice and reasonably full particulars of an event of force majeure (as described below) in writing, within a reasonable time after the occurrence of such event of force majeure, the Contractor shall not be liable for any delay or failure to perform to the extent caused by fire, flood, severe weather conditions, explosion, labor disputes, strike, shortage of utilities, compliance with any laws, regulations, orders, acts or requirements from the government, civil authorities, government-mandated facility shutdowns or limitations, acts of God or the public enemy, or any other act or event of any nature reasonably beyond the Contractor's control (a "Force Majeure Event"). In such circumstances, the Contractor is excused from performance until the impact of the Force Majeure Event can be reasonably mitigated. The County may, at its option, elect to cancel or reschedule the portion of any order subject to such delay by providing to the Contractor prompt written notice of its election, provided that, such cancellation or rescheduling shall apply only to that portion of the order affected by the foregoing circumstances and the balance of the order shall continue in full force and effect.
- B. The Contractor is expected to request its permits, as applicable, with the permitting agency within a timeframe that will allow the permitting agency its normal processing time to review a permit request. A schedule delay due to the processing time of a permitting

agency would only be deemed excusable if the Contractor demonstrated to the satisfaction of the County, through documented evidence, the permitting agency exceeded its standard time to review such permit.

ARTICLE 40 EXTRA WORK

- A. The County reserves the right to order changes that may result in additions to or reductions from the amount, type or value of the Work shown in the Contract and which are within the general scope of the Contract, in accordance with this article. Any such changes, additions or deletions, which result in changes to the Work, will be known as "Extra Work." Additionally, changed conditions other than those described in the Technical Specification, exercising of options, or changed conditions outside of the reasonable control of Contractor will also be deemed Extra Work. The Parties further agree that any changes requested by the County, for the exclusive benefit of the County, shall be also handled in accordance with this article.
- B. Unless an order to perform work is ordered by the Project Manager, no Extra Work shall be performed except pursuant to a written Supplemental Agreement ("Contract Modification" or "Change Order") issued by the County and accepted in writing by Contractor expressly authorizing the performance of such Work and explicitly declaring the intention of the County to treat the Work described therein as Extra Work. In the absence of such a Supplemental Agreement, if the County Project Manager shall direct, order or require any work, whether orally or in writing, which the Contractor deems to be Extra Work, but shall within five (5) business days of the County Project Manager's written order or directive, give written notice to the County Project Manager stating why the Contractor deems it to be Extra Work. Such notice is required to afford an opportunity to the County to (1) cancel promptly such order, direction or requirement; (2) keep an accurate record of the materials, labor and other items involved; and (3) take such action as may be deemed advisable in light of the Contractor's claim. The failure of the Contractor to give written notice within the time limit stated therefor shall be deemed a conclusive and binding acceptance on the Contractor's part that the direction, order or requirement of the County Project Manager does not involve the performance of Extra Work.
- C. Within thirty (30) days of the Contractor's submission of written notice that an order, direction or requirement of the County Project Manager is deemed by the Contractor to involve Extra Work, the Contractor and each Subcontractor shall submit in a form satisfactory to the County a detailed proposal ("Extra Work Proposal") (including the elements of cost identified in Article 41, *Change Order Basis For Extra Work Payment*, Paragraphs A and B) which shall include adjustments to the Contract price, to the extent permitted under Article 41 to the delivery schedule, or to any other provisions of the Contract necessary to accomplish the Extra Work. Upon written request of the Contractor, within the thirty (30) day period set forth above, for good cause shown, the County Project Manager may grant the Contractor additional time in which to submit an Extra Work Proposal. The failure of the Contractor to submit a detailed proposal within the time limit stated therefor, or within such additional time as is granted by the County Project Manager at its sole discretion, shall be deemed a waiver of any claim for compensation that the Contractor may have with respect to the claimed Extra Work.
- D. The provisions of the Contract relating to the Work and its performance shall apply without exception to Extra Work and the performance thereof, except as otherwise provided in a written Supplemental Agreement between the Contractor and the County.
- E. The Contractor must utilize the most recent updated schedule as required by the Contract to establish the price and schedule modifications. Contractor's Extra Work Proposal must include a schedule subnet, if there is a time impact, and an explanation of the cost, if applicable, and schedule impact of the claimed Extra Work on the Contract. The Contractor must demonstrate clearly how it proposes to incorporate the Extra Work into the schedule. If Contractor fails to notify the County Project Manager of the schedule changes associated with an Extra Work Proposal by submitting a revised schedule, it will be deemed to be an acknowledgment by Contractor that the proposed Extra Work will not have any scheduling consequences.

ARTICLE 41 CHANGE ORDER BASIS FOR EXTRA WORK PAYMENT

- A. If Extra Work requires the provision of items of Work or material of the same type as those for which unit prices are identified by the Article titled "Method and Times of Payment", compensation for such Extra Work shall be computed on the basis of the unit price in that article for such items.
- B. If Extra Work requires the provision of items of Work or material for which compensation cannot be computed on the basis of unit prices, in accordance with the Article titled "Method and Times of Payment", and the scope and extent of the Extra Work can be

determined before the Extra Work is performed, the County will perform a cost analysis of the Contractor's proposal and negotiate a lump sum amount with the Contractor as compensation for such Work. Upon the occurrence of one of the conditions listed in Article 20(B) for which the Project Manager may issue an oral direction, the County Project Manager may in such case direct the Contractor to proceed with the Extra Work pending performance of the cost analysis and negotiation of the amount of compensation for such Extra Work, subject to the provisions of Article 20(B), *Authority of the Project Manager*. The Contractor shall honor such request so long as it deems the financial risk of doing so to be viable.

ARTICLE 42 WORK PERFORMED WITHOUT INSPECTION

- A. At all times before Final Acceptance at each project site, Contractor shall remove or uncover such portions of the finished contracted Work as directed by the County. After examination by the County, Contractor shall restore the Work to the standard required by the Contract Documents. If the Work exposed or examined is not in conformance with the requirements of the Contract Documents, then uncovering, removing and restoring the Work, and recovery of any delay occasioned thereby, shall be at Contractor's cost, and Contractor shall not be entitled to any time extension.
- B. Any Work done or materials used without adequate notice to and opportunity for prior inspection by the County, may be ordered uncovered, removed or restored at Contractor's cost and without a time extension, even if the Work proves acceptable after uncovering.
- C. If Work exposed or examined under this article is in conformance with the requirements of the Contract Documents, then any delay from uncovering, removing and restoring Work shall be considered a delay caused by the County, and Contractor shall be entitled to a contract modification for the cost of such efforts and recovery of any delay to the schedule occasioned thereby.

ARTICLE 43 BENEFICIAL USE

- A. "Beneficial Use" shall mean (1) that the Work or relevant portion thereof is not complete, but the Contractor has installed, constructed, and commissioned (tested) the major new equipment and systems (hardware and software, as applicable) included in the Work or relevant portion thereof and (2) the County has taken possession or agreed it can and will use that Work or relevant portion thereof for its intended purpose(s).
- B. The County may, upon prior consultation with the Contractor, have Beneficial Use of any completed or partially completed portion of the Work at any stage. Immediately prior to partial Beneficial Use of the Work, the County and the Contractor shall jointly inspect the area to be occupied, as applicable, or portion of the Work to be used in order to determine and record the condition of the Work.

ARTICLE 44 SUBSTANTIAL COMPLETION

- A. The Work for each phase shall be deemed Substantially Complete when, as reasonably determined by the County Project Manager, there are no material and substantial variations from the Contract and the Work is fit for its intended purpose. Upon Substantial Completion of each phase, the County Project Manager shall issue a Letter/Certificate/written notice of Substantial Completion. The issuance of this Letter/Certificate shall not relieve the Contractor from its obligation hereunder to complete the Work. Substantial Completion must be achieved sixty (60) days prior to Final Acceptance.
- B. When the Contractor is of the opinion that the Work is Substantially Complete, Contractor may submit to the County Project Manager a written request that the County Project Manager inspect the Work so as to determine whether Substantial Completion has been achieved. Upon such request, the County must respond within twenty-five (25) days of its receipt with either (i) a Letter/Certificate of Substantial Completion/written notice of Substantial Completion or (ii) an explanation of the reasons why the Work is not Substantially Complete, including a list of open items necessary to achieve Substantial Completion. Nothing in this article precludes the County Project Manager from making a determination of Substantial Completion in the absence of a request therefor by the Contractor.

If the County, having substantiated cause, elects not to take possession of the Work upon Substantial Completion, the Risk of Loss remains with the Contractor until the County takes possession of the Work, or relevant portion of the Work, in accordance with the provisions of either Article 43, *Beneficial Use*, or Article 45, *Final Acceptance*. If the County elects to take possession of the Work

upon Substantial Completion or a portion of the Work for Beneficial Use, the transfer of title and Risk of Loss transfer to County upon the earlier of such Substantial Completion or Beneficial Use.

- C. The Work remaining after Substantial Completion shall be known as "Punchlist Work." The Punchlist Work shall be limited to minor omissions and defects except the County Project Manager may in their reasonable discretion, include Work which cannot be done until the County, or third persons perform other work which is not the Contractor's responsibility under the Contract provided such County or third-party other work is completed in a timely manner. The County Project Manager shall issue a Punchlist with the Letter/Certificate of Substantial Completion/written notice of Substantial Completion.
- D. Upon Substantial Completion, the Contractor shall remove its tools, materials and equipment from the Work Site(s), except for the tools, materials and equipment needed to complete the Punchlist Work, or unless otherwise authorized in writing by the County Project Manager.

ARTICLE 45 FINAL ACCEPTANCE

- A. Within ten (10) Days after the Contractor determines that all Work per Phase, as applicable, as required in the Contract, is fully completed, and all required submissions and deliveries to the County specified in the Contract have been made, Contractor shall give the County Project Manager a written Request for Final Acceptance specifying that the Work is completed, the date on which it was completed and stating:
 - 1. All of the Contractor's and Subcontractors' personnel, supplies, equipment, waste materials, rubbish and temporary facilities have been removed from the Worksite(s);
 - 2. Contractor has complied with all requirements associated with closeout of the Contract; and
 - 3. Contractor has delivered to the County Project Manager a Notice of Completion for the Work in recordable form.
- B. The County Project Manager shall advise the Contractor of the time reasonably required to complete all the Punchlist Work. The time set by the County Project Manager to complete Punchlist Work shall be no more than sixty (60) days from the issuance of the Letter/Certificate/written notice of Substantial Completion. When in the opinion of the County Project Manager the Punchlist Work is properly completed, the County Project Manager shall issue a Notice of Final Acceptance.
- C. In the event of an emergency or if the Contractor fails to diligently perform the Punchlist Work, the County may complete the Punchlist Work, either by its own forces or by other Contractors. The County's costs thereof will be deducted from the payment due to the Contractor, except that if the County completes the Punchlist Work because of an emergency, then the amount deducted from the payment shall be based on the Contractor's costs for completing the Punchlist Work. If such costs exceed the amount due the Contractor, the Contractor shall immediately upon demand pay such excess to the County.
- D. Acceptance of all Work by the County shall occur when in the opinion of the County Project Manager, the Work is complete in all respects including any outstanding items contained in the Punchlist provided with the Notice of Completion of the Work. Upon Acceptance the Contractor shall be given a Notice of Final Acceptance for the Phase and the Contractor shall be entitled to invoice the County for Final Acceptance payment milestone outlined in Appendix B.

ARTICLE 46 DISPUTE RESOLUTION PROCEDURE

- A. The Contractor hereby acknowledges that the Project Manager will determine in the first instance all questions of any nature whatsoever arising out of, under, or in connection with, or in any way related to or on account of, this Agreement including without limitations: questions as to the value, acceptability and fitness of the Services; questions as to either party's fulfillment of its obligations under the Contract; negligence, fraud or misrepresentation before or subsequent to acceptance of the Contractor's Proposal or the effective date of this Agreement; questions as to the interpretation of the Scope of Services; and claims for damages, compensation and losses.
- B. In accordance with Article 20, *Authority of the County Project Manager*, the Contractor shall promptly comply with every order of

the Project Manager, including the withdrawal or modification of any previous order and regardless of whether the Contractor agrees with the Project Manager's determination or order. Where orders are given orally, they will be issued in writing by the Project Manager as soon thereafter as is practicable.

- C. The Contractor must, in the final instance, seek to resolve every difference concerning the Agreement with the Project Manager. In the event that the Contractor and the Project Manager are unable to resolve their difference, the Contractor may initiate a dispute in accordance with the procedures set forth in this Article. Exhaustion of these procedures shall be a condition precedent to any lawsuit or arbitration permitted hereunder.
- D. In the event of a dispute that cannot be resolved with the Project Manager, the Parties authorize the DTPW Director or designee, who may not be the Project Manager or anyone associated with this Project, acting personally, to decide all questions arising out of, under, or in connection with, or in any way related to or on account of the Agreement (including but not limited to claims in the nature of breach of contract, fraud or misrepresentation arising either before or subsequent to execution hereof) Any such dispute shall be brought, if at all, before the DTPW Director within fifteen (15) business days of the failure to resolve the dispute with the Project Manager.
- E. The DTPW Director may base this decision on such assistance as may be desirable, including advice of experts, but in any event shall base the decision on an independent and objective determination of whether Contractor's performance or any Deliverable meets the requirements of this Agreement and any specifications with respect thereto set forth herein. The effect of any decision shall not be impaired or waived by any negotiations or settlements or offers made in connection with the dispute, whether or not the DTPW Director participated therein, or by any prior decision of others, which prior decision shall be deemed subject to review, or by any termination or cancellation of the Agreement. All such disputes shall be submitted in writing by the Contractor to the DTPW Director for a decision, together with all evidence and other pertinent information regarding such questions, in order that a fair and impartial decision may be made. Whenever the DTPW Director is entitled to exercise discretion or judgement or to make a determination or form an opinion pursuant to the provisions of this Article, such action shall be fair and impartial when exercised or taken. The DTPW Director, as appropriate, shall render a decision in writing and deliver a copy of the same to the Contractor. Except as such remedies may be limited or waived elsewhere in the Agreement, Contractor reserves the right to pursue any remedies available under law after exhausting the provisions of this Article.
- F. After the DTPW Director renders a decision, if the dispute has not been consensually resolved, then either party may commence arbitration proceedings through the American Arbitration Association ("AAA"). Arbitration proceedings shall be commenced by filing a demand for arbitration (a "Demand") in writing with such body and by simultaneously sending a copy of the Demand to the other Party. The arbitration proceedings shall be governed by and decided in accordance with the rules and proceedings of the AAA governing commercial arbitration in effect at the time of the arbitration (the "Rules"), unless the parties shall mutually agree otherwise in writing. The panel selected shall be a balanced panel, consisting of (1) independent and impartial arbitrator selected pursuant to the Rules in the event the total amount of the Dispute is less than \$1 million; or (ii) three (3) independent and impartial arbitrators selected pursuant to the Rules in the event the total amount of the dispute is \$1 million or more. The arbitration shall be conducted in English in Miami, Florida, provided that the arbitrator(s) may, for the convenience of the parties and without changing the situs of the arbitration proceedings, permit the taking of evidence outside of Miami. The parties may, by mutual written agreement, specify a different location for the arbitration. The award of the arbitrator(s) may be monetary damages and/or an injunction. In no event may the arbitrator(s) issue an award of any form of exemplary or punitive damages. The fees and expenses of the arbitrator(s) shall be shared equally by the parties and advanced by them from time to time as required. The award rendered by the arbitrator(s) shall be final and binding upon the parties, and judgment may be entered by any competent court having jurisdiction thereof. The award of the arbitrator(s) shall be accompanied by a written explanation of the basis for the award. Notwithstanding anything to the contrary provided in this section and without prejudice to the above procedures, any of the parties may apply to any court of competent jurisdiction for injunctive or other non-monetary judicial relief if such action is necessary to avoid irreparable damage.
- G. Notwithstanding the foregoing, as related to any relevant statute of limitations or other filing deadlines, Contractor may file a lawsuit or request arbitration prior to exhausting the dispute resolution procedures of this Agreement if necessary to maintain any claims related to the dispute. The parties agree however, that any such lawsuit or arbitration shall be stayed until the completion of the dispute resolution procedures contained in this agreement.

H. This Article will survive the termination or expiration of this Agreement.

ARTICLE 47 RESPONSIBILITY FOR MAINTENANCE, LOSS AND DAMAGE

Upon the County Project Manager's issuance of a Notice of Final Acceptance, the County, shall be responsible for the maintenance, loss, or damage to the Work or any element thereof, except as follows:

1. The County Project Manager's issuance of a Notice of Final Acceptance will not relieve the Contractor of its obligations related to Article 50 *Warranty*, Article 51 *Warranty Commencement and Duration* and Article 52 *Warranty Claims* or any element thereof, the non-completion of which was not disclosed to the County (regardless of whether such nondisclosures were fraudulent, negligent, or otherwise); or
2. The Contractor's action, negligence or breach of the Contract or the warranty causes loss or damage to the Work or any element thereof.

ARTICLE 48 PAYMENT CARD INDUSTRY DATA SECURITY REQUIREMENTS

If at any time any of the components, including but not limited to the Contractor's system, equipment, hardware, software, or policies, becomes non-PCI compliant, the Contractor is responsible for all costs related to upgrading the system so that PCI compliance is maintained throughout the term of the agreement.

- A. The Contractor confirms its knowledge of and commitment to comply by providing the following proof that Contractor's devices/applications/processes meet current, published, PCI compliance requirements:
 1. Contractor's current annual PCI Compliance certification if applicable. The County has the right to audit the Contractor's compliance by requesting copies of the Contractor PCI compliance certifications at any time.
 2. During an installation or a major system upgrade, the Contractor must provide implementation manuals and detailed diagram(s) that show all cardholder data flows across MDC's systems and networks, the internet, and the processor network.
 3. Provide Security Matrix for new systems - [IT Security Matrix - ESO Updated 01262023.docx](#)
- B. Contractor shall resubmit the aforementioned passing, updated, completed, and signed PCI compliance documents annually to the County. Furthermore, the Contractor shall update their solution, when required, to remain compliant with all changes to the PCI standards and requirements by the implementation dates mandated by the PCI Security Council and remediate any critical security vulnerabilities within 30 days of identification.
- C. Sensitive Authentication data and Primary Account number shall not be stored by the Contractor application at any point, even if masked. Any other Card holder data should not be stored by the Contractor application unless it is absolutely needed for County's operations.
- D. POS (Point of Sale) must be routed directly to Miami-Dade County's merchant provider (ELAVON) and must be EMV compliant. All POS devices must be capable of accepting NFC (near field communications) payment methods such as Google Wallet, Apple Pay, or Samsung Wallet.
- E. For payment processing applications, proof of validation must be countersigned by the PCI Council. Documentation to be submitted is as follows:
 - a. AOC for the application - Attestation of Compliance
 - b. Most current AOV - Attestation of Validation (when applicable)
- F. Cashiering Application systems that utilize MDC network for payment processing must be a validated PCI Point-to-Point

Encryption (P2PE) solution and transactions routed through our approved County merchant processor. The County's approved P2PE solution is Elavon's PCI Safe T P2PE Link Protect services. Confirmation of validated P2PE solution shall be provided as found on the PCI Council's P2PE Solutions website.

https://listings.pcisecuritystandards.org/assessors_and_solutions/point_to_point_encryption_solutions?agree=true

Prior to production going live, the P2PE Instruction Manual shall be provided as found on PCI website.

https://www.pcisecuritystandards.org/documents/P2PE_v3.0_PIM_Template.docx?agreement=true&time=1645920000555.

- G. Internet transactions and all other applications must be routed through Miami-Dade County's Internal Payment Gateway (Payment Card).
- H. Exceptions to any of these requirements shall require written justification by the Department Director prior to purchase of software/hardware, including a cost/benefit analysis, and require written approval by both the Miami Dade County Finance Director.
- I. Transactions processed through the Miami-Dade County Internal Payment Gateway are prohibited from accepting / processing PIN numbers for security reasons. Miami-Dade County provides two basic services that allow Contractor applications to interact with its Payment Gateways:
 - 1. Web-based Credit Card Transaction Service
 - 2. Recurring Payment Service (for monthly or yearly recurring payments). This service will allow merchants to develop recurring credit card payments on behalf of their payers. This is a SOAP Web Service, and Miami-Dade County will provide the service WSDL and the necessary documentation. The Recurring Payment Service is PCI-compliant, and all the sensitive credit card data is stored offsite in the County's clearinghouse.

There are two different ways that a merchant customer can handle the Credit Card transaction processing.

a. Option #1:

The Contractor's application interfaces directly with Miami-Dade County's Payment Gateway via a RESTful web-service. Miami-Dade County will provide the XML schemas to all basic services: web payment processing, void, refund, and recurring payments. Miami-Dade County will also provide all the necessary URLs for these services, as well as documentation detailing fields and response codes. All services will respond with the same XML receipt.

This solution will require the client application to fully interact with Miami-Dade County's Payment Gateway, reacting to processing and system errors. Even though this solution requires more development and integration from a Contractor, it will offer the greatest flexibility and customization level. This option also requires the Contractor's application to be hosted on a server inside the County's managed network, since Miami-Dade County's Payment Gateway is not accessible from the Internet. If the application is outside of the County's Managed network, Miami-Dade County can develop a Payment Module Application (option #2) that will service the Contractor's application.

b. Option #2:

The Contractor's application will utilize a Payment Module Web Application developed and maintained by Miami-Dade County. This solution can be a standard web application, a mobile web application, or both. A link will be provided on the Contractor application that sends payers to the Payment Module Application. For example, once the payer has selected the items to purchase (from the Contractor's application), there would be a "Pay Now" button that will redirect the payer to the Miami-Dade County Payment Module via HTTPs post, carrying all the necessary data to begin the payment process (User ID, Amount, etc.). This requires only minor development effort on the Contractor side. The Contractor will agree on custom fields to be passed to the Miami-Dade County Payment Module via HTTP protocol over TLS 1.2 or higher (only secure connections are accepted; SSL protocol is not accepted). In turn, the Miami-Dade County Payment Module will collect the payment information and process the transaction via the Miami-Dade County Internal Payment Gateway. Results will be posted back (post back URL is provided by the client application) to the Contractor application. This solution

will not require the client application to be hosted in the County's managed network. The Miami-Dade County Payment Module handles all processing and system errors, simplifying the integration effort on the Contractor side.

ARTICLE 49 RESPONSIBILITY TO COMPLETE THE WORK

Notwithstanding any other provision of this Contract that could be interpreted to the contrary (including in Contract Documents of higher precedence), it shall be the Contractor's continuing responsibility to complete and deliver every element, and the integrated whole, of the Work in accordance with all of the requirements of the Contract. The issuance of a Notice of Completion of Work by the County Project Manager for any element, or for the whole of the Work, shall not be construed to relieve the Contractor of this responsibility, or any part thereof. If, after the issuance of a Notice of Completion of Work, the County discovers any Deficiency, or item not completed or otherwise requiring correction or remedial action, whether or not the item appears on any Punch List or other list of clean up items, the Contractor shall correct the Deficiency, complete the item or otherwise remedy the condition to bring it in to full compliance with the Contract, subject to the warranty provisions of Article 50, *Warranty*.

ARTICLE 50 WARRANTY

- A. Contractor warrants that the Work shall be free of defects in design, material, and workmanship, and shall be fit for use for the intended function, remain in good working order, and shall meet all of the requirements of the Contract and shall be subject to the provisions of Article 51, *Warranty Commencement and Duration*.
- B. Without in any way limiting Contractor's Warranties with respect to the Work, Contractor shall obtain from all Subcontractors, manufacturers and Suppliers, and assign and deliver to the County all Warranties, including extended Warranties, if applicable, provided by such Subcontractors, manufacturers and Suppliers and from all other persons extending Warranties.
- C. All such Warranties shall: a) Survive Final Acceptance, and all the County and Contractor inspections, tests and acceptances, and b) Shall run directly to and be enforceable by the Contractor and the County.
- D. Upon receipt from the County of notice of a failure of any of the Work to satisfy any Subcontractor or Supplier Warranty or other obligation, Contractor shall enforce or perform any such Warranty or other obligation as a part of Contractor's other Warranty obligations hereunder. The County's rights under this article shall continue until the expiration of the later of the Contractor's Warranty (including extensions for rework) or Subcontractor's or Supplier's Warranty or extended warranty. Until such expiration, the cost of any Work (including re-engineering, if applicable) or Equipment (including taxes and shipping) shall be at the sole cost and expense of the Contractor.
- E. The Contractor's overall product solution will be covered by a warranty or maintenance agreement during the term of the Contract, as follows:

Except for separate warranties covering subcontractor or supplier products or services, the warranty term shall be as follows: (i) three (3) years from the date of the earlier of Beneficial Use or Acceptance of the relevant Payment Milestone in Appendix B for goods purchased by County, (ii) six (6) months from the date of installation for spare parts or the term of the manufacturer's warranty, whichever is longer; (iii) for the services associated with the implementation of the Licensed Software, ninety days from the earlier of (a) the date user acceptance testing is made available for any Licensed Software required under the Contract or (b) the date the Licensed Software is placed into production. Contractor warrants, to County, the goods manufactured by Contractor to be free from defects in material and workmanship and the services performed by Contractor to be in accordance with the specifications of this Contract. If within such period it shall be proven to Contractor's reasonable satisfaction that any goods are defective or any services are nonconforming, such goods shall, at Contractor's option, be (1) repaired or replaced (2) (F.O.B. Contractor's factory, with all removal and installation to be at County's expense) and such services corrected or a substitute obtained. This warranty shall not apply to (i) any loss or damage resulting from normal wear and tear or alteration, misuse, abuse or (ii) improper installation, operation or maintenance by County or a third party. THE FOREGOING WARRANTIES ARE IN LIEU OF, AND CONTRACTOR EXPRESSLY DISCLAIMS, ALL OTHER WARRANTIES, EXPRESS OR IMPLIED IN FACT OR BY LAW, INCLUDING WITHOUT LIMITATION ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE. THE FOREGOING WARRANTIES STATE CONTRACTOR'S ENTIRE AND EXCLUSIVE LIABILITY AND COUNTY'S SOLE AND EXCLUSIVE REMEDY, IN CONNECTION WITH THE

SALE OR FURNISHING OF MATERIALS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION, OPERATION OR OTHERWISE. Fare Collection Equipment provided under Contract No. CIP1-155-DTPW19-DB includes a paid three (3) year warranty under that same agreement commencing from Beneficial Use or Acceptance of the relevant Payment Milestone in Appendix B to Contract No. CIP1-155-DTPW19-DB.

ARTICLE 51 WARRANTY COMMENCEMENT AND DURATION

Warranties shall commence as stated in Article 50(E), *Warranty Commencement Date*, and shall remain in effect until three (3) years after the Warranty Commencement Date as stated in Article 50(E) or such longer period as may be specified in the Contract ("Warranty Period"). Subcontractor's, manufacturers or Supplier's Warranty Periods shall be for the longer of the above stated Warranty Period or the Warranty Period specified in the particular Warranty. Notwithstanding the three (3) year term of the Warranty Period, the Warranty Period for material/equipment specified in the Scope of Work shall apply for a longer term if therein required or if the longer term is provided by the manufacturer's standard warranty.

ARTICLE 52 WARRANTY CLAIMS

If the County determines that any of the Work contains a defect any time within the Warranty Period, the County will claim and Contractor shall correct, repair or replace such Work at its sole expense. Contractor shall respond to the County's Warranty claim within one (1) calendar day and shall repair the Deficiency within five (5) Days thereafter. If the Deficiency cannot be repaired within said five (5) Days, Contractor, within that five (5) Days, shall submit a schedule for completion of repairs, subject to the acceptance of the County Project Manager, and shall diligently proceed to complete the repairs within the approved schedule. If any defect affects operation of the Work, or any essential element thereof, the County may, in its reasonable discretion, require Contractor to complete repairs or identify a reasonable alternative or temporary solution in less than five (5) Days.

ARTICLE 53 THE COUNTY RIGHT TO CORRECT DEFICIENCIES

If Contractor fails to remedy Deficiencies or otherwise comply with this Warranty or any other Warranty in this Contract, or fails to propose a timely and adequate remedy, the County, after notice to Contractor, may perform or have performed by Third Parties the necessary remedy, and the costs thereof shall be borne by Contractor.

ARTICLE 54 OTHER REMEDIES

The Warranties herein are in addition to all rights and remedies available under the Contract or applicable Law and shall not limit Contractor's liability or responsibility imposed by the Contract or applicable Law with respect to the Work, including liability for design defects, latent defects, strict liability, negligence or fraud. To the extent that any Warranty from any person other than the Contractor would be voided in whole or part by reason of any act or omission of the Contractor, Contractor shall be fully liable to the extent of said Warranty.

ARTICLE 55 REPAIR AND REPLACEMENT

Unless otherwise provided, Contractor shall repair or replace all existing Improvements damaged or removed by Contractor. Repairs and replacements shall be at least equal to existing Improvements and shall match them in finish and dimension.

ARTICLE 56 MANUALS

- A. The Contractor shall prepare manuals for all equipment, systems, materials and finishes furnished as part of the Work. Operating and maintenance instruction manuals, and renewal parts list manuals, including all manufacturer's data, bound in fiberboard covers, shall be prepared for Contractor-supplied equipment and forwarded as soon as possible, but in no event delivered later than ninety (90) days before project completion. A draft copy of the entire manual shall be sent to the County Project Manager for review and approval at least thirty (30) calendar days prior to delivery.
- B. Failure to submit such manuals within the time prescribed may result in the delay of progress payment for such equipment, system, material or finish. The instruction manuals shall provide an overall description of the item or system being furnished (complete with

reduced size drawings), including its operating theory or principals, a detailed description of each sub-item or subsystem any required assembly instructions, detailed start up, operating, trouble shooting, and maintenance procedures. The renewal parts list manuals shall fully identify all parts of the equipment furnished by the Contractor, whether manufactured or purchased by him. The renewal parts shall be identified not only with part numbers assigned by the Contractor but also with the identification or part number assigned by the original equipment manufacturer of each purchased part.

- C. All manuals furnished shall be non-proprietary or shall be licensed for the County use by copyright owners. When copyrighted material is used, source credit shall be provided by footnote.

ARTICLE 57 MUTUAL OBLIGATIONS

- A. This Agreement, including attachments and appendices to the Agreement, shall constitute the entire Agreement between the parties with respect hereto and supersedes all previous communications and representations or agreements, whether written or oral, with respect to the subject matter hereto unless acknowledged in writing by the duly authorized representatives of both parties.
- B. Nothing in this Agreement shall be construed for the benefit, intended or otherwise, of any third party that is not a parent or subsidiary of a party or otherwise related (by virtue of ownership control or statutory control) to a party.
- C. In those situations where this Agreement imposes an indemnity obligation on the Contractor, the County may, at its expense, elect to participate in the defense if the County should so choose. Furthermore, the County may at its own expense defend or settle any such claims if the Contractor fails to diligently defend such claims, and thereafter seek indemnity for costs from the Contractor.

ARTICLE 58 WORK DAY

- A. Unless explicitly specified otherwise herein or in an Exhibit hereto, a Standard Work Day is defined as Monday through Friday, 7:00 AM to 5:00 PM, excluding holidays.
- B. Any provisions applicable to a Standard Work Day, set forth in the Contract Documents, will apply to this article and is hereby incorporated by reference.

County Holidays are:

New Year's Day
Martin Luther King, Jr. Day
President's Day
Law Enforcement Appreciation Day (2nd Friday of May)
Memorial Day
Juneteenth Day
Independence Day
Labor Day
Columbus Day
Veterans Day
Thanksgiving
Day after Thanksgiving
Christmas Day

ARTICLE 59 EMPLOYEES OF THE CONTRACTOR

All employees of the Contractor shall be, at all times, employees of the Contractor under its sole direction and not employees or agents of the County. The Contractor shall supply competent employees. The County may require the Contractor to remove an employee it deems careless, incompetent, insubordinate or otherwise objectionable and whose continued employment on County property is not in the best interest of the County. Each employee shall have and wear proper identification.

ARTICLE 60 INDEPENDENT CONTRACTOR RELATIONSHIP

The Contractor is, and shall be, in the performance of all Work and activities under this Agreement, an independent contractor, and not an employee, agent or servant of the County. All persons engaged in any of the Work performed or Services provided pursuant to this Agreement shall always, and in all places, be subject to the Contractor's sole direction, supervision, and control. The Contractor shall exercise control over the means and manner in which it and its employees perform the Work, and in all respects the Contractor's relationship and the relationship of its employees to the County shall be that of an independent contractor and not as employees and agents of the County.

The Contractor does not have the power or authority to bind the County in any promise, agreement, or representation other than specifically provided for in this Agreement.

ARTICLE 61 QUALITY ASSURANCE/QUALITY ASSURANCE RECORD KEEPING

The Contractor shall maintain, and shall require that its Subcontractors and suppliers maintain, complete and accurate records to substantiate compliance with the requirements set forth in the Agreement. The Contractor and its Subcontractors and suppliers shall retain such records, and all other documents relevant to the Work furnished under this Agreement for a period of three years from the expiration date of this Agreement and any extension thereof.

ARTICLE 62 AUDITS

- A. The County, or its duly authorized representatives and governmental agencies, shall until the expiration of three years after the expiration of this Agreement and any extension thereof, have access to and the right to examine and reproduce any of the Contractor's books, documents, papers and records and of its Subcontractors and suppliers which apply to all matters of the County. Such records shall subsequently conform to Generally Accepted Accounting Principles requirements, as applicable, and shall only address those transactions related to this Agreement.
- B. Pursuant to Section 2-481 of the Code, the Contractor will grant access to the Commission Auditor to all financial and performance related records, property, and equipment purchased in whole or in part with government funds within five business days of the Commission Auditor's request. The Contractor agrees to maintain an accounting system that provides accounting records that are supported with adequate documentation, and adequate procedures for determining the allowability and allocability of costs.

ARTICLE 63 SUBSTITUTION OF PERSONNEL

In the event the Contractor needs to substitute personnel for the key personnel identified by the Contractor's Proposal, the Contractor must notify the County in writing and request written approval for the substitution at least ten (10) business days prior to effecting such substitution. However, such substitution shall not become effective until the County has approved said substitution.

ARTICLE 64 CONSENT OF THE COUNTY REQUIRED FOR ASSIGNMENT

The Contractor shall not assign, transfer, convey or otherwise dispose of this Agreement, including its rights, title, or interest in or to the same or any part thereof without the prior written consent of the County, which consent shall not be unreasonably withheld or delayed.

ARTICLE 65 SUBCONTRACTUAL RELATIONS

- A. If the Contractor causes any part of this Agreement to be performed by a Subcontractor, the provisions of this Contract will apply to such Subcontractor and its officers, agents and employees in all respects as if it and they were employees of the Contractor; and the Contractor will not be in any manner thereby discharged from its obligations and liabilities hereunder, but will be liable hereunder for all acts, omissions, and negligence of the Subcontractor, its officers, agents, and employees, as if they were employees of the Contractor. The services performed by the Subcontractor will be subject to the provisions hereof as if performed directly by the Contractor.
- B. The Contractor, before making any subcontract for any portion of the Work, will state in writing to the County the name of the proposed Subcontractor, the portion of the Work which the Subcontractor is to do, the place of business of such Subcontractor, and such other information as the County may require. The County will have the right to require the Contractor not to award any subcontract to a person, firm or corporation disapproved by the County.

- C. Before entering into any subcontract hereunder, the Contractor will inform the Subcontractor fully and completely of all provisions and requirements of this Agreement relating either directly or indirectly to the Work to be performed. Such Work performed by such Subcontractor will strictly comply with the requirements of this Contract.
- D. In order to qualify as a Subcontractor satisfactory to the County, in addition to the other requirements herein provided, the Subcontractor must be prepared to prove to the satisfaction of the County that it has the necessary facilities, skill and experience, and ample financial resources to perform the Work in a satisfactory manner. To be considered skilled and experienced, the Subcontractor must show to the satisfaction of the County that it has satisfactorily performed Work of the same general type which is required to be performed under this Agreement.
- E. The County shall have the right to withdraw its consent to a subcontract if it appears to the County that the Subcontractor will delay, prevent, or otherwise impair the performance of the Contractor's obligations under this Agreement. All Subcontractors are required to protect the confidentiality of the County's and County's proprietary and confidential information. Contractor shall furnish to the County copies of all subcontracts between Contractor and Subcontractors and suppliers hereunder. Within each such subcontract, there shall be a clause for the benefit of the County in the event the County finds the Contractor in breach of this Contract, permitting the County to request completion by the Subcontractor of its performance obligations under the subcontract. The clause shall include an option for the County to pay the Subcontractor directly for the performance by such Subcontractor. Notwithstanding, the foregoing shall neither convey nor imply any obligation or liability on the part of the County to any Subcontractor hereunder as more fully described herein.

ARTICLE 66 ASSUMPTION, PARAMETERS, PROJECTIONS, ESTIMATES AND EXPLANATIONS

The Contractor understands and agrees that any assumptions, parameters, projections, estimates, and explanations presented by the County were provided to the Contractor for evaluation purposes only. However, since these assumptions, parameters, projections, estimates, and explanations represent predictions of future events the County makes no representations or guarantees; and the County shall not be responsible for the accuracy of the assumptions presented; and the County shall not be responsible for conclusions to be drawn therefrom; and any assumptions, parameters, projections, estimates and explanations shall not form the basis of any claim by the Contractor. The Contractor accepts all risk associated with using this information except that Contractor may be entitled to a Change Order if an inaccuracy by County creates a change affecting the timing or cost of the Work. In the event that County representations materially differ from site conditions, affecting the timing or cost of the Work, the provisions of Article 36, *Claims Regarding Differing Site Conditions*, will apply.

ARTICLE 67 SEVERABILITY

If this Agreement contains any provision found to be unlawful, the same shall be deemed to be of no effect and shall be deemed stricken from this Agreement without affecting the binding force of this Agreement as it shall remain after omitting such provision.

ARTICLE 68 TERMINATION AND SUSPENSION OF WORK

- A. This Agreement may be terminated for cause by the County for reasons including, but not limited to, (i) the Contractor commits an Event of Default (as defined below in Article 69) and fails to cure said Event of Default (as delineated below in Article 69), or (ii) Contractor attempts to meet its contractual obligations with the County through fraud, misrepresentation, or material misstatement.
- B. This Agreement may also be terminated for convenience by the County. Termination for convenience is effective on the termination date stated in the written notice provided by the County.
- C. If County terminates this Agreement for cause under the Article 68 (A) above, the County may, in its sole discretion, also terminate or cancel any other contract(s) Contractor has with the County.
- D. The foregoing notwithstanding, if the Contractors attempts to meet its contractual obligations with the County through fraud, misrepresentation, or material misstatement, the Contractor may be debarred from County contracting in accordance with the County debarment procedures. The Contractor may be subject to debarment for failure to perform and all other reasons set forth in Section 10-38 of the Code.
- E. In the event that the County exercises its right to terminate this Agreement for cause or convenience, the Contractor shall, upon

receipt of such notice, unless otherwise directed by the County:

- i. stop Work on the date specified in the notice (the "Effective Termination Date");
- ii. take such action as may be necessary for the protection and preservation of the County's materials and property;
- iii. cancel orders;
- iv. assign to the County and deliver to any location designated by the County any non-cancelable orders for Deliverables that are not capable of use except in the performance of this Agreement and has been specifically developed for the sole purpose of this Agreement and not incorporated in the Services;
- v. take no action which will increase the amounts payable by the County under this Agreement; and

F. In the event that the County exercises its right to terminate this Agreement, for cause or convenience, the Contractor will be compensated as stated in the payment articles herein for the:

- i. portion of the Work completed in accordance with the Agreement up to the Effective Termination Date, including contract close-out costs (in the event of a Termination for Convenience) and the payable unit cost of work in place based on the Payment Milestone Schedule, up to the Effective Termination Date; and
- ii. non-cancelable Deliverables that are not capable of use except in the performance of this Agreement and has been specifically developed for the sole purpose of this Agreement, but not incorporated in the Services.

G. All compensation pursuant to this article are subject to audit.

H. In the event the Contractor fails to cure an Event of Default timely, the County may terminate this Agreement, and the County or its designated representatives may immediately take possession of all of the following, to which it is lawfully entitled and owned by County: equipment, materials, products, documentation, reports, and County Data. .

This Agreement may be terminated for cause by Contractor if County commits an event of default and fails to cure said event of default within thirty (30) days after receiving written notice of such event of default from Contractor.

ARTICLE 69 EVENT OF DEFAULT

A. An Event of Default is a material breach of this Agreement by the Contractor, and includes but is not limited to the following:

- i. the Contractor has not delivered Deliverables and/or Services on a timely basis;
- ii. the Contractor has refused or failed to supply enough properly skilled staff personnel as provided for under this Agreement;
- iii. the Contractor has failed to make prompt payment to Subcontractors or suppliers for any Services;
- iv. the Contractor has become insolvent (other than as interdicted by the bankruptcy laws), or has assigned the proceeds received for the benefit of the Contractor's creditors, or the Contractor has taken advantage of any insolvency statute or debtor/creditor law or if the Contractor's affairs have been put in the hands of a receiver;
- v. the Contractor has failed to obtain the approval of the County where required by this Agreement;
- vi. the Contractor has failed to provide "adequate assurances" as required under subsection B below;
- vii. the Contractor has failed in the representation of any warranties stated herein; or

- B. When, in the opinion of the County, reasonable grounds for uncertainty exist with respect to the Contractor's ability to perform the Work or any portion thereof, the County may request that the Contractor, within the timeframe set forth in the County's request, but not less than ten (10) days, provide adequate assurances to the County, in writing, of the Contractor's ability to perform in accordance with the terms of this Agreement. Until the County receives such assurances, the County may request an adjustment to the compensation received by the Contractor for portions of the Work which the Contractor has not performed. In the event that the Contractor fails to provide to the County the requested assurances within the prescribed timeframe, the County may:
- i. treat such failure as a repudiation and/or material breach of this Agreement; and
 - ii. resort to any remedy for breach provided herein or at law, including but not limited to, taking over the performance of the Work or any part thereof either by itself or through others.

ARTICLE 70 NOTICE OF DEFAULT - OPPORTUNITY TO CURE

If an Event of Default occurs in the determination of the County, the County shall notify the Contractor (the "Default Notice"), specifying the basis for such default, and advising the Contractor that such default must be cured within a reasonable time limit set forth by the County, or this Agreement with the County may be terminated. The County may grant a reasonable additional period of such duration as the County shall deem appropriate without waiver of any of the County's rights hereunder, so long as the Contractor has commenced curing such default and is effectuating a cure with diligence and continuity during such period or any other period which the County prescribes. The Default Notice shall specify the date the Contractor shall discontinue the Work upon the Effective Termination Date.

ARTICLE 71 REMEDIES IN THE EVENT OF DEFAULT

If an Event of Default occurs, whether or not the County elects to terminate this Agreement as a result thereof, the Contractor shall be liable for all damages resulting from the default, irrespective of whether the County elects to terminate the Agreement, including but not limited to:

1. lost revenues;
2. the difference between the cost associated with procuring Services hereunder and the reasonable amount actually expended by the County for re-procurement of Services, including procurement and administrative costs; and
3. such other direct damages.

To the extent an Event of Default is known or should have been known to the County, and such Event of Default has the potential to lead to lost revenue or other direct damages, the County shall provide prompt notice to Contractor, in accordance with Article 70, before lost revenues and other direct damages accumulate. In order for Contractor to be held accountable for lost revenue and direct damages the County must supply substantiated evidence of such losses attributable to the Event of Default by Contractor. The Contractor shall also remain liable for any liabilities and claims related to the Contractor's Event of Default. The County may also bring any suit or proceeding for specific performance or for an injunction. If an Event of Default occurs and County seeks damages directly or indirectly from Contractor, County acknowledges that it will not pursue the same damages from Contractor under both this Agreement and Contract No. CIP1-155-DTPW19-DB.

ARTICLE 72 PATENT AND COPYRIGHT INDEMNIFICATION

- A. The Contractor shall not knowingly infringe on any copyrights, trademarks, service marks, trade secrets, patent rights, other intellectual property rights or any other third-party proprietary rights in the performance of the Work.
- B. The Contractor warrants that upon delivery, all Deliverables furnished hereunder, including but not limited to equipment, programs, documentation, software, analyses, applications, methods, ways, processes, and the like, do not infringe upon or violate any copyrights, trademarks, service marks, trade secrets, patent rights, other intellectual property rights or any other third-party proprietary rights.
- C. The Contractor shall be liable and responsible for any and all claims made against the County for infringement of patents, copyrights, service marks, trade secrets or any other third party proprietary rights, by the use or supplying of any programs, documentation,

software, analyses, applications, methods, ways, processes, and the like, in the course of performance or completion of, or in any way connected with, the Work, or the County's continued use of the Deliverables furnished hereunder. Accordingly, the Contractor at its own expense, including the payment of attorney's fees, shall indemnify, and hold harmless the County and defend any action brought against the County with respect to any claim, demand, cause of action, debt, or liability for infringement as provided in this section.

- D. In the event any Deliverable or anything provided to the County hereunder, or portion thereof is held to constitute an infringement and its use is or may be enjoined, the Contractor shall have the obligation to, at the Contractor's option to (i) modify, or require that the applicable Subcontractor or supplier modify or replace, the alleged infringing item(s) at its own expense, without impairing in any respect the functionality or performance of the item(s), (ii) procure for the County, at the Contractor's expense, the rights provided under this Agreement to use the item(s); The foregoing indemnity shall not apply to any claim that arises out of (i) Contractor's compliance with the specification or design of County; (ii) any products that have been altered or modified by any party other than Contractor; or (iii) the use of any product in combination with other equipment and materials not furnished by Contractor.
- E. THE FOREGOING CONSTITUTES THE ENTIRE LIABILITY OF CONTRACTOR AND SOLE AND EXCLUSIVE REMEDY OF COUNTY FOR INTELLECTUAL PROPERTY INFRINGEMENT RELATED TO THE GOODS AND SERVICES.
- F. The Contractor shall be solely responsible for informing the County whether a prospective supplier or Subcontractor is a party to any litigation involving patent or copyright infringement, service mark, trademark, violation, or proprietary rights claims or is subject to any injunction which may prohibit it from providing any Deliverable hereunder. The Contractor shall enter into agreements with all suppliers and Subcontractors at the Contractor's own risk. The County may reject any Deliverable that it believes to be the subject of any such litigation or injunction, or if, in the County's judgment, use thereof would delay the Work or be unlawful.

ARTICLE 73 CONFIDENTIALITY

- A. All materials, data, transactions of all forms, financial information, documentation, inventions, designs and methods obtained from the County in connection with the Services performed under this Agreement, made or developed by the Contractor or its Subcontractors in the course of the performance of such Services, or the results of such Services, or for which the County holds the proprietary rights, constitute Confidential Information and may not, without the prior written consent of the County, be used by the Contractor or its employees, agents, Subcontractors or suppliers for any purpose other than for the benefit of the County, unless required by law. In addition to the foregoing, all County employee information and County financial information shall be considered Confidential Information and shall be subject to all the requirements stated herein. Neither the Contractor nor its employees, agents, Subcontractors, or suppliers may sell, transfer, publish, disclose, display, license or otherwise make available to others any part of such Confidential Information without the prior written consent of the County. Additionally, the Contractor expressly agrees to be bound by and to defend, indemnify and hold harmless the County, and their officers and employees from the breach of any federal, state, or local law in regard to the privacy of individuals.
- B. The Contractor shall advise each of its employees, agents, Subcontractors, and suppliers who may be exposed to such Confidential Information of their obligation to keep such information confidential and shall promptly advise the County in writing if it learns of any unauthorized use or disclosure of the Confidential Information by any of its employees or agents, or Subcontractor's or supplier's employees, present or former. In addition, the Contractor agrees to cooperate fully and provide any assistance necessary to ensure the confidentiality of the Confidential Information.
- C. In the event of a breach of this article damages may not be an adequate remedy and either Party shall be entitled to injunctive relief to restrain any such breach or threatened breach. Unless otherwise requested by the County, upon the completion of the Services performed hereunder, the Contractor shall immediately turn over to the County all such Confidential Information existing in tangible form, and no copies thereof shall be retained by the Contractor or its employees, agents, Subcontractors, or suppliers without the prior written consent of the County provided that a copy may be retained for archival purposes, audit purposes, and for purposes of enforcing or defending a claim under this Agreement. A certificate evidencing compliance with this provision and signed by an officer of the Contractor shall accompany such materials.
- D. County will learn information that Contractor regards as confidential or proprietary, including information regarding Contractor's business. To the extent permitted by law, County will keep this information confidential, unless and until Contractor consents to disclosure, or unless such information otherwise becomes generally available to the public through no fault of County. To

the extent the Contractor wishes to claim a trade secret or other exemption from public disclosure recognized by law with respect to materials submitted to the County, the Contractor shall inform the County of the same prior to submission, and shall clearly label such material as "Confidential/Exempt from Public Disclosure." The County shall advise the Contractor of public records requests received for such, and the Contractor must file an action in circuit court within 30 days after the date of this notice seeking a declaratory judgment declaring that the documents in question contain trade secrets or other exemption and, seeking an order barring public disclosure of the documents. Failure to file an action within 30 days constitutes a waiver of any claim of confidentiality, and the County shall release the documents as requested, unless the County determines that the documents are exempt from production under the public records law pursuant to an exemption that is independent of the Contractor's claim.

- E. The requirements of this Article shall not apply to information that: (a) is or becomes publicly available without breach of this Agreement; (b) can be shown by documentation to have been known by Recipient prior to being furnished; (c) becomes available to Recipient on a non-confidential basis from a source other than Discloser, provided that such source is not known by Recipient to be bound by any obligation of confidentiality with respect to such information; or (d) can be shown by documentation to have been independently developed by Recipient without reference to the Confidential Information.

ARTICLE 74 PROPRIETARY INFORMATION

- A. As a political subdivision of the State of Florida, Miami-Dade County is subject to the stipulations of the public records laws of the State of Florida (the "Public Records Law").
- B. The Contractor acknowledges that all computer software in the County's possession, other than the Licensed Software provided under this Agreement, may constitute or contain information or materials which the County has agreed to protect as proprietary information from disclosure or unauthorized use and may also constitute or contain information or materials which the County has developed at its own expense, the disclosure of which could harm the County's proprietary interest therein.
- C. During the term of the Contract, the Contractor will not use directly or indirectly for itself or for others, or publish or disclose to any third party, or remove from the County's property, any computer programs, data compilations, or other software which the County has developed, has used, or is using, is holding for use, or which are otherwise in the possession of the County (the "Computer Software"). All third-party license agreements must also be honored by the Contractor and its employees, except as authorized by the County and, if the Computer Software has been leased or purchased by the County, all hired party license agreements must also be honored by the contractors' employees with the approval of the lessor or Contractors thereof. This includes mainframe, minis, telecommunications, personal computers, and all information technology software.
- D. The Contractor will report to the County any information discovered or which is disclosed to the Contractor which may relate to the improper use, publication, disclosure, or removal from the County's property of any information technology software and hardware and will take such steps as are within the Contractor's authority to prevent improper use, disclosure, or removal.

ARTICLE 75 PROPRIETARY RIGHTS

- A. The Contractor hereby acknowledges and agrees that the County retains all rights, title and interests in and to all materials, data, documentation and copies thereof furnished by the County to the Contractor hereunder or furnished by the Contractor to the County and/or created by the Contractor for delivery to the County, even if unfinished or in process, as a result of the Services the Contractor performs in connection with this Agreement, including all copyright and other proprietary rights therein, which the Contractor as well as its employees, agents, Subcontractors and suppliers may use only in connection with the performance of Services under this Agreement. The Contractor shall not, without the prior written consent of the County, use such documentation on any other project in which the Contractor or its employees, agents, Subcontractors, or suppliers are or may become engaged. Submission or distribution by the Contractor to meet official regulatory requirements or for other purposes in connection with the performance of Services under this Agreement shall not be construed as publication in derogation of the County's copyrights or other proprietary rights.
- B. Except as otherwise provided in subsection A above, or elsewhere herein, the Contractor and its Subcontractors and suppliers hereunder shall retain all proprietary rights in and to all Licensed Software provided hereunder. County and Contractor acknowledge

and agree that the work performed under this Contract does not constitute experimental, developmental or research work. Notwithstanding any other provision in this Contract, Contractor retains title to all intellectual property, patents, trademarks, know-how, copyrights, software, engineering and designs, models, production prints, drawings, work products, technical data, and other information and documents that relate to the goods and services sold to County.

ARTICLE 76 SUPPLIER/VENDOR REGISTRATION/CONFLICT OF INTEREST

A. Supplier/Vendor Registration

The Contractor shall be a registered vendor with the County – Strategic Procurement Department, for the duration of this Agreement. In becoming a registered vendor with Miami-Dade County, the vendor's Federal Employer Identification Number (FEIN) must be provided, via submission of Form W-9 and 147c Letter, as required by the Internal Revenue Service (IRS). If no FEIN exists, the Social Security Number of the owner must be provided as the legal entity identifier. This number becomes Contractor's "County Vendor Number." To comply with Section 119.071(5) of the Florida Statutes relating to the collection of an individual's Social Security Number, be aware that the County requests the Social Security Number for the following purposes:

- Identification of individual account records
- Payments to individual/Contractor for goods and services provided to Miami-Dade County
- Tax reporting purposes
- Provision of unique identifier in the vendor database used for searching and sorting departmental records

The Contractor confirms its commitment to comply with the vendor registration requirements and the associated affidavits available in INFORMS at <https://supplier.miamidade.gov>.

B. Conflict of Interest and Code of Ethics

Sections 2-11.1 (c) and (d) of the Code require that any County official, agency/board member or employee, or any member of his or her immediate family who, through a firm, corporation, partnership or business entity, has a financial interest, direct or indirect, with Miami-Dade County or any person or agency acting for Miami-Dade County, competing or applying for a contract, must first obtain and submit a written conflict of interest opinion from the County's Ethics Commission prior to the official, agency/board member or employee, or his or her immediate family member entering into any contract or transacting any business with Miami-Dade County or any person or agency acting for Miami-Dade County. Any such contract or business transaction entered in violation of these subsections, as amended, shall be rendered voidable. All County officials, autonomous personnel, quasi-judicial personnel, advisory personnel, and employees wishing to do business with the County are hereby advised they must comply with the applicable provisions of Section 2-11.1 of the Conflict of Interest and Code of Ethics Ordinance.

ARTICLE 77 INSPECTOR GENERAL REVIEWS

A. Independent Private Sector Inspector General Reviews

Pursuant to Miami-Dade County Administrative Order No. 3-20, the County has the right to retain the services of an Independent Private Sector Inspector General (the "IPSIG"), whenever the County deems it appropriate to do so. Upon written notice from the County, the Contractor shall make available to the IPSIG retained by the County, all requested records and documentation pertaining to this Agreement for inspection and reproduction. The County shall be responsible for the payment of these IPSIG services, and under no circumstance shall the Contractor's prices and any changes thereto approved by the County, be inclusive of any charges relating to these IPSIG services. The terms of this provision apply to the Contractor, its officers, agents, employees, Subcontractors, and assignees. Nothing contained in this provision shall impair any independent right of the County to conduct an audit or investigate the operations, activities, and performance of the Contractor in connection with this Agreement. The terms of this article shall not impose any liability on the County by the Contractor or any third party.

B. Miami-Dade County Inspector General Review

According to Section 2-1076 of the Code, Miami-Dade County has established the Office of the Inspector General which may, on a random basis, perform audits on all County contracts, throughout the duration of said contracts. The cost of the audit for this Contract shall be one quarter of one percent (0.25%) of the total Contract amount which cost shall be included in the total Contract amount.

The audit cost will be deducted by the County from progress payments to the Contractor. The audit cost shall also be included in all change orders and all Contract renewals and extensions.

Exception: The above application of one quarter of one percent (0.25%) fee assessment shall not apply to the following contracts: (a) IPSIG contracts; (b) contracts for legal services; (c) contracts for financial advisory services; (d) auditing contracts; (e) facility rentals and lease agreements; (f) concessions and other rental agreements; (g) insurance contracts; (h) revenue-generating contracts; (i) contracts where an IPSIG is assigned at the time the contract is approved by the Board; (j) professional service agreements under \$1,000; (k) management agreements; (l) small purchase orders as defined in Miami-Dade County Implementing Order No. 3-38; (m) federal, state and local government-funded grants; and (n) interlocal agreements. *Notwithstanding the foregoing, the Miami-Dade County Board of County Commissioners may authorize the inclusion of the fee assessment of one quarter of one percent (0.25%) in any exempted contract at the time of award.*

Nothing contained above shall in any way limit the powers of the Inspector General to perform audits on all County contracts including, but not limited to, those contracts specifically exempted above. The Miami-Dade County Inspector General is authorized and empowered to review past, present, and proposed County and Trust contracts, transactions, accounts, records, and programs. In addition, the Inspector General has the power to subpoena witnesses, administer oaths, require the production of records, and monitor existing projects and programs. Monitoring of an existing project or program may include a report concerning whether the project is on time, within budget and in conformance with plans, specifications, and applicable law. The Inspector General is empowered to analyze the necessity of and reasonableness of proposed change orders to the Contract. The Inspector General is empowered to retain the services of IPSIGs to audit, investigate, monitor, oversee, inspect, and review operations, activities, performance and procurement process, including but not limited to project design, specifications, proposal submittals, activities of the Contractor, its officers, agents and employees, lobbyists, County staff and elected officials to ensure compliance with contract specifications and to detect fraud and corruption.

Upon written notice to the Contractor from the Inspector General or IPSIG retained by the Inspector General, the Contractor shall make all requested records and documents available to the Inspector General or IPSIG for inspection and copying. The Inspector General and IPSIG shall have the right to inspect and copy all documents and records in the Contractor's possession, custody or control which, in the Inspector General's or IPSIG's sole judgment, pertain to performance of the Contract, including, but not limited to original estimate files, change order estimate files, worksheets, proposals and agreements form and which successful and unsuccessful Subcontractors and suppliers, all project-related correspondence, memoranda, instructions, financial documents, construction documents, proposal and contract documents, back-charge documents, all documents and records which involve cash, trade or volume discounts, insurance proceeds, rebates, or dividends received, payroll and personnel records, and supporting documentation for the aforesaid documents and records.

ARTICLE 78 FEDERAL, STATE, AND LOCAL COMPLIANCE REQUIREMENTS

As applicable, Contractor shall comply, subject to applicable professional standards, with the provisions of all applicable federal, state and the County orders, statutes, ordinances, rules and regulations which may pertain to the Services required under this Agreement, including, but not limited to:

1. Equal Employment Opportunity clause provided under 41 C.F.R. Part 60-1.3 in accordance with Executive Order 11246, "Equal Employment Opportunity", as amended by Executive Order 11375, and, implementing regulations at 41 C.F.R. Part 60.
2. Miami-Dade County Small Business Enterprises Development Participation Provisions.
3. The Clean Air Act of 1955, as amended, (42 U.S.C. §§ 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. §§ 1251-1387), as amended.
4. The Davis-Bacon Act, as amended (40 U.S.C. § 3141-3144 and 3146-3148) as supplemented by the Department of Labor regulations (29 C.F.R. Part 5).
5. The Copeland "Anti-Kickback" Act (40 U.S.C. § 3145) as supplemented by the Department of Labor regulations (29 C.F.R. Part 2).
6. Section 2-11.1 of the Code of Miami-Dade County, "Conflict of Interest and Code of Ethics Ordinance".

7. Section 10-38 of the Code of Miami-Dade County, "Debarment of Contractors from County Work".
8. Section 11A-60 - 11A-67 of the Code of Miami-Dade County, "Domestic Leave".
9. Section 21-255 of the Code of Miami-Dade County, prohibiting the presentation, maintenance, or prosecution of false or fraudulent claims against Miami-Dade County.
10. The Equal Pay Act of 1963, as amended (29 U.S.C. § 206(d)).
11. The prohibitions against discrimination on the basis of age under the Age Discrimination Act of 1975 (42 U.S.C. §§ 6101-07) and regulations issued pursuant thereto (24 C.F.R. Part 146).
12. Section 448.07 of the Florida Statutes "Wage Rate Discrimination Based on Sex Prohibited".
13. Chapter 11A of the Code of Miami-Dade County (§ 11A-1 *et seq.*) "Discrimination".
14. Chapter 22 of the Code of Miami-Dade County (§ 22-1 *et seq.*) "Wage Theft".
15. Any other laws prohibiting wage rate discrimination based on sex.
16. Chapter 8A, Article XIX, of the Code of Miami-Dade County (§ 8A-400 *et seq.*) "Business Regulations".
17. Byrd Anti-Lobbying Amendment (31 U.S.C. § 1352).
18. Executive Order 12549 "Debarment and Suspension", which stipulates that no contract(s) are "to be awarded at any tier or to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs".

Pursuant to Resolution No. R-1072-17, by entering into this Contract, the Contractor is certifying that the Contractor is in compliance with, and will continue to comply with, the provisions of items "j" through "o" above.

The Contractor shall hold all licenses and/or certifications, obtain and pay for all permits and/or inspections, and comply with all laws, ordinances, regulations and building code requirements applicable to the work required herein. Damages, penalties, and/or fines imposed on the County or Contractor for failure to obtain and maintain required licenses, certifications, permits and/or inspections shall be borne by the Contractor. The Project Manager shall verify the certification(s), license(s), and permit(s) for the Contractor prior to authorizing Work and as needed.

Notwithstanding any other provision of this Agreement, Contractor shall not be required pursuant to this Agreement to take any action or abstain from taking any action if such action or abstention would, in the good faith determination of the Contractor, constitute a violation of any law or regulation to which Contractor is subject, including but not limited to laws and regulations requiring that Contractor conduct its operations in a safe and sound manner.

ARTICLE 79 NONDISCRIMINATION

During the performance of this Contract, Contractor agrees to not discriminate unlawfully against any employee or applicant for employment on the basis of race, color, religion, ancestry, national origin, sex, pregnancy, age, disability, marital status, familial status, sexual orientation, gender identity or gender expression, status as victim of domestic violence, dating violence or stalking, or veteran status, and on housing related contracts the source of income, and will take affirmative action to ensure that employees and applicants are afforded equal employment opportunities without discrimination. Such action shall be taken with reference to, but not limited to recruitment, employment, termination, rates of pay or other forms of compensation, and selection for training or retraining, including apprenticeship and on the job training.

By entering into this Contract, the Contractor attests that it is not in violation of the Americans with Disabilities Act of 1990 (and related Acts) or Miami-Dade County Resolution No. R-385-95. If the Contractor or any owner, subsidiary or other firm affiliated with or related to the Contractor is found by the responsible enforcement agency or the County to be in violation of the Act or the Resolution, such violation shall render this Contract void. This Contract shall be void if the Contractor submits a false affidavit pursuant to this Resolution or the Contractor violates the Act or the Resolution during the term of this Contract, even if the Contractor was not in violation at the time it submitted its affidavit.

ARTICLE 80 CONFLICT OF INTEREST

The Contractor represents that:

- A. No officer, director, employee, agent, or other consultant of the County or a member of the immediate family or household of the aforesaid has directly or indirectly received or been promised any form of benefit, payment, or compensation, whether tangible or intangible, in connection with the award of this Agreement.
- B. There are no undisclosed persons or entities interested with the Contractor in this Agreement. This Agreement is entered into by the Contractor without any connection with any other entity or person making a proposal for the same purpose, and without collusion, fraud or conflict of interest. No elected or appointed officer or official, director, employee, agent, or other consultant of the County, or of the State of Florida (including elected and appointed members of the legislative and executive branches of government), or a member of the immediate family or household of any of the aforesaid:
 - 1. is interested on behalf of or through the Contractor directly or indirectly in any manner whatsoever in the execution or the performance of this Agreement, or in the Services, Deliverables or Work, to which this Agreement relates or in any portion of the revenues; or
 - 2. is an employee, agent, advisor, or consultant to the Contractor or to the best of the Contractor's knowledge any Subcontractor or supplier to the Contractor.
- C. Neither the Contractor nor any officer, director, employee, agency, parent, subsidiary, or affiliate of the Contractor shall have an interest which is in conflict with the Contractor's faithful performance of its obligation under this Agreement; provided that the County, in its sole discretion, may consent in writing to such a relationship, provided the Contractor provides the County with a written notice, in advance, which identifies all the individuals and entities involved and sets forth in detail the nature of the relationship and why it is in the County's best interest to consent to such relationship.
- D. The provisions of this article are supplemental to, not in lieu of, all applicable laws with respect to conflict of interest. In the event there is a difference between the standards applicable under this Agreement and those provided by statute, the stricter standard shall apply.
- E. In the event Contractor has no prior knowledge of a conflict of interest as set forth above and acquires information which may indicate that there may be an actual or apparent violation of any of the above, Contractor shall promptly bring such information to the attention of the Project Manager. Contractor shall thereafter cooperate with the County's review and investigation of such information and comply with the instructions Contractor receives from the Project Manager regarding remedying the situation.

ARTICLE 81 PRESS RELEASE OR OTHER PUBLIC COMMUNICATION

Under no circumstances shall the Contractor without the express written consent of the County:

- A. Issue or permit to be issued any press release, advertisement or literature of any kind which refers to the County, or the Work being performed hereunder, unless the Contractor first obtains the written approval of the County. Such approval may be withheld if for any reason the County believes that the publication of such information would be harmful to the public interest or is in any way undesirable; and
- B. Communicate in any way with any contractor, department, board, agency, commission or other organization or any person whether governmental or private in connection with the Work to be performed hereunder except upon prior written approval and instruction of the County, except as necessary to perform the Work; and
- C. Except as may be required by law and as necessary to perform the Work, the Contractor and its employees, agents, Subcontractors, and suppliers will not represent, directly or indirectly, that any Work, Deliverables or Services provided by the Contractor or such parties has been approved or endorsed by the County.

ARTICLE 82 BANKRUPTCY

The County may terminate this Contract, if, during the term of any contract the Contractor has with the County, the Contractor becomes involved as a debtor in a bankruptcy proceeding, or becomes involved in a reorganization, dissolution, or liquidation proceeding, or if a

trustee or receiver is appointed over all or a substantial portion of the property of the Contractor under federal bankruptcy law or any state insolvency law.

ARTICLE 83 GOVERNING LAW

This Contract, including appendices, and all matters relating to this Contract (whether in contract, statute, tort (such as negligence), or otherwise) shall be governed by, and construed in accordance with, the laws of the State of Florida. Venue shall be in Miami-Dade County.

ARTICLE 84 INTEREST OF MEMBERS, OFFICERS OR EMPLOYEES AND FORMER MEMBERS, OFFICERS OR EMPLOYEES

No member, officer, or employee of the County, no member of the governing body of the locality in which the Project is situated, no member of the governing body in which the County was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the project, shall, during his or her tenure, or for one year thereafter, have any interest, direct or indirect, in this Contract or the proceeds thereof.

ARTICLE 85 LIENS

The Contractor is prohibited from placing a lien on County property. This prohibition shall apply to all Subcontractors.

ARTICLE 86 FIRST SOURCE HIRING REFERRAL PROGRAM

Pursuant to Section 2-2113 of the Code, for all contracts for goods and services, the Contractor, prior to hiring to fill each vacancy arising under a County contract shall (1) first notify Career Source South Florida ("CSSF"), the designated Referral Agency, of the vacancy and list the vacancy with CSSF according to the Code, and (2) make good faith efforts as determined by the County to fill a minimum of fifty percent (50%) of its employment needs under the County contract through the CSSF. If no suitable candidates can be employed after a Referral Period of three to five days, the Contractor is free to fill its vacancies from other sources. Contractor will be required to provide quarterly reports to the CSSF indicating the name and number of employees hired in the previous quarter, or why referred candidates were rejected. Sanctions for non-compliance shall include, but not be limited to: (i) suspension of Contract until Contractor performs obligations, if appropriate; (ii) default and/or termination; and (iii) payment of \$1,500/employee, or the value of the wages that would have been earned given the noncompliance, whichever is less. Registration procedures and additional information regarding the First Source Hiring Referral Program are available at <https://iapps.careersourcesfl.com/firstsource/>.

ARTICLE 87 PUBLIC RECORDS AND CONTRACTS FOR SERVICES PERFORMED ON BEHALF OF MIAMI-DADE COUNTY

The Contractor shall comply with the Public Records Laws, including by not limited to, (1) keeping and maintaining all public records that ordinarily and necessarily would be required by the County in order to perform the service; (2) providing the public with access to public records on the same terms and conditions that the County would provide the records and at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law; (3) ensuring that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and (4) meeting all requirements for retaining public records and transferring, at no cost, to the County all public records in possession of the Contractor upon termination of the Contract and destroying any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements upon such transfer. In addition, all records stored electronically must be provided to the County in a format that is compatible with the information technology systems of the County. Failure to meet any of these provisions or to comply with Florida's Public Records Laws as applicable shall be a material breach of this Agreement and shall be enforced in accordance with the terms and conditions of the Agreement. To the extent Contractor receives a request directly from the public, Contractor may forward such request to the County for a response.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT (305) 375-5773, ISD-VSS@MIAMIDADE.GOV, 111 NW 1st STREET, SUITE 1300, MIAMI, FLORIDA 33128.

ARTICLE 88 VERIFICATION OF EMPLOYMENT ELIGIBILITY (E-VERIFY)

By entering into this Contract, the Contractor and its Subcontractors are jointly and severally obligated to comply with the provisions of Section 448.095, Florida Statutes, as amended, titled "Employment Eligibility." The Contractor affirms that (a) it has registered and uses the U.S. Department of Homeland Security's E-Verify system to verify the work authorization status of all new employees of the

Contractor; (b) it has required all Subcontractors to this Contract to register and use the E-Verify system to verify the work authorization status of all new employees of the Subcontractor; (c) it has an affidavit from all Subcontractors to this Contract attesting that the Subcontractor does not employ, contract with, or subcontract with, unauthorized aliens; and (d) it shall maintain copies of any such affidavits for duration of the Contract. Registration information is available at: <http://www.uscis.gov/e-verify>

If County has a good faith belief that Contractor has knowingly violated Section 448.09(1), Florida Statutes, then County shall terminate this contract in accordance with Section 448.095(5)(c), Florida Statutes. In the event of such termination the Contractor agrees and acknowledges that it may not be awarded a public contract for at least one (1) year from the date of such termination and that Contractor shall be liable for any additional costs incurred by the County because of such termination.

In addition, if County has a good faith belief that a Subcontractor has knowingly violated any provisions of Sections 448.09(1) or 448.095, Florida Statutes, but Contractor has otherwise complied with its requirements under those statutes, then Contractor agrees that it shall terminate its contract with the Subcontractor upon receipt of notice from the County of such violation by Subcontractor in accordance with Section 448.095(5)(c), Florida Statutes.

Any challenge to termination under this provision must be filed in the Circuit or County Court by the County, Contractor, or Subcontractor no later than twenty (20) calendar days after the date of contract termination.

ARTICLE 89 SURVIVAL

The respective obligations of the Contractor and the County under this Agreement, which by nature would continue beyond the termination, cancellation, or expiration thereof, shall survive termination, cancellation or expiration hereof.

ARTICLE 90 ACCEPTANCE PROCESS

The County will review, approve, and provide written Acceptance for all Payment Milestones listed in Appendix B via the following process:

1. Contractor's Project Manager will submit, via e-mail to the County Project Manager, a Milestone Completion Report (MCR), included as Attachment B1 to Appendix B, for each completed Payment Milestone.
2. The County will review the Deliverable(s) associated with the MCR within thirty (30) calendar days or as otherwise mutually agreed to in accordance with the schedule outlined in the project schedule. Upon County Acceptance, the Contractor may invoice the County in accordance with Article 11. The County agrees that such Acceptance shall not be unreasonably withheld or delayed. The Contractor understands that failure by the County to provide a notice of Acceptance does not constitute Acceptance.
3. If the County determines, in its reasonable discretion, that the Deliverable(s) associated with the MCR fails to conform to the requirements or are found to be defective in material or workmanship, then the County may reject the Deliverable(s) or may grant an Acceptance and issue payment for of a portion of Deliverables associated with an MCR which outlines pending actions to be taken to achieve Acceptance of the Deliverable(s) and reject the balance of the Deliverable(s) (herein after referred to as "Conditional Acceptance").
4. In the event of rejection, the County shall notify Contractor of such rejection in writing and specify therein the reasons for such rejection. Contractor agrees to deliver a fix or workaround replacement for the Deliverable(s) within fifteen (15) business days of Contractor's receipt of the County's notice, or such other time as agreed between the Parties. Payment shall not be issued for any Payment Milestone that is rejected. The County reserves the right to suspend all Work being performed under the Agreement, except those Services necessary for the correction of outstanding deficiencies, until such time that all such outstanding deficiencies have been corrected by the Contractor and resubmitted to the County for approval.
5. In the event of Conditional Acceptance for a payment milestone, the County shall notify the Contractor in writing of the deficiencies that resulted in the Conditional Acceptance. Contractor agrees to correct such deficiencies in the Deliverable(s) within fifteen (15) business days of the Contractor's receipt of the County's notice, unless otherwise mutually agreed by the parties. Conditional Acceptance may result in partial payment being issued for the Payment Milestone, and the remaining portion of the payment being completed upon the County's Acceptance of the corrected portion of the Deliverable(s).

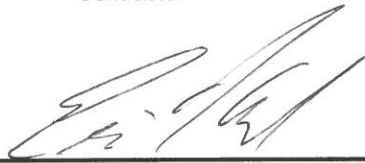
ARTICLE 91 MISCELLANEOUS PROVISIONS

- A. Waiver of Consequential Damages. Except for a breach of obligations regarding confidentiality, notwithstanding anything in this Contract to the contrary, to the fullest extent permitted by applicable law, neither Party shall be liable under any theory of relief, arising out of or related to the Contract or that Party's acts or omissions in connection therewith for consequential damages of any nature, including, without limitation, loss of profits or contract, damage to property or loss of use, any business interruption or loss of profit, anticipated savings, data, contract, goodwill or the like that may be suffered by that Party or claimed against it. Liquidated Damages and Actual Damages shall apply as defined by the Contract.
- B. Limitation of Liability. Except for a breach of obligations regarding confidentiality, neither Party's maximum aggregate liability under the Contract shall exceed: for Phase I, the contract value under this Agreement for Phase I; and for Phases 2 and 3 Twenty Million Dollars (\$20,000,000) for the applicable Phase(s) of Work or extension period giving rise to such liability.
- C. In the event any provision of this Agreement is held to be unenforceable for any reason, the unenforceability thereof shall not affect the remainder of this Agreement, which shall remain in full force and effect and enforceable in accordance with its terms. With respect to any unenforceable provision, the applicable arbitrator or court shall deem the provision modified to the extent necessary, in such adjudicator's opinion, to render such term or provision enforceable, and the rights and obligations of the Parties shall be construed and enforced accordingly, preserving to the fullest permissible extent the intent and agreements of the Parties set forth herein.

IN WITNESS WHEREOF, the Parties have executed this Agreement effective as of the last date that the Agreement is executed below.

Contractor

Miami-Dade County

By: 

By: _____

Name: Eric Kaled

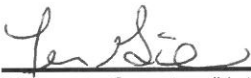
Name: _____

Title: President

Title: _____

Date: 9/19/2024

Date: _____

Attest: 

Attest: _____

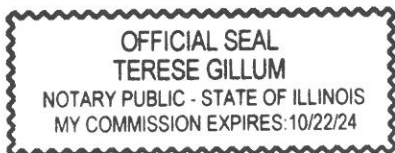
Corporate Secretary/Notary Public

Juan Fernandez-Barquin
Clerk of the Court and Comptroller

By: _____

(Deputy Clerk Signature)

Print Name: _____



Corporate Seal/Notary Seal

Approved as to form
and legal sufficiency

Assistant County Attorney



Appendix A

CONTRACT NO. EVN0001090
FARE COLLECTION EQUIPMENT

TECHNICAL SPECIFICATIONS

MIAMI-DADE COUNTY:
Department of Transportation and Public Works

Exhibits:

- 1 - Payment Processing Certification
- 2 - Reference Documents
- 3 - Payment Card Industry (PCI) Compliance
- 4 - Environmental Tables
- 5 - Current DTPW Fare Structure
- 6 - ITD Technology Model
- 7 - Cloud Services Usage Policy

Introduction and Scope

The Contractor shall design, furnish, deliver, and install the specified type and quantity of Fare Collection Equipment, inclusive of ancillary equipment, spare parts, and services as are described in these specifications in a phased approach as follows: Phase 1 –Continuing Support Services and Subscription-based Licensed Software for South Dade Transitway Fare Collection Equipment, Phase 2 – Bus Farebox Replacement, Phase 3 – Metrorail Station Fare Collection Equipment Replacement. The Contractor shall train all designated personnel in the operation and maintenance of the supplied equipment prior to Acceptance of each phase as further described herein. Further, the Contractor shall provide warranty, repair, maintenance, and support services as further described herein.

The Fare Collection Equipment, with the exception of Fareboxes which shall be cash only, shall use credit card sized, and ISO/IEC 14443 compliant contactless smart cards as well as all forms of Contactless Payment and a Barcode System.

1 Design

1.1 Design Objectives

The Technical Specifications require design and development efforts for all Fare Collection Equipment necessary to furnish and complete installation, including training, testing, documentation, warranty, and additional management functions as specified.

1.2 General Design Requirements

The Fare Collection Equipment to be designed shall utilize service proven equipment and technology satisfying all technical and functional requirements herein:

- A. Equipment shall be modular and non-proprietary to the greatest extent possible.
- B. Functionality shall be provided for activating period passes on first use for the period.
- C. Functionality shall be provided for ISO/IEC 14443 compliant contactless smart cards:
 - a. Shall read smart cards and integrate with the Fare Collection Application
- D. Fare Gates shall have paddle or panel type barriers.
- E. Ticket Vending Machines shall accept valid U.S. coins and bills, ISO/IEC 14443 compliant contactless smart cards, and credit/debit cards issued by valid certified financial institutions for fare payment in compliance with PCI DSS and cEMV payment method standards.
- F. Ticket Vending Machines shall issue receipts and dispense contactless smart cards, barcode media and maintain transaction and event records.
- G. Equipment shall be provided and installed in compliance with the American with Disabilities Act.

1.3 Design Processes for all Phases

Standard service proven products shall be used where possible, but notwithstanding, the Contractor shall have the responsibility to manufacture or supply, maintain, and warrant the Fare Collection Equipment in accordance with all terms and requirements as further set forth by these Technical Specification and the Contract. The design shall require like components to be fully interchangeable. All products shall conform to the applicable Federal laws and regulations in effect at the time of Proposal submittal.

Design shall be conducted as a two-step process, which shall be repeated for each phase: Conceptual Design Review (CDR) and Final Design Review (FDR).

For CDR, as further specified in this Section 1.4.6, the Contractor shall prepare a preliminary design plan, including but not limited to the following elements:

1. Proposed processes for communications and installation
2. Conceptual information on equipment design, configuration and layout, operations and maintenance requirements
3. Proposed infrastructure updates/modifications, to include both physical infrastructure, network infrastructure, and any other components necessary for the Fare Collection Equipment to operate
4. Any proposed changes to the Contract Data Requirements List (see Appendix G)
5. Proposed project management structure, change management processes, and documentation chain of command
6. Preliminary project schedule in conformance with the requirements of the Solicitation. This schedule shall specifically delineate the dates on which all submittals agreed to as part of CDR will be provided for review in advance of FDR to allow for County Approval in accordance with Sections 1.4.3 and 1.4.4.
7. Information and decisions required to progress project to FDR
8. Presentation of all Fare Collection Equipment design and layout
9. External interface requirements for third party systems as specified in these Technical Specifications
10. Spare parts list to support maintenance and warranty

For FDR, as further specified in this Section 1.4.7, the Contractor shall finalize design plans that will serve as the governing documents for completion of each phase.

1.4 Design Review and Support Documentation

1.4.1 Review Procedures for Drawings, Documents, and Data

The Contractor shall submit drawings, documents, procedures, and data in accordance with the Contract Data Requirements List (CDRL) (see Appendix G). The final CDRL shall be jointly agreed as part of Conceptual Design Review. The Contractor shall submit for review and approval copies of all documents, data, assembly, and installation drawings required to convey the concept, design, dimensions, maintenance, operation, and overall assembly aspects and interfaces required as a part of these design reviews. Drawings shall be accompanied by material specifications, process specifications, and test data required for review and approval of the drawings, including detailed parts drawings. CDRL 0101

DTPW reserves the right to reject, without review; any document that is not in English and that is not readily understandable due to lack of proper grammar, spelling, sentence structure, or punctuation. DTPW is under no obligation to expend extraordinary effort to interpret poorly written or translated documents.

DTPW reserves the right to request additional drawings, documents, or data, or any combination of documents, drawings, or data to support the review process. At the discretion of DTPW, the Contractor may be issued an extension of time during the review period, should the Contractor have fulfilled the specified submittal requirements and the additional information requested by DTPW is of sufficient complexity and/or volume. The extension of time, however, does not constitute a modification to or extension of the project schedule.

Except as provided below, DTPW shall respond to complete submittals within ten (10) Business Days after receipt. DTPW shall respond to the Contractor via a contact email address designated by the Contractor.

When the Contractor submits drawings, documents and data, a letter of transmittal listing drawing and document titles, numbers, and revisions shall accompany them.

Extension of time may be allowed, and extension of the schedule may be provided for revision and re-submittal of Contractor's submittals that have been either "disapproved" or "conditionally approved", but in no instance shall such extension exceed five (5) Business Days. Such submittals shall be resubmitted and shall be reviewed and returned to the Contractor within the same time intervals as would be allotted to the drawings and documents when initially submitted. Drawings shall be submitted in an orderly and logical sequence to enable DTPW to readily determine and review the interface relationships among elements and their subassemblies.

The Contractor shall maintain a record of Contractor and Subcontractor submittal status. This shall include drawing and document numbers, revision letter, drawing title, date submitted, transmittal document, disposition, and the document number identifying the disposition. This status shall be updated not less than monthly and submitted to DTPW, as part of the Monthly Progress Report. CDRL 0102

1.4.2 Requirements for Drawings, Documents and Data

All new drawings created for this project will be dimensioned in Metric; all wording shall be in the English language. Text in other languages is permitted on the drawings, but all information shall be translated into American English. All terminology used shall be conventional to the U.S. transit industry. All drawings submitted by the Contractor shall be CADD generated. Hand-drawn sketches shall not be accepted unless specifically requested by DTPW. Submittals shall include a title block with the following information:

- A. Date of drawing or revision.
- B. Name of Contractor and subcontractor submitting the drawing.
- C. Identification of contents and location of work, if applicable.
- D. Drawing number.

The contract number and submittal title and design review specification will be provided on a note included with the drawing submittal.

Title blocks on drawings shall be in the lower right-hand corner. Except for design drawings, all submitted reports, manuals, and other documents furnished to DTPW shall be on 8½" × 11" bond paper, or when a larger size is necessary, 11" x 17" and folded to 8½" × 11". Printing shall be high quality on one side only. Documents shall be stapled in the upper left-hand corner or bound along the left edge such that printed text is not obscured. The front cover of each bound submittal shall contain all data required for identification.

Contractor and subcontractor drawings shall be of a scale and to convey content and provided to DTPW in PDF and the native file format (CADD). Drawing sizes shall either be European size equivalents or conform to DTPW's standards as follows:

- 8½ × 11 inches (Size A)
- 11 × 17 inches (Size B)
- 17 × 22 inches (Size C)
- 22 × 34 inches (Size D)

Unless otherwise approved by DTPW, every drawing shall include a complete list of materials and parts lists on the field of the drawing or on a separate sheet of the same drawing, describing all parts or sub-assemblies, including subcontractor-furnished items which form a part of the assembly, subassembly, or piece depicted.

A revision block shall be provided for all documents, drawings, and data. The revision block shall identify the revision letter, date of revision, description and reason for the change and the initials of the Contractor's responsible engineer authorizing the revision.

Whenever reference is made on a drawing to a material or process by the Contractor's own specification number, the drawing shall also give the commercial equivalent. If there is no commercial equivalent, the Contractor shall provide copies of its specification.

Schematics shall be comprehensive in nature and thoroughly detailed to permit use by DTPW maintenance and service personnel to troubleshoot and repair the equipment.

All lettering and line work shall be of sufficient size, weight, and clarity so that it can be easily reproduced in PDF. Documents that shall be repeatedly used, such as operation and maintenance manuals, shall be printed on good quality paper and securely bound in appropriate cover to prevent loss of sheets or excessive deterioration under frequent use.

Submittals for this work shall include 3 printed copies of full sets of plans and specifications as well as electronic copies in PDF and native (i.e., CADD) format.

The Contractor's drawing format shall be subject to review and Approval by DTPW as part of the Conceptual Design Review. CDRL 0103

1.4.3 Submittals Requiring Approval

Documents, drawings and data to be furnished by the Contractor for Approval by DTPW shall include all information conveyed for the design review meetings, as described herein, including their completed, final form and all other submittals described in this Contract. DTPW reserves the right to request additional documents and/or drawings as required clarifying the intent or meaning of any documents and/or drawings furnished prior to granting Approval in accordance with Section 1.4.4 below.

1.4.4 Approval of Contractor Submittals

DTPW approval or disapproval of all submittals shall be provided within ten (10) Business Days of receipt of the complete submittal package in one of the three following categories:

- A. Approved as submitted.
- B. Conditionally approved. The Contractor may proceed in accordance with changes indicated and shall revise and resubmit the document, drawing, and data for DTPW approval.
- C. Disapproved. The Contractor shall revise and resubmit the document, drawing, and data for DTPW approval prior to commencing the affected portion of the work.

Approval does not relieve the Contractor of the obligation to meet all of the requirements of the Contract. Approval of a document, drawing, and data, which contain deviations from, or violation of, the Technical Specification does not constitute DTPW's approval for that deviation or violation. Such deviations must be specifically identified by the Contractor, requested of, and granted by DTPW in writing.

1.4.5 Design Review Requirements

The Contractor shall develop the agenda for all meetings associated with CDR and FDR and submit these agendas to DTPW for approval at least two (2) Business Days prior to any meeting. Design review meetings shall be held in which the Contractor conducts a presentation in accordance with a previously approved agenda. Development of the design review agenda and schedule shall take into consideration DTPW specific requirements, so as to maximize the time available for the review as well as participation of appropriate staff. In its presentation, the Contractor shall address design approaches, concepts, and design details. During these design review meetings, action items shall be identified, with each action item assigned to an individual for disposition by a pre-determined response date, which shall be captured and documented by the Contractor. All action items identified during the design reviews shall be recorded in an action item

log. Submittals required are listed in Appendix G: Contract Data Requirements List (CDRL).

The Contractor shall submit the required copies of the agenda and a data package and required submittals covering information to be addressed in the meeting. Design review meeting minutes shall be prepared by the Contractor and submitted to DTPW for review and approval within seven (7) calendar days after each meeting.

Attendance at design review meetings shall include representatives of the Contractor and appropriate Subcontractors and the necessary staff from DTPW and its representatives.

1.4.6 Conceptual Design Review

A Conceptual Design Review (CDR) meeting will be scheduled once the Contractor notifies DTPW of its completion of the Conceptual Design Review plan, but in no instance to exceed fourteen (14) calendar days from the Notice to Proceed issued by the County for a particular phase, unless otherwise approved by the County in writing. The CDR shall however be held in the timeframe as defined in the Agreement. The purpose of the CDR is for the Contractor and DTPW to coordinate their activities, for the Contractor to present its intended design, and to identify interface requirements. Contractor submittals to be provided for the CDR are identified in Appendix G: Contract Data Requirements List.

The CDR meetings shall be held at the DTPW offices for a duration determined by the Contractor but may be multiple days in length.

Documentation that the Contractor intends to present at the CDR shall be submitted to DTPW no later than five (5) Business Days prior to the meeting. Approval of all CDR submittals by DTPW is a prerequisite to proceeding to the Final Design Review. DTPW shall notify the Contractor within ten (10) Business Days after the CDR which submittals from the CDR shall be required to be submitted in greater detail for the FDR.

1.4.7 Final Design Review

The Final Design Review (FDR) shall take place as identified in the timeline contained in the Contract schedule. The FDR is to provide the final opportunity to review, revise, and agree on the details of the final design for each phase. FDR submittals shall include finalized submittals of all required drawings, documents, and data agreed to at CDR. The FDR meetings shall be held a minimum of ten (10) Business Days, but not more than fifteen (15) Business Days after receipt of the Contractor's Final Design Review submittals.

In addition to those items from the CDR that are to be resubmitted in greater detail, Contractor submittals for DTPW review and approval for the FDR are listed in Appendix G. The FDR meetings shall be held at the DTPW offices for a duration determined by the Contractor but may be multiple days in length.

The FDR shall be deemed completed when the Final Design Plan is Approved, and a punch list of outstanding issues is agreed upon.

1.5 Installation and Interface Plan

The Contractor shall provide timely, efficient, and effective implementation of the Fare Collection Equipment in accordance with the Phases defined herein.

As part of the CDR for each phase, the Contractor shall submit to DTPW for review an installation and interface plan. The installation and interface plan shall be finalized and approved as part of FDR and shall indicate the method of installation and connections, the installation schedules, installation testing periods and any required DTPW support to properly install the equipment for each station or on each bus. CDRL 0104

The installation and interface plan will provide information on the personnel assigned to the installation, their duties, and the on-site project manager for the Contractor for each phase of the project. As a part of this plan, installation templates

shall be provided for each of the items of Fare Collection Equipment provided as a part of this Contract. These templates shall be submitted at the CDR and approved at the FDR.

2 Contractor Installation Services

The Contractor shall provide the services necessary in each Phase as required to accommodate installation of all Fare Collection Equipment supplied under the Contract. These services shall be provided by a Contractor familiar with the Fare Collection Equipment, and qualified and licensed to perform the necessary work tasks. Plans and specifications supporting the installations shall be developed according to local standards and practices, Federal ADA standards, and shall conform to state and local building codes. The services to be provided shall include all elements normally part of equipment installation activities including but not limited to detailed modification drawings, obtaining required permits, and other similar services.

The Contractor shall submit installation plans and specifications at the CDR and FDR levels to be reviewed and approved by DTPW. All plan submissions shall include electrical, structural, civil/site, graphics and signage, and staging elements wherever necessary. Detailed installation drawing submittals for Phase 3 installation will be provided 60 calendar days prior to commencement of installation thereof, and installation services must comply with the DTPW Adjacent Design Manual found at <https://www.miamidade.gov/procurement/library/dtpw-adjacent-construction-manual.pdf>

CDR submittal will assist DTPW in evaluating the final layout and configuration of the equipment relative to accessible route compliance, architecture, signage, patron flow and the relation of the Fare Collection Equipment to other mechanical, electrical, and structural systems in the facilities and stations.

2.1 Contractor Installation Design Elements for Phase 3

The Installation design plans, submitted by the Contractor as part of the completion of FDR, shall take into considerations and include the following at each installation site:

- A. AC Power ducts and signal will be in the area of the location where the equipment will be installed at each station. All connection to the equipment shall be in accordance with local, state and Federal codes. In the event the existing duct cannot be used, the Contractor shall propose an alternative that is mutually agreed. The alternative mode of connection between consoles proposed by the Contractor i.e., a ramp or overhead channels, it must be visually compatible with adjacent finishes and must be approved by DTPW and in compliance with County Codes.
- B. All existing finishes damaged during installation work shall be patched matching the existing finishes.
- C. Local area network design from all equipment installation sites to closest County's network devices.
- D. Existing power panels in station electrical rooms have sufficient existing sized individual breakers to accommodate each piece of Fare Collection Equipment. Fare Collection Equipment will be located at the designated location at each station as approved by DTPW.
- E. Existing surfaces shall be structurally sound for installation of expansion bolts and core drilling to adequately support installation of the Fare Collection Equipment.

2.2 Installation Coordination

The Contractor shall be responsible for coordinating installation activities with Subcontractors and other County vendors to ensure that all phases are completed in accordance with the established project timelines.

2.3 Interference

The Contractor shall take all actions necessary to mitigate any interference with station operations or other works being conducted at stations during Fare Collection Equipment installation and commissioning activities. This shall include activities in the area which create objectionable dust, noise, or fumes in those public areas. For Phase 3, Metrorail stations

will remain in operation, including continuance of revenue operations, during installation of Fare Collection Equipment. Accordingly, Contractor shall appropriately phase Work to prevent interference to the greatest extent possible for regular Metrorail operations.

2.4 Security

Stations and other property shall be always protected by the Contractor while installation activities are being conducted. Contractors shall not create any conditions which compromise security. The Contractor will ensure that all temporary barriers required to provide adequate security in work areas are installed and secured daily.

2.5 Safety

The Contractor assumes full responsibility and liability for the safety of work performed. All work shall be performed in a manner that will ensure the safety of personnel and the work, prevent safety hazards and exposure of personnel and equipment to hazardous or potentially hazardous conditions. All work in the installation in all phases shall comply with the requirements of the Department of Labor, Occupational Safety and Health Administration (OSHA) provisions, as well as those of State and Local regulations.

The Contractor shall take all steps necessary to protect public safety in and around all work areas, shall work in a manner so as not to present barriers in violation of ADA regulations and shall comply with all DTPW rules and regulations including attending safety certification training. Proper signage and barricades shall be placed around all work areas to prevent personal injury. Additional safety precautions shall be taken when, in the opinion of the County's Project Manager, an unsafe condition exist.

2.6 Progress of Work

Upon commencement of installation work as defined in this section, the Contractor shall make all efforts necessary to complete the work in a minimum amount of time. Work shall progress according to schedules approved in FDR. In the event of slippage from those schedules, additional shifts as required, including Saturdays, Sundays, and holidays shall be scheduled to complete the work. All costs for additional work shift to correct any slippage caused by the Contractor shall be borne by the Contractor.

2.7 Site Access and Site Work Requirements

Installation and testing of the Fare Collection Equipment shall be done by the Contractor. The Contractor shall take into consideration the following guidelines for on-site work:

- Minimize nighttime disturbance of hotel, apartment, dormitory, single family, and condominium residents in the area as required by the local rules and regulations.
- Minimize disruption to retail, office, and university operations.
- Avoid restricting public rights-of-way.
- Shall not present barriers to existing accessible routes except where alternate, accessible routes have already been provided.

Drawings depicting the typical installation of each type of Fare Collection Equipment shall be provided for review and approval by DTPW at Conceptual Design Review. This approved information shall be the basis of the final installation information and drawings which shall be provided at Final Design Review. CDRL 0201

Access to DTPW stations and offices shall be coordinated through the DTPW Project Manager no less than ten (10) Business Days prior to the need for access.

2.8 Phase 1: Continuing Support Services and Subscription-based Licensed Software for South Dade Transitway Fare Collection Equipment

The parties agree that the acquisition and installation of Genfare provided Fare Collection Equipment for the South Dade Transitway shall be completed under Contract No. CIP1-155-DTPW19-DB, inclusive of a prorated initial year of Continuing Support Services in accordance with the provisions of Section 9 and prorated initial year of Subscription-based Licensed Software that conforms to the requirements for the MAS outlined within these Technical Specifications. Upon the expiration of such prorated initial year (October 1, 2025), Continuing Support Services and Subscription-based Licensed Software shall be provided under this Contract No. EVN0001090. To the extent that the same has not been provided to the County under Contract No. CIP1-155-DTPW19-DB, at the conclusion of the installation, Contractor shall provide as-built drawings within 45 calendar days showing any modifications (performed during the installation and approved by DTPW) to the stations, communications, electric and equipment installation site or other applicable site.

2.9 Phase 2 – Bus Farebox Replacement

The Contractor shall install the Fare Collection Equipment under the supervision of DTPW, including prioritized installation for a of any buses deemed by DTPW to be impactful on the South Dade Transitway. The Contractor shall supply supervision and oversight and materials required for the proper installation of the equipment in DTPW vehicles. All installation and removal of old equipment will be performed at a designated DTPW facility. Existing Fareboxes may remain the property of DTPW, however the Contractor may offer DTPW credit in exchange for such Fareboxes and revenue equipment which will then become the property of the Contractor.

The Fare Collection Equipment will be positioned for maximum ease of passenger movement and vehicle operator operation. The installed position will allow for complete, unrestricted opening of all maintenance and cashbox door(s). The Contractor shall identify handrails or other equipment, which may interfere with these access doors, at least sixty (60) calendar days prior to equipment installation. The Contractor will be responsible for properly reinstalling or repositioning any handrails during installation. The position of the equipment when mounted in the vehicle will allow for clear view by the operator from a normal, upright driving position of the coin and bill insertion areas. Bus equipment shall be installed in accordance with applicable ADA requirements.

The Contractor will supply and install all the necessary wiring, protective devices, and mounting hardware necessary for the proper installation and operation of the equipment located within the vehicle operator area within the interior of the vehicle. All new undercarriage wiring will be suitably protected against the road elements and fastened in a manner so as not to interfere with normal vehicle operation and/or maintenance. No "butt connectors" shall be utilized under the vehicle.

The Contractor shall provide detailed production, delivery, and installation schedules to DTPW for approval. These schedules shall be updated on at least a weekly basis, to consider the actual progress, and forwarded to DTPW by the Contractor's Project Manager.

2.10 Farebox Backend System (FBS) Installation

If the Contractor is providing an on-premises FBS, the FBS shall be installed in locations to be identified by DTPW having a power source of 120 VAC, 60 Hz available within 10 feet of the installation location. Environmental control will be supplied by DTPW. DTPW will identify these locations at the Conceptual Design Review and provide the Contractor with a site visit to each of the installation locations.

If the Contractor is providing an on-premises FBS, the Contractor shall furnish and install a rack or other mounting arrangement onto which hardware shall be installed in accordance with the installation/testing schedule. The equipment shall be secured within the mounting arrangement via means of the locks identified earlier within this Section.

The Contractor shall furnish all interfaces required for communication with all other Fare Collection Equipment and the

DTPW network and test the operation of the FBS once installed. The installation of field devices shall not commence until the FBS has been installed and its installation verified.

The Contractor shall provide all peripheral equipment (Receiver/Safe/Bin) for the extraction of money from the Fareboxes and then deposited in a safe container to transport them to a DTPW designated location to be counted and reconciled with the reports generated by the FBS.

If the Contractor is providing a hosted FBS, any necessary setup and configuration of the FBS must be completed in order to allow for full functionality in accordance with the project schedule established at FDR.

2.11 Phase 3: Metrorail Station Fare Collection Equipment Replacement Installation

Station equipment (including TVMs, Fare Gates) mounting shall be in a secure, robust, and vandal and burglar resistant manner. Cabinet mountings within the station shall be by means of four (as a minimum) stainless steel anchor bolts, to be provided by the Contractor, which shall be embedded in the concrete platform by the Contractor according to the bolt manufacturer's instructions. Separate electrical and communications wiring and cabling shall enter from underneath the Fare Collection Equipment, through the base.

Fare Collection Equipment shall be aligned, positioned, and installed in accordance with requirements identified in the station drawings included in Exhibit 2, *Reference Documents*.

The equipment shall be installed over any necessary junction boxes such that no wiring or cabling is exposed outside the cabinet or base.

The Fare Collection Equipment cabinets shall have an integral base with suitable means for leveling the machines upon installation to accommodate any floor slopes or irregularities providing the surface is not damaged. Access to the anchor bolts shall be through the service door or other access panels, subject to DTPW approval, in a manner that shall prevent unauthorized access. The Fare Collection Equipment shall be fully supported by their anchors. The interface between the base of the machine and platform shall be filled with an exterior grout and/or covered with a metal panel, in the case of a gap of more than 0.25". The panel shall be fabricated of the same material with the same finish as the machine.

Pursuant to Section 3.1 below, the Contractor shall identify and later implement any required modifications for the electric and communications at the Conceptual Design Review in writing. The required modifications shall be based upon a review of Exhibit 2, *Referenced Documents*, and site visits to all installation locations performed by the Contractor.

TVMs and Fare Gates cannot be wired directly from the AC line. An industrial AC cord and plug must be provided with each machine that will be inserted into a floor outlet, as per applicable codes an 110V/20A receptacle inside the machine to supply power for the unit.

Any special tools required for the installation or removal of the Fare Collection Equipment shall be provided to DTPW as a part of the special tools consignment to be delivered with the first equipment delivery.

At the conclusion of the installation, Contractor shall provide as-built drawings within 45 calendar days showing any modifications (performed during the installation and approved by DTPW) to the station, communications, electric and equipment installation site or other applicable site.

2.12 Monitoring and Alerting System (MAS) Installation – All Phases

If the Contractor is providing an on-premises MAS, the MAS shall be installed in locations to be identified by DTPW having a power source of 120 VAC, 60 Hz available within 10 feet of the installation location. Environmental control will be supplied by DTPW. DTPW will identify these locations at the Conceptual Design Review and provide the Contractor with a site visit to each of the installation locations.

If the Contractor is providing an on-premises MAS, the Contractor shall furnish and install a rack or other mounting arrangement onto which hardware shall be installed in accordance with the installation/testing schedule. The equipment shall be secured within the mounting arrangement via means of the locks identified earlier within this Section.

The Contractor shall furnish all interfaces required for communication with all other Fare Collection Equipment and the DTPW network and test the operation of the MAS once installed, as further defined herein. The installation of field devices shall not commence until the MAS has been installed and its installation verified.

If the Contractor is providing a hosted MAS, any necessary setup and configuration of the MAS must be completed in order to allow for full functionality in accordance with the project schedule established at FDR.

For on-premises installations, the Contractor shall supply the hardware for the MAS and install the hardware in a location to be identified by DTPW. An off-site system is also required for data recovery purposes. All system hardware designs for on premise MAS must be submitted for review during the Conceptual Design Review. CDRL 0202 Written approval must be given prior to any actual installations. All installations require oversight.

2.13 Plan and Schedule Submission

At FDR approval by DTPW. The written approval shall be required before the commencement of work. These plans will be submitted on a station-by-station. CDRL 0203

2.14 Quantities and Location of Equipment

The Contractor shall provide all Fare Collection Equipment as required by the Contract. The Contractor shall be responsible for assuring that the equipment is delivered to the installation site in a timely manner, so as not to delay installation. Any charges required for storing the equipment prior to its delivery to the installation site up to the date for its scheduled installation shall be borne by the Contractor.

Contractor shall be responsible for the removal and relocation to a designed DTPW facility for all existing Fare Collection Equipment. Existing Fare Collection Equipment may remain the property of DTPW, however the Contractor may offer DTPW credit in exchange for such Fare Collection Equipment which will then become the property of the Contractor.

2.15 Phase-In Plan Criteria

To ensure the completion of the installation stage, the Contractor shall provide an equipment phase-in plan for approval by DTPW for each Phase. The plan shall include a chart showing the relationship of all critical stages and shall indicate what equipment will be available at each installation sites in every segment of installation. CDRL 0204

3 General – Responsibilities

3.1 Contractor's Responsibilities

- A. The Contractor shall perform all assigned work tasks, and services, for the design, development, manufacture, delivery, and installation as well as future services to assist in the integration of all Fare Collection Application. . The Contractor shall ensure that a comprehensive system, inclusive of both Fare Collection Equipment and the Fare Collection Application, to be obtained under separate contract, is implemented and functions as one system to include, not limited to, and not necessarily in the order presented:
 - The Fareboxes must be ready to accept and function, either directly or via a Contractor-developed interface, with the Fare Collection Application
 - Data from Fareboxes (such as transactions, events, and alarms) and Revenue Island Receiver/Vault Equipment (revenue information such as monies received from each Farebox) will be processed by the FBS

to provide reports for revenue reconciliation and maintenance monitoring. The FBS receiving the data and event information from the Fareboxes must be able to interface, either directly or via a Contractor-developed interface, with the Fare Collection Application.

- Provide a mechanism for integration with the Fare Collection Application such as agnostic Fare Validators, developed APIs or interfaces with the Fare Collection Application, or other mechanism that allows the Fare Collection Equipment to operate in the intended manner in conformance with the Technical Specifications.
 - All Fare Collection Equipment provided under this Contract shall communicate with the MAS to allow for monitoring and alerting to ensure a complete functional system
 - Provide all ancillary equipment required to operate and support the system
 - All other equipment such as test stations shall be provided by the Contractor in order to ensure operations in accordance with the requirements in these Technical Specifications.
- B. The Contractor shall supply such materials and supervision as may be necessary for the proper installation of the Fare Collection Equipment. All equipment shall be tested in accordance with the test procedures to be developed by the Contractor and approved as defined in Section 8 (Testing and Acceptance). After testing, the equipment shall be suitable for installation, and capable of interfacing with the Fare Collection Application to perform all functions as designed.
- C. The Contractor shall provide personnel to install, supervise, inspect, and adjust the equipment for the period commencing from start of installation through Final Acceptance of each phase of implementation of the Fare Collection Equipment as defined in Section 8 (Testing and Acceptance) and 9 (Continuing Support Services).
- D. All Fare Collection Equipment shall be of the latest engineering change level available with modifications installed for all known operational problems. Contractor shall retrofit all new problem solutions (engineering changes) to the equipment installed during the testing and warranty period following DTPW approval of the modification. Contractor guarantees that any piece of equipment placed in revenue service will have at a minimum, the same functionality as the equipment already in service, will be compatible with the installed systems as were used in passing Final Acceptance testing unless otherwise approved by DTPW.
- E. The Contractor shall make available full and competent technical services to handle and correct all problems associated with the performance of the Fare Collection Equipment. The Contractor's specialized field representatives shall also be available for visits to the location where the Fare Collection Equipment is being installed during the period between the installation of the first item of equipment and the expiration of the warranty to provide general aid and instruction to DTPW personnel. In the event of a system defect that appears to be a generalized problem that may affect all similar equipment or a systematic defect (a defect that affects the ability of the Fare Collection Equipment to achieve its intended purpose), the Contractor shall respond, address, and correct this situation in accordance with the requirements of Section 4.
- F. The Contractor shall provide all training as identified in Section 9 (Continuing Support Services). Training shall be provided at various points during the phases of implementation and all documentation shall be prepared, provided, and approved by DTPW prior to the Contractor performing any training.
- G. The Contractor shall be responsible for continuing support as specified in Section 9).
- H. The Contractor shall provide the services of a qualified representative, located in the South Florida area, to meet with representatives of DTPW to provide consultation and instructions relative to the proper provisions and work for the installation of the Fare Collection Equipment. The Contractor shall prepare and submit to DTPW a detailed schedule of manufacture, training of personnel, and such other activities necessary for the proper and timely completion of the Work.
- I. The Contractor shall utilize existing AC electrical power at the project sites. The Contractor shall be responsible

for identifying any electrical equipment necessary to utilize existing voltages.

- J. All items or work shall be performed and completed in conformance with these Technical Specifications and in accordance with the schedule described herein or accepted in writing by DTPW. The suitability of Fare Collection Equipment to be utilized in the installation shall be determined based on strict technical compliance with these specifications.
- K. The Contractor shall provide secured storage of Fare Collection Equipment and staging and transition plans prior to installation. The Contractor shall be responsible for the safe removal and transport of all existing equipment in which replacement of existing equipment is required. All existing equipment removed by the Contractor shall be transported by the Contractor to locations designated by DTPW.
- L. The Contractor shall hold progress meetings at locations designated by DTPW and provide all materials for the meeting. Meeting minutes and document agreements reached during the meetings shall be prepared by the Contractor for approval by DTPW no later than 5 Business Days following each meeting.
- M. The Contractor shall prepare all testing materials, plans and procedures and prepare test reports describing the results of the testing.
- N. In accordance with Section 2.8 of the Solicitation, it is the responsibility of the Contractor to have reviewed the available station plans developed and prepared by DTPW to the extent the Contractor deems necessary in order to complete the tasks outlined herein at the fee included in the Contract. These reference drawings include electrical and data conduit locations, equipment placements and other pertinent information. Except to the extent permissible under the terms of Article 35, *Notice of Discovery of Differing Site Conditions*, of the Agreement, DTPW shall not be responsible for any additional costs incurred by the Contractor as a result of modifications not identified in the Proposal to the County but that are necessary for the completion of the Contractor's obligations under the Agreement.
- O. The Contractor shall be responsible for obtaining all licenses and/or permits related to installations of the Fare Collection Equipment, prior to completion of any activities for which such licenses and/or permits are required.
- P. The Contractor shall be responsible for obtaining certifications from nationally recognized testing laboratories as required for the Fare Collection Equipment being provided.
- Q. If the Contractor wishes to replace identified standards with other standards, such as European standards, the Contractor shall provide documentary proof that such standards completely meet the standards suggested to be replaced. Acceptance of this evidence must be approved by DTPW.
- R. The Contractor shall furnish and install Fare Collection Equipment that is EMV Level 1 (L1) certified, specifically those that will be accepting contactless credit cards as a form of payment method. The Fare Collection Equipment shall remain current with EMV certification throughout the life of this Contract. Contractor shall comply with the functional requirements of Exhibit 3, *Payment Card Industry (PCI) Compliance*, attached.

3.2 Quality Assurance Requirements

The County requires that Work under this Contract be performed in conformance with a Quality Assurance (QA) Plan, as further outlined in the section below, which complies with the Work defined in these Technical Provisions. The Contractor is advised that the QA Plan conditions shown below must be satisfied before a Contractor can be deemed responsible and eligible to commence work:

1. A draft QA Plan must be submitted for the County's review as part of CDR. The County may deny the authorization for the commence of Work for failure to furnish the QA Plan within the specified time.
2. If the County, at its sole discretion, determines that the submitted QA Plan does not satisfy the Contract requirements, the Contractor shall complete any requested updates to address County concerns in accordance with Section 1.4.1 and prior to FDR.

3. The final QA Plan shall be submitted as part of FDR.

3.3 Quality Assurance Standards

The Contractor shall organize and conduct the Contract with strict attention and adherence to a QA Plan that shall be in accordance with ISO 9001 and the FTA Quality Management System (QMS) Guidelines (Oct. 2019), as revised.

The QA Plan shall include the Contractor's quality system procedures, outline the structure of the documentation used in the quality system, and address the quality issues discussed in this section, and ISO 9001 Guidelines and FTA QMS Guidelines. This section defines aspects of a QA Plan that are considered as essential requirements for the Contract. The Contractor may utilize a proven in-house QA Plan so long as it meets the objectives outlined in this section and is accepted by the County as part of CDR.

The Contractor shall be responsible for all quality assurance of its Work, including Work performed by any of its subcontractors. It shall be the Contractor's responsibility to include in its subcontracts those provisions that are necessary to ensure that the quality of subcontracted Work will be as good as that which is required of the Contractor by the requirements of the Contract between the County and the Contractor.

The County shall have the right to audit and inspect the Contractor's and its subcontractors' quality systems. Such audits may be conducted on a random or routine basis and may include an audit of the Contractor's inspection and test records. Additionally, the County shall have the right to witness any and all tests or inspections and shall have access to all test data including test procedures, test specifications, and test results. Further, the County shall have the right to conduct independent tests or inspections at the County's expense on any material or equipment to be used on the Work. However, should such County-directed independent test result in failure, the Contractor shall reimburse the County's expense for the test and correct the work as outlined by the Contract. The objective of all audits, inspections, or tests conducted by the County is to ensure that all Contractor-performed Work is accomplished in compliance with applicable Contract requirements.

The County shall have the right to reject, and the Contractor shall replace at Contractor's cost any construction, production or installation, or portion thereof, that has not been accomplished or documented as accomplished in accordance with the accepted QA Plan.

3.4 Quality Management

The Contractor's management with executive responsibility shall define and document its policy for quality, including objectives for quality and its commitment to quality. The Contractor shall ensure that this policy is understood, implemented and maintained at all levels of the organization. The responsibility, authority and the interrelation of personnel who manage, perform and verify Work affecting quality shall be defined and documented, particularly for personnel who need the organizational freedom and authority to:

1. Initiate action to prevent the occurrence of any nonconformities relating to the work to be performed, product, process and quality.
2. Identify and record any problems relating to the work to be performed, product, process and quality.
3. Initiate, recommend or provide solutions through designated channels.
4. Verify the implementation of the solutions through designated channels.
5. Control further processing, delivery or installation of nonconforming product until the deficiency or unsatisfactory condition has been corrected.

The Contractor shall conduct a complete review of the requirements of this Contract to identify and make timely provisions

for the special controls, processes, test equipment, fixtures, tooling and skills required for assuring construction, installation and product quality.

3.5 Applicable Standards

The following standards and codes in effect at the time of proposal submittal shall be followed as applicable during the design construction and installation of the system. The Contractor shall also comply with all applicable State and local codes, including those listed below, as applicable:

- A. American Bankers Association (ABA)
- B. American National Standards Institution (ANSI)
- C. American Society for Quality Control (ASQC)
- D. American Welding Society (AWS)
- E. Americans with Disabilities Act (ADA)
- F. International Standards Organization (ISO)
- G. National Electrical Code
- H. National Fire Protection Association (NFPA) 130 (exception for fare gate height)
- I. Transit Communications Interface Protocols (TCIP) NTCIP 1404 – Scheduling/Runcutting, NTCIP 1405 – Spatial Representation, and NTCIP 1408:2001 V01.01 – Fare Collection
- J. Underwriters' Laboratories, Inc.
- K. State, county and city building and construction codes, as applicable
- L. ANSI Standard – General Purpose Paper Cards
- M. ANSI Standard – General Purpose Plastic Cards
- N. ANSI X9.2 and 8 Pin pad unique key and encryption
- O. European Norm EN55022, Emissions standards for CE marking
- P. European Norm EN55024, Immunity standards for CE marking
- Q. FCC Part 15 Class B – Radio Frequency Devices
- R. IEC-801-2 pertaining to electrostatic discharge
- S. ISO/IEC 7810, Identification Cards – Physical Characteristics
- T. ISO/IEC 7811, Identification Cards - Recording Techniques
- U. ISO/IEC 7816, Identification Cards – Integrated Circuit Cards with contacts
- V. ISO/IEC 10373, Identification Cards – Test Methods
- W. ISO/IEC 14443 Parts 1 through 4 – Contactless Smart Card Standard
- X. MIL-STD-461B-CS06 pertaining to transmitted communication type interference
- Y. MIL-STD-461B-RS02 pertaining to radiated susceptibility
- Z. UL 1950, UL Standard for Safety of Information Technology Equipment
- AA. MIL-STD-810D pertaining to Shock and Vibration Testing
- BB. Society of Automotive Engineers; J1708, J1587, J1939

4 General Requirements – Fare Collection Equipment

The Fare Collection Equipment herein shall be designed to function reliably in the South Florida sub-tropical environment. This environment shall be considered to actively support the growth of fungi and various corrosive reactions on metals. All normal conditions for this environment, including, but not limited to dust, moisture, electromagnetic interference, power line fluctuations, vibration, high wind, lightning, salt air and exposure to other atmospheric conditions shall not affect the reliability or service life of the equipment provided. The use of sculptured buttons tinted latent panels, high intensity light, surface grain depth and direction shall be employed to enable easy readability and operation to minimize patron transaction time. The range of these environmental conditions shall be tested during the First Article Test (see Section 8,

Testing and Acceptance). All Fare Collection Equipment shall conform to the requirements of the latest version of National Fire Protection Agency (NFPA) 130.

Clock components shall use the presently employed Network Time Protocol source in the County for the update of date and time information of all the Fare Collection Equipment.

4.1 Environmental Conditions

The Fare Collection Equipment shall be designed to conform to the environmental requirements indicated herein. The Contractor shall be responsible for acquiring all the data on the pertinent conditions that exist at the installation sites and shall assure by test, analysis, or field records that the Fare Collection Equipment operates under these conditions. The Fare Collection Equipment will be designed to be in a wet environment. If the FBS is on-premises, the hardware shall be of industrial quality to withstand the environment at DTPW garages/bus depots.

All Fare Collection Equipment shall be designed to meet environmental conditions, set forth in Exhibit 4, *Environmental Table*, for proper operation in an open station environment. Fareboxes shall be designed for proper operation in the bus environment. Revenue Island Receivers, Vaults and FBS shall be designed for proper operation in the revenue island environment.

The Contractors design shall maintain its structural integrity and all environmental requirements for winds up to 150 mph, and driven rain not less than 5 degrees off lateral to front of equipment. All Fare Collection Equipment shall remain operational in the presence of the following contaminants: airborne particles, grease, oil, moisture, and other contaminants accumulated on coins and bills including "street money." The components within the Fare Collection Equipment shall be sufficiently shielded against ingress of water resulting from wind-blown rain, water dripping from patrons clothing or possessions and wet coins or other fare media.

4.2 Temperatures and Humidity

The Fare Collection shall function normally, between an external ambient temperature range and in a relative humidity range per Exhibit 4 (non-condensing). The Contractor shall take all measures necessary to ensure the equipment meets reliability requirements.

The Fare Collection Equipment shall be tested using the environmental criteria as set forth in Sections 8 (Test and Acceptance) and Exhibit 4. Performance shall not be affected by any increase in internal temperature caused by the rigors of the test program, such as constant cycling over long time periods.

The Fare Collection Equipment shall not be affected by water seepage through the concrete from water sprinklers, floor scrubbers and devices existing in the operating environment. Revenue service proven components, subject to approval by DTPW during the design reviews, may be used which are not fully protected.

4.3 Thermal Shock

The Fare Collection Equipment shall not be impacted by a thermal shock of 1°F per minute change in temperature over any 15°F increment between 25°F and 110°F.

4.4 Noise

The Fare Collection Equipment shall not cause a sound pressure level, above the ambient, of more than 60 dbA at 3.0 feet in any direction, except for specified alarm conditions. This specification does not apply to audio feedback, Fareboxes, or Cash Receiver Equipment.

4.5 Dust

The Fare Collection Equipment shall sustain normal operation if exposed to airborne particles; especially brake shoe dust

and normal dust, both abrasive and non-abrasive, including electrically conductive dust and salt-laden air.

Suitable enclosures and filtering shall be provided inside the equipment for sensitive components such as printed circuit boards and memory storage devices. Where possible, positive air pressure and appropriate filtering shall be used to reduce the dust intake.

It shall not be necessary to cover any Fare Collection Equipment with a dust cover during the daily bus interior cleaning process. When a cyclone-type vacuum machine or the interior of the bus is washed using a hose the Farebox shall be covered.

4.6 Vibration

The design and installation of the Fare Collection Equipment shall be such that the usual shock and vibration levels experienced during transportation by bus, rail, truck, or airplane shall have no damaging effect on the equipment. This assumes that no special precautions are taken other than solid anchoring and special packaging internally to prevent damage.

After installation, the equipment shall operate normally under the following conditions:

- Intermittent shocks of per Exhibit 4
- Continuous sinusoidal vibration per Exhibit 4

4.7 Sunlight

Measures shall be taken to minimize the effects of direct sunlight on the Fare Collection Equipment. The equipment shall be designed to operate with a solar radiation loading of not less than 275 BTU/hr-ft². Graphical displays shall not be affected when exposed to direct sunlight. Sufficient automatic brightness, contrast and any other means shall be provided to ensure the effects of "washout" are minimized.

To minimize problems caused by the heat or brightness of the sun, the Contractor shall consider the following factors in the design:

- selecting components with a temperature range at least 20° F above the maximum working temperature expected.
- turning on exhaust or cooling fans automatically.
- using tilt, surface orientation, texture, and covers to reduce reflections and glare; and
- using graphics and display types that are readable under all natural and artificial light conditions.

Components sensitive to ultraviolet radiation shall be always protected, and the equipment shall be resistive to damaging effects from this type of radiation, including when the front door is open for maintenance and servicing activities.

4.8 Exterior Installation

All Fare Collection Equipment that is to be used by or in the presence of the public shall be designed per Exhibit 4.

Equipment installed upon vehicles shall operate properly at an inclination of up to 10° off vertical.

4.9 Electrical Environment

Some parts of the Transit System create a very demanding electrical environment for Fare Collection Equipment. Numerous and sustained power outages can be anticipated due to the frequency of electrical storms. A few stations lie near railroad rights of way that are electrified with 700 VDC traction power. The equipment provided shall be able to function properly in this environment.

The Fare Collection Equipment shall be immune from electromagnetic interference and electrostatic discharge.

Transmissions from the equipment, either radiated or conducted, shall not cause interference to other systems. Applicable standards shall be complied with and proven by actual tests, per Exhibit 4.

The Contractor shall be required to ensure that equipment functions properly in the field as specified. The Contractor shall provide certification of all tests conducted in accordance with accepted standards and provide details of the test and test results. CDRL 0401

The Fare Collection Equipment installed on buses shall operate with:

- Primary voltage of +12 volts DC or +24 volts DC nominal.
- Operation from +10 to +18 volts DC for nominal +12-volt DC systems.
- Operation from +20 to +36 volts DC for nominal +24-volt DC systems.

The Contractor shall be responsible for providing a DC connection for each Farebox.

This equipment shall also be able to withstand 1,000-volt DC spikes for 50 milliseconds. Power consumption on these vehicles shall not exceed 220 watts peak, 50 watts average. (These parameters referenced in Exhibit 4.)

In addition to the above electrical characteristics, Fareboxes shall be able to withstand sustained voltage levels of up to plus 25 volts DC for periods of up to ten (10) minutes (+12 VDC nominal) and up to plus 50 VDC for periods of up to ten minutes (+24 VDC nominal). Fareboxes shall not suffer damage or lose its transactional or operational data when the supply voltage increases to plus 25 volts DC (+12 VDC nominal) or plus 50 VDC (+24 VDC nominal) or decreases to any value down to 0 volts DC. Polarity reversals shall not damage Fareboxes (- 12 and/or -24 volts).

4.9.1 Line Voltage and Stability

The Fare Collection Equipment at fixed facilities shall operate from a single-phase power source of 120 VAC plus or minus 10 percent, 3-wire, 60 Hz plus or minus 10 percent and draw 1500 Watts per unit maximum. The 1500 Watt per unit maximum power draw for Fare Collection Equipment includes all ancillary power requirements.

A maximum of 1500 Watts per unit shall be allowed for TVMs. Primary power will be available at the main breaker panel in each station. The power supply and subassemblies shall be designed to ignore microcuts up to 15 milliseconds (ms) in duration with a recurrence of 100 ms on the primary power line. All equipment shall be designed to return to operational status after power failure or voltage spikes or drops which exceed the design envelope.

4.9.2 Radio Frequency (RF) and Electromagnetic Environment

Fare Collection Equipment shall be capable of performing its specified functions when a typical conducted high frequency noise is present at the primary power input per Exhibit 4.

The Fare Collection Equipment installed on buses shall operate with electrical interference per Exhibit 4.

4.9.3 Grounding

A metallic, corrosion-resistant, high-conductivity grounding stud which meets applicable codes shall be provided within each piece of Fare Collection Equipment to ground all conductive materials such as frames and metallic covers, motor frames, trays, and doors in accordance with the National Electric Safety Code.

Exposed, non-current carrying parts of electrical equipment, raceway systems, and metallic cable armor shall be grounded by means of copper conductors. Grounding connections to the equipment shall be made with bolted connectors after the contact surfaces have been cleaned. Nonmetallic raceway shall have a green color insulated grounding wire. Ground wires shall not be smaller than the circuit wires, and the ground resistance from any metallic part to ground shall not be greater than 500 milliohms.

Electronic circuits shall be grounded through a network of insulated wires and/or printed circuit traces and be grounded at only one point in the cabinet. Leakage current between the equipment common grounding point and the earth shall be less than 0.5 milliamps with the equipment power "on".

All on-board equipment shall be suitably grounded.

4.9.4 Electrical Outlets

Each unit of Fare Collection is powered by 120 VAC power and shall have an easily accessible circuit breaker within the equipment to open the supply circuit.

4.10 Accessibility Compliance

All Fare Collection Equipment to be used by the public shall conform to the requirements that are in effect at the time of proposal submission. All Fare Collection Equipment (for Fare Gates, applies to ADA gate aisles only for wheelchair accessible) must meet the ADA requirements. All Fare Collection Equipment shall be installed in a manner that ensures that facilities shall be accessible to and usable by persons with disabilities and fully compliant with ADA requirements. The Contractor shall demonstrate that the Fare Collection Equipment can be conveniently used by people with disabilities, including people who have limited manual dexterity and people who are blind, if feasible without the need for assistance or special training. The demonstration must show how people who are blind will locate the machine, have access to instructions, select the proper fare, insert payment, and obtain a ticket. The Contractor shall provide documentation that the Fare Collection Equipment meets ADA requirements. CDRL 0402

4.11 Stand-alone Operation

Fare Collection Equipment shall be able to function in a stand-alone mode in the event of a network communications failure. All functions normally provided shall be available and shall reconcile upon connectivity being restored. The Fare Collection Equipment shall be designed to easily recover from communications failures without the loss of data on individual transactions.

4.12 Modularity

Components, subsystems, assemblies, and subassemblies shall be of modular design for ease of maintenance and interchangeability and shall conform to these Technical Specifications.

4.13 Interchangeability

Components performing identical functions shall be interchangeable where possible. Components performing different functions shall not be interchangeable. Electrical and mechanical components shall be packaged together in shop repairable and field exchangeable modules according to the function they perform. The Contractor shall provide a full listing of interchangeable and noninterchangeable components at FDR for each phase.

4.14 Maintainability

All components shall be packaged in replaceable and repairable modules. To the greatest extent possible, standard commercially available, service proven, non-proprietary equipment and components shall be used for flexibility and ease of maintenance. Components should be placed so that those that are most frequently maintained are the most accessible. Special customized carrying cases shall be provided to avoid damage to sensitive modules, as necessary, in quantities sufficient to support the level of maintenance required. There shall be sufficient latitude in the operating tolerances to permit the substitution of modules without the necessity of making any electrical or mechanical adjustments.

4.15 Weight Limitation

Components requiring removal for off-site maintenance shall be limited to 50 pounds. Components weighing more than

20 pounds and requiring on-site maintenance within the equipment structure shall be provided with hinges or roll-out slides. Equipment shall include handles as applicable on heavy components or less accessible components for ease of handling.

4.16 Electronic Components

The electronics in all the Fare Collection Equipment shall be mounted on printed circuit boards (PCB) for ease of handling and repair. The electronics shall include all digital logic, drive circuits, power supply circuits, relays, solenoids, batteries, communication interfaces, input/output ports, and discrete electronic components. Edge connectors and boards shall be keyed to prevent the insertion of a board in the wrong position.

All field computer equipment including central processor units (CPUs), if applicable, and all peripherals shall be service proven industrial quality components which are commercially available within the continental USA and shall be Intel based CPU compatible or produced by another nationally recognized supplier subject to County approval, and equivalent in quality and performance to the highest level of proven industrial components available at the time of Contract award.

4.17 Exterior

Fare Collection Equipment having surfaces that are exposed to the public, including all fixed equipment used by DTPW employees in stations shall be clad in stainless steel. Stainless steel sheets shall be in accordance with ASTM A167, Type A304 and finished in accordance with ASTM 480, #4 finish, 120 to 150 grit. The direction of the grain shall be parallel to the long dimension of the surface. Other revenue service proven materials shall be considered, subject to DTPW approval. CDRL 0403

Fastenings shall be concealed wherever possible. Exposed corners shall be rounded or mitered, welded, and ground smooth. Stainless steel shall be formed around corners so that edges are folded and concealed from patrons' views when doors are closed.

There shall be no exposed bolt heads, nuts, sharp corners, non-functional or unnecessary cracks or openings on the outside surfaces. Displays, buttons, bezels, trims, and labels shall be aligned parallel to their mounting plate. All welding marks, burrs, discolorations, or distortions resulting from either fabrication or shipment shall be removed. No projections, sharp edges, or corner shall be permitted.

Materials used in displays, buttons, bezels, trim, and labels shall be appropriate for the intended use, durable and weather resistant. All doors, panels and enclosures shall be weather resistant to IP ratings in Exhibit 4. All conduit entries shall be weatherproof. A replacement grommet shall be installed in such manner that it cannot be dislodged without removing the conduit. Where a wire enters an equipment box without a conduit, the entry shall be made waterproof with a strain relief bushing with a grommet seal. All electrical equipment enclosures shall have condensate drain holes at the low points.

4.18 Tampering with Equipment

All equipment shall be designed so that tampering which interferes with the proper operation of the equipment, or its subsystems shall be detectable and reported back to MAS proposed by the Contractor instead of a physical central computer system and approved by DTPW. TVMs shall be equipped with adjustable sensors that detect physical impact, vibrations, and certain environmental conditions such as heat.

4.19 Tracking of Service Entries and Equipment Defects

All fare collection equipment cabinet door openings, including TVMs, Fare Gates, shall be reported back to MAS. This system shall be capable of monitoring and to enable a properly authorized analyst to access a particular piece of equipment or all accesses made by a designated individual. Any subsystems accessed shall also be shown, as applicable. In addition, all maintenance requirement alerts, and out-of-service condition messages shall be tracked and reported to

the MAS.

4.20 Security of Vaults when Outside Machines

The system shall indicate when a vault (bill and/or coin) has been inserted or removed at a TVM. This message shall provide the identity of the employee who performed the insertion/removal.

4.21 Alarms

Alarm conditions should be immediately sent to the MAS or a Contractor's proposed system via SNMP and other method proposed by the Contractor and approved by DTPW. CDRL 0404

The system monitor workstation provided shall have the ability to recall and display alarm conditions locally, in reverse chronological order.

4.22 Individual Vault Identification

All vaults or devices containing revenue (bill boxes, coin boxes, and re-circulating coin hoppers) shall have individual electronic identification that shall be automatically recognized when the vaults are inserted into the machines. The electronic identification feature of the vaults shall be implemented using a standard, but not necessarily identical, module for each of the three vault types. The identification unit shall be securely mounted to the vault, rugged enough to withstand normal handling of the vault, and shall be removable only from the inside of the vault.

The identification unit shall not obstruct filling or emptying of the vault. If battery power is required, the battery shall have a minimum life of five years, be easily replaced, and commercially available within the United States. Maintenance documentation shall have a periodic procedure to ensure that batteries are replaced every five years. It shall not be possible to modify the vault I.D. without removing the module from the vault. Each module shall have a unique identification number.

4.23 Locks and Keys

The Contractor shall provide all equipment with locks necessary to secure all fare collection equipment. Contractors shall provide a secure keyless lock system to be approved by DTPW. The analysis presented would have to indicate a positive financial benefit to be considered. CDRL 0405

4.23.1 General Lock and Key Requirements

Locking systems for access to revenue containers shall employ the use of high security locks via a secure locking system. CDRL 0406

All locks used shall be unique, and not employ keys that may be duplicated by anyone other than the lock manufacturer or DTPW approved original equipment manufacturer (OEM). All locks and keys shall be numbered sequentially with the key codes reserved for DTPW use only. The locks and key codes shall become the exclusive property of DTPW.

Locks and keys shall be shipped, via "signature controlled" carrier directly to DTPW.

A designated DTPW representative will accompany the Contractor during any lock installation or replacement performed by the Contractor.

Additional procurement of similarly keyed locks and keys shall only be done through the lock manufacturer, or designated OEM, with signature approval of DTPW. For all locks provided, DTPW shall own their keyways.

Locks shall include, at a minimum, the following separately keyed lock types:

- Equipment Lock – Used to secure all equipment except as indicated below.

- Computer Systems Lock – Used to secure all computer and communication equipment.
- Revenue Lock – As required for opening all boxes containing revenue at the Revenue Facility.
- Treasury Lock – As required for removal of boxes containing revenue from the field equipment.
- Maintenance Level Lock – As required for maintenance access without allowing access to revenue.

The number of key sets to be provided shall be as shown in the table following. The quantity will need to be reviewed in connection with the schedule of items including spares.

Table 4-1: Key Set Requirements

Item	Equipment	DTPW Quantity (Key Sets)
1	Farebox	
	- Cashboxes (Money Room)	50
	- Maintenance Access	50
2	Garage/Depot	
	- Receiver/Mobile Safe	25
	- Mobile Safe Door	15
	- Mobile Safe (open in Money Rm)	25
3	Fare Gates	50
4	Ticket Vending Machines	
	- Cash Vaults (Money Room)	50
	- Revenue Service for Cash Vaults	25
	- Maintenance Access	50

4.24 Access Methods

To access the interior of the Fare Collection Equipment, access codes shall be required in order to create a record that the Fare Collection Equipment has been accessed. Verification of access codes shall be done before access to the interior of the machine is permitted. Entry codes shall be entered with delayed alarm triggered if the proper code is not used.

In equipment which contains revenue, the use of an access code and exterior access control system (PIN code, smart card, or other security scheme) shall be required.

The Contractor shall provide access procedures to be used in the event keypads are inoperative or power is lost, using a separately keyed high security lock or other approved means. In equipment which contains revenue, the use of multi-point, vault type locking systems shall be employed on all access doors. In other equipment, access doors shall be designed with multi-point locking systems to eliminate pry points to the extent possible.

The Contractor shall provide procedures describing how access is gained to each applicable item of Fare Collection Equipment for approval by DTPW prior to the Conceptual Design Review. CDRL 0407

4.25 Security

All Fare Collection Equipment shall be constructed to provide maximum protection for equipment and revenue contained therein. All equipment shall be designed to be vandal resistant to the extent possible and shall not suffer damage as a result of reasonably foreseeable conditions.

4.26 Network Interface

All Fare Collection Equipment provided shall utilize a standard Ethernet connection employing a RJ45 female connector and CAT 6 cable for connection to the DTPW network. The jack shall be installed at an easily accessible location.

4.27 Reliability

The minimum acceptable reliability for equipment, for the term of the Agreement and any extension or renewal thereof, shall be as follows:

Table 4-2A: Mean Cycles between Failures (MCBF)

Item	Equipment Type	(MCBF)
1	Ticket Vending Machine (TVM)	10,000
2	Fare Gate	
	Paddle Regular configuration	20,000
	Paddle Accessible configuration	20,000
3	Electronic Farebox	12,500

Table 4-2B: Mean Time between Failures (MTBF)

Item	Equipment Type	MTBF (Hours) (In Service)

1	Ticket Vending Machine (TVM)	12,000
2	Fare Gate	
	Paddle Regular configuration	12,000
	Paddle Accessible configuration	12,000

To accurately determine whether or not the Fare Collection Equipment is meeting their performance and reliability goals the Mean Cycles Between Failures (MCBF) and Mean Cycles Between Jams (MCBJ) measurements will be based upon a usage model to be agreed at Conceptual Design Review. Performance and reliability will be measured using the usage model agreed upon at Conceptual Design Review reflecting the actual usage of the various equipment types. Failure to meet these reliability requirements shall be considered a Service Incident in accordance with Section 9.8, and shall be classified based upon the quantity of impacted equipment (i.e. system wide, per station, single device, etc.).

The reliability calculation scheme will be defined based on the following:

A **material failure** is a malfunction which prevents the Fare Collection Equipment from performing its designated function, or meeting its performance criteria, when used and operated under the environmental and operational conditions stated in these specifications, such that a patron is prevented from successfully completing a transaction. A transaction is defined as a transaction record captured by the MAS. The following conditions will be considered material failures for the equipment (as applicable):

- Printing tickets and/or receipts with incorrect data.
- Encoding fare media with incorrect data.
- Partial or complete failure of passenger or operator display.
- Failure to correctly validate/inspect a fare medium.
- Failure of a Fare Gate to open or close.

Material failures need to be reported to the County's Project Manager immediately to allow for verification by DTPW including necessary information and according to agreed procedures established as part of FDR.

A **Non-material failure** is typically a malfunction caused by a condition external to the Fare Collection Equipment under test, which is neither a functional, environmental, nor a test requirement in this specification and is not expected to be encountered during normal and correct operation of the Equipment in revenue service. Non-material failures will include failures outside the Contractor's control.

Non-material failures will not affect the reliability and accuracy calculations and other agreed reliability measures, and following are samples for non-chargeable failures:

- Mishandling and vandalism.
- Failure of test facility or test instrumentation or cause by erroneous counting of revenues.
- Equipment failures caused by external conditions in excess of the Technical Specifications.
- Failures caused by incorrect operating, maintenance, or repair procedures on the part of DTPW.
- Failures or jams caused by out of specification fare media or foreign cash/currency.

MTBF and MCBF will be calculated on the counting of component replacements. Component replacement is defined as

follows: "Exchange of a defective component that must be removed and repaired to bring the equipment back into compliance with Technical Specifications. Proper measures to cure defects of the equipment in the field within 30 minutes are not counted as a component replacement."

In measuring the performance and reliability criteria, the following rules will apply:

- "Jams" will only be included in the MCBJ calculation and not in the MCBF calculation.
- "Patron Cycles" will be used in measuring reliability.
- Network related incidents will be reviewed by DTPW to determine if it is a material failure.
- All material failures must be reliably verifiable.
- Failures caused by Preventive and Corrective Maintenance will be excluded.
- Cash Accuracy errors outside the manufacturer's published specifications will be reviewed by DTPW to determine if it is a material failure.

4.27.1 Automatic Diagnostics

Automatic diagnostic routines shall be included in all equipment. Diagnostic routines shall guide the repair person through testing procedures and shall isolate any defects to the lowest level field repairable unit. The Contractor shall identify the automatic diagnostic routines included for each of the items of Fare Collection Equipment. CDRL 0408

4.27.2 Self-Testing Capabilities

Fare Collection Equipment shall be designed to diagnose internal faults in subsystems, and report any defects found to MAS. Self-testing procedures shall include both software and hardware diagnostics and be able to pinpoint defects to a subsystem level or better. Testing procedures shall be carried out continuously in a background mode and shall not interfere with normal system operation. Errors found during self-testing routines shall be sent to the MAS. Status shall be available at least on an exception basis and when queried by the MAS. The Contractor shall identify the self-testing routines included for each of the items of Fare Collection Equipment. CDRL 0409

4.27.3 Self-Clearing Features

Fare Collection Equipment shall be constructed to utilize self-clearing features to minimize out-of-service time because of coin or bill module jams, as applicable. Data of any self-clearing events shall be sent to the MAS.

4.28 RJ45 Interface

A standard RJ45 jack for connecting to the station network shall be installed at an easily accessible location in each TVM and Fare Gate.

4.29 Customer and Service Lights

Customer and service lighting shall be installed in each TVM as appropriate. The lighting shall provide sufficient light for the purchasing of tickets by patrons as well as functions to be performed by servicing and maintenance personnel. The opening and closing of the door shall automatically control the power to the service lighting. All lights shall incorporate standard commercially available bulbs and fixtures. Special order, sole source parts shall not be accepted.

4.30 Currency Recognition Standards

At the CDR review meeting, the Contractor shall be required to submit available information on the steps used to verify the authenticity of each denomination of bill accepted in the Farebox and TVMs. The Contractor shall specify the manufacturer and model number for the bill acceptor equipment to be provided and provide the manufacturer's

specifications for the unit and historical information on the manufacture, reliability, and use of the bill acceptors. Statistics regarding experience in revenue service shall also be provided. CDRL 0410

4.30.1 Street Money

Street money shall be used in the testing of the Fare Collection Equipment. Street money is defined as bills, which are used by the public in various environments. It is money that is in general circulation at any given time and/or location. This shall include straight, folded, rolled, and crumpled bills; new, medium aged and old bills; dry and damp bills; whole bills and bills with tears and parts missing. The bill acceptor and other bill handling components shall accept all "street money" with the following exceptions:

- No missing or folded areas on any edge of the bill that exceeds one-eighth inch square. No missing areas in other parts of the bill.
- No tears greater than one-half inch that are not rejoined while being processed.
- No mending tape is located such that improper readings of the magnetic ink portion can occur.
- No staples or other deposits on the bill, which change the thickness or interfere with the functions of the read head.
- No bills whose recognition characteristics are altered, destroyed, or defaced by such methods as overprinting and use of foreign substances.
- No damp bills to the extent that slippage occurs between the belts and the currency.
- No bills in such a condition that validity cannot be ascertained.
- No bill that is unrecognizable by their lack or degradation of a magnetic signature.
- No folds or creases which cause part of the bill to fold onto itself, causing a change in the dimensions of the bill or a void greater than one-eighth square inch.
- No rigidity to the extent that the bills cannot be transported properly resulting in misreads.

4.30.2 Test Money

Test money shall be used to specifically check the reliability of the bill handling components. Test money should be obtained from currency collected in service vehicles and deposited into the money room. The quantity and condition of the bills which are to be inserted into the bill acceptor in a flat, unfolded condition for test purposes shall be as follows for each 100 bills inserted:

All bills shall be dry (conditioned at 65% RH), un-mended. All folds made by means of a mandrill of one-sixteenth (.062) inches in diameter.

4.31 Equipment and Component Serialization Program

Each item of Fare Collection Equipment shall incorporate a unique serial number. This serial number shall be in an easily visible location. The equipment serialization scheme shall be provided at the Final Design Review for DTPW approval. CDRL 0411

Each removable component/module shall be identified with a barcode of standard format including a manually readable serial number of the bar-coded number. This bar code shall be placed in an easily accessible location to permit manual reading as well as automatic scanning. The bar code shall include a part number and serial number unique to that part number. This bar code shall be provided in the same location for each module of the same type. The bar code format and numbering scheme shall be provided for DTPW approval. CDRL 0412

5 Fare Gate/Barrier System and Ticket Vending Machines

5.1 Fare Gates / Barrier Equipment

This section covers the requirements of the Fare Gates / Barrier Equipment that shall separate the free areas from the paid areas.

5.1.1 Functional Modes

The Fare Gates / Barrier Equipment shall be capable of operating in four functional modes as follows:

1. Closed Mode – The barriers shall normally be in the closed position. When a valid type of Contactless Payment (Smart Card, cEMV credit cards, all different cell manufacturer Wallet applications, and other contactless devices, i.e., wristwatch etc.) is properly processed, a tone shall sound, the barrier mechanism shall be released, and the barrier shall open to permit passage through the aisle by the patron. If the Contactless Payment is read as invalid, then the barrier mechanism shall not open, and a distinctive tone shall sound.
2. Open Mode – The barriers shall normally be in the open position to permit the patron to pass through the aisle quickly. When the valid Contactless Payment is properly processed by the Fare Validator, a tone shall sound, and barrier mechanism shall remain in the open position. If the Contactless Payment is read as invalid, or if a Contactless Payment is not presented by the patron, then the barrier mechanism shall close, and a distinctive tone shall sound.
3. Exit Mode – The barriers shall normally be in the closed position. When a patron approaches the Fare Gate console, the barrier shall open. An entry/exit Fare Gate shall be configured as an exit only Fare Gate via integration with the Fare Collection Application or by the removal of internal control modules. The console displays shall show the Fare Gate status to the patron.

The CDR shall include a description of Fare Gate modes. CDRL 0501

5.1.2 Fare Gate Array for the South Dade Transitway

Fare Gates shall have paddle or panel type barriers and shall have entry and exit controlled modes selected by DTPW. There shall be three types of equipment (consoles) that make up an array of two accessible fare gates as follows:

1. Right End console, Type 1 (1 long paddle on the left side and only CSCR (Contactless Smart Card Reader) for entry)
2. Accessible Fare Gate console, Type 2 (2 long paddle on both side and CSCR for entry)
3. Left End console, Type 3 (1 long paddle on the right side and no CSCR needed)

All Fare Gates shall be configured to process Contactless Payment and Barcode media. This may be accomplished either via multiple Fare Validators on a single Fare Gate or via a Fare Validator with the capability to accept both fare mechanisms.

5.1.2.1 Fare Gate Console, Accessible or Regular

The Fare Gate console providing entry and exit paths shall accept and process valid Contactless media as well as valid Barcode. Invalid media shall be unprocessed and cause a distinct audible tone to sound, an appropriate message on the passenger display and an LED visual indication.

The console shall also control the flow of patrons from the paid area of the station to the free area. Entry or exit through a Fare Gate shall either be allowed without restriction or prohibited depending on the setting of the gate. Gates that do not permit exit or entry (out of service or set to not operate) shall illuminate the appropriate end display. All gates shall be capable of operation in either entry or exit mode, as determined by a setting from within the console as well as remotely from the MAS.

All Fare Gates shall incorporate a row of yellow or other distinctive color LEDs on a visible area of the cabinet. These lights, visible from the free and paid areas of the Fare Gate array, shall illuminate when a full fare is processed, when a reduced or free fare riders' media is used for entry, and when an invalid media is presented to the reader. The color for each indication should be agreed by the DTPW. The Fare Gates shall be configurable, both locally at the device and remotely via the MAS.

5.1.3 Accessible Fare Gate Console

Each station shall have set of two Fare Gate consoles providing a wide path shall be furnished and installed in each fare collection area to permit patrons with disabilities and others who cannot use the standard gate to gain access to or exit from the station. It shall also serve as a service gate and as a backup to the regular

gate array and as an emergency gate, when required. It shall consist of a console and wide paddles or panels.

The Contractor shall provide fully dimensioned scale drawings of the accessible Fare Gates at Conceptual Design Review, showing each side and with the doors and covers both opened and closed. CDRL 0502

The Contractor shall provide detailed scale drawings identifying the preferred locations for displays and graphics on the Fare Gate. CDRL 0503

The Contractor shall identify all system status changes that are sensed by the gate equipment. CDRL 0504

The Contractor shall identify the location of all patron sensors. CDRL 0505

Full detailed information on the accessible Fare Gates, including operation and exploded-view drawings, shall be provided at Final Design Review. CDRL 0506

The accessible Fare Gate console shall be clearly differentiated through signage and paddle size from the standard gate console in addition to the following additional requirements: CDRL 0507

1. The contactless media target shall be the same as the standard gate console to allow easy identification by patrons.
2. The international symbol of accessibility (wheelchair symbol) sign shall be affixed to both ends of the console.
3. A remote "unlatch" command shall be available from the MAS. A key operated unlatch shall be available on the console for use by emergency personnel.
4. All contactless media processing shall be identical to the standard gate console.
5. Fare media acceptance or denial shall utilize clearly discernable audio beep or alarm and visible indication. Care should be given not to use alarm frequencies and volume that are likely to trigger disorientation in older people or epileptic seizures.
6. The accessible Fare Gate shall sense the direction of travel through the gate and shall sound an audible alarm if entry is attempted when the gate has been activated in the exit mode, or if more than two entries are detected in an entry mode (two entries shall be allowed to permit a paid entry with a baby stroller). The alarm shall be adjustable in duration between five and thirty seconds.
7. The accessible Fare Gate shall sense an open gate condition and shall transmit a message when the gate opening has exceeded the allowable time. The allowable time shall be adjustable in duration by software control, between ten and sixty seconds. Once an open gate message has been transmitted, the accessible Fare Gate shall transmit a gate closed message upon closure of the gate.
8. The sound level of alarms shall be 80 dB minimum measured 10 feet from the barrier with adjustment possible from within the console or through software control. An externally accessible key switch shall be provided to deactivate the

alarm.

9. The accessible Fare Gate shall only function in closed mode for entrance and open mode for exit.

5.1.4 End Gate Console (Left and right end of array)

An end console shall be installed to provide a clearly defined end to the Fare Gate array. The end console shall have only the light graphics and barriers required to complete the last aisle in a Fare Gate array. The end console shall have the same Fare Gate cabinet as the other Fare Gate console.

5.1.5 Fare Gate Barrier (Paddle or panels) System

The Fare Gates shall only have a paddle or panel type barrier system, which shall be perpendicular to the aisle when closed. The barrier system shall be activated by the Fare Gate console, which shall regulate passage in one direction and shall have the following characteristics:

1. The gate barrier shall have a smooth surface on both sides. Paddles or panels shall be of sufficient height and width to provide the necessary access and egress control between the paid and free areas. The final design of the barrier system shall be approved by DTPW at FDR.
2. Clearance. The gap between the paddles or panels when closed at the centerline of the aisle shall not exceed three inches. The unobstructed entry aisle shall be a minimum of 20 inches wide for the freestanding Fare Gate and end console. For accessible Fare Gate console, the unobstructed path provided shall be 36 inches.
3. Response Time. The total time for the processing of a contactless media and Barcode, from presentation to the target to release of the barrier mechanism shall be 500 ms or less with an additional 200ms for cEMV transactions.
4. Loss of Power. Upon loss of power, the gate shall switch to an emergency power backup and shall process the last transaction and initiate an orderly shutdown. Entry and exit through the Fare Gate array shall be possible without restriction. Data stored at the Fare Gate shall be stored in non-volatile memory and shall not be lost even with total loss of power to the Fare Gate. CDRL 0508
5. Restoration of Power. Upon restoration of power, the entry gate shall return to its normal operating state within four (4) minutes.
6. All applicable State of Florida and Federal ADA requirements concerning accessible fare gates in effect at the time of award of this Contract shall be met.
7. All Fare Gates shall incorporate an interface appropriate for connection to the station fire control system to provide for unattended emergency gate release.
8. The Fare Gates shall meet all ADA requirements and the overall height of the Fare Gates shall not exceed 50 inches, including all displays, unless the Contractor has obtained all the necessary approvals for any Fare Gate exceptions.

5.1.6 Smart Card Target Accessibility

The Fare Gate shall be designed to ensure that entry transactions occur in a minimum of time. The patron shall be guided through all procedures interactively by easily understood graphics and displays. Graphics and displays shall be easily read under all conditions of light. The top of the display shall not be more than 10 inches above the top surface of the Fare Gate console.

All consoles shall incorporate a smart card target on the top, front or side of the console. Graphics shall be provided on the smart card target. All facilities and equipment shall be accessible to and usable by persons with disabilities and fully compliant with the ADA. The Contractor shall demonstrate that the equipment can be conveniently used by people with

disabilities, including people who have limited manual dexterity and people who are blind, if feasible without the need for assistance or special training. The demonstration must show how people who are blind will have access to instructions, select the proper fare, insert payment, and obtain a card. If it is not feasible to provide independent use, the Contractor shall provide the highest degree of independent and convenient use feasible for people with disabilities.

Contractor shall provide detailed drawings identifying the preferred locations for displays and graphics on the Fare Gate. CDRL 0509

5.1.7 Contactless Media Processing

Upon placement of the Contactless Media near the Contactless Smart Card Reader (CSCR), the "target", the via integration, the logic in the Fare Collection Application shall determine if the Contactless media is valid (sufficient remaining value, valid period of validity, valid transfer privilege, etc.). CDRL 0510

If the check is valid, the console shall permit one entry and a sign "Enter", and the remaining value shall be displayed for smart card media. An audible beep shall accompany the "Enter" display. Distinctive audible beeps shall be used for other fare media classes, such as reduced and free fare or elderly.

All facilities and equipment shall be accessible to and usable by persons with disabilities and fully compliant with the ADA.

5.1.8 Sensors

Sensors shall be located within the Fare Gate console to detect the passage of a patron in either direction between the paid or the unpaid areas. This passage shall trigger a message to be sent to the MAS indicating one entrance or exit transaction, along with a fare gate ID, date, and time stamp. A record file per gate per date of all passengers entering and exiting the station should be maintained. Sensors shall be able to detect attempted unauthorized passage between the unpaid and the paid areas and cause the barrier to remain locked. This attempted passage shall trigger a message to be sent to the MAS indicating one unauthorized entrance or exit attempt and shall be programmable to sound an alarm at the Fare Gate. The volume of the alarm shall be adjustable from within the Fare Gate or through MAS.

The Fare Gate shall also be equipped with sensors to detect when an object is stuck between the two paddles or panels during the closing cycle. When an object is sensed, the panels or paddles shall immediately return to the open position until the patron is sensed as passing through the aisle in either direction. When this occurs, a message shall be stored with the details of the transaction, together with the direction of patron travel. The Contractor shall identify the location and operation of all patron sensors. CDRL 0511

5.1.9 Graphics and Displays

Graphics for the Fare Gates shall conform to ADA requirements. The Fare Gate shall have a display that is easily read in open sunlight. The display shall be demonstrated during CDR. The Fare Gate shall have the capability to be remotely updated and programmable via the MAS to display various greetings and messages. When a new display configuration is transmitted from MAS, a log at the MAS and at the local device shall show the message was received and implemented. Displays shall be latent and shall become visible only upon electrical illumination for:

- A. International symbol for "Entry Prohibited" - A red "X" facing each end to alert the patron not to use that aisle.
- B. International symbol for "Entry" - a green display including an arrow pointing in the direction of the aisle to use to enter or exit the system.
- C. Indicator lights to provide a visual signal that a reduced fare instrument is being used.

A label of the international symbol for "Accessible" shall be placed only on the appropriate Fare Gate.

Top displays on each Fare Gate shall be capable of displaying a minimum of two rows of 20 alphanumeric characters, 0.37-inch high (minimum), total. The display can be a backlit high contrast "super twist" LCD, vacuum fluorescent, electro

luminescent panel or any other method approved by DTPW. The top display shall be programmable locally, and via the MAS to display various greetings and messages. Preprogrammed messages, limited to 20 characters per line shall include but not be limited to:

1. "Welcome" - A message greeting the patron when the Contactless media reader is ready for use as well as the Barcode Reader.
2. "Please Add Value" - A flashing message that is lit when the value of the smart card is insufficient for fare payment. The message shall also present the amount that needs to be added so the value is sufficient for a full fare. It shall remain on for a user settable period (initially set to five seconds).
3. "Call for Assistance" - A flashing message that shall be lit whenever the acceptable media cannot be processed in the normal manner, contactless or barcode.
4. "Out of Service" - A message that shall be lit whenever the Contactless media processing system is inoperative to prevent the use of the Fare Gate.
5. "Acceptable media validated. Thank you for riding" _____ (20 characters). A message that shall be lit after an acceptable media has been verified as valid. This display shall also indicate "Amount Remaining \$XXX.XX" for all stored value cards, where \$XXX.XX is the value remaining on the account in the Fare Collection Application linked to the patron card at the conclusion of the transaction. When rolling period passes are used, the Fare Gate display shall indicate the expiration of the pass by displaying "Valid Through MM/DD/YY."
6. "Smart Card Already Validated" - A message to indicate that a time-based pass has already been used at the current station within the passback period. It shall remain on for a time settable by DTPW.
7. "Acceptable media No longer Valid" -A flashing message that is illuminated when the Contactless media or barcode presented has expired, has insufficient value for the fare selected, or is otherwise no longer valid. It shall remain on for a time settable by DTPW (initially set to five seconds).
8. "Current Value" or "Current Validity Period" - Appropriate messages, selectable and programmable by DTPW, to display the status of account status linked to the smart card.
9. "Exit Only" - a message that is lit when the fare gate is locked in the exit direction and does not permit entry. This shall be a settable function for all fare gates.
10. The fare gate shall include space for a display card on each of its ends, facing the patrons as they enter and exit the station paid area.

Other messages shall be provided as needed to furnish the patrons with proper instructions for the operation of the fare gate. The wording of messages to be displayed to the patrons shall be defined at the Conceptual Design Review and finalized at the Final Design Review. CDRL 0512

5.1.10 Microprocessor Assembly

The microprocessor assemblies in the gate consoles shall control and monitor all functions of the Fare Gates. The microprocessor assemblies in the gate consoles shall be identical and interchangeable. Each Fare Gate shall be a stand-alone system; however, the Fare Gates shall communicate in real time with the MAS and Fare Collection Application.

The failure of any microprocessor assembly in an array shall not affect more than one aisle. All microprocessors used shall be of the latest service proven commercial grade production releases of Intel® or Intel-compatible chips or equivalent.

Communication with the MAS shall be an integral, but not necessary part of the microprocessor operation. Communications shall allow for uploading of entry data, exit data, and Fare Gate status messages, and downloading of

control information. There shall be no dependency on maintaining communications with the MAS for normal operation.

5.1.11 System Clock

Each Fare Gate shall have an internally maintained time and date clock through a single source of time and date. The clock shall have the capability of being set and synchronized locally and remotely via the MAS or via another mechanism determined by the Contractor and shall provide the following time and date information:

1. Time Tagging of All Messages and Alerts - To be included with all data transmitted to the MAS.
2. Time and Date Stamping when using Contactless Media and Barcode. - The date and time of use shall integrate with the Fare Collection Application to be stored on the account linked to the media.
3. Peak/Off Peak Fare - The clock shall automatically control the time periods selected for these categories of fares, if implemented as well for the validity transfer period selected.
4. Validity Checking for Time-Based Passes. - Including day, month, year, and day of the week.

5.1.12 Downloading

Downloading from the MAS and Fare Collection Application to each Fare Gate shall be used for the following purposes:

1. Synchronize/set the clocks
2. Provide new fare tables
3. Execute commands and update software.
4. Apply changes to system variables
5. Purge all transmitted transactions after data is transferred to FBS and/or Fare Collection Application
6. Identify equipment addresses for physical and logical location

In the event of loss of communication with the MAS and Fare Collection Application, downloading of all transaction data shall be possible on a local basis for an individual fare gate console with the use of a portable programming device or a PC-compatible handheld or notebook type computer.

5.1.13 Fare Collection Application Data Transmission

Data shall be transmitted to the Fare Collection Application for each transaction, shall include the following information as a minimum. CDRL 513

5.2 Upon Valid Payment Method

1. Transaction Number
2. Fare Gate ID (with station identifier)
3. Entry time and date
4. Smart Card serial number or Barcode number and Credit Card Transaction identifier needed to track the transaction in the Fare Collection Application in fully compliance with PCI DSS
5. Smart Card issuing equipment ID
6. Agency Code
7. Complete cEMV data from valid Contactless Payment via credit/debit card and all applicable forms of mobile wallet

applications in strict compliance of PCI DSS

5.3 Upon Attempted Invalid Payment Method

For unauthorized or invalid entries, the following shall be stored:

1. Transaction Number
2. Fare Gate ID (with station identifier)
3. Attempted entry time and date
4. Attempted type of payment media used

5.4 Upon Change in System Status

When the status of the Fare Gate changes, the transaction number, date, time, Fare Gate number, and failure/event code shall be stored locally and transmitted to the MAS. Fare Gate status events include the following:

1. Intrusion alarm conditions
2. Maintainer identification
3. Maintenance mode
4. Out of service
5. In service
6. Power restored
7. Gate open
8. Gate closed
9. Data verification error
10. Contactless media misread
11. Contactless media cannot be read
12. Invalid fare type

Contractor shall identify all system status changes sensed. CDRL 0514

5.5 As Requested by the MAS

Fare Gates shall identify:

1. Fare Gate ID
2. All transactions since last data transfer to Fare Collection Application
3. Status of each subsystem
4. Patron counts (by direction, exit and entrance)
5. Out of service
6. In service
7. Maintenance mode

8. A list of all Fare Gate variables, software version number and required checksums

5.5.1 Data Storage

All maintenance-related data shall be transmitted to the MAS and shall be stored until instructed to purge transactions by the MAS. In the event communications cannot be established with the MAS or a purge command is not received, data shall be stored locally, with storage for a minimum of two (2) days' worth of transactions provided in the Fare Gate. For purposes of this section, two days' worth of transactions shall be considered 150,000 entry transactions, alarms, events, and status messages. In the event data storage requirements are exceeded, the fare gate shall take itself out of service. The Fare Gate shall provide for the storage described herein in two physically separate locations within each Fare Gate to protect against data loss and corruption. One complete set of data shall be transferred to the MAS together with the checksum of the second set of data. Checksum errors shall be identified, and an alarm message shall be reported to the MAS together with both sets of data. CDRL 0515

All data related to patron transactions shall be identified with the device and station at which the data was generated.

5.5.2 Invalid Smart Card List – Patron Flow

The Fare Gates shall achieve the required patron flow (defined in the following section 5.5.4) regardless of the invalid smart card and invalid credit card used randomly during a high patron flow operation. CDRL 0516

5.5.3 Passback Control

Each Fare Gate shall monitor all transactions to prevent re-use of acceptable media within a predetermined time limit, subject to approval. The time limit for the passback control shall be set under program control, between the limits of zero and 60 minutes. The control of passback shall be based on all entries and shall require continuous updating of information from all Fare Gates at a given location. Maintenance of the passback list can be done either centrally at the MAS or in a distributed fashion at each Fare Gate. Alternately, passback control may be achieved through use of the data stored on the CSCR. CDRL 0517

5.5.4 Patron Flow Rate

The Fare Gate shall be able to process Contactless and Barcode media patrons at a minimum rate of 40 patrons per minute. The patron flow rate for the equipment shall be determined by timing consecutive transactions in a controlled environment based on all fares being accepted the first time. Consecutive taps will keep the Fare Gate paddles retracted for a constant flow of passengers to reach a minimum requirement rate of 40 per minute.

5.5.5 Test Mode

Each console shall employ a test mode switch. In this test mode, the maintainer shall be able to test all electrical and mechanical functions of the Fare Gate. A Fare Gate shall only accept a test mode smart card when in the test mode. When a test smart card is processed, all functions shall be performed for that type of Contactless media, except that the transaction shall not be included in revenue summaries and entry shall not be provided to the paid area. The system shall be able to generate reports independently on all test transactions from the MAS or other method determined by the Contractor. Contractor should provide a test procedure to assure the Contactless payments are processed properly. Test Contactless media shall be invalid when the Fare Gate is in the normal operating mode and shall not permit entry to the paid area. An alarm condition shall be generated at the MAS if any equipment is left in the test mode longer than a maximum time settable at the MAS level.

5.5.6 Maintenance Display / Keypad

A display shall be used along with an internally mounted keypad to enable troubleshooting of the console. The keypad shall have the capability to access software statements to perform such tasks as exercising the logic networks and

mechanical modules. Safeguards shall be employed to ensure that changes to the software cannot be made unless a secure and pre-approved procedure is followed. Failure codes, which shall diagnose problems to a subassembly level, shall be displayed upon addressing by means of the keypad. Diagnostics of the microprocessor logic and memory storage shall be continuous and automatic. Diagnostics shall also be possible through the keypad. A port shall be provided for connection to a PC-compatible handheld or notebook type computer for additional testing, for local printouts of statistical data or other stored data, and for downloading locally when necessary. A Wi-Fi connection to each gate from PC-compatible handheld or notebook type computer to perform Maintenance troubleshooting tasks will be very convenient.

5.5.7 Maintenance Test Smart Cards

Fare Gates shall recognize and process maintenance test smart cards as well as the fare types. Maintenance test smart cards should exercise all Fare Gate smart card functions and transactions recorded as "non-revenue." A method of testing Contactless payments and Barcode should also be included for a Maintenance Test Mode. Contractor may propose alternative method for testing the Fare Gate functions at CDR for DTPW review and Approval.

5.5.8 Power Switch

Each console shall have incorporated within its housing a single-pole, single-throw power switch which shall be used to power down and power up the Fare Gate.

5.5.9 Ventilation

Consoles shall be designed to provide adequate air circulation and ventilation.

5.5.10 Cabinet Design and Construction

Fare gate cabinets shall be constructed with a rigid frame to which all exterior panels and interior components shall be attached. Cabinets of monocoque construction with integral structural members are acceptable. Frames, panels, and doors shall be constructed with appropriate tooling that allows for complete interchangeability of all like panels, covers and doors with consistent fits. All fare gate cabinets shall have identical exterior dimensions and identical appearance except for the provision of cutouts, displays and other features required on some configurations and not on others.

Paddle or panel barriers shall be made from vandal-resistant, revenue service-proven materials and shall be able to withstand forces equivalent to a 200 lb. patron moving at 3 mph and striking the barrier at the junction of the two paddles. A 200 lb. downward force shall also cause no damage to the barrier or its mechanisms.

Fare Gates shall be capable of being installed adjacent to a wall and provide for maintenance access. Servicing or maintenance access and activity shall not require the closing of any adjacent fare gate aisle. The Contractor shall provide dimensioned drawings of the Fare Gates showing each side and with the doors and covers both opened and closed.
CDRL 0518

5.5.10.1 Structural Strength

Equipment cabinets, including the base, shall withstand a concentrated load of 200 pounds applied to any one area of one square inch or a uniformly distributed load over an entire surface of 50 pounds per square foot without causing damage or permanent deformation.

5.5.11 Location of Assemblies

Assemblies performing identical or similar functions in each Fare Gate shall be mounted in the same location within each fare gate cabinet. Electrical, electronic, and mechanical components shall be packaged together in replaceable assemblies according to the function performed. Assemblies performing identical functions in each type of cabinet shall be interchangeable.

5.5.12 Access Doors and Covers

Fare Gate cabinets shall have hinged doors and covers providing direct access to the assemblies. Doors and covers shall be equipped with devices to hold them in the fully open position. Top covers shall not penetrate an adjacent Fare Gate aisle when fully opened. Hinges shall be concealed and shall not protrude beyond the outer surface. The closing joint shall prevent unauthorized entry, as well as dirt, dust, and moisture from entering the cabinet.

5.5.13 Mounting and cables between consoles

The Fare Gate base shall be provided with not less than four mounting holes for securing the cabinet to the floor. Any specialized mounting devices shall be provided by the Contractor.

5.5.14 Barcode Device

Every Fare Gate should be equipped with a Barcode Reader to validate and process the barcode. Upon implementation of the Fare Collection Application, the Contractor shall be responsible to ensure that the Fare Collection Equipment and Fare Collection Application interface properly and function as a cohesive system.

5.5.15 General

This section covers the requirements of full-service Ticket Vending Machines (TVM). These patrons-operated machines shall be designed to vend and process valid smart cards according to and in support of the fare structure contained in Exhibit 5, *Current DTPW Fare Structure*. In addition, the TVMs shall also permit patrons to add value or purchase passes under accounts residing in the Fare Collection Application linked to the patron contactless smart card (ISO/IEC 14443 compliant) that can be used as a method of payment at the Fare Gates. TVM also needs to provide an appropriate and effective fare media for those patrons purchasing "one fare ticket" to use as "one trip ticket" and/or "one trip + transfer" which one option could be a "barcode ticket" to be accepted by the Fare Gates or any other method proposed by the Contractor and approved by DTPW.

Cables interconnecting consoles should be run in conduits or walker-duct or other sort of underfloor ducts. The use of the platform between the consoles can be considered if they comply with all code and regulation and approved by DTPW proper authorities.

TVMs shall be capable of providing a minimum of four (4) unique languages with English as the default language. Languages are to be specified by DTPW, but shall include English, Spanish, and Creole.

Patrons shall be able to choose the language employed by the TVM by both visual and audio means. For the visually impaired, audio annunciation shall be provided for information depicted on the visual displays upon pressing a "PUSH FOR AUDIO" pushbutton. Audio requirements are further defined in Section 5.2.18.

All TVMs shall include an emergency power backup, which shall enable them to complete a transaction in progress and then complete an orderly shutdown in the event of a power loss.

Each TVM shall maintain a connection with the Fare Collection Application for validation.

Contractor shall provide a description of the process to be employed for validation of transactions. CDRL 0519

Reduced fares of all types shall be offered by the TVMs. Purchase of reduced fare products shall be accomplished when a patron is using a reduced fare permit card linked to a proper registered and certified "Reduced Account" in the Fare Collection Application via an interface or integration to the Fare Collection Application.

All TVMs shall be furnished with required features as described follows:

1. A. Full Service TVM – These TVMs shall accept valid United States Currency in general circulation, valid cEMV credit

and bank debit or ATM cards issued by certified financial institutions, and stored value smart cards using a menu driven patron interface to perform the following functions that resides in the passenger account established in the Fare Collection Application:

2. Sell and dispense a card to be linked to account in the Fare Collection Application where stored value or time-based products purchased at the TVM will be recorded and available to be processed at Fare Gates and bus Stand-Alone Validators (provided under the Fare Collection Application product).
3. Provide change (value programmable) with the cash purchase of a smart card and fare products.
4. Display remaining value and/or rides and pass expiry information recorded in the Fare Collection Application linked to the previously issued smart cards.
5. Allow the purchase of multiple cards in one transaction if this can be accomplished in an Open Loop System and each card can be linked to a corresponding Fare Collection Application account with the subsequent purchase of a fare product per card.

All full service TVMs shall be supplied with coin vault(s), re-circulating coin magazine(s), a bill vault, coin acceptor, and bill acceptor. Each TVM operational spare will consist of same capacity as primary coin vault(s), re-circulating coin magazine(s) and bill vault. The TVM should also be able to vend Extended Use Smart Card (EUSC) and "one fare ticket" to use as "one trip ticket" and/or "one trip + transfer" which one option could be a "barcode ticket" to be accepted by the Fare Gates. The Contractor can propose an alternative method to accomplish the sale of this type of fare product.

The TVMs shall also have the capability of issuing a printed receipt with a credit/debit card purchase and generating printed reports automatically or upon request at the service terminal. The printer could be also used to issue the Barcode as a separate mechanism to dynamic Barcodes.

5.5.16 Payment Card Industry Compliance

The TVMs shall fully comply with Payment Card Industry ("PCI") Security Standards. The County's current process for establishing and maintaining such compliance is outlined in Exhibit 2, *PCI Provisions*, to this Contract. The Contractor shall provide turnkey encryption services for all payment options within the TVMs. These services, including any third party agreements required to be executed by the County, and costs shall be disclosed in as an assumption in the Proposal Price Schedule.

5.5.16.1 Ongoing PCI Compliance

The Fare Collection Equipment and Contractor shall comply with the Payment Card Industry Security Standards in effect and at all times throughout the term of the Contract. If at any time any of the components of the Fare Collection Equipment, including but not limited to Contractor's equipment, hardware, software, or policies, become non-PCI compliant, the Contractor is responsible for all costs related to upgrading the Fare Collection Equipment so that PCI compliance is maintained throughout the term of Contract. The Contractor must provide the following:

1. Any communications into or out of the County's network must be encrypted unless explicitly allowed by ITD's Enterprise Security Office. All subsystems must be able to send logging information into a central logging system for event audit and anomaly detection.
2. During an installation or a major upgrade, the Contractor must provide implementation manuals and detailed diagram(s) that show all cardholder data flows across the County's systems and networks.
3. The Contractor shall resubmit the aforementioned passing, updated, completed, and signed PCI compliance documents annually to the County.
4. The Fare Collection Equipment shall be updated, when required, to remain compliant with all changes to the PCI standards and requirements by the implementation dates mandated by the PCI Security Council and remediate any critical security vulnerabilities within 30 calendar days of identification.

5.5.17 Front Panel Assembly

The operating features on the front panel of the TVM shall have the features indicated herein, as required to meet the operational requirements of the full-service TVMs as identified above, as well as Federal, State and Local regulations.

The Contractor shall provide a fully dimensioned scale drawing of TVM showing all components, slots and displays, with the door open as well as closed, when installed on its base. CDRL 0520

5.5.18 Message Display Unit (MDU)

The patron interface shall incorporate a Message Display Unit (MDU), (a touch screen is permissible) together with a set of soft keys and a minimum of six and a maximum of ten software configurable function keys and shall be the primary means of communications between the TVM and patrons.

This soft key screen interface shall operate properly under the same environmental conditions as identified in these Technical Specifications without additional protection from the elements. The MDU screen shall be a color SVGA display with a minimum 800 x 600 resolution and a minimum 15-inch (diagonal) screen.

Major message strings displayed for the patron on the MDU shall be at least 0.4 inches in height. The MDU shall be programmable by DTPW via internet access through the MAS or other method determined by the Contractor for changing messages and graphics without Contractor assistance.

Due to the extreme temperatures caused by solar gain a fan kit shall be used to cool the display. The MDU shall have a maximum operating temperature of at least 50 degrees Celsius. In addition, the MDU shall have an initial brightness rating

of no less than 1000 units (cd/m²), a contrast ratio of at least 150:1, a horizontal viewing angle of at least 70 degrees, and a vertical viewing angle of at least 90 degrees.

Within the viewing angle envelope, no part of the MDU shall be obscured by bezels or the aperture in the TVM door when viewed from 18 inches from the vertical plane of the TVM front door.

Full and detailed information on the patron interface hardware (MDU, pushbuttons, and keypad) and software, including operation, and dimensioned drawings shall be provided. CDRL 0521 Messages shall be displayed to provide the patron with operational information regarding the TVM including operation in the following degraded modes.

The TVM's Electronic Control Unit shall indicate the limited operating condition of the TVM on the MDU and a status update message shall be stored for transfer.

In addition, the MDU shall conform to the following requirements:

1. Provide messages and menus to the patron regarding cash, smart card, credit and debit card transactions, and instructions.
2. MDU shall be capable of displaying multilingual text, including English, Spanish, and Creole. Fonts used shall be selected to provide maximum readability.
3. Employ a display such as a backlit, high contrast display or revenue service-proven equal. Readability shall be enhanced as required to preclude "washout" in direct sunlight and to minimize glare and reflections. Cathode ray tubes (CRTs) shall not be provided.
4. Be vandal resistant using one-half inch polycarbonate "Lexan™," or equal, front cover panel. The panel shall be attached from the inside of the door and be easily replaceable within ten (10) minutes of opening the front door and entering the correct PIN. The front cover panel shall be installed in such a manner that, if hit, it shall not cause damage by flexing into the MDU. To the greatest extent possible, the front cover panel shall be scratch and UV resistant.
5. Have software configurable function keys adjacent to the MDU or in a Touch Screen MDU.
6. Multilingual text shall have an equivalent audio response.

5.5.19 Out of Service Message

The "Out of Service" message shall be displayed, at a minimum, for the following abnormal conditions or by command from the MAS:

1. Failure to operate in cash, smart card, and credit/debit card operating modes
2. Security breached, such as access procedure violated and door open

5.5.20 Cancellation and Reversal of Transaction

Two methods of cancellation are required – manual and automatic. A transaction reversal must be executed when EUSC or single use cards cannot be issued.

5.5.20.1 Manual Cancellation

A "CANCEL" button, in addition to the keypad, shall be provided as a separate button on the face of the TVM or soft button on the touch screen is acceptable as long it is in compliance with ADA requirements, which shall allow the patron to cancel a transaction at any time prior to:

1. Inserting the full amount due
2. The commencement of the ticket being printed and issued, for a cash or smart card transaction

3. Bank authorization request and/or processing in the case of a credit/debit card transaction

Upon cancellation, "Transaction Canceled" shall be displayed and inserted coins and bills shall be returned within five (5) seconds (including up to 20 coins and all inserted bills), after which time the display shall revert to idle screen.

5.5.20.2 Automatic Cancellation

The MDU shall display "Transaction Canceled" upon automatic cancellation of a transaction. A message shall be displayed to the patron to indicate the reason for the cancellation and all coins, and all bills inserted by the patron shall be returned within five (5) seconds (including up to 20 coins and all inserted bills). Automatic cancellation shall occur under the following conditions:

1. Patron exceeded the preset time limitation between actions.
2. Maximum coin and/or bill escrow capacity has been exceeded.
3. Patron has exceeded the pre-set number of attempts to enter the correct PIN number.
4. When a smart card cannot be dispensed after insertion of monies.
5. When a smart card cannot be read during a smart card transaction.

5.5.20.3 Reversal of Transaction

If a smart card cannot be dispensed for an approved credit or debit transaction, a means shall be provided to automatically reverse such transactions. When a transaction reversal occurs, details of the transaction shall be stored and transferred to the Fare Collection Application. A printed receipt shall be issued to the patron to show the account and reversed activity. An abbreviated account number conforming to Federal regulation requirements shall be printed on the receipt.

5.5.21 Access Lock

General requirements concerning Locks and Keys are provided in Section 4.23. Access for removal of revenue containers from the TVM is controlled using secure keyless lock system. CDRL 0522

5.5.22 Placard Frame

A waterproof holding frame shall be built into the front panel in a readily visible location. It shall be possible to insert a placard, about 1/16-inch in thickness, containing operating instructions into the frame from the inside. A polycarbonate, transparent sheet, 1/16-inch in thickness shall cover the placard for protection and be replaceable from the inside. It shall be possible to retrieve and replace the contents through a narrow vertical or horizontal slot in the placard frame in less than one minute. Contractor shall provide the frame dimensions during initial design review meetings. Alternative use of the main front Screen or another type of display programmable from the MAS or other method provided by the Contractor can be approved by DTPW, provided that the approval will not be unreasonably withheld. CDRL 0523

5.5.23 Operating Modes

The TVM shall have three basic modes as follows:

1. Normal Mode
2. Limited Operation Mode
3. Test Mode

5.5.23.1 Normal Mode

There shall be three primary normal operating modes. The TVM shall automatically place itself in the correct operating

mode depending on the patron's actions and prohibit the other modes. The TVM shall function as indicated herein.

1. **Cash Transaction.** To purchase a smart card or a barcode ticket with cash, the patron selects a fare type (for example: single ride, stored value, 1-day pass, 3-day pass, 10-ride pass etc.), patron category, and selects cash as method of payment. Once the patron chooses the desired fare type, the TVM will prompt the patron to insert the required cash. The TVM will display the full amount due and decrement the amount as cash is inserted and verified. Once cash is inserted into the TVM, the TVM shall recognize this as a cash transaction and inhibit the use of credit/debit cards for that transaction. Appropriate text should be displayed on the MDU throughout the transaction. When the smart card is vended, a transaction record shall be stored with details of the Smart Card purchase. This transaction record shall include the serial number of the smart card issued. A receipt shall be printed if requested by the patron. Fare product purchased should be recorded in the Fare Collection Application linked to the card used.
2. **Card Transaction.** To purchase a smart card with a credit or debit card, the patron selects a fare type (for example: single ride, stored value, 1-day pass, 3-day pass, 10-ride pass etc.), patron category, and selects credit or debit card as method of payment. Once the patron chooses the desired fare type, the TVM will prompt the patron to insert or tap the credit or debit card. Once a credit/debit card is inserted or tapped on the Credit Card Processing device, the TVM shall recognize this as a credit/debit card transaction and inhibit the use of cash. A menu-driven display shall appear on the MDU to guide the patron to complete the smart card purchase transaction.
3. **Replenishment Transaction.** To add value to a smart card using either cash or a credit/debit card, the patron shall select the replenishment function and either place the smart card near the target on the TVM or insert the card in the appropriate receptacle as per the Contractor's design. An audible tone shall sound, and a message displayed on the MDU to indicate that the smart card has been properly accessed. The patron shall select the method of payment (cash or credit/debit card) and the other payment methods shall be inhibited. After selecting the value to be added and completing cash payment or receiving credit/debit card authorization, the Back Office Account linked to the patron smart card shall be replenished. An audible tone shall sound, and a message displayed on the MDU to indicate that the value has been updated and the patron account in the Fare Collection Application is credited with the product purchase via an interface/integration. A receipt shall be issued for smart card replenishments when requested.

The Contractor shall develop and submit for approval, during each of the design reviews, detailed menu procedures and flow charts to take care of specific rules, additional information, and step-by-step actions such as determining need for change, handling of remaining value account cards, confirmation of transaction and restrictions placed on maximum account smart card value, minimum account smart card value, and maximum change permitted be as described in Table 5-1: Limited Operations of Full Service TVM. CDRL 0524

5.5.23.2 Limited Operation Modes

Whenever possible, the TVM shall remain in service even if multiple failures occur; for example, it shall be possible for the TVM to simultaneously be in both "No Coins Accepted" mode and "Exact Fare Only" mode. The TVM shall automatically go out of service only when:

1. A component necessary to support all TVM operations fails, such as the Electronic Control Unit, power supply, patron keyboard, etc.; or
2. All payment accepting modules fail (coin acceptor, bill acceptor, bank card reader, smart card module); or
3. The Smart Card Read (SCR) Module fails or other operational conditions as defined in the technical specifications occur.

5.5.23.3 Test Mode

The TVM shall revert to the test mode upon the activation of an internal test mode switch, or selection during maintenance using the MDU selections. All fare types sold from the TVM shall be available for purchase in this mode. The TVM shall function as it normally would except that all money inserted shall be returned. A credit/debit card purchase during this mode shall bypass the bank certification check and authorization. For each smart card issued in the test mode, a transaction record shall be generated, stored, and transmitted to the MAS, and that transaction shall be identified as "TEST." Change shall not be made with or without the purchase of a smart card. When the TVM is in the Test Mode, the Message Display Unit shall display an out of service message also indicating that the TVM is in the Test Mode. After an DTPW settable period of inactivity while the TVM is in the Test Mode, an alarm message shall be transferred to MAS. Contractor should offer their proposed alternative test procedures to check the TVM main functions.

5.5.24 Electronic Control Unit

The Electronic Control Unit (ECU) shall control all operating functions of the TVM. It shall control the performance and timing of all other assemblies, sub-assemblies, modules, displays, and all communications with the MAS. The ECU shall be based on an embedded microprocessor or similar approved by DTPW/ITD. The ECU shall run an up-to-date version of its operating system, or an operating system approved by DTPW/ITD. The ECU shall have sufficient RAM to avoid the use of virtual memory as a means of temporarily supplementing RAM during normal TVM activities. Provision shall be furnished to permit plug-in upgradeability to double the amount of memory initially supplied.

All microprocessors used shall be of the latest service proven commercial production releases of Intel® or Intel-compatible chips or equivalent approved by DTPW/ITD.

The primary copy of dynamic data registers, status flags, fare tables, event records, etc. shall be stored on the non-volatile memory device(s). Capacity of the non-volatile memory device(s) shall exceed current storage needs by at least 200%. The non-volatile memory device(s) shall be field replaceable.

Full and detailed information on the ECU and its associated modules, including operation, dimensioned drawings and exploded drawings, shall be provided. CDRL 0525

5.5.25 TVM Data

The type of data compiled by the TVM shall include the following as a minimum:

Alarm/Event Data

- A. Door open
- B. TVM Out of Service
- C. TVM in limited mode (including fail component and mode identification)
- D. Smart Card level low
- E. Coin vault near full
- F. Bill vault near full
- G. Coin vault full
- H. Coin hopper near empty (including ID #)
- I. Coin hopper empty (including ID #)
- J. Low Coins in the re-circulating unit (s) (including ID#, denomination and value)
- K. Bill vault full
- L. Intrusion alarm
- M. Communication failure
- N. Maintenance Technician ID

- O. Failure Code
- P. TVM Returned to Service
- Q. Reject bin full
- R. TVM ID Number
- S. Test Mode

Revenue Service Data

- A. Coins accepted by denomination
- B. Bills accepted by denomination
- C. Bills Rejected
- D. Coins Rejected
- E. Coins dispensed by denomination
- F. Coins dispensed from hoppers by denomination (as applicable)
- G. Number of coins in recycling unit by denomination (as applicable)
- H. Revenue Service Personnel ID
- I. Dollar value and ID of coin vault when pulled
- J. Dollar value and ID of bill vault when pulled
- K. Dollar value of coins in hopper when pulled
- L. Smart Card ID and fare products added to its Back Office account
- M. Hopper re-charged (including value inserted)
- N. ID No. of replacement coin vault
- O. ID No. of replacement bill vault
- P. Credit card used by type, dPAN card number, and TVM ID
- Q. Debit card used by type, dPAN card number, and TVM ID
- R. Credit/debit card misreads
- S. Registered credit or debit card transactions

Smart Card Sales Information

- A. Transaction number
- B. Time and date stamp of each transaction
- C. Details of each transaction, including but not limited to:
 - i. Smart card sold by type and value
 - ii. Smart card serial number
 - iii. Payment Method
 - iv. Initial smart card Back Office account value
 - v. Serial number of value smart card used (if applicable)
 - vi. Credit/Debit card dPAN number (encrypted, if applicable)
 - vii. TVM number
 - viii. Authorization number by transaction (credit/debit card)
 - ix. Transaction Number
 - x. Origin and Destination Data

Maintenance Information

- A. Field Service Personnel ID
- B. Event information generated by the device for each internal action

Transaction information shall be transmitted to the Fare Collection Application via an interface/integration on a complete transaction basis except that information required for credit/debit card verification are transmitted on a real time basis. All transactions shall include a transaction number, which will be sequential for each individual TVM. Post installation, DTPW shall be able to reconfigure the data so it may be used to produce customized reports without assistance from the Contractor.

The status of the components within the TVM shall be reported to MAS. This information shall also be available through the TVM local maintenance service terminal or a Contractor's recommended testing-troubleshooting method and as a report printed at the TVM.

All out of service and degraded operating conditions at the TVM shall be reported immediately to the MAS.

Failure information for specific devices shall be communicated to the MAS. For failures, the MAS shall track maintenance activities and be capable of scheduling and tracking preventive maintenance activities. The MAS shall also have the capability of sending an email or page to a user settable designated number or IP address indicating the out of service information.

Failure information shall be available to the MAS that will be utilized by DTPW for the dispatching of County service technicians. The field service personnel shall provide repair information during the repair process regarding each device undergoing repair, which will be recorded by a designated DTPW person responsible for monitoring service activities. This MAS shall initially be capable of handling five (5) concurrent users but should be capable of expansion through the purchase of additional concurrent user licenses, as future requirements dictate.

Full and detailed information on the transactional information stored by the TVM shall be provided as an entity relationship diagram/data dictionary at the Conceptual Design Review and updated prior to Final Design Reviews. CDRL 0526

5.5.26 Data Storage

Sufficient data storage shall be provided within the TVM to store all data (transaction and event) in non-volatile memory or storage devices for at least thirty (30) calendar days. For the purpose of this Section, each day shall be assumed to consist of a minimum of 2000 patron transactions per day. Data shall consist of transaction information as required, plus all other information needed to provide a complete audit trail of machine transactions. The MAS shall ensure that the data redundancy requirements are always met for all data. This redundant data shall be available for downloading at the TVM by County Staff and shall be available for transmission to the MAS.

Upon reaching a user-definable data storage level (identified as a percentage of the total memory capacity), the TVM shall transfer an alarm message to the MAS. TVMs shall take themselves out of service if insufficient data storage is available to store additional transaction information. An alarm message shall be generated and forwarded to MAS when this automatic shutdown occurs.

All data related to patron transactions shall be identified with the date, time, device and station where the data was generated. TVM maintenance data shall remain with the TVM.

5.5.26.1 Data Transmission

Data on all transactions shall be transmitted to MAS or the Fare Collection Application as applicable. If the transmission is not successfully completed, the TVM shall periodically attempt to retransmit data, continuing until the transmission is acknowledged by the MAS. No data shall be removed from memory until receipt of transmissions and redundant storage of information has been confirmed.

5.5.27 Service Keyboard

A standard size internally located alphanumeric computer keyboard shall be used by maintenance and revenue service

technicians. The keyboard shall be used to input data, initiate commands, follow menu driven instructions or equivalent aids, request data, and initiate repair routines.

5.5.28 TVM Timers

The TVM shall include user-settable timers to control the allowable intervals between steps in transactions, communication responses and other activities. Preset time limits shall be adjustable by the MAS to each TVM. Patron actions shall include insertion of bills and/or coins, which are rejected by acceptors. Timers shall reset to zero when a subsequent action is taken by the patron within the allotted time interval. If the timer elapses, the transaction shall be automatically canceled.

5.5.29 Coin Handling Assembly

The coin handling assembly shall include:

1. Coin Slot
2. Coin Acceptor
3. Coin Escrow
4. Change Making/Coin Recycling (Supplemental Coin Hoppers and Coin Chutes)
5. Coin Vault
6. Coin Return Cup.

Whenever a coin vault, supplemental coin hopper or coin recycling component is removed, a revenue service audit report shall automatically be generated in both electronic and printed form. Sensors shall be provided to detect and report the occurrence of jams. The electronic version of the audit report shall be immediately transferred to the MAS. It shall not be possible to "fish" coins from the coin vault or from the interior of the TVM.

The coin handling assembly shall:

1. Limit the dollar value of the change dispensed to the dollar value of the money received and up to the maximum levels imposed for change giving.
2. Employ a reliable concept for accurately dispensing the required number of coins for change, with 99.9% accuracy.
3. Dispense coins at the rate of at least two coins of each denomination per second.
4. Deny access to any of the coin storage locations without the use of the Revenue Key.
5. Provide accumulated readings of the coins dispensed and readings since the last coin vault removal by quantity and dollar value of each denomination.
6. Provide the current number and value of coins in re-circulating modules/tubes.

Full and detailed information on the coin acceptance system and associated modules, including operation, dimensioned drawings, and exploded drawings, shall be provided by the Contractor as part of CDR. CDRL 0527

5.5.29.1 Coin Slot

The shape of the slot and bezel shall minimize accidental deflections of the coins to be accessible to and usable by persons with disabilities. Graphic representations of the coins accepted shall be provided adjacent to the coin slot and shall meet ADA requirements. The coin slot shall permit 5-cent, 10-cent, 25-cent, \$1 (SBA and Sacagawea) coin denominations to pass without restriction directly into the coin acceptor assembly by the force of gravity. The bezel shall be precisely aligned to the coin acceptor to prevent diversion of the coin, or it shall be part of the coin acceptor. There shall be no transports, conveyors, or other mechanisms employed to move the coin from the coin slot to the input of the coin acceptor assembly. A mechanical shutter shall be employed to close the slot between transactions provided that the

slot opens automatically upon selection of a fare type and method of payment. The slot shall be sized to physically block the insertion of a 50-cent coin at its minimum diameter and the simultaneous insertion of two dimes, each at their minimum thickness.

Coins detected as invalid, such as tokens, slugs, washers, counterfeit coins, and foreign coins, shall be returned directly to the coin return cup. The coin slot shall be easily replaceable from the inside to accept coins of different dimensions. The TVM shall be able to accommodate up to six different coin profiles simultaneously.

5.5.29.2 Coin Acceptor

The coin acceptor shall be of an electronic type. The coin acceptor shall have proven itself in a rail rapid transit environment. Each coin shall be checked for metal content, which shall be within the coin standards set by the U.S. Mint for coins in general circulation. Reprogramming for future coin types shall be provided by the Contractor.

5.5.29.3 Coin Escrow

For the coin escrow, the TVM shall employ a method to track the coins inserted by the patron and return the appropriate coins if the TVM transaction is cancelled. This can be using a re-circulator, which shall return the actual inserted coins, or a system whereby the exact mix and quantity of coins shall be returned, but not the actual coins inserted. A minimum of 20 coins shall be accommodated in this manner.

5.5.29.4 Change Making/Coin Recycling

The change making section of the TVM shall have a coin recycling feature, which shall provide for the reuse of deposited coins based on standards as set forth in section 5.6.15.2 above. The coin types to be recycled shall initially be nickels, dimes, quarters, and dollars. The recycling feature shall be able to accept a minimum of 50 coins of each type. All other coins accepted shall be directed to the coin vault.

If self-replenishing magazines are used, the TVM shall dump all coins in the recycling feature into the coin vault upon an authorized command, provided that adequate space exists in the coin vault.

The TVM shall be able to make changes from supplemental hoppers that shall handle or be configurable to accommodate four different types of coins. The hopper denominations shall be reconfigurable. The TVM shall be prevented from going into service if the incorrect hopper is installed. As initially configured, a total of 2,000 nickels, 1,600 quarters, and 1,500 dollar coins should be available for change making, in conjunction with the coin recycling system, when the machine is fully loaded, quantities may be reduced if approved by DTPW. The TVM shall have the ability to be reconfigured for making change with other types of coins. Electrical and/or mechanical safeguards shall be provided to prevent the mixing of coin types during conversion.

When dispensing change, using the recirculating magazines as a source of first supply, the TVM shall always issue change in the least number of coins possible, even if doing so requires the use of one or more supplemental hoppers.

When insufficient change is available for completing a transaction, a signal shall be given to put the TVM into the exact change degraded mode. When sufficient coins have been received to build up the reserves to a prescribed level, the TVM shall automatically revert to the change returned full-service function. Supplemental hoppers required to meet the above limits shall provide change only if one or more denominations required in issuing change in the least number of coins are not available from the coin recycling units.

All re-circulating coin hoppers shall be locked in the machine and be removable only using the Revenue Key. These coin hoppers shall also conform to the following requirements:

1. May not weigh more than 40 pounds when fully loaded.

2. Electronic ID automatically recognized and recorded upon insertion.
3. Consecutive insertions of a hopper with the same ID number shall be prohibited in the same TVM. This function doesn't apply to a new, unused hopper. This function can be overridden with configuration settings of the TVM.
4. Sufficiently durable to withstand being dropped from a height of three feet on a concrete surface fully loaded, landing on its corner or side without incurring any damage that would cause access to the coins.
5. All locking mechanisms and electronic components shall be inaccessible from outside the coin vault.
6. An interface shall be replaceable if damaged, difficult to duplicate, and durable enough to withstand 20 years of normal use (or a minimum of 10,000 cycles) .
7. Positioned at a specific location within the TVM so that removal and replacement can be performed easily and without injury to personnel or damage to components.
8. Two complete sets of supplemental change hoppers shall be provided for each machine (one set is installed in the machines and the second is the operational spare) to facilitate revenue servicing.
9. Include a locked top that can be opened only with the Revenue Key. No coins shall be removable from the hopper in the locked position, including when shaking or moving the hoppers.
10. Designed to permit bag loading or automatic loading using filling machines.

A command shall be provided via the TVM service terminals to empty the recirculating coin hoppers to the coin vault. Supplemental coin hoppers shall not be affected by this command. This command shall be initiated through the service terminal and shall require unique employee logon to access. Initiation of this command shall cause an event message to be stored in the TVM memory, all revenue registers to be adjusted to reflect the contents of the coin vault and recirculating hoppers and the revenue report to reflect the change in the contents of the coin vault and recirculating hoppers.

The Contractor shall provide a step-by-step description of how this procedure is performed and include copies of the before and after reports. CDRL 0528

5.5.29.5 Coin Vault

The Coin Vault shall conform to the following requirements:

1. Stainless steel reinforced 18 gauge minimum, all welded construction or engineer approved high strength composite material providing equivalent security and a minimum of 250 cubic inches.
2. May not weigh more than 40 pounds when fully loaded
3. Electronic ID automatically recognized and recorded upon insertion.
4. Consecutive insertions of a vault with the same ID number is prohibited in the same TVM. This function can be overridden with the entry of appropriate password and PIN.
5. Manually opened after insertion to accept coins and manually closed and locked for removal. A Revenue Key shall be required to remove the coin vault. Alternately, coin vaults may be pre-opened, provided the coin vault locks upon removal from the TVM and incorporates a feature to prevent accidental closing during handling.
6. Treasury Key is required to open the coin vault.
7. Hinged, non-removable cover.
8. Sufficiently durable to withstand being dropped from a height of three feet to a concrete surface fully loaded, landing

on its corner or side without incurring any damage that would cause access to the coins or removal of the coin vault from service. When dropped empty, a normally open coin vault shall not close, and a normally closed coin vault shall not open.

9. Treasury Key is required to lock coin vault to its interface unless the coin vault is located within a locked compartment. A feature shall be provided to indicate that the coin vault is properly locked in place.
10. Coin vault must be in place, properly set, and open before TVM can return to service. A feature shall be provided to indicate that an inoperable coin vault has been inserted.
11. Coin storage area free of obstructions to permit a 100% dump on the first attempt.
12. All locking mechanisms and electronic components inaccessible from outside the coin vault. No coins shall be removable from the coin vault in the locked position.
13. An interface durable enough to withstand 20 years of normal use (or a minimum of 10,000 cycles), difficult to duplicate, and replaceable if damaged.
14. Positioned at a specific location within the TVM so that removal and replacement can be performed easily and without injury to personnel or damage to components.
15. The time to perform a remove and replace cycle shall be two (2) minutes, maximum, measured from the time that the TVM is placed out of service by the action of opening the door until it is placed back in service and ready for use.
16. Provisions for a "near full" signal at approximately the 80% level, and a "full" signal at about the 95% level. The "full" signal shall cause the TVM to revert to a "Bills or Card Only" mode. These levels shall be settable from the MAS for a single TVM, a group of TVMs or all TVMs.
17. Security for the coin vault shall be provided by a locked compartment or a locking device that requires opening by the Treasury Key before removal can be made. Stainless steel runners and guides shall be employed to enable the coin vault to slide freely and to prevent damage to the interface. Alternately, the coin vault may be locked to the coin vault frame.

5.5.29.6 Coin Return Cup

Coins detected as invalid, such as tokens, slugs, washers, counterfeit coins, and foreign coins, shall be returned directly to the coin return cup.

The coin return cup shall be constructed of stainless steel and shaped to enable quick and easy removal of returned coins without creating a pinching hazard. An inward swinging transparent polycarbonate plastic cover, 1/8-inch-thick minimum, shall be used to prevent coins from jumping out of the cup and to enable the patrons to see into the cup. The cover shall also be provided to prevent access to internal components via the return cup. Whenever any coin is returned, the cup shall be illuminated for approximately 5 seconds.

A series of 0.25-inch diameter holes shall be provided for drainage along the bottom of the cup with a drain tube to carry liquids outside the cabinet on the side nearest the cup. The Contractor shall ensure that the proper change is returned to the patron.

5.5.30 Bill Handling Unity (BHU)

This assembly shall be an integral unit and shall include:

1. Bill Bezel
2. Bill Acceptor

3. Bill Escrow
4. Bill Recycling Device
5. Bill Stacker
6. Bill Vault

Access to the bill acceptor and bill escrow shall be possible without access to the bill vault to permit easy removal of jammed bills. If the removal of the bill acceptor and/or bill escrow units allows access to the bill vault, the bill acceptor and bill escrow units shall be locked in place, and removal of the bill acceptor and bill vault shall require the use of a treasury key and create an event which is forwarded to the MAS. Information generated by the bill acceptance system, including full data provided by the diagnostic programs inherent in the TVM modules provided by sub-suppliers, such as the bill acceptance subsystem, shall be transferred to the MAS. Full and detailed information on the bill acceptance system and its associated modules, including operation, dimensioned drawings and exploded drawings, shall be provided. CDRL 0529

The bill handling unit should be capable of providing change using the bills from a compartment suitable to store a convenient amount of money per denomination, a bill recycling device.

5.5.30.1 Bill Bezel (Insertion and Return slot)

The bill bezel shall be constructed of stainless steel or cast aluminum and formed with a ledge and side guides such that the patron can hold the bill down and slide it into the bill acceptor entry slot to minimize any tendency to skew. The bill slot shall be designed for one hand insertion of the bill. The bezel shall be of sufficient strength to withstand minor acts of vandalism and shall be an easily replaceable component. Design of the bezel mounting shall minimize damage to the acceptor in the event of vandalism to the bezel. Graphics, located adjacent to the entry slot, shall illustrate the correct orientation of the bill plus denominations accepted and shall meet ADA requirements. The bezel shall not extend more than one and one-quarter inch from the surface of the front panel and shall be affixed directly to the bill acceptor and not the front panel. The bill acceptor shall require no more than an inch of the end of the bill to be inserted to activate the bill feed mechanism.

Upon cancellation of a transaction or rejection, bills inserted by the patron shall be returned via the bill return slot within 2 seconds. The bills shall be held firmly in place until forcibly removed by the patron.

5.5.30.2 Bill Acceptor

The bill acceptor shall conform to the following requirements:

1. Ability to accept the seven denominations of bills of all designs currently in circulation, initially \$1, \$5, \$10, \$20-dollar bills, in any combination, in any lengthwise orientation. The denominations accepted shall be software configurable.
2. Perform dimensional and optical checks to verify authenticity. No bill shall be inserted in the bill stacker without being verified.
3. Reject all counterfeit, foreign, and copied bills.
4. Prevent "milking" by physically blocking the forceful retrieval of a bill already accepted or by preventing the manipulation of two bills or any other fraudulent scheme that results in a fare value greater than the actual money received.
5. Return rejected bills through the bill return slot and hold until forcibly retrieved.
6. Use software-controlled techniques to activate motors to clear a jam using more than one attempt if necessary. This requirement shall apply to the total path of the bill from the bill acceptor to the bill vault.

7. The motor's run time is to minimize as much as feasible. The motor is to be triggered on by an inserted bill and the bill then automatically drawn in for authenticity checks.
8. The bill acceptor shall be able to process a bill regardless of which end is inserted or which side is up.
9. Acceptance of at least 95% of "street condition" bills on the first attempt, and at least 90% of the rejected bills on the second attempt. Street condition bills are bills found in everyday use by patrons that are not torn, creased, crumbled, folded, or worn beyond what is normally found in street condition bills. Acceptance percentage assured using self-adjusting system that accounts for differences between bills in circulation caused by production variances and unique aging changes.
10. Employ a shutter covering the input slot that automatically opens upon detection of a bill about to be inserted. If a bill is not inserted within a pre-determined time (programmable) the shutter shall close and the transaction cancelled.
11. Reject all bills inserted when escrow capacity has been reached and display a message on the MDU advising patrons that no more bills can be inserted.
12. Enable a quick exchange of bill system modules and components.
13. Any setting of variables or parameters shall be performed as the bill is being processed to reduce the time to start the processing of the following bill.
14. Re-initiate time to complete a transaction upon acceptance of each bill.
15. Maximum time to accept, verify and be ready for the next bill insertion shall not exceed 1.5 seconds.

5.5.30.3 Bill Escrow

The bill escrow shall conform to the following requirements:

1. Minimum capacity of 15 bills
2. Bills in escrow not to be affected by rejected bills
3. No attempts to transport the bill from the Bill Acceptor to the escrow until note authentication by the Bill Acceptor is completed
4. Transfer the bills to the bill vault after successful issuance of a ticket

5.5.30.4 Bill Vault & Stacker

The bill vault and stacker shall receive unfolded bills from escrow in a neatly stacked, forceful manner and shall assure that the bills are not trapped, torn, or otherwise mishandled while being stacked. The stacker shall be an internal and easily removable section of the bill vault. TVMs shall be fitted with vaults having a capacity of 1,000 bills or less if approved by DTPW. The design shall permit quick and easy removal of the bills from the stacker in a manner that reduces the handling time required to prepare the bills for counting.

5.5.30.5 Bill Vault

The bill vault shall conform to the following requirements:

1. Constructed of revenue service proven material and durable to the extent that dropping of the bill vault from a height of four feet above a structural concrete floor and landing on its weakest areas, edges, or points after 10 drops shall not cause access to the bills. When dropped empty, a normally open bill vault shall not close, and a normally closed bill vault shall not open.
2. 1,000 bill capacity.

3. All other requirements are the same as for the coin vault.
4. One additional Bill Vault (operational spare) shall be supplied with each TVM to facilitate revenue servicing.

5.5.30.6 Bill Vault Security

A locked enclosure containing and providing security for the bill vault shall be used. The design and construction shall deter forced entry. A revenue field key shall be required to access the bill vault. A locked enclosure or latch containing and providing security for the bill vault shall be included. The access door for the locked enclosure shall be hinged and non-removable. At least one mounting bolt shall be located inside the enclosure. The stationary half of the interface connector for the bill vault shall be located completely inside the enclosure. An acceptable alternative shall be the locking of the bill vault directly to its locking device and connector interface, affixed in a secure manner to the TVM.

5.5.30.7 Bill Recycling Unit

The bill recycling capability should offer a reliable banknote (up to 4 denominations) recycling function offering a positive customer experience receiving change in a very convenient way of bills instead of several coins. Coins will only complete the change due except when the unit is out of service and only coins will be available to dispense the change required for the customer purchase. The Recycle unit should be configured as a module easily interchangeable to facilitate the maintenance service. The unit should work under the environmental conditions detailed in Exhibit 4

5.5.31 Credit/Debit Card Assembly

The credit/debit card assembly shall consist of:

1. Card Reader
2. Keypad
3. Card Control electronics

The card assembly shall conform to the requirements indicated herein. Full and detailed information on the credit/debit card assembly and its associated modules, including operation, dimensioned drawings and exploded drawings, shall be provided by the Contractor. CDRL 0530

5.5.31.1 Card Reader

1. The card reader shall be of the type that does not remove the card from the sight of the patron.
2. The card reader shall read and verify information in tracks 1, 2 and 3 of cards encoded in accordance with current ABA and latest ISO/IEC standards. In the event a card cannot be read by the card reader, an "invalid" read message shall be immediately displayed to the patron on the MDU and an event recorded in the machine's memory.
3. The card reader shall incorporate a contact smart card reader chip with the ability to interface with a contact smart card based on ISO/IEC 7816 and latest cEMV standards, which shall be maintained for the term of the Contract.
4. A card reader capable of processing all sort of Contactless payment and in fully compliance with cEMV, PCI DSS standards shall also be provided and maintained for contactless transactions for the term of the Contract.

5.5.31.2 Card Transaction Keypad / Touchscreen

There shall be a keypad/touchscreen utilizing the standard key pattern of a telephone type keypad provided on the front panel of the TVM. The keypad shall be used during the ticket selection process to support the credit/debit feature.

The keypad/touch screen shall be like the alphanumeric keypads/touchscreen and shall meet the following requirements:

1. The input keypad/touchscreen shall operate interactively with the TVM and shall supply transaction data to the TVM as an interface for the user. The customer will use the keypad/touchscreen to enter the required Personal Identification Number (PIN) when completing a debit card transaction. The keypad/touchscreen shall also provide input for other data entry as may be required to complete transactions. The necessary push buttons shall be provided to support a credit and debit card transaction in accordance with banking industry standards.
2. Each PIN pad shall be equipped to operate in both clear and encrypted modes, support Derived Unique Key Per Transaction (DUKPT) key encryption, employing a dynamic master session key. The PIN pad shall be given a new master session key each day.
3. Serves as an input device for PINs.
4. Shall be secured such that physical entry into the housing that contains the memory chip in which the encryption software resides shall cause automatic erasure of the device memory.
5. Location and mounting of PIN pad shall preclude the ability for others to observe a patron's PIN selection.
6. Construction shall be vandal resistant and shall prevent moisture from getting inside the unit. The keypad shall be easily removable from the inside only.
7. The letters, numbers, symbols, and words on the keys shall be wear resistant. The number 5 key shall contain a raised dot or other technology to permit recognition by the visually impaired.
8. Employs tactile or equivalent feedback to indicate to the patron that his/her action has been recognized.
9. Installed in an ADA-compliant location and in a manner that complies with ADA.
10. Provide for and utilize a key injection method that can be easily managed by DTPW.

5.5.31.3 Card Control Electronics

The Contractor shall demonstrate that the card control electronics can be conveniently used by people with disabilities, including people that have limited manual dexterity and people who are blind, if feasible, without the need for assistance or special training. The demonstration must show how people who are blind will locate the machine, have access to instructions, and carry out transactions. All information provided by the equipment shall be provided in an accessible manner which may require a person who cannot see to use an earphone of the same specifications used for accessible ATMs. If it is not feasible to provide independent use, the Contractor shall provide the highest degree of independent and convenient use feasible for people with disabilities.

1. Accept all valid major credit cards in circulation. Acceptable credit cards shall be selected through simple selection.
2. Prohibit the use of cash upon the insertion and recognition of one of the accepted cards.
3. Display the necessary steps in an operational sequence to permit purchase of a smart card in the minimum amount of time.
4. Require acknowledgment of the purchase price before requesting authorization from the banking network.
5. Permit canceling of the transaction or changes to the smart card value up to the point of acknowledgment of the smart card value which shall occur immediately prior to the request for authorization.
6. Upon loss of power, TVM completes the transaction and performs an orderly shutdown.
7. Limit smart card values to preset minimums and maximums in \$1 increments. Both limits shall be easily changed by the MAS.

8. Automatic cancellation of the transaction shall display the reason for the cancellation and shall occur when:
 - i. Authorization from the bank is negative.
 - ii. Valid smart cards cannot be dispensed.
 - iii. Time constraints are exceeded.
 - iv. Procedural constraints are violated.
 - v. Smart cards presented for credit are invalid.
 - vi. PIN is invalid after 3 attempts.
 - vii. Expired Credit Card.
 - viii. Invalid card (i.e., department store or gas company credit card).
9. Attempts to enter PIN, required for all debit cards, shall be limited to three within a prescribed time period. The time period shall be adjustable by DTPW from 3 to 30 seconds in one-second increments. When exceeded, the display shall indicate the reason and return to the standby mode.
10. Display error messages on the MDU including, but not limited to, the following:
 - i. Card invalid.
 - ii. PIN invalid, repeat PIN.
 - iii. Transaction not approved.
 - iv. Selected value under minimum - please select higher value or cancel.
 - v. Selected value exceeds maximum - please select lower value or cancel.
 - vi. Preset transaction limit per day per card exceeded.
 - vii. Maximum dollar limit per week per card exceeded.
 - viii. Credit card operation only.
 - ix. Debit card operation only.
 - x. No Cards accepted.
11. Request approval of credit/debit transactions in real time from the Fare Collection Application. Once a successful read of the credit or debit card has been achieved, the TVM shall pass the transaction information to the Fare Collection Application.
12. Provide software configurable limits (from 1 to 10) on the number of transactions permitted by fare type, and the dollar value (from \$1 to \$500) that can be purchased by a single card and within a software configurable period (from 1 to 744 hours). This feature shall be user settable by DTPW.
13. Initiates a signal to the MDU to indicate the non-availability of a transaction receipt.

5.5.31.4 Card Transaction Receipts Printer

1. The non-availability of a receipt shall be indicated at the beginning of a transaction on the MDU, giving the patron the option to continue the transaction or to cancel.
2. A printed receipt shall be provided upon request during the fare selection process. Once the smart card is issued, if a receipt has not been requested, a receipt shall not be issued. The receipt shall contain all the information required to comply with the "Electronic Fund Transfer Act" as promulgated in the latest revision of Federal Reserve Board, Regulation.

As a minimum, the information shall include:

- i. Date and time of purchase.
 - ii. TVM ID Number.
 - iii. TVM station location.
 - iv. Dollar amount of the transaction.
 - v. Transaction authorization number (where required) and reference number.
 - vi. Smart card serial number.
 - vii. Last four digits of credit/debit card number.
 - viii. Credit/debit card expiration date.
 - ix. If debit, an indication that it is from primary account.
 - x. Method of payment (cash, credit or debit).
 - xi. Type of smart card vended.
 - xii. Transaction number.
 - xiii. Phone numbers to contact Customer Service.
3. The receipt shall be issued from a field replaceable, modular printer unit using a thermal printer.
 4. The receipt shall be issued within one second after issuing the smart card. The stock for the receipts shall have the capacity to issue at least 1000 receipts that are a minimum of two inches in width.
 5. The receipt can be issued through a slot or dropped into the coin return cup.
 6. The receipt printer shall employ a thermal print head and paper. The printer shall be capable of supporting the ASCII character set.

Full and detailed information on the journal printer, including operation, dimensioned drawings and exploded drawings, shall be provided by the Contractor. CDRL 0531

5.5.31.5 Contactless Smart Card Reader

The CSCR shall process an authorized smart card, when the card is passed in the vicinity of the target.

The TVM shall function to read the necessary information (UID) on the card(s) to link it to the patron account via an interface/integration with the Fare Collection Application and determine whether the card is "valid", it has enough stored value, a pass or "invalid" based upon the data recorded in the passenger account. Cards shall be read on the first proper pass with an accuracy of not less than 99.99%, assuming each card is valid. The Contractor shall define criteria for "proper pass" for test and evaluation purposes.

If a cash or credit/debit card transaction is initiated, this action shall cause the processor to be inoperative during the time while such transaction is in process, unless the parameters of system operation permit. The processor assembly shall be readily accessible from the interior of the TVM. Electrical connections shall be plug-in and screw type connectors, or equivalent, as approved by the DTPW. Contractor shall train DTPW staff to be able to replace the CSCR assembly within five minutes.

5.5.31.6AC Power Cord and Plug

TVMs shall include an industrial AC cord and plug that will be inserted into a floor outlet to supply power for the machine. The outlet should be raised from the floor minimum 3 inches and mounted sideways. A 120V/20A receptacle inside the TVM shall also be required.

5.5.31.7 Front Panel Mock-Up

At the Conceptual Design Review, the Contractor shall provide a full-sized mock-up of the TVM front panel. These mockups shall be constructed of material that shall retain its shape for the duration of the mock-up evaluation period. The mock-up shall be exact in dimensional details for all the features and approximately in color and texture and shall include all graphics printing and actual displays. Samples shall be provided for such items as the front panel surface, keypad, decals and MDU to be used. The mock-up shall be self-standing with the front panel vertical and at the exact height above the floor as the production equipment. This mock-up shall be used to obtain public input on the design of the TVM. The design of the mock-up shall be submitted to the DTPW Project Manager for approval prior to fabrication. The mock-up shall become the property of DTPW upon delivery. CDRL 0532

5.5.31.8 Commands from the MAS

Commands from the MAS shall include but not be limited to the following:

- Reset time/date information.
- Initiate self-diagnostic operations, unless performed automatically at machine level.
- In service/out of service control.
- Transaction menu contents and formats.
- Change of all TVM variables such as minimum fare, remaining value, card maximum value, maximum stored value, time between events.
- PIN assignments for equipment access for maintenance and revenue crews defining the level of access.
- Software/communication to the Fare Collection Application to handle smart card acceptance verification.
- Fare table changes.
- Forced polling of data.

5.5.31.9 Data Dictionary

Full and detailed information on the transactional information downloaded to the TVM shall be provided as a data dictionary at the Conceptual Design Review and updated prior to Final Design Reviews. CDRL 0533

5.5.31.10 Human Factors

The TVM shall be designed to permit all contactless mode of payment transaction to occur in a minimum amount of time. The patron shall be guided through full interactive menus. Graphics and displays shall be easily read under all conditions of illumination, including direct sunlight. All graphics and displays shall conform to DTPW's standards for printed medium. Controls shall be organized and located to minimize patron confusion, transaction time and patron motion.

The Contractor shall demonstrate that the equipment can be conveniently used by people with disabilities, including people that have limited manual dexterity and people who are blind, if feasible, without the need for assistance or special training. The demonstration must show how people who are blind will locate the machine, have access to instructions, and carry out transactions. All information provided by the equipment shall be provided in an accessible manner which may require a person who cannot see to use an earphone of the same specifications used for accessible ATMs. If it is not feasible to provide independent use, the Contractor shall provide the highest degree of independent and convenient use feasible for people with disabilities.

Results shall be discussed, and action taken as agreed and approved by DTPW at the Conceptual Design Review

meeting. CDRL 0534

The Contractor shall design the front panel incorporating the operating features indicated, or equivalent. It is recognized that practical aspects have a higher priority than optimum locations. The Contractor shall have the flexibility to submit a draft concept based on consideration of human factors and location of internal components. The Contractor shall identify what features shall stay in a particular location and what features can be relocated and to what locations. Messages and instructions, and alternatives for each, provided by the MDU shall also be supplied with alternatives. The same shall apply to all front panel graphics. All equipment shall use the approved font for all graphics, with variations in text denoted by upper and lower case, light, medium, and bold character weight, and use of different point sizes, as described in DTPW's standards. The Contractor with the participation of DTPW, shall develop the TVM graphics during the Conceptual Design Review. CDRL 0535

Graphics, efficient machine timing, appropriate bezel design, software efficiency, and the quick display of subsequent instructions shall be employed. Timing within equipment, between modules and subassemblies, and between various steps in the transaction is crucial and should be efficiently handled.

The TVM shall accept a subsequent transaction without delay. Bills and coins shall be accepted one after the other without causing the patron to wait between insertions. The cancellation of a transaction shall be immediate, and displays shall be timed such that the messages or instructions are coordinated with the patron's actions.

Interfaces with the patron such as visual displays, display format, display language, printed information and instructions, design and location of slots and operating functions, and keypads shall be evaluated at all the Conceptual Design Review Meeting. The Contractor shall assure that no "change order" or additional software modification will be required to make future changes to the graphics and instructions texts for all different screens. CDRL 0536

5.5.31.11 Display Language Selection

TVMs shall be designed so that alternate languages can be selected to enable non-English speaking patrons to use a machine without assistance. Language selection shall be available from the initial screen prior to beginning a transaction. The display shall return to English after each transaction is complete, regardless of whether it terminates normally or is aborted. Instructions on how to return the display to English shall be always available in English. Utilities to permit the agency, without the participation of a Contractor, to add or modify alternate language screens shall be provided as part of this contract. English, and at minimum three other language screens shall be provided, to include Spanish and Creole, with the capability to add or modify additional selected languages without reprogramming provided in the design. No "change order" or software modification will be required to make those changes for the audio instructions.

5.5.31.12 Cash Transactions / Transaction Speed

The assumed speed of TVM transactions is a critical parameter in the calculations used to determine the number of TVMs required at each station. Transaction time is calculated as the time from completion of fare selection to when the contactless payment is processed, the account in the Fare Collection Application is recorded via an interface/integration, and all change, in bill and coins are dispensed.

Assuming all inserted coins and bills are accepted on the first insertion and all transactions are for the purchase of a single CSC, the time required to complete the following sample transactions should not exceed the Transaction Times defined in the following table. CDRL 0537

Table 5-2: Maximum TVM Transaction Times Sample Transaction Content	Maximum Time to Complete
One bill inserted; two coins returned	12seconds
Four coins inserted; two coins returned	15 seconds
Three coins inserted, one bill inserted, four coins returned	17 seconds
Two bills inserted; four coins returned	15 seconds
One bill inserted, four coins inserted, two coins returned	17 seconds
Five bills inserted; four coins returned	25 seconds
Credit/Debit/Smart Card Transaction	30 seconds
Insert two bills to replenish a Smart Card	15 seconds

All bills processed by the bill handling unit and change provided by the recycling component should comply with the manufacturer specifications.

In addition, for all varieties of transactions listed above, the time between the completion of the transaction (when the smart card is issued, and all coins and bills are deposited, and change provided) and the TVM is available to begin another transaction shall not exceed 3 seconds.

If a transaction is canceled by the patron before money has been deposited, the TVM shall immediately return to the idle screen. If a transaction is canceled after money has been deposited and before the first smart card is issued, all money shall be returned and the TVM shall resume its idle state within 5 seconds of the cancellation.

Where possible, TVM speed shall be optimized using concurrent activities. For example:

1. Dispensing of change shall occur concurrently with the transfer of any inserted bills from the bill escrow into the bill vault.
2. If a change requirement calls for dispensing coins from the recirculating coin system and the hoppers, both devices shall be activated simultaneously.
3. If a cancelled transaction requires the return of coins and bills, both the coin and bill systems shall be commanded to do so simultaneously.

5.5.31.13 Credit/Debit Card Transactions

Transaction times for bank card transactions, measured from the time a card is inserted into the TVM to the time a smart card is dispensed, shall not exceed the following times (excluding PIN entry time and clearing house processing time):

1. When the Fare Collection Equipment is on-line with the clearinghouse: 4 seconds.
2. When the Fare Collection Equipment is not on-line with the clearinghouse, with an attempt to establish communications for a period of 10 seconds of remaining off-line, the TVM will go into "Cash Only Mode".

5.5.32 Contactless Agency CSC and Barcode Media Transactions

Transaction times for contactless media transactions, measured from when a contactless media used to the time a smart card is dispensed, shall not exceed the following:

1. When the Fare Collection Equipment is on-line with the clearinghouse: 4 seconds.
2. When the Fare Collection Equipment is not on-line with the clearinghouse, with attempt to establish communications: 10 seconds.
3. An audible tone shall sound, and a message displayed on the MDU to indicate that the value has been updated on the CSC (Contactless Smart Card). A receipt shall be automatically issued for all CSC replenishments or new fare product recorded at the corresponding account in the Fare Collection Application.
4. To perform an automatic update (autoload) function, the patron shall select the appropriate function and place the smart card near the target on the TVM or insert the card in the appropriate receptacle. An audible tone shall sound, and a message displayed on the MDU and spoken in the selected language to indicate that the smart card has been properly credited. The TVM will then display and speak 'complete' in the selected language. Audio messages will be further developed and refined during Conceptual Design Review and finalized during the Final Design Review. CDRL 0538

5.5.33 Audio

Each TVM shall be equipped with an audio jack into which patrons may plug an earphone for using the audio system. The audio jack shall be in an easily identified location that is readily accessible.

Voice instruction shall be provided to audibly announce machine instructions, prompts and other information including degraded operation conditions. A TVM audio system utilizing an audio system approved by DTPW. This audio system should support both SAPI4 and SAPI5 interfaces, and work within any field-proven speech application. Adjustable volume control and a clearly marked button permitting the patron to start or adjust the audio system should be provided. All audible messages should be stored in digital form and be easily modified by DPTW without participation of a Contractor or a need of a change order or software modification.

The Contractor shall demonstrate that the equipment can be conveniently used by people with disabilities, including people that have limited manual dexterity and people who are blind, if feasible without the need for assistance or special training. The demonstration must show how people who are blind will locate the machine, have access to instructions, and carry out transactions. All information provided by the equipment shall be offered in an accessible manner which may require a person who cannot see to use an earphone of the same specifications used for accessible ATMs. If it is not feasible to provide independent use, the Contractor shall provide the highest degree of independent and convenient use feasible for people with disabilities.

Full and detailed information on the audio system, including operation, timings, settings and capacities, placement of external speaker, etc., shall be provided at Conceptual Design Review.

6 Phase 2: Bus Farebox Replacement – Equipment and Functional Requirements

This section describes the requirements for the Bus Farebox Replacement. Fareboxes and the FBS shall process all cash fare, U. S. coins and bills and shall be deposited into a single cashbox, securely compartmentalized to separate the coins and bills. Stand-alone validators for processing of Contactless media will be acquired separately as a component of the scope of the Fare Collection Application project.

The Farebox shall be capable of electronically verifying all coins and bills inserted for fare payment. All coins and bills shall be automatically verified and identified by denomination, without operator action. All U. S. coins and bills that cannot be electronically verified shall be automatically rejected and returned to the patron. The Farebox shall assist operators with verification of the fare deposited by showing an immediate display of the value of coins and bills inserted. If the coin verification functionality is not available due to a jam or equipment malfunction, the operator shall be able to place the coin module into bypass mode. While in bypass mode, all coins inserted shall be directly deposited into the cashbox.

The Farebox shall register all fares collected for subsequent data retrieval by the FBS. The FBS shall transfer transaction revenue and operational data to the MAS and will receive fare tables and other functional parameters.

Cashbox receivers shall be installed in the operating facilities listed in this Section to securely transfer cash from bus vehicle to the receiver. The receivers shall empty the cashboxes into mobile vaults that shall receive and store the cash. The cashbox receivers and the mobile vaults shall maintain complete secure separation of all coins from bills.

The Fareboxes and/or associated equipment shall have provisions for secure transfer of the mobile vaults onto and off the money trucks that will transport the mobile vaults from the facility to the DTPW Revenue Collection Facility (RCF). At the RCF, the Fareboxes and/or associated equipment shall have provisions for secure transfer of the mobile vaults from the money trucks into the interior of the counting room. Cash shall not be accessible by personnel or the public from the time of its insertion into the Farebox until the time of emptying the mobile vaults at the RCF.

The Bus Farebox Replacement shall consist of the following equipment:

- Fareboxes that are securely mounted, with coin and bill processing units.
- Removable cashboxes for the Fareboxes.
- Cashbox receivers and receiver vaults installed at the operating facility.
- Cashbox Transport Containers.
- Data transfer devices/system linked to the FBS.
- Portable Data Units

The basic functions that are required for the Fareboxes are:

- Accept and process inserted valid U. S. coins.
- Accept and process inserted U. S. Currency.
- Ability to retain data for all revenue cash transactions, and to off-load the data for revenue verification.

DTPW presently operates vehicles from the three (3) garages; Central, Coral Way, and Northeast.

6.1 Farebox Operating Environment

The Farebox shall function without any degradation in performance or accuracy under the environmental conditions listed in Section 4 and in Exhibit 4

6.1.1 Farebox General Description

The Farebox shall be capable of electronically verifying all coins and bills inserted for payment. All U. S. coins and bills shall be automatically identified by denomination, without operator action. All U. S. coins and bills that cannot be verified shall be automatically rejected and returned to the patron. All accepted U. S. coins and bills shall be deposited into a single secure cashbox, compartmentalized to separate the coins and bills.

A display shall be positioned to be visible to the patron when entering the bus and shall display fare information and other patron information data as determined by DTPW. CDRL 0601 An Operator Control Unit (OCU) with keyboard and multi-line display, installable within the bus driver area with DTPW's approval, shall enable the bus operator to monitor and control the Farebox, and to enter fare and patronship information as required by DTPW as well as provide guidance for maintenance and troubleshooting procedures.

The Farebox shall be capable of interfacing other on-board bus systems over industry standard interfaces utilizing a SAE J-1708 or RG45 ethernet connection. Interfacing will allow for full message transfer between the Farebox and these on-board systems. This interface requirement is to ensure the capture of all Farebox alarms, position tagging ridership transactions, the sharing of driver login and route/run/trip/ pattern information and provide data or instruction to the Farebox through the standard ITS/SAE communications protocol.. The Farebox shall permit the patron to insert the required fare easily and rapidly. It shall automatically ascertain that the correct fare has been paid and shall signal the operator of such through audible signals and through the OCU display.

Transaction data shall not be transmitted over the J-1708 network. Transactions can be tagged with position data if available from the J-1708 network. The Farebox shall provide specific transactional information regarding cash details, as well as daily operation information including revenue collected, driver/route identification, and other information needed to account for revenue and monitor the equipment. The data collection and recording capabilities of the Farebox shall be as described in Section 6.2.4 (Data Collection Operations).

6.1.2 Position of Farebox on the Vehicle

The Farebox shall be installed adjacent to the operator position in close proximity to the front door, and shall be positioned so that an entering patron, including persons with disabilities, may easily insert the fare into the Farebox. The Farebox position shall allow the rapid and secure inspection of the OCU data or positioning of the data probe, and convenient removal of the cashbox from the Farebox. The Farebox shall not impede the vehicle operator from ready access to their seat when sitting down to drive the bus. The Contractor shall provide all mounting hardware. Correct placement of the farebox on each different make and model of bus shall be provided. For each different make and model of bus the Contractor shall ensure that the placement of the new Fareboxes meets the required maneuvering and reach ranges of ADA accessibility guidelines are required. Relocation, removal or installation of new railings or other elements that may represent barriers that could be encountered in the vicinity of the new farebox shall be performed as necessary to meet these requirements.

The Farebox position shall also allow for the rapid removal of the Farebox from the vehicle. The Farebox shall be installed so that it shall permit complete unrestricted opening of all maintenance lids/doors and the cashbox access door. It shall be possible for an experienced maintenance technician, equipped with the proper tools, to remove the Farebox from the bus in less than fifteen minutes. In addition, the Farebox top shall be removable without providing access to any fare media, coins, or bills in the Farebox.

The design of the Farebox to meet all the requirements of the Technical Provisions shall be submitted for review and approval by DTPW at CDR and finalized as part of FDR. CDRL 0602

6.1.3 Farebox Power

The Farebox power supply shall include adequate filters and other provisions to regulate the vehicle-supplied voltage and suppress power spikes and noise that could contribute to erroneous signals or corruption of data. The power supply shall be rendered immune to electrical interference caused by such items as fluorescent lights, bus alternators, air conditioning units, radios, etc. Adequate protection against transient surges in the bus power supply shall be incorporated to the extent

necessary to prevent damage to electronic components, and to prevent loss or corruption of data stored in Farebox memory.

Loss and restoration of power shall not result in any corruption of the data in Farebox memory. The Farebox shall be protected against damage, loss, or modification of data caused by power fluctuations identified in Section 4.9 (Electrical Environment).

The Farebox shall monitor and record each instance of the primary power source dropping below ten volts DC. In addition, events, alarms, and other non-revenue data can be transmitted to the FBS through a Wireless LAN when the bus arrives to the Revenue Island for on-line inquiry and reporting. Power supply monitoring information may be used to determine possible problems with power systems. The reporting shall be an event record stored in the Farebox and uploaded at probing for routing to the MAS.

6.1.4 Bill Acceptance

The Bill Handling Unit (BHU) shall electronically verify U. S. bills using optical and/or magnetic identification technology and shall be able to distinguish valid bills accurately and securely by denomination. Distinguishing bills by length shall not be satisfactory.

The Farebox shall be capable of verifying and counting existing, "street quality", new and old-style U.S. currency (\$1 \$5, \$10, and \$20) presented in any of four (4) lengthwise orientations. Currency not capable of verification shall be rejected and returned to the patron through the bill insertion slot. Foreign bills, counterfeit bills, partial, torn, and mutilated bills shall always be rejected. The Farebox shall accept, verify, and deposit a bill in not more than two (2) seconds. The Farebox shall accept 95% of verified bills on first insertion and 99% of verified bills on second insertion. After verification, bills shall be automatically transported to the cashbox.

The Farebox shall be capable of allowing the operator to bypass bill verification and to manually designate the denomination of a bill to accept an apparently valid bill. The operator may input the denomination of the currency note by depressing a key on the OCU. Only denominations of \$1 dollar or \$5 dollars shall be initially acceptable. The operator shall also press "Accept Next Bill" to permit verification of a worn or mutilated bill that cannot be electronically verified by the Farebox.

After operator entry on the OCU of the "Accept Next Bill" command, the next bill inserted into the Farebox shall be transported directly to the cashbox without verification. After the bill is stacked, the Farebox shall automatically return to normal operation (i.e., electronic verification of all bills). The Farebox transactional data shall record every instance of the "Accept Next Bill" command, to permit tracking should discrepancies appear in the money room when the cashbox contents are counted.

Alternate suitable means to support driver-controlled bill acceptance in the sense of an "accept bill function" may be considered. This feature shall be initially deactivated and shall be activated via download a command or a local control to Farebox.

The paper currency entrance slot shall be positioned away from the coin insertion slot to avoid passengers placing coins in the bill slot and the dimensions of the paper currency slot shall hinder the accidental entry of coins into it. The BHU shall accept currency that has been opened to its full area and inserted lengthwise. The insertion slot shall be illuminated for ease of bill insertion. The top surface shall be designed to aid the rapid insertion of the currency into the Farebox.

The bill transport shall employ a top roller mechanism to positively engage an unfolded bill. It shall require no force to cause the mechanism to start. Solid-state devices, rather than mechanically actuated switches, shall be employed in starting the mechanism. The insertion slot and the acceptor mechanism shall prevent any external access to the inserted currency. Means to prevent access to the bills in the cashbox when the bill transport is removed shall be provided. The method used shall be submitted to DTPW for approval as part of CDR and finalized in FDR. CDRL 0603

For each bill accepted and counted three Farebox functions shall be incremented, as follows:

- The amount displayed on the bus operator's control unit, as further defined herein, shall be increased by the value of the bill.
- The two "Revenue" registers shall increment by the value of the bill and the resulting value shall be stored in memory.
- The appropriate "Bills" register (by denomination) shall increment by one (1) count and the resulting dollar value shall be stored in memory.

6.1.5 Coin Acceptance

The Farebox Coin Acceptor Unit (CAU) shall electronically verify coins using technology such as electronic field displacement or metallurgical signature to determine type and denomination. Distinguishing coins by diameter alone shall not be satisfactory.

The Farebox shall be capable of accepting valid U.S. pennies, nickels, dimes, quarters, dollar coins. The Farebox shall be capable of being programmed to associate up to two coins within a single denomination, so that different series of coins can be accommodated. Invalid coins shall be returned to the patron.

The CAU shall be capable of being reprogrammed so that coins and coin series can be added, modified, or deleted by DTPW's personnel. No modification to Farebox hardware shall be required to add, change, or delete a coin type.

The CAU shall be capable of automatically and continuously processing coins at a sustained insertion rate of not less than ten (10) coins per second.

The CAU shall verify 95% of valid coins on first insertion, and 98% of valid coins on second insertion.

The coin slot shall allow rapid insertion of coins by patrons. It shall be shaped to direct inserted coins into the Farebox and shall admit no coin larger than largest coin identified above. Its design shall deter entry of paper into the coin slot and minimize coin jams.

All invalid coins shall be returned to the patron in the coin return slot. The coin return slot shall be clearly visible to the patron and marked with the legend "Coin Return."

The Farebox shall be capable of producing an audible alert when coins are rejected to alert the operator and patron. This audible alert shall be software configurable for sound type and level and shall be able to be suppressed.

The CAU shall be capable of handling deformed coins, i.e., coins that are bent or bulged, not perfectly round, or have attached foreign material, except for:

- Coins that are so bent, bulged, encrusted with foreign material, or otherwise damaged that they will not fit through the

coin slot.

- Coins whose electrical characteristics have been altered due to loss or addition of conductive material as to render them unrecognizable by the acceptor.

The coin insertion slot and the coin acceptor mechanism shall prevent any external access to the inserted fare revenue. Means to prevent access to the coins in the cashbox when the coin acceptor is removed shall be provided. The method used shall be submitted to DTPW for approval as part of CDR. CDRL 0604

6.1.6 Jam Clearing Features

The Farebox shall continuously monitor the coin and bill handling systems and shall be able to automatically sense and report bill and coin jams. All detected jam conditions shall be recorded in the Farebox transactional data and displayed to the operator on the operator control unit display. Upon sensing a jam, the coin and/or bill processing shall be disabled until the jam is cleared.

The operator shall be able to attempt to clear bill jams through operator control unit commands. After completion of the jam clearance function, bill processing shall be automatically re-enabled. CDRL 0605

6.1.7 Patron Display

The Farebox shall be provided with a high intensity, industrial application type display that is visible (operator has OCU and patron views Farebox display) at three feet and a viewing angle of 60 degrees from the top and sides. The display shall be capable of providing the patron with information including transaction details, transaction assistance, and other messages as determined by DTPW. The display shall be integrated with the Farebox.

When fare media is processed, pertinent information shall be displayed on the patron display. If the media is acceptable, the display shall indicate one of 20 messages. Message wording shall clearly define the transaction status in abbreviated form as necessary to fit the character limitations of the display. The displayed message shall extinguish after a software configurable interval of up to 15 seconds after removal or immediately upon re-insertion of the same media or presentation of another media document. Wording on the display shall be subject to DTPW approval as part of FDR. CDRL 0606

Under normal operations, when the Farebox is static for a continuous period of one (1) minute the display shall automatically extinguish or go into a sleep mode to preserve its operating life. When a coin or bill is inserted, the display shall illuminate displaying either "0.00" if no monies were deposited or display the value of the monies inserted into the Farebox BHU and CAU. As coins and bills are inserted, this display shall count upward reflecting the amount of money inserted.

6.1.8 Operator Control Unit (OCU)

The Farebox shall be delivered with an Operator Control Unit (OCU) for operator entry of commands, patronship information and other information required by DTPW, and to display transactional information, errors, prompts, and other information as required by DTPW to the operator. The OCU shall connect to the Farebox using a durable armored cable and shall be mountable up to ten (10) feet from the Farebox. The following OCU description shall be considered functional in nature. DTPW is open to alternative OCU layouts that meet the functional description found below.

The OCU shall have a high visibility backlit display capable of displaying up to 320 x 240 pixels of graphic and text data. The OCU keyboard is backlit and consists of either soft keys or numeric keypad as follows:

- A fixed numeric input pad with keys for the numbers 0 through 9, * and #, four arrow directional keys and an "enter" key, or;

- Soft keys, which can be configured to allow the operator to perform any Farebox command.

The OCU keyboard shall be large enough to allow easy use by the operator and shall provide tactile and audible feedback to the operator on each key press. Contractor shall provide dimensional drawings of the OCU showing all buttons and displays and including the connection cable to the Farebox as part of CDR. CDRL 0607

6.1.9 Audible Signals and Driver Displays

The Farebox shall provide audio feedback or display an appropriate code to the driver depending upon certain operating conditions. Media accept/reject shall be assigned to produce two unique audible tones to indicate to the operator whether the media has been processed correctly (accepted as fare paid) or rejected (not accepted for some reason). If the fare media is invalid, a tone shall sound to indicate invalidity both to the patron and to the operator.

The Farebox shall be able to produce audible signals to alert the operator and/or patron of errors or events, including, but not limited to:

- A. Coin rejected.
- B. Bill rejected.
- C. Bill jam.
- D. Bill jam cleared.
- E. Fare registered by operator command.
- F. Fare registered automatically by Farebox.
- G. Invalid operator command entered.

The Farebox shall display the following codes related to cashbox full condition:

- A. Cashbox coin area 90% full.
- B. Cashbox coin area full.
- C. Cashbox bill compartment 90% full.
- D. Cashbox bill compartment full.

Events alarms shall also generate messages to the FBS. The Farebox shall be capable of producing not less than 10 separate and distinct audible signals and shall be configurable for sound type and level to permit the association of any of these audible signals with any alert.

Audible alerts shall be able to be suppressed by the bus operator.

6.1.10 Cashbox

The cashbox shall have two individual and separate compartments to receive and retain coins and bills in their respective compartments. The cashbox shall always maintain separation of coins and bills. The cashbox shall have a minimum storage capacity of 500 bills and shall have a minimum of 195 cubic inches for coin storage.

The cashbox shall be constructed of durable, lightweight material. Rough service shall not cause the cashbox to become distorted or inoperable. A fully loaded cashbox, if dropped in the upright position to a hard floor and landing on its bottom or bottom corner from a height of 36 inches, shall suffer no operational impediment or security breach. The cashbox shall not distort when filled to capacity.

The cashbox shall be designed so that it securely locks prior to being removed from the Farebox during revenue service. After removal from the Farebox, the cashbox shall remain locked until vaulted in a Receiver Vault.

Cashboxes shall be interchangeable between Fareboxes. The cashbox shall fit into the Farebox only in a singularly correct position and shall easily be placed into the ready position to collect revenue. The cashbox insertion and removal procedure shall be designed to positively guide the cashbox into and out of the Farebox and the cashbox receiver.

Under normal operations, the Farebox shall recognize the presence of a cashbox properly engaged and ready for service. The absence of a cashbox properly engaged shall cause the Farebox not to accept monies until the cashbox is properly engaged. The method employed shall be subject to the approval of DTPW as part of FDR. CDRL 0608

The cashbox shall be designed to minimize risks to personnel associated with lifting, replacing, and carrying the cashboxes between the buses and the receivers. The lightest possible material of suitable security, durability and strength shall be used in the fabrication of the cashbox. The minimum quantity of this material shall be used to design the smallest and lightest unit that will accommodate the required coin volumes. The empty weight and maximum full weight of the unit shall be prominently labeled on the front side of the unit. Handle placements shall allow the wrists and forearms to remain in as straight an alignment as possible and minimize swinging or extension of the elbows and shoulders during transport.

The Farebox shall automatically monitor the level of bills and coins deposited in the cashbox, and shall, without disclosing the contents of the Farebox, send an alarm to the operator when the cashbox reaches a software configurable percentage of bill and/or coin capacity for appropriate action (i.e., notify maintenance). The alarm shall remain active until the cashbox is extracted. Separate alarms shall be provided for the bills and coins.

When coin capacity reaches 100%, the Farebox shall notify the operator and automatically disable coin acceptance. After coin acceptance is disabled, the Farebox shall reject all inserted coins and return them to the patron. When bill capacity reaches 100%, the Farebox shall automatically cease accepting bills. The Farebox patron display shall be software configurable to automatically notify patrons when coin and/or bill acceptance is turned off.

Each cashbox shall be delivered with a unique electronic ID that is readable by the Farebox and receiver vault/garage equipment counting station. This ID shall also be indelibly printed on the cashbox in text and bar code formats. The unique electronic ID shall be a minimum of four-digits.

All alarms described above shall be reported to the FBS.

Readings shall be automatic and the information relative to the serial number, date or day of week and time of insertion and removal shall be stored in the Farebox memory for subsequent data transmission to the FBS.

Cashboxes specifically designed and identified, by color, prominent labeling or other easily recognized means should be provided for equipment training.

6.1.11 Electronic Cashbox Door Locking System

The Farebox shall provide the ability to retain a specific five-digit code number for the purpose of controlling release of the locking mechanism, which secures the access door that permits removal of the cashbox from within the Farebox. Mechanical keys shall not be used for opening the Farebox door. This code number shall be stored or altered only by means of receipt of the correct data message input to the data port from the probe connected to the FBS.

Release of the door locking mechanism shall occur only when the coded number received from a probe at a garage or

from the portable data unit exactly matches the number that has been previously entered and stored in the Farebox. When the probe connected to the FBS is used, this release code shall occur because of successful transmission of the Farebox data from the Farebox to the FBS.

The Farebox shall be provided with a sensing device capable of monitoring the length of time that the cashbox security door is open. If the cashbox security door is opened longer than one (1) minute an alarm signal shall be transmitted to the data storage within the Farebox memory for transmission to the FBS. The length of time shall be a settable parameter. Alternative unlocking mechanisms shall be allowed, must provide for identical revenue security and shall be subject to approval of DTPW. This process shall be described and submitted to DTPW for review as part of CDR and Approval at FDR. CDRL 0609

6.1.12 Fare Sets and Fare Categories

The Farebox shall allow up to 10 fare sets to be available for selection either by operator command or through automated commands received from the FBS. The fare sets available for operator selection shall also be able to be restricted by route/run/trip information. Each fare table shall allow up to 100 different fare categories to be registered by the operator.

Fare tables shall provide, at a minimum, the following information:

- A. Default fare for automatic fare registration.
- B. Time/day validity (so that fare sets can be restricted by time of day and/or day of the week).
- C. Route/run validity.

The fare categories available for selection within a fare table shall be software configurable. Fare categories shall be assignable to any OCU soft key to permit rapid selection by the operator. At a minimum, each fare category within a fare table shall define the following information:

- A. Name (e.g., "adult full fare," "student fare," etc.).
- B. Fare payment type (e.g., "cash fare", "flash pass", "register only - no payment", and other types designated by DTPW).
- C. Fare amount.

The Contractor shall provide details of the Fare Table configuration required for the Fare Collection Equipment at the CDR. CDRL 0610

The Fare Table will be provided by the provider of the Fare Collection Application. Both Contractors shall work together to achieve a solution to deliver the Fare Table data in accordance with Section 9.1.

6.1.13 Fare Records and Patronship Registration

While in revenue service, the Farebox shall be capable of continuously and automatically accepting and verifying all coins and bills presented for payment. Coins and bills that are successfully verified shall be deposited into the cashbox, and their value shall be added to the "payments received" display on the OCU and on the patron display.

The value of all coins and bills verified and accepted by the Farebox shall be added to the "payments received" display and shall be considered "unallocated revenue" until either:

- A. The operator presses a patronship registration command (such as "full adult fare" or "student fare"), allocating the revenue to a particular fare.
- B. A software configurable timeout period expires and the Farebox automatically allocates the revenue to the default fare.

The Farebox shall be software configurable to produce an audible alert whenever payment equaling the value of a “default fare” for the current fare table is entered.

The Farebox shall record transaction by transaction, data for all monies presented as payment including:

- A. Date and time of payment (to the highest resolution of the embedded clock).
- B. Cash payment, value of Cash collected.

Summary counts of number and denomination by route/run shall be stored in the Farebox.

The Farebox shall permit the operator to enter fare patronship information through the OCU and shall match such patronship information to payment transactions where possible. Patronship information shall be selectable by the operator by entering the command with the OCU or by pressing the OCU “soft key” that has been assigned to the fare category.

Patronship registration shall be recorded in a manner that shall permit the matching of patronship information with payment information.

The Farebox shall record all errors and exceptions including errors resulting from jammed bills or coins, mechanical malfunctions, operator errors, and all such conditions where the normal operation of the Farebox may be disrupted, including software exception conditions. An individual record with date, time, and other relevant details, shall be written for each occurrence of an error or exception. Errors and exceptions shall be recorded in such detail that an analysis of this information shall represent a full and complete picture of the Farebox performance.

6.1.14 Route/Run Segmenter

The Farebox shall be provided with a feature that shall automatically create records at regular time intervals or whenever assigned buttons are properly pressed in combination. All the data described shall be recorded within the Farebox for later data retrieval. The regular time intervals shall be one hour on the half-hour all day, plus one-half hour during peak weekday hours, which shall be software configurable from the FBS.

All Fareboxes shall be delivered with a route/run segmenter. The route/run segmenter shall permit the operator to indicate when a route/run segment has been completed and a new segment has begun. A record shall be recorded in the transactional data indicating the segment change, date and time of segment of the Farebox change, and other information as required. There shall be a minimum capability to store 2,000 transactions and/or route/run records on a daily basis in the Farebox memory.

6.1.15 Log-On/Log-Off

The following describes the Farebox processes related to logging on and off.

6.1.15.1 Log-On Process

The operator shall log-on to the Farebox using the keypad as an alternative method. The design of this system shall include the items addressed below:

- The single log-on/log-off location may be the Standalone Validator via an interface/integration in which case the Farebox shall receive log-on/log-off information as it is provided by the CAD/AVL control head over this interface.
- In the case where the Standalone Validator function is not available, the Farebox shall provide a mechanism for independent log-on/log-off as described herein.

The Contractor and the provider of the Fare Collection Application shall work together to achieve the log-on/log-off function.

The Contractor shall certify that the protocol within the Farebox is capable of handling all of the messages transmitted to it without loss of any messages due to capacity constraints from either the Farebox hardware or software.

Prior to the Farebox entering revenue service, the operator shall be required to successfully log on. Successful log-on shall require a valid operator ID, operator password, and route/run/trip information. Operator IDs and passwords shall be securely maintained at the FBS and shall be downloaded to the Farebox.

Route/run validity information shall also be resident on the FBS and shall be used by the Farebox to ensure that route/run information is correctly and accurately entered by the operator during log-on.

The Farebox shall also support temporary (relief) operator log-on, supervisor log-on, and manager log-on. Non-revenue service log-on shall be possible for maintenance and revenue technicians.

Provision shall be included to display which of the above items is to be input, to display all entered selections, and to correct any mistaken entry without re-entering all previous correctly entered selections.

At a minimum, the following security levels shall be software configurable:

- A. Normal Operator
- B. Supervisor
- C. In training Personnel
- D. Manager
- E. DTPW Maintenance Technician
- F. Revenue Service Agent

The required security level for all Farebox functions and commands shall be software configurable. Functions and commands requested from operators with insufficient security shall be denied, and a transaction documenting this denial shall be recorded in the Farebox transactional data. Alternatively, the Farebox operating concept shall only offer such functions that are in compliance with the permissions for the logged-on user. In this case, no denials will occur.

Upon completion of the log-on process, a log-on record shall be established defining all the above selections, together with the date or day of week and the time when the log-on occurred.

6.1.15.2 Log-Off Processes

To initiate the log-off procedure shall require the operator to press an assigned button combination.

Upon completion of the log-off process, a log-off record shall be established defining the operator number, together with the date, day of week and the time when the log-off occurred. Log-off shall occur manually (by the driver) or automatically. After a DTPW configurable time period beginning after the last activity, the Farebox shall go into hibernation mode. The Contractor shall indicate if the Farebox can receive SAV message while in hibernation, and if the Farebox will come out of hibernation upon receipt of messages addressed to the Farebox (i.e., operator log-in, etc.).

6.1.16 Clock

The Farebox shall accurately maintain date and time and/or day of week and time. The date/day of week and time data

may originate be distributed to each Farebox by the MAS or FBS or via another mechanism determined by the Contractor. The process of updating time/date and maintaining synchronization shall be agreed at CDR. The Farebox time shall deviate no more than two minutes between probing, and time/date shall be protected from a power failure for at least 14 days. The clock shall use the presently employed Network Time Protocol for the update of date and time information.

6.1.17 Maintenance Actions

Provisions shall be included to allow maintenance personnel to initiate an event record indicating that a maintenance action has been performed on the Farebox. The procedure for initiating this record shall require entry of a security code and the technician shall be prompted to enter their ID (up to five digits) and a two-digit code identifying the action. The records shall store the time/date of entry. The memory shall store all such records for subsequent transfer to the FBS upon probing or using a wireless LAN or other method proposed by the Contractor and approved by DTPW. It shall not be possible to clear the Farebox memory until all data has been downloaded from the Farebox. Contractor shall provide details on the event information to be entered into the Farebox at CDR. CDRL 0611

6.1.18 Transaction Operation Data Storage

The Farebox shall make use of solid-state memory for the storage of all transaction data.

Memory shall be retained indefinitely without the use of batteries. The Farebox memory shall store counts of all activities resulting in a message being displayed and/or an audible tone being produced. Power spikes or transients, or the complete loss of power shall not cause any information or data contained in memory to be lost or altered.

The operation and fare logic of the Farebox shall be controlled by a solid-state memory that is retained indefinitely without battery backup. Storage shall also include the pre-set fare amounts, functions and values of the trip category buttons, register and activity data storage, Farebox door open, cashbox removed, all other events and alarms, and the electronic clock.

Fare logic updates shall originate in the Fare Collection Application and shall be transmitted to the Farebox by way of the FBS. Fare logic shall be updated as a regular component of the daily probing sequence and shall be included in the maximum probing time discussed in Section 6.2.4 (Data Collection Operations). There shall be a minimum of two tables: 1) current or active, and 2) future. The future fare logic shall become current or active upon reaching a programmable date and time.

The Farebox shall securely and accurately record all transactional information, including sales data, operational errors, and exception conditions, patronship information, and operator commands. At a minimum, the Farebox shall record a complete transaction on the following events:

- A. All payment transactions, including the value of coins and the value of bills.
- B. All patronship registration transactions.
- C. All operator commands.
 - Route
 - Run
 - Entry Location (Latitude and Longitude)
- D. Farebox power off.
- E. Farebox power on.
- F. Operators log-on.
- G. Operators log off.

- H. Door/cover opened (including identification of door/cover).
- I. Door/cover closed. (Including identification of door/cover)
- J. Successful data probe of transactional data.
- K. Unsuccessful data probe of transactional data.
- L. Successful download of Farebox configuration data.
- M. Unsuccessful download of Farebox configuration data.
- N. Revenue door opened (at times other than revenue service after data probing).
- O. Revenue door closed.
- P. Cashbox removed.
- Q. Cashbox inserted.
- R. Farebox errors and failures.
- S. Security errors and intrusions.
- T. Coin jams.
- U. Clearance of coin jams.
- V. Bill jams.
- W. Clearance of bill jams.
- X. New fare table selected.
- Y. Farebox in "bypass mode"
- Z. Farebox returns to "revenue mode" back from the bypass mode.

In addition to transactional data, the Farebox shall maintain running counts by operator shift of other items such as total number of coins rejected, total number of bills rejected, and other items as required. Under no circumstances shall Farebox discard detailed data or substitute summary data, except as configured by DTPW. All transaction and revenue data shall be date and time stamped to the highest resolution of the available clock. All transaction and revenue data shall be assigned a unique (per Farebox) 32-bit (minimum) incrementing record sequence number at the time it is recorded.

The Farebox shall provide adequate data storage capacity to store a minimum of 30 days of full revenue data accurately and securely. When the capacity of the Farebox data storage is reached, the Farebox shall suspend normal service and indicate that data probing is required.

Transactional data shall be communicated to the FBS when data is probed prior to revenue service, or any other method proposed by the Contractor and approved by DTPW. After successful data probing, the Farebox shall continue to retain the transactional data until such time as the FBS directs that the data can be deleted from the Farebox.

The FBS shall not direct the Farebox to delete the transactional data for any revenue shift unless directed by the Fare Collection Application after successful receipt and processing of that data by the Fare Collection Application via an interface/integration.

Alternative technologies for the storage of data, which provide the same capacities and functionality, shall be permitted, subject to the approval of DTPW/ITD.

6.1.19 Bus System Locks and Keys

General requirements for locks and keys are provided in Section 4.23 (General Lock and Key Requirements).

Fareboxes and cashbox receivers shall have a common cashbox key. The cashbox key shall be mounted in the back wall

of the cashbox receptacle in the lower portion of the Farebox and within the cashbox receiver. If the removal and insertion of a cashbox into the Farebox or cashbox receiver is awkward and/or lends itself to damaging or misaligning the cashbox, Farebox, cashbox receiver or lock/key mechanisms, the system shall be rejected. Alternative vaulting concepts, which provide the same security and similar access controls, shall be considered.

Lock combinations and keys for all identical functions shall be keyed alike. Different combinations shall be provided for each function. Keys shall be separately serialized to permit easy insertion into the key control program in place at DTPW. Keys shall be a high security type. Contractor shall provide details on the key system proposed at CDR. CDRL 0612

Bus Fare Collection Equipment used for training and other instruction shall be keyed separately from equipment used in revenue service.

6.1.20 Farebox Dimensions

The completed farebox assembly excluding the mounting base plate shall measure not less than thirty-six inches (36"), nor more than forty-one inches (41") high, as measured from the vehicle floor, and not more than eleven inches (11") in cross section. The base plate for a Farebox shall not exceed 12-1/2" by 12-1/2". Contractor shall provide fully dimensioned scale drawings of the Farebox and base plate showing full views for each side and with the doors and covers both opened and closed at the CDR. CDRL 0613

6.1.21 Power On/Off Switch

A manually operated on/off switch shall be provided to turn off the power to the Farebox. It shall be accessible by authorized personnel only behind a locked door or cover. This switch shall be rugged, in construction, intended for industrial use and shall have two positions (ON/OFF). It shall be clearly labeled so that the switch handle position points to or is aligned with the conditions indicated by the label.

6.1.22 Test Points and Indicators

All circuits within the farebox shall be designed to permit testing and/or voltage measurement of the various components/boards through designated test points that are clearly indicated and accessible. If test points are not provided, the use of extended boards is permissible with DTPW approval.

6.1.23 Cashbox Door Security Switch

Concealed magnetic contacts and associated circuitry shall be positioned to immediately detect without any delay the opening of the cashbox access security door. A set of normally closed contacts shall be connected by wires and terminated at the base of the Farebox, so that it can be connected to the bus radio system to detect the opening of the cashbox access door while the bus radio is in operation. The Contractor shall be responsible for the connection to the radio box terminal and for verifying the proper operation of the interface. Alternative concepts, which provide the same security and similar alarm, shall be considered by DTPW as part of CDR, and if approved, included in FDR.

6.2 Revenue Transfer and Collection Equipment

The Revenue Transfer and Collection Equipment shall consist of the following items:

- A. Cashbox Receiver and Vault Housing securely anchored to a concrete pad.
- B. Mobile vault with steerable castors, "dead-man" brakes and provision for forklift operation.
- C. Cashbox Transport Cart with steerable castors, and "dead-man" brakes to transport cashboxes for audit purposes.

The equipment shall perform the following functions:

- A. Cashbox Receiver - The cashbox receiver shall accept a cashbox and by means of a mechanism operated in a high security manner shall open the cashbox and discharge its contents (coins and bills) into the mobile vault.
- B. Mobile Vault - The mobile vault shall have two compartments within it so that when the revenue is emptied from each cashbox using the cashbox receiver, coins shall be stored in one compartment and bills in the other compartment. The mobile vault shall have a minimum capacity to hold 10,000 U.S. bills in the bill compartment and not less than \$10,000 of mixed U.S. coinage in the coin compartment. When removed from the vault housing the mobile vault shall be in a closed and locked condition.
- C. Cashbox Transport Cart (CTS) - shall provide means to transport cashboxes between the garage and the counting facility. Each CTC shall have carrying capacity for a minimum of 12 cashboxes. The CTC shall be designed for roll out or forklift operation and shall have the same overall dimensions as the mobile vault.

6.2.1 Cashbox Receiver and Vault Housing

The Cashbox Receiver and Vault Housing shall be constructed of heavy-duty plate steel and shall be securely anchored to a concrete pad by means of anchor bolts. The design of the structure shall take into consideration strength and security requirements to resist forced unauthorized entry. The Contractor shall submit structural diagrams and installation plans to DTPW as part of CDR for Approval. CDRL 0614

Completely emptying a full cashbox in the cashbox receiver shall take no longer than ten (10) seconds as measured from the time when the cashbox is inserted in the cashbox receiver to the time when it is withdrawn from the cashbox receiver.

Once the cashbox is inserted in the proper manner, a heavy-duty door with interlock shall then be closed. When the door is closed, it shall be locked with a crank being turned. Cashbox emptying shall take place only when the door is locked, the crank is fully turned, and all other interlocking conditions have been satisfied.

The cashbox receiver shall contain means to identify each cashbox by reading the serial number encoded on it. In a similar manner, the vault housing shall contain means to identify each mobile vault by reading the serial number encoded on each unit. The cashbox receiver shall not operate unless a mobile vault is in position and properly seated within the vault housing.

The opening to receive the cashbox shall be approximately 48 inches from the lowest point of the vault housing to facilitate ease of cashbox insertion. The cashbox receiver and vault shall be designed to minimize risks to personnel associated with lifting, replacing, and carrying the cashboxes between the buses and the receivers.

Contractor shall provide at the CDR fully dimensioned scale drawings of the cashbox receiver and vault housing showing views for each side, with the doors and covers for the cashbox receiver and vault housing both opened and closed. CDRL 0615

6.2.2 Mobile Vault

The Mobile Vault shall be constructed of heavy-duty steel so assembled as to not allow access to the contents of the Mobile Vault other than through authorized protected apertures. Appropriate maintenance apertures shall be provided. Each of these shall be secured with high security locking systems.

The Mobile Vault shall have two large revenue discharge doors, each secured by a high security lock. The bill compartment shall be separate from the coin compartment. Coins shall be discharged from the Mobile Vault by means of gravity utilizing

sloped stainless steel bottom surfaces to aid in the process. Revenue discharge doors and openings shall be securely designed to prevent exposure of revenue except when opened in an authorized manner.

The Mobile Vault shall have a reinforced lower section so that it may be lifted by means of a forklift without deformation of the structure. A channel guide structure for the forklift shall be designed to support full load vault conditions. The Mobile Vault shall have provision for tie-down adequate to secure a fully loaded Mobile Vault for transport in revenue service trucks.

The overall envelope of the Mobile Vault shall not exceed 32" inches wide by 42" inches deep by 39" inches high (including casters).

All Mobile Vaults provided under this contract shall be identical in manufacture and dimensions and shall be interchangeable between any of the cashbox receivers and vault housing.

The Mobile Vault shall be equipped with four wheels, two fixed and two with 360-degree swivel capability to facilitate maneuvering. Handles shall be provided so as not to protrude beyond the envelope of the Mobile Vault. Six-inch (6") heavy-duty casters shall be supplied such that the Mobile Vault shall be able to overcome a 1-inch floor transition and a 2.5-inch floor gap. The material used in the casters shall be appropriate in size to permit easy movement and support the weight of a fully loaded Mobile Vault.

A heavy-duty "deadman" braking system shall be provided to positively engage the brakes on the two fixed wheels so that a fully loaded Mobile Vault shall be held in stationary position on a maximum 6-degree incline. The Contractor shall submit braking system design for approval at the Conceptual Design Review. CDRL 0616

6.2.3 Cashbox Transport Cart

The Cashbox Transport Cart (CTC) shall provide means to transport fully loaded cashboxes between the garage and the counting facility. Transport shall be by means of a revenue truck.

Each CTC shall have carrying capacity for a minimum of 12 cashboxes. The CTC shall be designed for roll out or forklift operation and shall have the same overall dimensions as the mobile vault. The CTC shall have provision so that appropriate personnel are able to securely lock the cashboxes into the unit and prevent unauthorized removal of the contents. Contractor shall provide fully dimensioned scale drawings of the CTC showing views for each side and with the doors and covers both opened and closed.

6.2.4 Data Collection Operations

The FBS shall provide the necessary transmission requirements, error checking and data input parameters, for the reliable transfer of data between Farebox, cashbox receiver and the MAS.

As part of the revenue service process, and prior to the removal of the cashbox, the Farebox shall be connected to the FBS for the transfer of revenue and transactional information from the Farebox and for transmittal of operational updates to the Farebox. Probing in this context shall mean bi-directional communications, using a data probe and/or wireless LAN and shall be based upon industry standards. Probe data of 50 kilobytes shall transfer in not more than six (6) seconds. Probe access security shall be guaranteed by use of cryptographic authentication (using triple DES or other approved standard) prior to all probe functions. At no time shall a cryptographic key be stored or transmitted in the clear. Alternative transmission concepts, which provide the same security and similar access controls, shall be submitted at CDR for review

and approval at FDR by DTPW/ITD.

After revenue and transactional information is transferred to the FBS, any control or configuration information required including operational software updates shall be downloaded from the FBS to the Farebox. The standard information to be transmitted by the Farebox, and received and stored by the FBS shall include all data accumulated by the Farebox (Alternative data management concepts, which provide the same security and similar access controls, shall be considered by DTPW as part of Conceptual Design Review) since its last probing:

- A. All transaction level data.
- B. The date and time of probing.
- C. The bus number and Farebox number.
- D. The stored operator badge numbers.
- E. The stored block numbers and route numbers.
- F. The cumulative number of times the Farebox has been probed.
- G. The date and time of the last six probing, including probe number.
- H. The revenue totals, resettable and non-resettable.
- I. Bill, coin, fares manually enter by the Operator (Tallies record).
- J. Selective registration of fares (e.g., key categories 1-9).
- K. Cashbox number.
- L. All alarms activated with the date and time alarms were activated.
- M. Such other information may be required to produce the specified reports.

The transmission of data from the Farebox to the FBS or directly to the Fare Collection Application shall not exceed three (3) seconds for all data identified above plus one (1) additional second per ten (10) trip records as identified below. Alternative data management concepts, which provide the same security and similar access controls, shall be considered. The format of the trip records shall be designed by the Contractor and submitted to DTPW for approval at the CDR. CDRL 0617

The FBS shall download into the Farebox memory new fares for the presets and associated push-button values and the serial numbers each time a Farebox is probed.

When the data is transmitted from the Farebox, it shall be buffered in the FBS memory, checked for validity, stored on the hard disk, and immediately forwarded to the Fare Collection Application, when available, via an interface/integration. Alternative data transmission concepts, which provide the same security and similar access controls, shall be submitted at CDR for review and approval at FDR by DTPW/ITD.

The FBS shall be used to enable updates. Updates are passed from the Fare Collection Application, when available, to FBS, which shall be used to update the fares within each of the Fareboxes being probed or via other method provided by the Contractor. These updates shall include as a minimum:

- Values of the preset full fares,
- Values and function of each individual operator push-button, and
- Time of day shall automatically be transmitted to correct the clock in the Farebox each time the Farebox is probed.

Time used for transmission to Fareboxes shall originate from the FBS.

Upon successful uploading and downloading of all data with the FBS, Farebox shall allow the opening of the revenue door to permit removal and vaulting of the cashbox. A probe shall be utilized for the purposes of unlocking and opening of the revenue door for cashbox vaulting. The probe shall be connected to the FBS and shall provide the mechanism to guarantee all data transfer between the FBS and the Farebox is or has been completed. The communication between the Farebox and the probe shall be by non-contact mechanisms. The probe shall be positioned near the cashbox vaulting site. At no time shall the revenue door on the Farebox be allowed to automatically open outside of the cashbox vaulting area. At no time shall the revenue door on the Farebox be allowed to open without first successfully uploading and downloading of all data with the FBS. The Contractor shall explain in their CDR documentation the probing mechanisms, procedures, and means by which cashbox access and security is maintained.

The probing mechanism proposed by the Contractor should be used to transfer revenue data and lock codes from the Farebox to the FBS. All other data may be sent via the wireless LAN. Alternative communication concepts, which provide the same security and similar access controls, shall be submitted at CDR for review and approval at FDR by DTPW/ITD. CDRL 0618

The Contractor shall be responsible for submitting the design and obtaining security approval of the wireless LAN utilize to perform the bi-directional data transmission between the farebox and FBS during Design Reviews. The latest techniques for security shall be employed and shall require approval of DTPW/ITD. CDRL 0619

During the probing process when the FBS identifies an alarm condition a maintenance notification identifying the alarm, Farebox plus any other available data shall be created and transmitted to the FBS and MAS.

6.2.5 Portable Data Unit

A Portable Data Unit (PDU) shall be provided. The PDU's primary function is to collect data from Fareboxes that are unable to transfer data using the data probe installed at the garage. Once the data is collected from the Farebox, the PDU shall transfer the data to the FBS. The PDU shall utilize proven technology for secure data storage and transfer. This technology shall be presented at CDR and approved at FDR by DTPW/ITD.

The PDU shall utilize the same security methodology as the garage probing for uploading and downloading of data to/from the Farebox. The PDU shall extract all stored transaction and event data from a single Farebox in not more than twenty-five (25) seconds and store the information in a unique file(s) on the PDU hard drive. As a default, each time the PDU is used to probe a Farebox, the Farebox data shall be reset once the data exchange has been successfully completed. The act of probing with a PDU shall also store new Farebox operating program and rules in a similar fashion to the garage probing equipment. Following successful probing, a security key shall be validated between the PDU and the Farebox and if valid shall allow the unlocking of the revenue door on the Farebox so that emergency cashbox vaulting can be facilitated. Unlocking of the revenue door shall only occur after successful communication between the Farebox and the probe.

The PDU shall cause the Farebox to increment the non-resettable PDU counter each time the PDU is used to download the Farebox data. A similar register shall be provided to indicate the number of times that the PDU has been used to read data from a Farebox.

An event record, which includes the serial number of the PDU, plus data and time, shall also be stored in the Farebox each time the PDU is used to download Farebox data. A similar event record shall be generated at the PDU, each time it

is used to read data from a Farebox. Contractor shall provide fully dimensioned scale drawings of the PDU showing all displays, slots, controls, and interfaces to DTPW for approval as part of CDR. DTPW is willing to consider reasonable alternatives to the PDU that meet the requirements defined in this section. CDRL 0620

6.2.6 Driver Training Farebox Systems

Driver training courses for DTPW require complete Farebox installations that can be easily moved between classrooms and can be powered using standard 120VAC. To satisfy these requirements, each Farebox training unit shall contain:

- A complete Farebox and OCU system in a stand-alone configuration. The OCU shall be mounted directly to the Farebox to permit easy adjustments and use by instructors and trainees.
- A power supply to convert 120VAC to 12VDC, with sufficient power capacity to supply the Farebox, associated OCU. The power supply shall be equipped with an easy-to-reach On/Off switch, and all cables connecting to the farebox shall be neat and securely fastened.

A “stable platform” onto which the Farebox, OCU, and power supply are mounted. The platform shall include at least 4 steerable casters and have a sufficient “wheelbase” to resist tipping while the training unit is being moved.

6.3 Tools and Gauges

Special tools and gauges needed for adjustment of the farebox coin and bill acceptor units shall be provided. The Contractor shall provide a list of suggested suppliers for all special tools and gauges for approval by DTPW. Contractor shall provide an initial set of 6 sets to DTPW with 14 days of completion of Phase 2 installation. CDRL 0621

6.4 Farebox Software

All software for the Farebox and supporting systems shall be in conformance with the County's Technology Model (Exhibit 6) and/or Cloud Computing Policies (Exhibit 7), as applicable.

6.5 Secure Automatic Revenue Audit Trail

The Farebox and FBS shall be designed in a manner that establishes a direct audit trail between revenue deposited into a Farebox (“registered revenue”) and revenue counted in the money room (“deposited revenue”).

The FBS shall provide the following functions to support the secure revenue audit trail:

- A. Each cashbox shall be delivered with a unique electronic ID resistant to duplication and counterfeiting.
- B. The Farebox shall read the cashbox electronic ID upon insertion of the cashbox and periodically during revenue service.
- C. The Farebox shall record and track all revenue deposited into the cashbox, along with all other transactional detail information, and shall report this data to the FBS when probed for data during revenue service.
- D. The Farebox shall be capable of storing no less than thirty (30) days of full revenue and transactional detail information, without resorting to storing such information in summary form.
- E. The FBS shall transmit all cashbox revenue data to the MAS.
- F. The cashbox shall close securely and automatically lock prior to removal from the Farebox, and the cashbox shall be designed to prohibit removal from the Farebox unless it is in a closed and locked state.
- G. After removal from the Farebox, no revenue within the cashbox shall be visible or accessible.
- H. Unlocking the cashbox to access the revenue shall not be possible without the “cashbox revenue key,” which shall be available only in the money room or receiver/vaults. Alternative mechanisms for unlocking the cashbox will be considered as long as they maintain revenue security.

- I. The FBS shall compare the registered and counted revenue and shall automatically report any and all discrepancies.

6.6 Farebox Self-Test and Diagnostics

The Farebox shall automatically test all components and functions on every power up. Errors detected during this self-test function shall be recorded in the Farebox transactional data and displayed to the operator on the OCU display.

The performance of the Farebox shall be continuously monitored during operation, and all errors, exceptions, anomalies, and other items required by DTPW shall be recorded in the Farebox transactional data reported to the operator on the OCU.

6.7 Local Area Networks

All Fare Collection Equipment within a rail station or where a group of Fare Collection Equipment are installed shall be interconnected through use of a Local Area Network (LAN). The Contractor shall be responsible for developing a new or supplementing the existing station LAN installations. LANs shall be Ethernet-based and shall use commercially available industry standard IEEE compliant network interface cards. LANs shall use and fully support the DOD Internet Protocol TCP/IP as the standard communication protocol. Only Fare Collection Equipment as specified under this contract shall be connected to the LAN. All routers, switches, and CSUs/DSUs shall be SNMP-managed and interfaced into a SNMP-management system, to be provided by the Contractor. Information on the SNMP-management system shall be provided as part of the Conceptual Design Review for DTPW's approval. The system design shall include appropriate firewall and security scheme(s) (hardware and/or software) to provide the protection necessary and yet allow for link data exchange. Information on the proposed firewall and security apparatus shall be provided at Conceptual Design Review. The LAN architecture and protocol shall be presented for review at the Conceptual Design Review and approval at FDR. CDRL0622

7 Monitoring and Alerting System (MAS) and Farebox Backend System (FBS)

This section describes MAS and FBS hardware and operating software, as applicable, and functions to satisfy the needs for Fare Collection Equipment control, operation, and reporting requirements. The MAS should serve as the repository and control location for the Fare Collection Equipment supplied under this Contract to communicate. This MAS shall also interface with and permit authorized system users at workstations (dedicated for specific functions) to access the MAS.

The MAS and FBS shall comply with the County's Technology Model (Exhibit 6) and/or Cloud Computing Policies (Exhibit 7), as applicable. All application software used by the MAS and FBS shall be designed to be modular, "user friendly", allowing the user to access all functions and features through a modern graphical user interface, employing pull down menus, and on-line help features where appropriate all based on a uniquely assigned password and user ID privileges.

For cloud or hosted MAS and FBS, the Contractor shall maintain availability of 99.982% uptime, calculated annually, not including routine maintenance or administrative procedures to be scheduled during non-business hours with prior notification the County. Cloud or hosted MAS and FBS should be designed to effectively mitigate latency and data speed issues. The Contractor shall provide appropriate bandwidth required to ensure optimal performance for concurrent application access and data access for normal daily operational use. Geographical hosting must be contained within the Continental United States and/or United States territories. Should the Contractor fail to meet the annual uptime requirements specified in herein for cloud or hosted MAS a credit amount of \$500 per calendar day of downtime shall be issued to the County and applied to the next available invoice. For purposes of this section, any period of time in excess of 3 hours shall be considered a calendar day. Should the Contractor fail to meet the annual uptime requirements specified in herein for cloud or hosted FBS, a credit amount of \$5,000 per additional calendar day of downtime shall be issued to

the County and applied to the next available invoice. The parties acknowledge and agree that the amount/value of such performance credits does not account for the full business damages experienced by the County as a result of a system downtime, up to and including lost revenues, and shall not be construed to be an assessment of the value of damages.

7.1 System Architecture

The MAS and FBS shall be designed as scalable systems. The use of suitable scaling techniques and technologies to properly size and configure the systems to address both current and future needs must be provided in the overall system architecture design. The Contractor shall submit full documentation of the system architecture and identify all its components for review and approval at the applicable CDR. This submission shall include, as applicable, the proposed hardware platform, operating systems, database, report generation software, communications topology and protocols, system hardware, and systems development schedules or equivalent residing in a hosted/cloud environment. All third-party software incorporated as part of the systems shall be identified, including version number, and shall not be subject to separate compensation by the County. To the extent a third-party license is necessary in connection with making any functionality provided in the Scope of Services for the Solution available to the County, the Contractor shall also provide such third-party license for the term of the Contract, including any extensions or renewals thereof, to enable the County to fully utilize the MAS or FBS in accordance with the Contract. In the event that a third-party license becomes unavailable during the term of the Contract, including extensions or renewals thereof, the Contractor shall, at no cost to the County, either: 1) obtain a replacement third-party license to cause the MAS or FBS to perform in conformance with the Technical Specifications or 2) complete customization/development to the MAS or FBS to cause performance in conformance with the Contract. All submittals under this section shall be updated and more fully defined at each successive design review until final design approval is achieved at FDR. CDRL 0701

If applicable, data communications equipment used shall be service proven commercially available equipment employing and supporting industry standards and protocols. The detailed design of such data communications shall be provided by the Contractor for review at CDR. Included in the design document shall be an analysis of communications systems alternatives, together with an analysis of installation and operational costs related to the equipment to be supplied under this Contract.

Contractor shall identify any updates to the operating systems or other components to be used that have been updated since the Proposal submission for DTPW/ITD review and approval at the Conceptual Design Review. CDRL 0702

The MAS shall be of sufficient power and speed to perform its required functions. These shall include the following as a minimum:

- A. Collect, process, and store all status equipment data generated by all Fare Collection Equipment.
- B. Generate reports (daily and periodic) as scheduled and on demand.
- C. Timely responses to users' queries without affecting system performance.
- D. Forward equipment operating status and alarm information to designated workstation in real time.
- E. Smart Card TVM stock and Barcode status
- F. Maintain Negative List
- G. Generate all required reports.
- H. Interface with existing systems as defined in these Technical Specifications

The MAS shall be capable of transmitting, receiving, processing and storing data including simultaneous receipt and transmission of data to and from Fare Collection Equipment while receiving report queries from DTPW users, data transmissions to/from the workstations and requests from other portions of the network; in a manner consistent with Exhibit

6 (Information Technology Department's Technology Model). The MAS and FBS shall, as applicable, consist of the most recent commercial versions of operating system software, relational database management software and other applications needed to perform the system functions or the most current version available at the time of the design review. In addition, the Contractor shall supply all application software as necessary and shall configure all software programs for optimal system performance, including its associated networks. Standard commercially available software packages may be embedded in the system provided. All provisions of this Contract shall apply to all third-party software. The Contractor shall identify all third-party software to be integrated and shall include complete documentation on these integrated third-party software packages during the Conceptual Design Review. CDRL 0703

7.1.1 Interfacing to Other Systems

The identification, design, and programming of necessary interfaces between MAS, FBS, and the Fare Collection Application and shall be the Contractor's responsibility under the direction of the DTPW/ITD in accordance with Section 9.1. Final approval regarding the necessity of identified interfaces and the subsequent design and programming of said interfaces shall be with DTPW. All submittals under this section shall be updated and more fully defined at each successive design review until final design approval is achieved at FDR. CDRL 0704

7.2 MAS and FBS Requirements

All computer and data communications equipment provided for the MAS shall at minimum fully support the following software and hardware requirements. DTPW will have the right to accept, decline, and/or request substitution, of any item of computer or data communication system equipment which does not meet the operational, functional or performance needs and which is not in conformance with the County's Information Technology Model (Exhibit 6) or Cloud Services Usage Policy (Exhibit 7), as applicable, unless a deviation thereof is approved by the County in writing as part of CDR. The MAS and FBS shall be made available accessible from cellular phones, tablets, laptop computers, and desktop computers.

7.2.1 Data Redundancy

The MAS and FBS shall be designed to include data redundancy. Redundant information shall be stored so that no one subsystem failure shall compromise any other copy of the data. The Contractor shall indicate how this functionality will be performed. Additionally, the Contractor shall submit a Disaster Recovery Plan that ensures no data will be lost in the event of a catastrophic event at CDR. CDRL 0705

7.2.2 Data Backup Requirements

The Contractor shall provide a means for regular automated backup (that can be scheduled by the user) to separate secure storage media or other appropriate mechanism for hosted/cloud data. The back up process shall clearly define the appropriate verification, recovery and restoration procedures, and clearly demonstrate a successful process without loss or duplication of data.

Data backup shall be provided for all critical files including but not limited to system parameter and settings files, data transferred (transaction and event) from the fare collection equipment, and all operational parameters for all fare collection equipment. Backup shall be accomplished using removable media at the server, as well as on a separate backup server storage system. The data backup hierarchy shall be that data is first copied to the backup server storage system, and verified, and next copied and verified to the removable media. Restoration of data shall be accomplished for a single file, a service type, or day basis at a minimum through a menu-driven interface.

As part of the requirements of this section, procedures, documentation, training and exercises must be designed and provided for restoration of data from the various redundant sources in the event of failure in primary data storage and

transmission facilities. Contractor shall provide technical specifications and hardware and software details on the backup system to be provided at the CDR. CDRL 0706

7.2.3 Data Archiving

The Contractor shall provide a data archiving solution. Data that meets the following criteria shall be automatically archived.

- Data whose "last used file date" is a settable parameter.

Details for the archiving process shall be presented at Conceptual Design Review. Data that has been archived shall be readily available (data for the previous two (2) year period shall be stored on-line ready for immediate retrieval and data older than two (2) years shall be archived) and easily accessed for retrieval, reporting and query purposes. Archiving procedures shall be established and documented by the Contractor. The Contractor shall also provide detailed documentation regarding the process and procedures for reload of archived data into live production at the CDR. CDRL 0707

7.2.4 Storage Capabilities

The Contractor shall be responsible to properly size equipment memory and data storage according to the needs of the provided MAS and FBS. In developing this sizing, the Contractor is reminded of the scalability requirements. The systems shall have adequate capacity to retain data until redundant copies have been made and verified elsewhere in the system. All equipment and server systems shall have at least 50% excess storage and processing capacity, as calculated based on maximum system operation.

7.2.5 Version Control

The Contractor shall propose a method of identifying, tracking and managing the version number for all software modules used within the systems. This information shall include at minimum a record of the current release, all previous releases, and the reason for all modifications to the software. The version control plan shall be presented to DTPW at Conceptual Design Review and is subject to review and approval. No software shall be released for use until the Version Control plan and methodology is approved by DTPW. This tenet shall be strictly adhered to throughout the course of the project. CDRL 0708

7.3 System Security Provisions

Appropriate security measures in accordance with the mutually agreed upon Information Technology Security Matrix (Attachment 9), which shall mutually be finalized between the parties as part of the negotiation process pursuant to Section 4.8 of the Solicitation, including password protection to levels prescribed by the County shall be included to prevent unauthorized access or modification to the MAS and FBS hardware and software. The MAS and FBS shall have sufficient measures in place which are continuously active and designed to prevent unauthorized intrusion into the operating system, applications, parameters, and other software modules. The MAS and FBS shall through security administration functions, support the maintenance of access level tables. These tables shall be used to establish employee and employee group access.

Reports shall be available through the security administration function. At a minimum these reports shall provide information on employee and technician access levels, access logs for logins, central functions, maintenance activities, and security violations.

Additionally, DTPW desires to ensure that all components of the MAS and FBS including but not limited to all operating system, application and other software operate in a virus-free protected environment. To help achieve and support this

requirement, the Contractor shall provide a fully licensed, upgradeable commercially available anti-virus software application.

Functional access shall at a minimum provide for such things as fare table and associated file design and maintenance, design and access of report queries and network configuration. Data access shall, at a minimum, provide for three security levels: read only, update access (add, delete, change record), and create. All changes shall be maintained by the system and stored in a change file and associated with the appropriate username, plus date and time of each change.

7.4 Operational Requirements

The Contractor shall provide and install all software necessary for the MAS and FBS to:

- A. Allow control of all designated system functions from remote locations.
- B. Control and monitor system access, both the system as a whole and its separate functions.
- C. Record all system and remote access.
- D. Provide high-level security to fare tables, ticket layout functions and associated files to ensure protection from unauthorized access, tampering or transmission.
- E. Allow all system functions to be monitored and controlled using a modern Graphical User Interface.
- F. Provide context driven help functions.
- G. Store and maintain all system and transactional data.
- H. Define and produce user-defined reports.

7.4.1 Data Communications System, as applicable

Data communications equipment, as applicable, shall be commercially available equipment using industry standard protocols. The design of the fare collection communications system shall be provided by the Contractor for DTPW review at CDR. CDRL 0709.

7.4.2 Pre-programmed Reports

The MAS and FBS shall provide for pre-programmed reports. All reports shall be generated using a query language and standard query engine that provides for the greatest flexibility for future updates, and for creation of new reports. Report writer software shall include the ability to generate graphs and charts based on criteria and format defined by the user. All reports shall be generated with configurable time parameters, including as a minimum annual, monthly, weekly, daily and with user defined start-end date ranges.

The reports shall be available as a real-time snapshot of the Fare Collection Equipment status (if applicable), and as a historical picture for a user selected time period (including selection of time of day for a given period).

A set of preprogrammed reports typically utilized for system operation and maintenance shall be provided. The preprogrammed reports for the MAS and FBS (as applicable) shall be included, but not limited to:

- Current Software Configuration.
- Current Hardware Device Configuration.
- Personnel Access Control List.
- Device Users.
- Device Access Groups.
- MAS or Cloud Service Users.
- MAS or Cloud Service Access Groups.
- Cash Transaction Details.

- Device Transaction Summary.
- Device Smart Card Issue Summary.
- Bus Facility Probe and Vault Activity.
- Buses from this Facility Probed at Another Facility.
- Buses from Another Facility Probed at this Facility.
- Buses not Probed.
- Bus Cashboxes Probed not Vaulted.
- Bus Cashboxes Vaulted Not Probed.
- Real Time Buses Not Probed.
- Devices Not Heard from Since Selected Date.
- Cashbox Tracking by Type.
- Cashbox Tracking by Facility.
- Equipment Inventory by Facility.
- Fare Actions.
- Device Event History.
- Current Equipment Status.
- Equipment Performance Summary
- Bus Device Event History
- Receiver Vault Event History
- Entry/Exit by Facility
- Passengers Transfers
- Entry/Exit by Hour
- Entry/Exit by Day
- Entry/Exit by Day and Facility
- Passenger Totals by Category and Time of Day
- Passenger Averages by Category and Time of Day
- Passenger Totals by Device and Time of Day
- Passenger Totals by Device and Category
- Passenger Totals by Facility
- Passenger Averages by Facility
- Passenger Totals by Route, Category, and Time of Day
- Passenger Averages by Route, Category, and Time of Day
- Bus Route Activity Summary
- Bus Route Activity
- Bill Cashbox Removal by Facility
- Coin Cashbox Removal by Facility
- Coin Hopper Removal by Facility
- Coin Hopper Insertion by Facility
- Cashbox Reconciliation by Cashbox
- Cashbox Reconciliation with Piece Count
- TVM Cash Adjustments by Facility
- TVM Cash Balance Report
- TVM Cash Balance Summary

- Bus Facility Cash Summary
- Bus Facility Cash Breakdown
- Bus Facility Revenue by Payment Type
- Vaulted Bus Cashbox Summary by Facility
- Vaulted Bus Cashbox Cash Breakdown by Facility
- Unvaulted Bus Cashbox Summary by Facility
- Unvaulted Bus Cashbox Cash Breakdown by Facility
- Mobile Safes in Vault at End of Revenue Day
- Mobile Safes Not Reported in Revenue Day
- Summary of Total Reported Cash
- Mobile Safe Removal Summary by Facility
- Mobile Safe Removal Cash Breakdown by Facility
- Mobile Safe Reconciliation
- Mobile Safe Counted Cash Breakdown
- Bus Cashbox Reconciliation (Cashboxes Not Vaulted)
- Bus Cashbox Counted Cash Breakdown
- Mobile Safe Reconciliation with Piece Count

In addition to those reports outlined above, Contractor shall develop and provide a minimum of 5 additional reports at no additional cost, at the request of DTPW. Modifications to preprogrammed reports that are required to meet DTPW specific requirements shall be made by the onsite technology expert under DTPW direction for the duration specified in Section 9.2. After the duration of the technology expert, report changes shall be capable of being completed by DTPW staff, who will add and modify reports to DTPW's requirements. It shall be possible at the MAS to query any item of data stored, including transactional information, alarms, status changes and all other elements stored as transaction records. This shall include historical records as well as current information.

7.4.3 Ad-Hoc Fare Card Ridership and Revenue Reporting

The MAS and FBS shall provide the ability to prepare ad-hoc reports including as a minimum:

1. Transaction-level reports for user-defined start and end points, including as a minimum the following fields or subset thereof defined by the user:
 - A. Route ID
 - B. Run ID (bus and rail)
 - C. Trip ID (bus and rail)
 - D. Date of transaction
 - E. Time of transaction
 - F. Amount or value of transaction
 - G. Valid fare payment or underpayment
 - H. Linked or unlinked trip
2. Statistical and research reports using user-defined criteria. Examples include:
 - A. Usage characteristics for user-defined customer market segments, potentially broken down by type of fare

payment used (stored value or type of pass), geographic area or route, period of travel, and/or frequency of travel.

7.5 Functionality

At a minimum, the functionality identified in the following sections shall be provided by the Contractor as a part of the MAS and FBS, as applicable.

7.5.1 Alarm Monitoring

The Fare Collection Equipment shall, through the appropriate MAS function, receive from the on-line Fare Collection Equipment current alarm and security conditions. These messages shall be capable of being viewed and/or routed to any workstation connected to that system. The system shall send alarm conditions to the workstations and re-send alarm conditions as required (this shall include the capability of sending a message via email to a designated location), and according to the alarm priority settings, in the event an alarm condition receipt verification is not received from the workstation operator.

7.5.2 Configuration Management

The Contractor shall propose and provide a method of managing the functionality of adding, changing, or deleting of configurations, and/or tables utilizing a GUI menu-driven interface that allows County staff to make updates without interaction from the Contractor. This method shall allow DTPW the ability to change and test configurations or program tables before being updated throughout the system and forwarded to the Fare Collection Equipment installed in the field. This method shall also provide DTPW the ability to back out and return to the original configuration or table (only one version back). As delivered and licensed to DTPW, the software and database structures for the FBS and MAS shall have the capacity to support the equipment quantity listed in Exhibit 5. Further, the FBS and MAS shall be scalable to provide sufficient capacity and flexibility.

From any workstation connected to the MAS, based on password/username security, any authorized user shall be able to download to any selected group or all items of the same type of Fare Collection Equipment connected to that MAS. This includes the following:

- A. Fare tables (including associated audible messages, parameter settings, full values, discounts and validation settings)
- B. Security access codes, including those for all revenue service personnel and maintenance personnel.
- C. Configuration files of all items of equipment installed.
- D. Operational parameters of all items of equipment installed.
- E. Communications parameters of all items of equipment installed.
- F. Programmed delays and timeouts for all types of equipment.
- G. New and updated barcode ticket layouts and text and validation method.
- H. New and updated patron display screen text, graphics, menus, and sub-menus.
- I. New and updated voice message files.
- J. Any other information necessary for the operation and maintenance of the Fare Collection Equipment.

All configuration files and operational parameters of the Fare Collection Equipment shall be managed by the MAS. No change to these files or parameters shall be transmitted to any item of Fare Collection Equipment without a record of the change being stored on the MAS.

The MAS shall store all changes made to all configuration files and operational parameters and allow for an on-line review of no less than the previous 100 changes made. Records of each change to Fare Collection Equipment configuration files

and operational parameters shall include the user responsible for the change, workstation number where change was made, the date and time the change was made, the Fare Collection Equipment number and type to which the change was transmitted, and the date and time of transmission.

Methods to alter configuration files and operational parameters shall not require the user to edit files with a text editor but shall instead utilize preformatted input forms supported by the relational database manager.

As required in these Technical Specifications, some operational parameters shall be capable of being downloaded to all devices at a given station, garage or point of sales outlet. The configuration files and operational parameters to be managed shall include at the minimum the following information:

- A. Idle screen graphics and button functions
- B. Station names, Garage/Depot and equipment numbers.
- C. Graphical depiction of equipment layout by type of equipment at a station.
- D. Fare tables.
- E. Display screen configuration.
- F. Communications parameters.
- G. Operational parameters such as timeouts, vault full levels, accepted bill denominations.
- H. Event descriptions, categories, and priorities.
- I. Cash handling device (i.e., vault, hopper) serial numbers in the system.
- J. Digitally recorded voice message file assignments (when to play which message).
- K. Payment methods accepted.
- L. Technician identification and access codes.
- M. Revenue service personnel identification and access codes.
- N. Operation status indication (five color code scheme) for e.g., TVM and Fare Gates

Preliminary description of procedures to track and modify all operational parameters and downloadable information shall be submitted for review and approval at the Conceptual Design Review. CDRL 0710

The MAS shall provide a method of managing the adding, changing, and deleting of hardware configurations. The method shall allow DTPW the ability to track all hardware configuration changes and the ability to allocate geographical and logical unit identifications.

7.5.3 Fare Table

The MAS shall provide menu options to create, edit, display and/or print, and download to the end devices the fare tables that are used to generate tickets and receipts. The "create" and "edit" functionality shall be coded so that it can be executed independently, if necessary. The fare table generation and manipulation software shall be maintained by and operated via the MAS.

Fare tables shall support fare changes based on fare types, full fare and discounted, as well as on an exception basis. Exception based changes include fare changes for an entire service, line/route, or a branch and down to the individual level. Similarly, means shall be provided to program special fares for designated special events, for specific services, routes, line segments and stations/stops.

Fare tables shall be identified by the date/time that they become effective. At a minimum, the MAS shall be able to retain the currently active fare table, allow editing of any component of that table, and provide for two fare tables, one with a

future effective date/time and one current, plus the previously activated version.

Current and future fare tables shall be available for downloading to any or all equipment.

The ability to access fare table routines and files shall be controlled through a separate layer of user ID/password security.

Records shall be kept of all changes made to fare table components and associated files by user ID, date, time location and modification made. Fare collection equipment shall generate text for printing on the paper receipt, such as station names, date, ticket type, price, and TVM Number. The Contractor shall detail the information that may be printed on the receipt and the location of printing on the receipt at the Conceptual Design Review. CDRL 0711

This text is downloadable from MAS, to produce the printed receipt(s). In the event of a network failure means shall be provided to create a file for manual transfer to the TVMs via the backup media approved by DTPW/ITD.

The Contractor working under the strict direction of DTPW shall participate in definition of fare table elements at the Conceptual Design Review and finalized at the Final Design Review. CDRL 0712

7.5.4 Monitoring Alert System

The Contractor shall be responsible for the configuration and activation of MAS software. The MAS shall have the capability of inventorying the numbers of all cashboxes, and shall provide reports of any cashbox, which has been removed from a Farebox but not emptied into a receiver within an DTPW-defined time period for each day's probing operation. The MAS shall also be able to identify cashboxes removed from Fareboxes that were not previously placed in the known cashbox inventory database.

The MAS shall perform all necessary administrative functions. These functions shall at a minimum include:

- A. Review of status, and the ability to manually initiate communications with the Fare Collection Equipment.
- B. The Contractor ensures that data is synchronized with a time protocol.
- C. Monitoring of file transfer events.
- D. Supervision and display of current status of the network and the fare collection system.
- E. Communications lien status and error checking/clearing functions.
- F. Diagnostic and troubleshooting software that shall provide effective communications fault diagnosis.
- G. The ability to add and delete facilities, add, and delete devices at facilities, and to change names of existing facilities.

7.5.4.1 Revenue Service Functions

Means shall be provided to remotely monitor revenue service functions via the MAS. Monitored functions shall include:

1. View the status of bill vaults, cash vaults and change handling modules including a recycling unit in TVMs.
2. Send automated messages to and receive automated messages from the Revenue Collection Facility and the fare collection computer operator's console, including storage of these messages for review by multiple revenue agents. All messages shall also be stored in the MAS.
3. Query and display the status of all TVM equipment in the station, including status of all money handling units, change issuing units and smart card and barcode stock.
4. DTPW may adjust the parameters of the bill and coin handling and storage devices, including the full and near full capacities.
5. Require the use of authorized access and security codes prior to use.
6. Fare Table Maintenance

7. Operations Configurations

Full and detailed information on the workstation and associated software, including operation and dimensioned and exploded drawings, shall be provided at the Conceptual Design Review and fully defined at the Final Design Review. CDRL 0713

7.6 Additional Computer Operation Requirements

7.6.1 Remote Data Recovery System

The Contractor shall supply a Remote Data Recovery System, which shall receive and store from DTPW's MAS, all data requiring backup as described in Section 7.2.2. The data backup hierarchy shall be data that is first copied to the Remote Data Recovery System, verified, and then copied and verified to the removable media. DTPW's Remote Data Recovery System shall be mirrored. The Contractor shall install DTPW's Remote Data Recovery System in the data center at a location identified by DTPW or via an approved cloud service.

7.6.2 Real-Time Status and Event Monitoring in MAS

Fare Collection Equipment status shall be updated and automatically maintained by the system. Graphical representation of each station shall be provided with an overview of the status of all equipment at a station. Status shall be provided in three levels of detail - station, line subsection and system. When a station has more than one alarm in effect, the station shall be shown in the color of the highest priority alarm. When a station is selected, a schematic diagram of the equipment at the station shall be displayed. When a specific item of Fare Collection Equipment is selected, detailed information shall be displayed in text form, including the status of each internal module of a given piece of Fare Collection Equipment, operating status and date and time of the ten (10) most recent events. Table 7-1: Station Conditions provides the parameters related to display color and status conditions.

7.6.3 Data Transmission and Event Recording

The Fare Collection Equipment shall provide unsolicited data transmissions by the MAS under schedule (schedule via time) controls established by DTPW.

Data shall be transmitted from each item of equipment for a pre-selected and user modifiable time period and available on demand. Received data shall be automatically processed and populated into all pertinent databases. The MAS shall record the date and time data was received from each device.

Devices shall provide the reporting of contents of the TVM cash containers. This shall be provided for all, a group or individual TVMs, as selected by the user.

All software and event error code tables shall be available for editing through the MAS. Updated tables for TVM error and event messages shall be downloaded to the TVMs where they will be resident.

Table 7-1: Station Conditions

Display Color	Status Conditions
Green	All Equipment at Station Functioning Normally
Blue	Access in progress or attention needed at one or more items of Fare Collection equipment is out of service (Priority 3 alarm in effect)
Yellow	One or more items of fare collection equipment malfunctioning, out of service, or off-line (Priority 2 alarm in effect)

Red	Security alert – e.g., intrusion, impact, duress alarm. (Priority 1 alarm in effect)
White	No Connected Equipment at Station

Each of the alarms provided by the MAS shall be assignable via the MAS to one of the above status conditions. The default status conditions for each alarm shall be provided and finalized at the design reviews as described herein. Contractor shall identify all alarms generated by the system at the Conceptual Design Review to permit DTPW to assign priorities. Final priorities for the alarms shall be agreed at the Final Design Review. CDRL 0714

7.6.4 Remote Control

Each item of Fare Collection Equipment shall have the capability of being remotely controlled by an authorized user to perform the following functions:

- A. Place equipment in service or out of service.
- B. Diagnostics are performed at device by technician.
- C. The TVM utilizes a resource manager to automatically restart programs.
- D. Enable or disable any payment mode or module.
- E. Download fare table and ticket format changes.
- F. Download bill parameters.
- G. Download text changes that are also supportable by audio language changes.
- H. Download audio messages.
- I. Set fare gates to open.

The Contractor shall identify all remote-control functions and provide event message wording for approval by DTPW at Conceptual Design Review. CDRL 0715

8 General – Testing and Acceptance

The Contractor shall plan for, perform, monitor, and document all tests required to prove their design and functionality of the Fare Collection Equipment and associated systems furnished under this Contract. The Contractor shall furnish all Fare Collection Equipment that meets the approved design and satisfy the requirements of these Technical Specifications. The Contractor shall develop and submit for approval a test plan to demonstrate successful functionality of all components supplied under this Contract, per Phase: including but not limited to TVMs, Farebox, FBS, MAS, and Fare Gates and supporting computer equipment for maintenance monitoring and troubleshooting activities.

DTPW may require the Contractor to submit proof of test acceptability of any item at any time during the duration of this Contract. Substantiating evidence shall include one or more of the following:

- Testing witnessed by DTPW, or their designated representative.
- Testing performed by an independent testing facility.
- Results of Testing performed in accordance with test procedures.

The Contractor shall furnish all test instruments and other equipment and materials listed in the test plan necessary for performing all tests.

The various elements of shall be tested when connected to other interfacing components to simulate as closely as possible the actual operation. Within this Section, the term Fare Collection Equipment shall include, at a minimum, the following items:

- A. Ticket Vending Machine (TVM)
 - 1. Full Service TVM
- B. Fare Gate
 - 1. Fare Gate Consoles
 - 2. Accessible Fare Gate Consoles
 - 3. End Consoles
- C. Workstations, as applicable
- D. Electronic Farebox
- E. Portable Data Unit (PDU)
- F. Revenue Transfer/Collection Equipment
- G. FBS
- H. MAS

8.1 Test Program Plan

The Contractor shall prepare and submit an overall Testing Program Plan to DTPW for approval per Phase at the respective CDR. CDRL 0801 The Test Program Plan shall include descriptions, approximate scheduling, sequencing, and dependencies of all inspections, qualification tests, and revenue service acceptance tests to be performed. These inspections and tests shall demonstrate that the equipment produced is following the specified requirements. This plan shall include the format for test results documentation including test script, pass/fail criteria, result (pass/fail/repeat), classification of failures, and procedure for resolution of failures.

First Article Testing and System Integration Testing, as described herein, may take place at the facilities of the Contractor. System Integration Testing shall include the hardware and software required from this Contract to demonstrate the operation of the Fare Collection Equipment.

Also, as a part of this plan the Contractor shall identify the locations and estimated time and staff per Phase required for conducting the inspections and tests of each of the various types of Fare Collection Equipment and where integrated testing is to be performed. The plan shall include time and resources to allow for repeat tests.

8.1.1 Test Schedule

The test schedule shall be a component of the overall project schedule. The Contractor shall ensure that this important project component is adequately addressed and is within the project time parameters stated in the Terms and Conditions. The Test Schedule shall include, as a minimum, the following requirements:

- A. Scheduled test dates.
- B. Dates that the test procedures shall be submitted.
- C. Sequence and expected duration of test elements.

The schedule shall recognize and consider the fact that representatives of DTPW have the right to witness all such activities and, as such, tests and inspections shall not be scheduled concurrently without DTPW approval. CDRL 0802

8.1.2 Test Procedures

Test procedures for all tests shall be submitted to DTPW for review and comment within (14) fourteen calendar days of submittal. Contractor must address all comments and provide a mutually agreed upon resolution. CDRL 0803 The test procedures shall include, as a minimum, the following:

- A. Objectives of test

- B. Number of units of equipment to be tested¹
- C. Test environmental conditions
- D. Detailed test procedures, inclusive of calibration and configuration records including individual steps within each procedure.
- E. Test equipment to be utilized during the test and the calibration of such equipment.
- F. Pass/fail criteria and how performance will be measured.
- G. Re-test procedure, if appropriate
- H. Test data sheet format.
- I. Test report format.
- J. Configuration Audit – Review of all engineering documentation, including change notices.
- K. Set-up and configuration of requirements for each test

8.1.3 Test Results Reports

Test reports shall be prepared in accordance with the test procedure and signed by all responsible witnessing parties. The test reports shall be submitted to DTPW within ten (10) Business Days of completion of testing. CDRL 0804 DTPW shall either accept or reject, with justification, within ten (10) Business Days after receipt of test results each if the submitted test results. If DTPW determines not to witness a test or tests, test reports shall nevertheless be submitted to DTPW.

All inspection reports, test certifications, and test reports shall be signed and certified by the Contractor's authorized Quality Assurance/Quality Control (QA/QC) representative. During the manufacture, testing and inspection phases the QA/QC representative shall submit daily inspection reports identifying participating personnel, equipment, material tests, results, and defects. Such reports shall be signed and certified by the Contractor's authorized QA/QC representative.

8.1.4 Test Waiver Requests

Qualification or other tests may be waived upon written request from the Contractor. DTPW will only review and consider all complete requests for waivers. The Contractor shall identify those tests for which waivers may be requested at the Conceptual Design Review. For those waiver items identified by the Contractor at CDR, the Contractor shall submit with the CDR, sufficient written documentation clearly stating that the equipment for which the waiver is being requested is exactly similar (with no deviations) for hardware/software functionality and its intended use is the same and this exactly similar unit has previously successfully passed similar tests. Copies of the test procedures and results of the previous tests shall also be submitted. If the Contractor desires a waiver of testing, the Contractor shall submit required information for each applicable component or subsystem 10 calendar days prior to the date of planned testing.

Each additional test waiver request shall include a declaration that shall be signed by an officer of the Contractor. This declaration shall include statements attesting to the accuracy and authenticity of the previously passed tests clearly identifying the exactly similar (with no deviations) nature of the hardware/software functionality and use for the item in question. The declaration shall also include the locations where the hardware/software functionality was installed, and complete contact information for the individual responsible. CDRL 0805

For the following service proven equipment, waivers for environmental and cycle testing may be granted at FDR:

- Farebox
- TVM
- Fare Gates

A written response from DTPW will be provided indicating acceptance or denial of any additional test waivers. This response will be included with the CDR approval. Approval of a test waiver will constitute a change to the Contract; and DTPW will issue a change order as such. The fact that DTPW honors the Contractor's request for waiving a specific test does not eliminate in any form the Contractor's responsibility for all stated functionality and performance requirements for the specific component and/or function, as stated herein.

8.1.5 Additional Testing

If in DTPW's opinion a specific component of the Fare Collection Equipment, subsystem, or the complete system itself has not been sufficiently demonstrated during the defined tests, additional testing shall be required to ensure and verify that the Fare Collection Equipment meets all requirements of these specifications. This new testing shall be performed by the Contractor and all costs of such testing shall be borne by the Contractor, including costs for DTPW representatives to witness the testing.

The requirement for this additional testing will not be subjective, but based on definitive results of prior tests that in DTPW's opinion did not sufficiently display and/or demonstrate the Contractor's equipment or systems to be following stated technical functional, and/or reliability requirements. All test requirements, including testing plans and documentation requirements set forth in this section shall also apply to these additional tests, again at no additional cost to DTPW.

8.2 First Article Configuration Inspection (FACI)

First Article Configuration Inspections (FACIs) shall be performed on the first three production units of each type of Fare Collection Equipment supplied by the Contractor. If the unit model configuration is standard product manufactured and tested previously, the Contractor can apply for a "Waiver" as described above providing documentation of history of test and assuring the configuration of the unit tested previously is absolutely the same as unit now produced for this Contract.

The FACIs shall be used to establish the baseline of the quality of workmanship and the conformance of the Contractor to the stated QA requirements. The FACI shall verify that production Fare Collection Equipment and associated subsystems comply with these Specifications, including all design configurations and drawings produced as a result of Final Design Review. This performance threshold shall be maintained during the balance of Fare Collection Equipment production.

The Contractor shall provide a minimum of fourteen (14) calendar days notification to DTPW before the commencement of FACI. CDRL 0806 Although the FACI shall be a static (non-functional) inspection of the equipment, the Contractor is encouraged to provide working demonstrations of the equipment to facilitate future qualification testing and to foster better understanding of the equipment. The following requirements shall apply to the FACI even if the "Waiver" is approved:

- A. A complete set of approved Final Design drawings for the item to be inspected shall be readily available.
- B. Contractor Inspection forms of previous testing (is "Waiver" is approved) that control the in-process work and document the inspections performed on the item to be inspected shall be readily available.
- C. Tools and labor required to make mechanical or electrical measurements to confirm Contract and drawing/documentation compliance shall be provided during FACI.
- D. Tools and labor to perform limited disassembly and removal of covers, as required for proper inspection, shall be provided during FACI.

The test shall verify that the configuration of the equipment complies with the approved Final Design Review drawings and design configuration. Drawings, documents, and data necessary to establish that the production equipment complies with the final design agreements shall be submitted to DTPW and shall be readily available during configuration inspection.

The FACI shall be conducted at the earliest possible time in the manufacturing stage on the first production units that are representative of the approved final design and configuration. The FACI shall be conducted far enough in advance of subsequent production units to permit resolution of any problems identified during FACI and allow sufficient time for development of design alternatives to be reviewed and approved for incorporation of any changes necessary prior to the beginning of full production.

Upon review and approval of the drawings, documentation, and data, and the completion of the FACI, the equipment design shall not be changed, nor any drawings or documentation modified, without written DTPW approval. The approval of the FACI results shall be required prior to the production of subsequent units of any type of equipment and the performance of the First Article Test.

8.3 First Article Test (FAT)

The FAT is comprised of several different tests to verify that the Fare Collection Equipment operates as specified, and as approved during Final Design Review. The FAT also provides verification that the functional, physical, operational and performance requirements of the specifications have been satisfied. The equipment and components to be tested shall be from the first run of production units. The Contractor shall conduct the FAT only upon successful completion of FACI. Contractor shall submit FACI results, final FAT test procedures and notify DTPW of plans to proceed with FAT no later than twenty-one (21) days after successful completion of FACI. CDRL 0807

If the unit model configuration is standard product manufactured and tested previously, the Contractor can apply for a "Waiver" providing documentation of history of test and assuring the configuration of the unit tested previously is absolutely the same as unit now produced for this Contract.

The Contractor is responsible for supplying all materials required for FAT.

The following tests shall be performed as part of the FAT, which are further described herein:

- 1 Functional Test
- 2 Cycling Test – shall be waived upon written request from the Contractor, for equipment as described in Section 8.1.4 (Test Waiver Requests).
- 3 Environmental Conditions Tests - shall be waived upon written request from the Contractor, for equipment as described in Section 8.1.4 (Test Waiver Requests).
- 4 Maintainability Test

The Contractor shall keep a detailed log of all FAT tests conducted and of all events that occur during each test, including failures with a detailed description of the failure; function tested, number of cycles, tester and observer. Where possible, digital photographs of failure conditions shall be included to document the failure.

The Contractor shall certify the accuracy of all FAT test results. Results that do not meet or conform to the specified requirements shall be fully documented, with a plan for correction and retest that does not disrupt the approved schedule. DTPW shall not allow delivery of any equipment or systems for which required test documentation is not provided and approved.

All equipment supplied under this contract shall be connected to their respective MAS for functional and cycling tests to

allow for data transfer and checking of all equipment functions related to the MAS.

The County shall provide smart cards required for conducting tests. Contractor shall provide all coins and bills required for conducting the tests..

8.3.1 Functional Tests

This test shall prove the proper functioning of Fare Collection Equipment features, performance criteria, and capabilities. This test shall be performed using the FACI approved equipment and shall utilize application software that is complete for all required functionality and is ready to enter revenue service. The purpose of this test shall be to demonstrate that for each type of equipment the functions specified throughout this document, shall be met. Each item of equipment shall be required to execute all hardware and software functions as detailed in these specifications and satisfy the stated performance criteria requirements. In addition, the upload and download of data to the Fare Collection Application shall be following the requirements of the established in the requirements of the Fare Collection Application contract. Both Contractors shall work together to assure a successful integration of all components to allow for the collection of fares in accordance with the terms of the respective contract. The procedures for handling maintenance (troubleshooting, and correcting faults) and service functions (extracting data) shall also be demonstrated.

The Contractor shall be responsible for developing a functional test procedure that satisfactorily demonstrates equipment functions of Fare Collection Equipment and shall submit this test procedure to DTPW at least fourteen (14) days in advance of the test for review and comment. Contractor must address all comments and provide a mutually agreed upon resolution. At a minimum, the test shall cover the following:

- A. All operating conditions shall be tested.
- B. All limited operational modes shall be tested.
- C. All possible patron inputs and responses (including those for blind patrons) shall be tested.
- D. Verify that only valid and authentic fare media, bills, and coins are accepted.
- E. All service commands shall be demonstrated.
- F. All possible fare types shall be verified as issued/accepted.
- G. The card issuing and encoding is performed properly.
- H. All patron sequences shall be verified for fare media purchase, replenishment, and usage.
- I. Transaction times, response times, time-out operations, and all other performance criteria that can be measured without resorting to numerous transactions shall be measured for compliance to the specifications.
- J. All Contactless Media data is properly provided, stored, and protected.
- K. All data is generated and transferred properly to the MAS.
- L. A software test where all software features and functions and tariffs are completely tested using a detailed test script.
- M. Security features and alarms functioning
- N. Coin vault, bill vault, and re-circulating unit audits, emptying and refilling re-circulating coin hoppers, bill escrow operation, and bill stacking tests to check capacity of bill vaults shall be performed, as appropriate, for each type of TVM.
- O. Redundant data storage and proper purging of data.
- P. Data storage capacity for each type of fare collection equipment.
- Q. Fare table modification.
- R. Farebox data extraction and vault emptying procedure.

Any identified hardware or software flaws shall be corrected and retested before the Functional Test shall be declared complete. Retesting of software shall include regression testing to ensure that corrections have not impacted other areas of related software even if such software has been previously tested.

The Contractor shall submit to DTPW the list of identified open issues, including software and hardware failures and open items identified during the testing. DTPW shall notify the Contractor within five (5) days of receipt of such list if any open items or failures must be resolved prior to successful completion of the Functional Test. Determination of items, which require correction prior to designation of successful completion of the Functional Test, shall be jointly determined by DTPW and the Contractor.

8.3.2 Cycling Test

The Contractor can also apply for "Waiver" for this type of test in compliance with Section 8.1.4

After the Fare Collection Equipment has passed the Functional Test, a Cycling Test shall be performed for each of the following types of Fare Collection Equipment. The purpose of the cycle test is to determine that the equipment meets the reliability and performance requirements included in these Technical Specifications.

Temperature and humidity under which cycling testing is performed shall be measured and recorded at the start and finish of each test day. Transactions shall be divided approximately evenly between all possible fare type and fare combinations and shall use all possible payment combinations, including coins only, bills only, smart cards, and simulated credit/debit transactions. The number of cycles to be exercised is specified for each type of equipment.

8.3.2.1 Ticket Vending Machines (TVM)

Using each type of TVM, combinations of all fare categories and representative mixtures of bills and coins for each fare level shall be used. Fare levels for the tests shall be selected by DTPW to represent a sampling of the potential fare types to be charged and the potential fare types to be provided. The TVM cycling test shall consist of no less than 5,000 completed transactions. Payment media to be used for this test shall be "street" money obtained by the Contractor from bills and coins collected in Farebox and/or from banks in the South Florida region. It shall be the Contractor's responsibility to acquire the variety of correct bills necessary for the test. During the cycling test of the TVMs, the following shall also be verified:

- A. Each selection shall be purchased at least 25 times.
- B. Change dispensing shall be made to occur from all coin and bill sources.
- C. Coins of each denomination shall be diverted to the coin vault.
- D. Change supplies shall be depleted to cause the TVM to enter "Exact Fare Only" mode.
- E. At least 10% of the transactions shall occur while the TVM is in a Limited Operation mode as defined in these specifications.
- F. Sufficient coins shall be inserted to cause the TVM to clear "Exact Fare Only" mode.
- G. Sufficient bills shall be inserted to cause the bill vault to fill and the TVM to enter "No Bills Accepted" mode.
- H. At least one card stock shall be depleted.
- I. At least 10% of all transactions shall occur with the voice system activated.
- J. Bills of each denomination, and each version in general circulation, shall be used.
- K. The TVM outer door shall remain closed.
- L. Test period shall simulate no less than 2 transit days.
- M. Data interchange with the AFC CCS and/or the MS and/or the ABBO Server through the communications network

- N. Entry log-in procedures
- O. Alarm annunciations - early warning messages, maintenance codes and simulated forced entry.

This same cycling test shall be performed on each type of TVM. This shall include the validation processes for all forms of Contactless Media as well as credit and debit payment processes. In addition, the following contactless smart card functions shall be demonstrated on each type of TVM using at minimum 20 different Contactless smart cards and 50 transactions of each type (minimum total of 5,000 transactions):

- A. Stored value.
- B. Add value.
- C. Display autoloading reminder (employee pass, value load, trip load).
- D. Completion of autoloading procedure (subscription and directed).

8.3.2.2 Fare Gate

For each Fare Gate, using each type of card and/or fare product available from the TVM, the correct operation of the Fare Gate shall be verified. Entry and exit functions, as appropriate, shall be included as part of this test. The Fare Gate cycling test shall consist of:

- A. 250 stored value cards purchased from the TVM.
- B. 250 bus Transfers assigned to smart cards by the Farebox.

DTPW currently utilizes a Free-exit feature on Metrorail and the new system in addition should provide "exit control". Both modes of operation shall be tested.

Appropriate cycling tests shall be performed on the accessible Fare Gate. This shall include a minimum of 2,000 transactions, 80% of which shall be reduced fares and reasonably equally between all reduced fare types. The remainder of transactions shall be full fare transactions.

8.3.3 Environmental Conditions Test

The Contractor can also apply for "Waiver" for this type of test in compliance with section 7.1.4

8.3.3.1 Station Equipment - Environmental Conditions Test

Upon successful completion of the cycling test, the station equipment (all TVM types and Fare Gates types,) shall be subjected to the environmental extremes specified in Section 4, *General System Requirements*, and Exhibit 4. A portion of the cycling test shall also demonstrate the capability of the equipment to operate successfully under these conditions. At least 10% of the cycles in each test shall be run at the extremes of supply voltage specified in Section 4.9 (Electrical Environment).

Directed heat energy to simulate solar loading shall be applied to the surface where most patron interfaces are located, or to the surface representing the worst-case scenario for the device under test.

Software for the environmental test shall be identical to that which was exercised during the successful cycle test. The Fare Collection Equipment shall be subjected to the following environmental test. The Fare Collection Equipment shall be allowed to stabilize for a period of two (2) hours at each given environmental condition setting. Fare media and currency shall be subject to the same environmental conditions as the equipment under test.

Thereafter, the number of transactions to be processed shall be as indicated in Table 8-1 and the equipment cycled as per procedures established for Cycling Tests.

Successful completion of this phase of the Environmental Test requires no more than one relevant failure as defined in the General Provisions. In addition, a water ingress test shall be conducted, simulating worst-case rain and wind conditions as specified in Section 4.1, *General Environmental Conditions*, and simulating the salinity of the water vapor from the nearby ocean.

Table 8-1: Environmental Test Conditions Rail Equipment

Run No.	Exterior Temperature	Solar Loading BTU/Ft ²	Exterior RH (%)	Input Voltage	Number of Transactions
1	20°F	Nominal	20-40	125	100
2	125°F	275	50	125	400
3	80°F	100	95	138	100
4	80°F	100	95	100	100

RH = Relative Humidity (non-condensing)

8.3.3.2 Fareboxes - Environmental Conditions Test

The electronic Farebox equipment shall be subjected to the environmental tests as identified below. Where appropriate, each installation configuration shall be tested for compliance to these requirements.

8.3.3.2.1 Fareboxes – Vibration

The Contractor shall ensure that for the bus fleet, vibration conditions expected in the area of installation are taken into account to ensure that proper isolation/protection is built in the on-board equipment design. In addition, the following requirements shall be met. The on-board equipment shall be tested per the procedure of MIL-STD-810 with appropriate revisions and as defined in Section 4 (General System Requirements). This includes driver control unit, power supply, Farebox and cashbox at a minimum.

At the conclusion of this test the Farebox shall be cycled using a minimum of ten (10) of each type of valid fare media to verify proper operation. The Farebox shall be probed to obtain a record of the transactions. DTPW shall review and approve the test plan at the CDR. CDRL 0808

8.3.3.2.2 Fareboxes – Shock

The Farebox shall be tested per Procedure I of MIL-STD-810 with appropriate revisions with the following changes:

- A. The half sine shock pulse shall have a peak value (A) as defined in Section 4.5 (Vibration) and duration (D) of 20 milliseconds.
- B. The on-board equipment shall operate normally after the shock tests and shall not have experienced broken or loosened components as a consequence of these tests.
- C. The equipment shall operate normally after these shock tests and shall not experience broken or loosened parts from these shocks.

At the conclusion of this test the Farebox shall be cycled using a minimum of ten (10) of each type of valid fare media to

verify proper operation. The Farebox shall be probed to obtain a record of the transactions. DTPW shall review and approve the test plan at the CDR. CDRL 0809

8.3.3.2.3 Farebox - Electromagnetic Effects

The Farebox shall be tested under conditions specified in Section 4.9 (Electrical Environment). The equipment shall not sustain any permanent damage as a result of application of the conditions specified. At the conclusions of these tests, the Farebox shall be cycled using a minimum of ten (10) of each type of fare media to verify proper operation.

8.3.3.2.4 Farebox - Radiation of Electromagnetic Interference

The Contractor shall be responsible for compliance with all applicable Federal Communication Commission regulations (i.e., FCC Rules, Part 15, Subpart J) concerning conducted and radiated radio frequency energy.

8.3.3.2.5 Farebox Temperature/Humidity

The on-board equipment shall be allowed to stabilize for a period of two hours at each of the given environmental condition settings. Thereafter, the number of fare payment cycles to be processed shall be as indicated below. All coins, bills and fare media shall be maintained at the temperature and humidity of the equipment under test.

Table 8-2: Temperature/ Humidity Test Requirements

Test No.	# of Cycles	Temp (°F)	Humidity
1	125	25	20-45%
2	125	110	95%
3	125	85	75%
4	125	65	95%
5	125	95	20-45%
6	125	95	95%

8.3.3.2.6 Farebox - Voltage Test

The on-board Fare Collection Equipment (Fareboxes, associated equipment, any equipment providing the interfaces) equipment shall be tested to verify operation at six different voltages, including the high and low end of the power requirements, in the range identified in 4.9 (Electrical Environment). At the conclusion of each test the Farebox shall be cycled using a minimum of ten (10) of each type of valid fare media to verify proper operation. The Farebox shall be probed to obtain a written record of the transaction.

Upon completion of the voltage test, a Farebox shall be installed on each type of bus vehicle and tested for proper operation as identified in Section 7.3.2 (Cycling Test). Successful completion of this test shall be required for acceptance of the FAT results.

8.3.4 Maintainability Test

The Contractor can also apply for "Waiver" for this type of test in compliance with section 7.1.4

Fare Collection Equipment shall be designed to be easily maintained, repaired, and restored to service. Fare Collection Equipment shall require preventive maintenance no more than once per month or per 10,000 transactions, whichever occurs first. Each preventive maintenance visit shall be capable of being performed by one technician in less than 60 minutes.

Table 8-3: Maintainability Test Requirements

ITEM	MTTR (Hours)	<u>MTTR (90% max)</u> (Hours)
On-Board Bus Equipment	0.40	0.90
Revenue Island Equipment	0.40	0.90
Rail Station Equipment	0.50	0.90
AFC Central Computer System Hardware	0.60	1.00

In conjunction with the Functional Tests, the Contractor shall conduct a Maintainability Test of the equipment. The purpose of this test is to determine that the equipment tested conforms to the maintainability requirements listed above. This will be accomplished by introducing faults into the equipment and then measuring the time required for a technician to correct the fault.

At least 30 days prior to the FAT, the Contractor shall submit to DTPW a test outline that shall be prepared in accordance with the DTPW approved maintainability test plan and shall show the basis of sample size selection and list of faults to be introduced into the equipment. CDRL 0810 This list shall represent every known failure mode for each unit of equipment. Next to each fault, the Contractor shall identify a reasonable time limit for repair performed by an average technician, based on field experience with the equipment. DTPW must approve this list and the repair times prior to conducting the maintainability test. The test shall be conducted in the following steps:

- A. Contractor shall provide multiple units of the equipment to introduce failed components and adjustments and incorrect settings. The simulated failures shall be introduced in proportion to their expected failure rate.
- B. Contractor's maintenance personnel shall be unaware of the simulated failures and shall be assigned to repair the equipment.
- C. Repair times shall be recorded and MTTR shall be compared with the advance list provided by the Contractor. All results will need to be approved by DTPW.

These tests shall be performed for each item of Fare Collection Equipment.

8.3.5 Fare Media Compatibility Test

The Contractor shall participate in all Fare Media Compatibility Tests conducted by the Fare Collection Application provider. The Contractor shall act in cooperation and provide on-site resources to allow testing to be completed as expeditiously as possible.

8.4 First Article In-Service Test

Upon completion of FAT requirements as defined in Section 8.3 (First Article Test), and the correction and verification of all deficiencies identified, the fare collection equipment shall be subjected to in-service testing at designated facilities. This test shall verify the operation and integration of all equipment, especially equipment that requires special design or development. The testing shall also include all integrations and reporting. For this test, equipment in the following quantities shall be delivered, installed, and verified:

- A. Ticket Vending Machine (TVM) -Full Service TVM
- B. Fare Gates, including Accessible Fare Gate

- C. Workstation, as applicable
- D. Farebox
- E. MAS
- F. FBS
- G. Wireless Data System, as applicable
- H. Revenue Transfer/Collection Equipment (Revenue Vault)
- I. Portable Data Unit, as applicable

Installation of the Fare Collection Equipment shall be provided as follows to allow for testing:

- A. Phase 2: The Farebox shall be installed on a few selected buses at a DTPW designated garage. The supporting equipment shall be located and installed at a single lane in the same bus garage.
- B. All Phases: Components of the MAS shall be functioning as required in order to provide for the necessary data communication and transfer.

This equipment shall be tested for a period of 2-week settling-in period in order to verify that all equipment performs the basic functions properly under actual service conditions. In order to have considered the test a success, the following goals must be achieved:

- A. MCBF for each of the items of Fare Collection Equipment shall be met as defined herein.
- B. There shall be no security failures (no exposed money, no illegal accesses to the MAS or FBS functions).
- C. No data shall be lost.
- D. All revenue audits shall meet the accuracy requirements as identified.

If the system, as installed, operates properly and requires no unreasonable attention by the Contractor, then the equipment will be deemed as satisfactory. Any type of equipment which does not meet the specified requirements shall require attention and correction by the Contractor prior to production. A demonstration test lasting not less than two weeks shall occur for items of equipment which do not pass the initial, or subsequent, pre-revenue service tests. CDRL 0811

8.4.1 Network Test Requirements, if applicable

A system shall be provided with test data simulating the DTPW database for the purpose of this test. During this test, time changes will be verified for Daylight savings, Leap year, New Years Day, and data latency.

All interface connections shall be inspected for proper installation. All functions requiring interface to the MAS including alarm and boundary conditions and security provisions, shall be tested. These functions shall include, but not be limited to, the following:

- A. Alarm transmission and all other device/component monitoring functions
- B. Device queries to and from the MAS
- C. Data transmission to and from the MAS
- D. Data transmission, including all control functions, from the MAS
- E. Automatic report generation at the MAS.

The Contractor shall identify each integrated function in its Test Procedures, including the boundary conditions and security provisions for each item of equipment and operation.

All data transmissions shall be inspected and tested for accuracy. Inaccurate data transmissions shall be recorded as a failure. The Contractor shall take any corrective action necessary to ensure the proper performance of all functions.

At a minimum, the Network Integration Test shall include the specific tests listed below:

- F. Integration of all appropriate data transfer with the MAS
- G. 2 days of continuous testing of all System Components, during which all system components shall be operational 24 hours a day.
- H. 20 actual transactions per day per TVM, Fare Gate and Farebox System (FBS, Farebox and Validator).
- I. Regular uploads from Station LAN and MAS.
- J. Alarm and boundary conditions to be tested 3 times each.
- K. 20 bills and 20 coins of each denomination to be accepted.
- L. Fare table download
- M. Credit/Debit card processing
- N. 5 of each card type issued.
- O. 5 of each card type accepted.

8.4.2 Report Generation Test

For purposes of report generation, data created to simulate DTPW's installation containing all data, event, transaction, and record types shall be used to conduct this test. The simulated data will be jointly determined based on DTPW projected ridership data.

Samples of all reports available shall be generated by the MAS. Format, layout, page and column headers, data and all other information shall be reviewed to confirm compliance with the designs approved at the Final Design Review. Contents of the reports shall be compared with the known contents of the data. Successful completion of the test requires no discrepancies between report contents and known data as well as proper formats.

8.4.3 Data Exchange Tests

The MAS shall poll the Fare Collection Equipment for data. Accuracy of the received data shall be confirmed by generating the relevant reports. The MAS shall also initiate additional polls for status. The following features shall be tested:

- A. The Contractor shall demonstrate software control for: changing printing content and format for all devices, changing patron display content and format, altering operational parameters and configuration files, changing fares, and adding and deleting fare types.
- B. Data transmission (upload and download), event recording and transmission, clock synchronization, and other such functions.
- C. Alarms generated shall be recorded and confirmed.
- D. Other events, such as revenue servicing, shall also be instigated on the various items of Fare Collection Equipment and then corroborated on the MAS.
- E. Multiple new fare structures (a minimum of three) shall be downloaded and confirmed.
- F. Other downloadable data, such as the list of valid employee identification numbers, shall also be sent for confirmation.

Passage of this test requires no discrepancies in data exchange.

8.4.4 System Security Test

Boundary and security provisions to be tested to ensure compliance with these Technical Specifications shall include but

not be limited to the following:

- A. Data encryption/security provisions for each type of data transfer.
- B. Required data anti-collision provisions for each applicable type of data transfer.
- C. Maintenance/service personnel access control.
- D. Transaction data access control

This test shall also verify that the proper procedures are in place to ensure access to each of the system functions and access to the system and stored data is protected by the password system. At the conclusion of the test, the data shall be reviewed to verify that the proper events and alarms were recorded for each valid and invalid access. Passage of this test requires no discrepancies in authorization or access privileges.

8.5 Production Acceptance Test

Each subsequent production unit of equipment produced upon FAT approval shall be subjected to a functional test after assembly, performed at ambient temperature conditions. The test shall utilize all modes of operation.

Acceptance of coins and bills shall be tested, quality of printing, and the alarm system shall be tested for proper response.

The production test shall also include a preproduction test, 12-hour cycle test, where the completed equipment is left powered on and where appropriate the completed equipment will be placed in cycle mode where an Automatic Diagnostic test is running continuously exercising all the Hardware, for at least 12 hours. After this burn-in period, the production acceptance test shall be conducted.

8.6 Pre-Shipment Inspection

DTPW retains the right to conduct pre-shipment inspections of Fare Collection Equipment supplied by the Contractor. The program schedule shall include at least one day for final inspection by DTPW. All deficient items indicated in QA and test reports shall be corrected before pre-shipment inspection takes place. The Contractor shall provide a qualified supervisor to accompany DTPW or its representative during pre-shipment inspection. The Contractor shall notify DTPW at least ten (10) Business Days in advance of scheduled shipping. Within 5 days of this notification, DTPW shall inform the Contractor whether inspections will occur; if DTPW opts not to inspect, DTPW shall grant the Contractor permission in writing to ship the equipment. No equipment shall be shipped to DTPW without written authorization from DTPW.

8.7 Installation Acceptance Test

After installation of the Fare Collection Equipment, the Contractor shall perform a test on each unit installed to confirm that the equipment is properly installed and interfaces correctly with the MAS. Installation test procedures for review and comment shall be submitted to DTPW fourteen (14) calendar days prior to the delivery of the first items for each equipment type CDRL 0812. Contractor must address all comments and provide a mutually agreed upon resolution. The procedure shall include at a minimum:

- A. All installed equipment shall be inspected for:
 - 1. Quality of installation
 - 2. Damage to equipment
 - 3. Missing components and parts
 - 4. Correct power and communication connections
 - 5. Correct positioning and mounting
- B. All installed equipment shall be energized and exercised and tested for function and operation.
- C. All installed equipment shall be subject to communications testing (both mentioned Contractors participation is required) that shall confirm proper data exchange.

- D. All inspections and tests shall be witnessed and accepted or rejected by DTPW's designated representatives.

9 Continuing Support Services

9.1 Fare Collection Application Integration/Interface

Contractor shall be responsible for developing any integration/interface with the Fare Collection Application required to deliver any component of these Technical Specifications. This shall include any necessary coordination, collaboration, and cooperation with the provider of the Fare Collection Application and the County. Further, the Contractor shall be responsible for assisting in the development of appropriate testing, including any necessary regression testing, required to validate that such integration/interface is fully functional and operating in accordance with the Technical Specifications. A project kick-off meeting will be scheduled by the County with the Contractor, Fare Collection Application provider, and appropriate County staff within 30 calendar days of the award of the Fare Collection Application contract. The parties shall work collaboratively to develop an integration development plan within 10 Business Days following the project kick-off meeting, which shall specifically delineate the roles, responsibilities, resources, milestones, and timeline for the development, testing, and Acceptance of the integration/interface.

Further, the Contractor shall provide enhanced support services during development and testing of the Fare Collection Application integration/interface, which shall include, for a period of six (6) months, the ability of the Contractor to be on-site within 2 business days for a period of 60 calendar days, with a maximum of 30 days onsite during the implementation of integrations/interface by the Fare Collection Application provider. Such days may or may not be sequential but shall occur within the 6-month term specified herein.

9.2 Training

The Contractor shall conduct three (3) rounds of on-site training, per Phase, for all Fare Collection Equipment provided under the Contract for a minimum of 80 DTPW maintenance employees, 40 DTPW operational staff members, and 20 train-the-trainer attendees. Recorded copy or video training shall be made available to DTPW. Three (3) rounds of training shall be provided for any new equipment introduced or upon deployment of scheduled technology upgrades. The Contractor shall provide a suggested schedule (including duration and course content) training plan as part of Conceptual Design Review for each Phase. Such training plan shall be finalized during FDR. CDRL 0901

Training class documentation as well as all Equipment Operational and maintenance Manuals should be provided to DTPW for approval at the CDR. CDRL 0902

9.3 Staffing

Beginning at Final Acceptance continuing through the term of the Contract, including any extensions or renewals thereof, Contractor shall provide a minimum of two (2) on-site technicians, which may be co-located at a County facility, to guide and assist staff in assessment, repairs, and continuing training. Technicians will be expected to work normal business hours: Monday through Friday from 6:00AM – 3:00PM for the duration of the Contract. Outside of the normal working hours specified above (between 3:00PM – 6:00AM), the Contractor shall make on-call services available throughout the life of the Contract.

The Contractor shall make on-call services available throughout the life of the Contract. On-call technician must be available and on-site within 1 hour of call. Additional support shall be made available for enhanced resources or specific expertise within five (5) business days of written request.

In addition, Contractor shall provide a minimum of one (1) on-call technology expert with the ability be on-site within 2 hours of the call to address any issues related to technology, integration, MAS or FBS functionality/reporting, or similar

functional or technical aspects of the Fare Collection Equipment beginning 30 calendar days prior to the planned go-live for each Phase and for a period of 30 calendar days following Final Acceptance of each phase. Additionally, the technology expert shall remain on-call and accessible remotely within one (1) hour, with the ability to be on-site within two (2) Business Days during the implementation of the Fare Collection Application and for a period of one (1) year following the go-live thereof.

Prior to placement of the staff required herein, the Contractor shall provide resumes of candidates for pre-approval and selection by DTPW staff. Changes to personnel shall be approved by DTPW in advance of placement pursuant to the procedure outlined in Article 62, *Substitution of Personnel*, of the Agreement.

9.4 Firmware and Software Updates

Contractor shall establish a communication protocol to ensure that all DTPW and ITD staff is notified of software or firmware updates. Any updates shall be pre-scheduled and pre-approved by DTPW and ITD staff prior to deployment. Further, installation instructions, installation plans, and installation packages shall be provided for review and approval a minimum of two (2) weeks prior to deployment.

9.5 Parts Inventory and Storage

Contractor shall be responsible for procuring and storing a minimum of 10% of all parts at their own site in accordance with manufacturing storing requirements for the term of the Contract, including any extension or renewal thereof. A list of parts provided should be submitted for DTPW approval at Conceptual Design Review. CDRL 0903. Delivery of parts to designated DTPW locations shall be made within 45 minutes of request.

Contractor shall coordinate with DTPW assigned personnel on the inventory and sourcing of high turnover parts and long lead-time items. All parts outside of required inventory must be available within 10 business days of request. In addition, the spares delivered shall be inspected by the Contractor and verified as having the same mechanical and software versions as those installed in the Fare Collection Equipment. This shall be confirmed in writing. Those spares not meeting these requirements shall be replaced with spares, which do meet these requirements.

DTPW shall reserve the right to conduct audits of stored inventory at any time within the life of the contract with no longer than 24-hour written notice to designated Contractor staff.

9.5.1 Maintenance Test Station

The Contractor shall provide and install a designated for the Maintenance Test Station, which shall include the following: TVM (1), Faregate (1), Accessible Faregate (1), Fareboxes (4), Revenue Vault (1), Receiver (1) and an instance of the FBS for testing purposes, at a location designated by DTPW prior to conducting installation testing and inspection which shall remain in place at the facility. Other complete spare units shall be assembled (if necessary) and tested by the Contractor at DTPW's facility to assure that the equipment has been received in good condition and operates properly.

9.6 Preventive Maintenance

Preventive maintenance cycles shall be performed by the Contractor or its representatives, in cooperation with DTPW staff, for all equipment a minimum of four times per year for the term of the Contract, including any extensions or renewals thereof. In advance of each cycle, Contractor must provide a comprehensive preventive maintenance plan including specific units and parts to be maintained, schedule, and sequence to be followed in the preventive maintenance plan.

9.7 Equipment or Part Obsolescence

The Contractor shall alert DTPW in writing any of the components or other hardware for the Fare Collection Equipment,

at least six (6) months prior to them being discontinued or reaching end of life, during the life of the contract. The Contractor shall supply DTPW with the replacement part or system to ensure no interruption of service in accordance with the parts inventory requirements outlined herein. DTPW shall be responsible for the cost of such replacement parts, provided that the Contractor complies with the provisions of this Section 9.7. Further, the parties shall act in good faith to negotiate pricing for such parts, up to and including credits for existing inventory.

9.8 Technical Support Services

For the term of the Contract, including any extensions or renewals therefore, in addition to the staffing services provided under Section 9.2 above, the Contractor have a technical support staff available 24 hours per day, seven days per week, and a method in which service tickets can be submitted electronically, email or phone and tracked.

The services shall comply with the requirements outlined below:

Severity Level	Definition	Response Time	Status Update
1=Critical /Outage	A major component of the Fare Collection Equipment whether hardware or software, is in a non-responsive state, creating a Transit System-wide disruption.	15 minutes	One (1) Hour
2=Urgent	Any component failure or loss of functionality not covered in Severity 1, which is hindering operations, such as, but not limited to: excessively slow response time; functionality degradation; error messages; does not impact all stations or fareboxes	One (1) Hour	Two (2) Hours
3=Important	Lesser issues, questions, or items that minimally impact the workflow or require a work around.	Four (4) hours	Four (4) hours
4=Minor	Issues, questions, or items that don't impact the workflow. Issues that can easily be scheduled such as an upgrade or patch.	8 hours	Weekly Status Call

The parties shall mutually agree to a resolution timeframe for each incident at the time of when the incident is reported.

9.9 Performance Credits

In the event that Contractor is unable to meet the target times for response or frequency of updates for support incidents as established above or fails to remediate the issue within the mutually agreed upon timeframe, the County may assess performance credits in the form of monetary deductions from the next available invoice, at the County's option and sole discretion in a credit amount equal to three times the prorated value of the annual maintenance and support fee for Severity Level 1 issues for the duration of the incident and the actual prorated value the annual maintenance and support fee for Severity Level 2 issues for the duration of the incident. The parties acknowledge and agree that the amount/value of such performance credits does not account for the full business damages experienced by the County as a result of an unresolved support Incident and shall not be construed to be an assessment of the value of damages.

9.10 Technology Refresh

The Contractor agrees participate in technology refresh process for all provided Fare Collection Equipment provided under the Contract in the manner outlined herein. Upon written notice from the County stating its desire to consider exercising the first Option-to-Renew, the parties will enter into good faith negotiations to establish a scope for the replacement and/or upgrade of existing Fare Collection Equipment. The County shall request a detailed Statement of Work from the Contractor that shall define in detail the services, equipment, software, etc. to be provided and the associated costs. The County and the Contractor shall mutually agree upon the terms and conditions required to complete the Statement of Work prior to the effective date of the OTR. The Contractor shall complete the Technology Refresh promptly, as agreed by the parties, upon the effective date of the OTR. This Technology Refresh process will be repeated prior to the exercising of the second OTR.

EXHIBIT 1
PAYMENT PROCESSING CERTIFICATION

Certifications



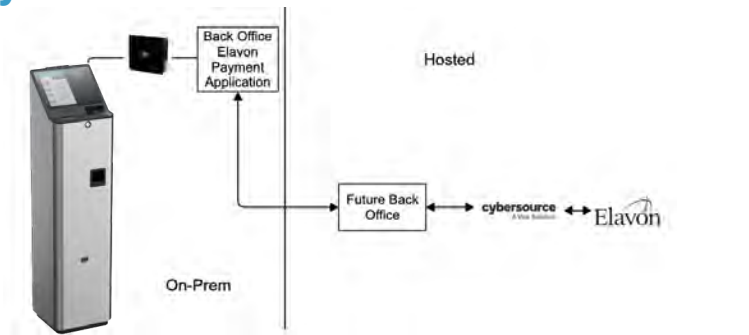
Level	Scope	Compliance
EMV Level 1	Hardware	Yes
EMV Level 2	Card Brand Kernel	Yes
EMV Level 3	Payment Application End to End	- GenPay Solution– Yes - Future Integration– Requires compliance work from 3rd party



Standard	Scope	Compliance
PCI – DSS	Data Security Standard	Genfare Link – Yes
PCI – PA DSS	Payment Application DSS	- GenPay Solution– Yes - Future Integration– Requires compliance work from 3rd party
PCI – P2PE	Point to Point Encryption	- GenPay Solution– Yes - Future Integration– Requires compliance work from 3rd party

OPEN PAYMENT OPTIONS

Open Payment with Future Vendor and Elavon

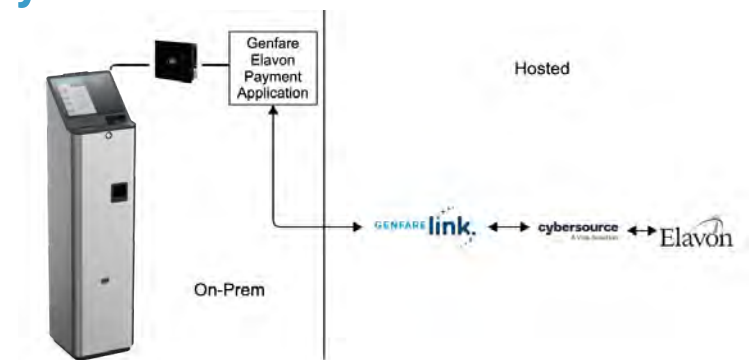


Agency Tasks	Genfare Tasks	3 rd Party Tasks	Timing
- Commercial Agreement with Genfare - Commercial Agreement with 3^d party	- Maintain L1 and L2 Certifications - Support 3^d party vendor tasks	- Elavon Payment Application - Obtain L3 Certification - Maintain PCI Certification	18 – 24 months from 3rd party selection

4 | FOOTER TEMPLATE

GENFARE

Open Payment with Genfare and Elavon

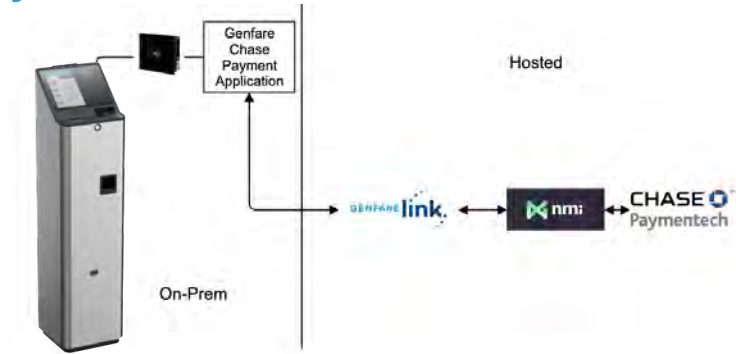


Agency Tasks	Genfare Tasks	3 rd Party Tasks	Timing
Commercial Agreement with Genfare	- Elavon Payment Application - Maintain PCI Certification - Obtain L3 EMV Certification - Data Integration to 3rd Party Optional	Data Integration to Genfare Link– Optional	18 – 24 months

5 | FOOTER TEMPLATE

GENFARE

Open Payment with Genfare and Chase



Agency Tasks	Genfare Tasks	3rd Party Tasks	Timing
- Commercial Agreement with Genfare - Merchant Agreement with Chase	- Onboard Agency - Maintain PCI Certification - Maintain EMV Certifications - Data Integration to 3rd Party- Optional	Data Integration to Genfare Link- Optional	Now

GENPAY PAYMENT PROCESSING

GenPay Payment Processing

Single payment processing service to handle all credit and debit card transactions



One stop shop for all payment transactions through Chase Merchant Services

- Supports Visa, Mastercard and Discover
- Web portal availability to support customer transaction lookup, disputes and all Customer Service Representative (CSR)-related use cases



Tap-and-go

- Open Link Validators (OLVs) and Fast Fare fareboxes
- Contactless EMV (cEMV) transactions
 - Physical bank cards
- Mobile wallets (Apple Pay, Google Pay, Samsung Pay)



E-commerce and retail transactions

- e-Fare
- Administrative point-of-sale (APOS) and retail point-of-sale (RPOS) terminals
- Ticket vending machines (TVMs)
- Handheld inspection devices (HHIDs)

GenPay



EXHIBIT 2
REFERENCE DOCUMENTS

As Contained in Exhibit A to RFP No. EVN0001090

Includes:

- Metrorail Station As-Built Fare Collection Drawings
 - Metrorail Station Fence Drawings
- South Dade Transitway BRT Station Typical Drawing
- South Dade Operations Center Floor Plan Drawing
- South Dade Transitway Local Stop Typical Drawing

EXHIBIT 3

PAYMENT CARD INDUSTRY (PCI) COMPLIANCE

The Contractor shall comply with the Payment Card Industry Security Standards in effect and at all times throughout the term of the resultant agreement. If at any time any of the components, including but not limited to the vendor's system, equipment, hardware, software, or policies, becomes non-PCI compliant, the vendor is responsible for all costs related to upgrading the system so that PCI compliance is maintained throughout the term of the agreement.

- The Contractor confirms its knowledge of and commitment to comply by providing the following proof that Contractor's devices/applications/processes meet PCI compliance requirements:
 1. Contractor's current annual PCI Compliance certification. The County has the right to audit the Contractor by requesting copies of the PCI compliance certifications at any time.
 2. During an installation or a major system upgrade, the Contractor must provide implementation manuals and detailed diagram(s) that show all cardholder data flows across the County's systems and networks, the internet, and the processor network.
 3. Vendor Form – Payment Application(s)– Only applicable to System is installed in County environment.
- The Contractor shall resubmit the aforementioned passing, updated, completed and signed PCI compliance documents annually to the County. Furthermore, the Contractor shall update their solution, when required, to remain compliant with all changes to the PCI standards and requirements by the implementation dates mandated by the PCI Security Council and remediate any critical security vulnerabilities within 30 days of identification.
- Sensitive authentication data and primary account number shall not be stored by the Contractor's system/equipment at any point, even if masked. Any other card holder data should not be stored by the System/equipment unless it is absolutely needed for County's operations.
- POS (Point of Sale) and retail transactions must be routed directly to Miami-Dade County's merchant provider (ELAVON) and must be EMV (Eurocard, MasterCard, Visa) chip technology compliant. All POS and retail transactions must be capable of accepting NFC (near field communications) payment methods such as Google Wallet, ApplePay, or Samsung Wallet.
- Cashiering Application systems that utilize the County's network for payment processing must be a validated PCI Point-to-Point Encryption (P2PE) solution and transactions routed through our approved County merchant processor. The County's approved P2PE solution is Elavon's PCI Safe T P2PE Link Protect services. Confirmation of validated P2PE solution shall be provided as found on the PCI Council's P2PE Solutions website;
https://listings.pcisecuritystandards.org/assessors_and_solutions/point_to_point_encryption_solutions?agree=true.
Prior to production going live, the P2PE Instruction Manual shall be provided as found on PCI website;
https://www.pcisecuritystandards.org/documents/P2PE_v3.0_PIM_Template.docx?agreement=true&time=1645920000555.
- Internet transactions and all other applications must be routed through Miami-Dade County's Internal Payment Gateway (Payment Card)/
- Exceptions to any of these requirements shall require written justification by the Department Director prior to purchase of software/hardware, including a cost/benefit analysis, and require written approval by both the Miami Dade County Chief Financial Officer/Finance Director.

- Transactions processed through the Miami-Dade County Internal Payment Gateway are prohibited from accepting / processing PIN numbers for security reasons. Miami-Dade County provides two basic services that allow Contractor applications to interact with its Payment Gateways:

1. Web-based Credit Card Transaction Service
2. Recurring Payment Service (for monthly or yearly recurring payments). This service will allow merchants to develop recurring credit card payments on behalf of their payers. This is a Simple Object Access Protocol (SOAP) Web Service, and Miami-Dade County will provide the service WSDL and the necessary documentation. The Recurring Payment Service is PCI-compliant, and all the sensitive credit card data is stored offsite in the County's clearinghouse.

There are two different ways that the Contractor can handle the Credit Card or ACH (e-Check) transaction processing;

a. Option #1:

The System interfaces directly with Miami-Dade County's Payment Gateway via a RESTful web-service. Miami- Dade County will provide the XML schemas to all basic services: web payment processing, void, refund, and recurring payments. Miami-Dade County will also provide all the necessary URLs for these services, as well as, documentation detailing fields and response codes. All services will respond with the same XML receipt.

This solution will require the client application to fully interact with Miami-Dade County's Payment Gateway, reacting to processing and system errors. Even though this solution requires more development and integration from a vendor, it will offer the greatest flexibility and customization level. This option also requires for the vendor application to be hosted on a server inside the County's managed network, since Miami-Dade County's Payment Gateway is not accessible from the Internet. If the application is outside of the County's Managed network, Miami-Dade County can develop a Payment Module Application (option #2) that will service the Contractor's application.

b. Option #2:

A Contractor application will utilize a Payment Module Web Application developed and maintained by Miami- Dade County. This solution can be a standard web application, a mobile web application, or both. A link will be provided on the vendor application that sends payers to the Payment Module Application. For example, once the payer has selected the items to purchase (from the vendor's application), there would be a "Pay Now" button that will redirect the payer to the Miami-Dade County Payment Module via HTTPs post, carrying all the necessary data to begin the payment process (User ID, Amount, etc.). This requires only minor development effort on the vendor side. The Contractor will agree on custom fields to be passed to the Miami-Dade County Payment Module via HTTP protocol over TLS 1.2 or higher (only secure connections are accepted; SSL protocol is not accepted). In turn, the Miami-Dade County Payment Module will collect the payment information and process the transaction via the Miami-Dade County Internal Payment Gateway. Results will be posted back (post back URL is provided by the client application) to the Contractor application. This solution will not require the client application to be hosted in the County's managed network. The Miami-Dade County Payment Module handles all processing and system errors, simplifying the integration effort on the Contractor side.

EXHIBIT 4 ENVIRONMENTAL TABLES

The tables below provide the environmental requirements to be met as part of this contract:

Equipment	Temperature Range	Relative Humidity Range (non condensing)	Water	Dust
Gate	20 to 122 F	5 to 95 %	IP32	IP32
TVM	20 to 140 F	5 to 95%	IP34	IP34
Farebox components	25 to 110 F	13-99%	Installed inside bus.	0.01 mg/cubic cm
Smart Card Reader	20 to 140 F	15 to 95%	IP32	IP32

Equipment	Vibration	Intermittent Shock	Emissions	Susceptibility
Gate	0.25 g rms 5-25 Hz	1g 8-12 ms	61000-6-3 (2001) Emission Standard	Susceptibility Standard EN 61000-6-2 (2001)
TVM	0.25 g rms 5-25 Hz	1g 10 ms	61000-6-3 (2001) Emission Standard	Susceptibility Standard EN 61000-6-2 (2001)
Farebox components	1.5 g rms 5-200 Hz	3g 20 ms	FCC Class A	FCC Class A
Smart Card Reader	0.25g rms, 5-25 Hz	3g peak 4 to 10 ms	61000-6-3 (2001) Emission Standard	Susceptibility Standard EN 61000-6-2 (2001)

EXHIBIT 5

CURRENT DTPW FARE STRUCTURE

DTPW operates a flat fare for all transit modes. The fare collection equipment will support the future establishment of a zone fare structure for all modes and ticket types should DTPW decide upon that type of fare structure.

Current fare structure:

Fare Type	Full Fare	Reduced Fare	Media
Metrobus	\$2.25	\$1.10	Cash, all Contactless and Barcode Media
Metrorail	\$2.25	\$1.10	All forms of Contactless and Barcode Media
Metrobus Inter-County Express	\$2.65	\$1.30	Cash & all forms of Contactless and Barcode Media
Metromover (*)	Free	Free	None
Transfers			
Bus-to-Bus	Free	Free	All forms of Contactless Media
Bus-to-Rail	Free	Free	All forms of Contactless Media
Bus-to-Mover	Free	Free	None
Rail-to-Bus	Free	Free	All forms of Contactless Media
Rail-to-Mover	Free	Free	None
Mover-to-Bus	\$2.25	\$1.10	Cash & all forms of Contactless and Barcode Media
Mover-to-Rail	\$2.25	\$2.25	All forms of Contactless and Barcode Media
Bus/Rail-to-Inter-County Express	\$0.95	\$0.45	All forms of Contactless Media
Monthly Transit Passes			
Monthly Transit Pass	\$112.50	\$56.25	EASY Card and Barcode Media
Monthly Group Discount - 10% Corporate Discount (Groups of 4-99)	\$101.25	N/A	Special Encoded EASY Card
Monthly Group Discount - 15% Corporate Discount (Groups of 100+)	\$65.00	N/A	Special Encoded EASY Card
Monthly College/Adult Education Pass	\$56.25	N/A	Special Encoded Ticket & Barcode Mobile Pass
Monthly Metrorail Parking Permit (with purchase of a Monthly Transit Pass)	\$11.25	N/A	Contactless Mobile Pass
Monthly Transit Parking without Monthly Transit Pass	\$45.00	N/A	Contactless Mobile Pass
Regional Monthly Transit Passes			
Regional Monthly Pass	\$155.00	\$77.50	Smart EASY Card and Mobile Pass
Other Transit Passes			
Weekly Transit Pass	\$29.25	\$14.60	EASY Card/Ticket & Barcode Media

Daily Transit Pass	\$5.65	\$2.80	EASY Card/Ticket& Barcode Media
EASY Card /EASY Ticket			
EASY Card	\$2.00	N/A	Smart EASY Card (Extended Use)
EASY Ticket	Free	Free	Smart EASY Ticket (limited Use)
Special Fare Programs			
Golden Passport	Free	Free	Special Encoded EASY Card

Page 2 of 2

Appendix 2 Fare Structures

- Tokens are available for purchase at all Metrorail stations and ticket booths.
- Monthly Metro passes are available at selected sales outlets.
- Golden Passports/Patriot Passes are issued only at Government Center Station.
- Golden Passport: senior citizen 65 yrs and older or a Social Security beneficiary and permanent Miami-Dade resident are eligible to ride with a Golden Passport. Senior 65 and older receives a permanent card and other eligible a yearly card.
- Patriot Passports are issued to Veterans Honorably Discharged from U.S. Armed Forces earning less than \$22,000 per year.
- Metrorail fare gates process magnetically encoded reduced fare Permits reducing fare.

Other DTPW Fare information:

Service	Full Fare	Reduced
Metrobus & Metrorail	\$2.25	\$1.10
Express Bus	\$2.65	\$1.30
Shuttle Bus	Free	Free
Metromover	Free	Free

Always pay your fare in exact change when boarding. Transit fare equipment does not provide change, but you'll find change/token machines in all rail stations. All senior citizens 65+ years ride free with a [Golden Passport](#).

On Metrobus, the fare box accept, dollar bills, quarters, dimes, and nickels, all form of Contactless Media and Barcode Mobile Passes.

Metrorail fare gates accept EASY Card/Tickets, all form of Contactless Media and Barcode Mobile Passes (At units equipped with the Barcode Reader).

Metromover is free.

The EASY Card/Ticket products are sold at over 50 sales outlets.

EXHIBIT 6

INFORMATION TECHNOLOGY DEPARTMENT TECHNOLOGY MODEL

Summarized Currently Implemented Technology

Distributed Operating Systems	➤ Windows Server 2016 Enterprise Edition or greater. No new installations of Windows Server 2008 are allowed. On January 14, 2020, support for Windows Server 2008 and 2008 R2 will end. That means the end of regular security updates. ➤ AIX 7.2 TL5 or higher AIX 7.3 or Higher ➤ Red Hat Linux 8 or Higher ➤ Oracle Enterprise Linux 7.9 and 8.4 Solely for the Informs project ➤ VMware ➤ OSX
Mainframe OS and OLTP	➤ z/OS 2.4 ➤ CICS V5.5.0
Database	➤ Oracle Enterprise Edition Release 19C RAC Certified Systems (Enterprise Solution) ➤ AIX Oracle Non-RAC 19c and higher Enterprise 64 bit ➤ Oracle Exadata X8M-2 Node RAC Oracle 19C Enterprise Release ➤ Microsoft SQL Server 2017 and 2019 ➤ DB2 version 11 ➤ IDMS 19 IR4 Incremental Release 4 ➤ Must be able to comply with any upcoming/ongoing ITD Security Group's Database related mandates ➤ Databases must be able to function seamlessly with encryption enabled in transit and at rest, whenever these future Security/DB initiatives are put into place, ➤ SQL is supported only in TLS1.2 (lower versions are not supported) ➤ All Databases in all environments(SQL/IDMS/Oracle/DB2) must be able to function well with supported versions and must be able to upgrade whenever necessary
Hardware	➤ HPE blade servers with CITRIX XenServer for XenApp virtualization (Virtual Desktop and App Presentation) ➤ HPE blade servers with VMware Vrealize Cloud suite and NSX-T (Software Defined Datacenter OPS) ➤ HPE ProLiant Discrete Servers for specific workloads. ➤ IBM pSeries servers (2 - model 980-M9S can run AIX and LINUX Workloads) ➤ Thin Client Workstations – WYSE 3040, 5060, and 5070 ➤ Mobile Devices – iPhone, iPad, Android

Network	➤ Fiber channel (BROCADE Fiber switches – Fe1, Fe2, Fe4, Fe40) ➤ TCPIP Communications Protocol ➤ Network Switches ➤ Telephone Switches ➤ Telephone Equipment ➤ DSL (Being phased out, replaced by AT&T ASE) ➤ FiCon ➤ SolarWinds ➤ EdgeSight monitoring ➤ Remote locations connected to central County location with varying speeds from ADSL 256kbps to 1gbps for core sites Bandwidth is as high as 10Gbps at some locations. (ADSL being phased out, replaced by AT&T ASE)
	➤ Microsoft DNS ➤ Citrix SSL VPN ➤ Citrix Access Gateway
Storage	➤ Mainframe Storage – IBM DS8910 ➤ SAN/Block Storage – HPE Alletra with wide area Fiber Channel between primary datacenters for native block access. ➤ NAS/File Storage – EMC Isilon, Superna EyeGlass, and RD for security and DR failover. ➤ Mainframe Tape Storage – SUN/STK SL8500 –T10000D Tape Drives ➤ Mainframe Oracle StorageTek Virtual Storage Manager (VSM) ➤ Distributed Systems Data Backup Storage – SUN/STK SL8500 and T10000D Tape Drives, Veritas Disk Backup Appliances, exagrid appliances, veeam storage appliances all with offsite replication and off- prem replicaion
Storage Management	➤ Veritas NetBackup 9.2 for some distributed systems backups ➤ Veeam Backup and Recovery 11a for NAS/FILE, Virtual Server, and Physical Bare metal recovery ➤ Exagrid deduplication appliances for SQL targeted backups. ➤ IBM PowerHA SystemMirror for AIX V7.2 or greater ➤ IBM Spectrum Scale V5.0.1 or Greater Formerly known as Global Parallel File System (GPFS) ➤ IBM-HSM for mainframe backup and recovery ➤ Innovation FDR for mainframe backup and recovery ➤ CA/Disk for mainframe backup and recovery
Security & Identity Management	➤ RACF (mainframe security) ➤ FireEye HX servers and endpoints ➤ FireEye Helix SIEM ➤ Rational App Scan ➤ Qualys Vulnerability Management (PCI and CJIS are used as baselines) ➤ Active Directory ➤ IBM Security Access Manager ➤ Multi-Factor Authentication via physical and soft tokens
Web Platform & Social Media	➤ Opentext Teamsite & Livesite ➤ Salesforce Marketing Cloud

Applications Desktop & Enterprise	➤ Windows 10 64bit (1809) and later ➤ Modern browser versions current & current-1 for IE, Chrome, and Firefox ➤ Office 365 Pro Plus ➤ Citrix (Thin Client Access)
Enterprise Applications	➤ PeopleSoft ERP using WebLogic and Tuxedo ➤ ESRI software products for GIS (ArcGIS for Server, ArcGIS for Desktop, ArcGIS Online, Esri Maps for Office and Esri Maps for IBM Cognos) ➤ Infor Asset Management ➤ Microsoft Exchange Online (Office 365) Documentum Electronic Document Management System ➤ EnergyCAP Utility Billing ➤ AssetWorks Fleet Maintenance ➤ Microsoft SharePoint Online (Office 365)
Middleware	➤ IBM MQ Message Broker and Workflow ➤ IBM WebSphere Application Server 8.5 ➤ Microsoft IIS 8, Soon to be all IIS 10 ➤ Microsoft Reporting Services 2014 ➤ Microsoft Power BI

	➤ Shadow z/Services for CICS ➤ GlobalScape SFTP ➤ IBM Video Analytics ➤ IBM Water Analytics ➤ IBM Cognos ➤ Informatica Power Center
Systems and Asset Management	➤ HP Oneview (for HP hardware management) ➤ HP Continuous Access Replicator ➤ MS SCCM ➤ Scheduling Software IBM Workload Scheduler(IWS) formerly known as TWS and OPC – all platforms ➤ Ansible Tower 3.5.3-1.el7 ➤ Red Hat Satellite Server 6.6.3 or higher ➤ ILMT/BigFIX and agent (IBM License Metric Tool for and Servers where IBM Passport Advantage Software utilized)
Cloud Providers	➤ Azure ➤ AWS ➤ Oracle Cloud
Container & Orchestration	➤ CNCF-certified Kubernetes distributions, including Microsoft AKS and Amazon EKS are supported deployed on Miami-Dade's public cloud accounts/subscriptions

Distributed Application Development Stack
(versions where not specified are current & current-2)

• Integrated Development Environments (IDEs)	➤ Rational Application Developer ➤ Visual Studio ➤ IntelliJ IDEA ➤ Eclipse ➤ Visual Studio Code

Backend: Frameworks and programming languages	➤ .Net Core ➤ ASP.NET ➤ Java Enterprise Edition ➤ Spring ➤ C# ➤ Visual Basic ➤ Java ➤ Python
Frontend/Mobile: Frameworks and programming languages	➤ Angular ➤ Ionic ➤ Typescript ➤ Javascript ➤ Objective-C ➤ HTML5/CSS3 ➤ DevEXpress ➤ RESTful web API ➤ OpenApi 3.0
UI Libraries	➤ Bootstrap ➤ Materialize ➤ AdminLTE

Cloud services	➤ Azure ➤ AWS ➤ Oracle Cloud
Project Management/ Code repositories / Version control	➤ Azure DevOps
Other (build tools, test tools, support tools, picture/image libraries, etc.)	➤ Maven ➤ Node.js ➤ Adobe PhoneGap ➤ Selenium ➤ New Relic ➤ Proto.io ➤ BrowserStack ➤ Apiary.io ➤ Adobe Creative Suite ➤ iStock Photos

**Miami-Dade County Information Technology Department
Technology Model – Database Systems**

Background:

ITD provides Database services for applications on five distinct DBMS platforms, of which only 2 are approved for new system development or implementation of new vendor packages.

- The CA-IDMS mainframe based DBMS running under MVS is available only for maintenance and minor enhancements of existing legacy applications.
- The IBM DB2 mainframe based system is a turnkey database used exclusively for On- Demand report management on the mainframe and further development is not allowed.
- The IBM UDB distributed database on the AIX platform is used exclusively as a turnkey DBMS in direct support of specific IBM products that do not support our standard new systems RDBMS platforms. No development is allowed on this RDBMS platform.
- For new system development or implementation of vendor packages the two DBMS platforms are MSSQL and Oracle. An architectural review would be needed to determine the best DBMS platform for any given application. Factors used to determine the best DBMS platform include, but are not limited to, number of users, data type, total database size, transaction counts, DR, COOP, HA and multi-site co-processing requirements, integration(s) with other systems, internet vs. intranet usage, mainframe legacy interface, and reusability of existing enterprise components.
 - o The MSSQL DBMS runs on the Windows 64 bit platform.
 - o The Oracle RAC RDBMS system on the Red Hat Linux; non-RAC Oracle DBMS runs on AIX platform. Application databases that are CPU and/or I/O intensive are best suited for the AIX Oracle platform.
 - o Oracle Data Warehouse runs in a dedicated Exadata environment.

**ITD Infrastructure Current Technology Model
Database Systems**

Current Release Levels by Product:

IDMS	IDMS Release 19.0 on IBM ZOS release 2.2 moving to 2.4
DB2	DB2 Release 10 running on IBM ZOS release 2.2 moving to 2.4 UDB
UDB	Release 9 to 10 running on AIX release 7.1
MS SQL	Enterprise 64 bit running on Windows 64 bit HP Servers
Oracle	Oracle Enterprise Edition Release 12c RAC Certified Systems running on Linux Red Hat release AS 6 or higher on HP servers or AIX release 7.1 Oracle Edition Release 12.2.0.1– Partitioning is not available.

Current Infrastructure Configuration:

For purposes of this document the IDMS DB2 and UDB infrastructure configurations will not be described since new development or new systems installations are not authorized on these platforms.

MSSQL

The current County-wide shared platform consists of:

- The Production and Test environments consist of clustered servers each consisting of 2 HP servers with 2 multi-core processors running Windows 64 bit and MSSQL 64 bit.
- Planned implementation of a mini-warehouse cluster consisting of 2 HP servers with 2 dual core processors running Windows 32 bit and MSSQL 32 bit. This platform will also support legacy link services between MSSQL to Oracle. Due to the inherent stability issues of this type of link service, current legacy systems requiring this service are located in this infrastructure with lower than 95% availability expectations.
- Planned implementation of a small Disaster Recovery Stand-by cluster to be located at the ICFB consisting of 2 HP servers with multi-core processors running Windows 64 bit and MSSQL 64 bit.

Current Infrastructure Configuration (cont.):

Oracle

The current County-wide shared platform consists of:

- Multiple Production Two-Node Oracle RACs consisting of multiple HP 2 dual core servers running Red Hat Linux for DBMS systems that fully conform to County standards of operation.
- One Test Two-Node Oracle RAC consisting of multiple HP 2 dual core servers running Red Hat Linux.
- One planned Production Standby and Co-processing Multi-Node RAC consisting of multiple HP 2 dual core servers running Red Hat Linux located at ICFB for DBMS systems that require either standby Disaster Recovery operations or require full 24x7 co- processing systems.
- Two Production and Two Test AIX LPARs with mutual failover for DBMS systems that fully conform to County standards of operation.

Within the County-wide Oracle platform customers may select service levels as follows:

- Standard availability 7 a.m. to 7 p.m. Monday to Friday – Non Mirrored Storage
- Standard availability 7 a.m. to 7 p.m. Monday to Friday – Mirrored Storage
- 24 x 7 availability - Non Mirrored Storage
- 24 x 7 availability – Mirrored Storage
- 24 x 7 availability – Mirrored Storage – with offsite standby databases
- 24 x 7 availability – Mirrored Storage – with two site co-processing databases

The County also maintains application specific infrastructures in the AIX environment for specialized use systems such as EDMS/ECM, ERP, EAMS and the like.

ITD Infrastructure Current Technology Model Database Systems

Restrictions of Use:

The following general restrictions of use apply to all platforms.

- Access to Production is locked down for access by pre-programmed application sets only.
- Application systems or users are not authorized the use of system administrator or database owner privileges in the production or test environments. Database or Schema Owner privileges are allowed in the test environments when requested.
- Users connecting to the database through the applications must do so with a unique userid known to the DBMS system. The application must encrypt the password in such a way that the particular user id cannot be used for logon through some other third party tool using an ODBC connection such as Toad or MS Access.

- Applications requiring data auditing must include auditing within the application.
- Databases or portions thereof may not be transported offsite or copied to test systems without the expressed authorization of the ITD Security Administrator.
- The database infrastructure is dedicated exclusively to managing requests for data contained in the database. Application program sets are not authorized execution in DBMS specific infrastructure. Limited availability of an application specific FTP area will be considered when no other option is available.
- All systems are subject to review and possible denial of service of high resource using SQL statements that impact other users or applications. The database support staff is available to assist application developers in pinpointing problem areas and suggesting possible improvements or design changes to alleviate these high resource SQL queries.
- Any application whether vendor supplied or developed by County staff must provide certification of use on new vendor releases or patches no more than 90 days after the DBMS provider announced General Availability Date. Any DBMS vendor security patch must be immediately certified for use by the application and will be applied as soon as is feasible upon DBMS vendor release.
- The County will not provide support to any database that is not on the current supported release level of the DBMS vendor.
- Storage for databases are provided exclusively through SANs (Storage Array Systems) provided by both HP and IBM devices.
- Images and text documents are not authorized for storage in a database.
- Changes to Production must follow currently published ITD Change Management procedures.
- For the convenience of our customers and for planning purposes a service lead time table is provided for the typical requests for service at <http://database.miamidade.gov> (Internal link)
- See Database Security Policies for further usage restrictions.

Restrictions of Use (cont.):

MSSQL

ITD Infrastructure Current Technology Model Database Systems

- Previously known as DTS processing now under the name of SSIS (SQL Server Integrated Services) is not a clustered application. Therefore availability of this service is not guaranteed.
- Mirrored storage is not provided in the MSSQL infrastructure.
- Applications requiring data encryption must include encryption modules within the application.
- Link services between SQL to Oracle are not provided – (however Oracle to SQL link services are provided).
- SQL Report services are not supported as an operational component within the County-wide SQL database infrastructure.

Oracle

- All Systems targeted for the RAC must be RAC Compliant at the current release level supported by the County infrastructure.
- Only Oracle features available from the Oracle Enterprise Edition are available for use. The Oracle Key Features Summary (below) outlines those features that are currently supported.
- Standby and co-processing databases are limited to like infrastructures for the master and standby systems or the co-processing infrastructure.

Oracle Key Feature Summary

Windows
Linux
Unix AIX

Enterprise Edition

Not Supported
Supported
Supported

64 Bit Support	Supported
Total Recall	\$Option
Active Data Guard	\$Option
Fail Safe	Supported
Flashback Query	Not supported
Flashback Table, Database and Transaction Query	Not supported
Oracle Secure Backup	Not supported
Server Managed Backup and Recovery	Supported
Real Application Clusters	Supported
Integrated Clusterware	Not supported
Automatic Workload Management	Not supported
Java, PL/SQL Native Compilation	Supported
Oracle Database Vault	Option
Oracle Audit Vault	Not supported
Oracle Advanced Security	\$Option
Oracle Label Security	\$Option
Secure Application Roles	Supported
Virtual Private Database	Supported
Fine-Grained Auditing	Supported
Proxy Authentication	Supported
Data Encryption Toolkit	Supported
Oracle SQL Developer	Supported
Application Express	Not supported
Java Support	Supported
Comprehensive XML Support	Not supported
PL/SQL and Java Server Pages	Supported
Comprehensive Microsoft .Net Support, OLE DB, ODBC	Supported
Real Application Testing	\$Option
Enterprise Manager	Supported
Automatic Memory Management	Supported
Automatic Storage Management	Supported
Automatic Undo Management	Supported
Advanced Compression	\$Option
OLAP	\$Option
Partitioning	\$Option
Data Mining	\$Option
Transportable Tablespaces, Including Cross- Platform	Not supported
Star Query Optimization	Supported
Information Lifecycle Management	Not supported
Summary Mgmt - Materialized View Query Rewrite	Not supported
Oracle Warehouse Builder	\$Option
Oracle Streams	Supported
Advanced Queuing	Supported
Workflow	Not supported
Distributed Queries/Transactions	Supported
XML DB	Not Supported

Multimedia	Not supported
Text	Not supported
Locator	Not supported
Spatial	\$Option
Secure Enterprise Search	Not supported
Oracle Content Database	\$Option

- * Supported = Currently supported by the County
- * Not Supported = Currently not supported by the County - Additional Funding may be required for Support Staff.
- * \$Option = Currently not supported by the County - Additional Funding for Licenses and Support Staff Required

Miami-Dade County Information Technology Department Technology Model Geographic Information System (GIS)

Background:

Miami-Dade County has a mature Enterprise Geographic Information System (GIS) utilized by County departments, residents and external agencies. The county's GIS utilizes ArcGIS products developed by Esri (Environmental Systems Research Institute). Windows platforms are maintained for the hosting of desktop and web applications, services, and batch jobs. ArcGIS for Desktop and extensions are made available through Citrix XenApp. Additionally, the County utilizes ArcGIS Online, a cloud service offered by Esri to deploy Internet-based services and applications. GIS data is maintained in ArcSDE enterprise geodatabases using SQL Server. Refer to Appendix A: GIS Infrastructure Diagram.

Address locator services, GIS web services, and map cache services are maintained for general use. Refer to Appendix C: Miami-Dade County Enterprise GIS Services.

GIS architecture relies on the geodatabase model to manage geographic data and build relationships between different data types. The County has over 1,000 geographic layers in its GIS Central Data Repository as well as current digital orthophotography and oblique imagery from Pictometry. Refer to Appendix D: Miami-Dade County GIS Central Data Repository Layers.

Data can also be downloaded, viewed and accessed from the County's GIS Open Data site which contains all the layers available to the public at no charge. This is the link to the site:

<https://gis-mdc.opendata.arcgis.com/>

GIS Infrastructure Requirements:

1. Any ArcGIS for Desktop application should be deployable through Citrix XenApp technology.
 - o Local application data that requires read/write access must be stored/and accessed from the centralized ITD CITRIX file shares. The application cannot require the end user to write to the servers' hard drive.
 - o End-user application customizations must be stored in the end users profile under documents and settings.
 - o Applications (including ArcGIS for Desktop extensions) must be compatible with 64bit Windows Server operating systems.
 - o Source code must be available.

2. Any ArcGIS for Desktop editing application should use Miami-Dade County ArcGIS Editing Extension.
3. All addresses must adhere to Miami Dade County – USPS Address Standards (Appendix B).
4. Any GIS layer must be stored in Florida State Plane East Zone NAD83, feet coordinate system.
5. The solution must use Miami-Dade County address locators and Web services for address standardization, geocoding, etc. Refer to Appendix C: Miami-Dade County Enterprise GIS Services.
6. The solution should make use of Miami-Dade County's GIS Web services. Refer to Appendix C: Miami-Dade County Enterprise GIS Services.
7. Any new or restructured GIS data layer will need to meet Miami-Dade County's GIS data standards.
8. The solution should not require the implementation of its own proprietary GIS components.
9. The solution must not require the implementation of GIS software other than the Esri suite of products.
10. The solution must be implemented using SQL Server databases for spatial data.
11. If the solution requires batch processing, jobs must be scheduled and executed without manual intervention.
 - o Batch jobs must work with the current version of ArcGIS desktop/SDE suite running in production servers or a newer planned upgrade version.
 - o All batch jobs must comply with the GIS standards for jobs development and ITD job naming conventions and scheduling procedures.
 - o Any temporary data should be created in the designated batch job folder within the Scratch Area.
 - o All errors should be written to a log folder in the corresponding job directory created for each batch processing job.
 - o All applications should access data from ITD ArcSDE servers, and only specific datasets should be stored locally. A process should be implemented if data needs to be refreshed.
 - o Jobs should be tested thoroughly in the development environment before a change management request is submitted to move job/job-related components to the production batch processing servers.
 - o All changes to batch processing jobs in the production environment should be requested via change management procedures and should be implemented by the assigned GIS staff.
12. If web-based, the solution must use REST (Representational State Transfer) architecture style.
13. If custom web-based, the solution must be implemented using the ArcGIS API for JavaScript.
14. If web-based, the solution must be implemented using the ArcGIS Online or ArcGIS Enterprise hosted application templates.
15. The solution must stay current with Esri Product Life Cycle.
16. Applications to be hosted in Miami-Dade County's GIS infrastructure must adhere to Miami-Dade County GIS Application Hosting Standards as specified in this document.
 - o The application must work with the current version of ArcGIS for Server running in production servers or a newer planned upgrade version.
 - o All applications should access data from ITD ArcSDE servers, and only specific datasets should be stored locally. A process should be implemented if data needs to be refreshed.
 - o All errors should be written to a log folder in the corresponding website directory created for each GIS application.
 - o If the application is found to contain errors that render it unusable or that present erroneous or misrepresented data, the GIS Web administrator will remove it immediately from production until such time as the application is fixed and tested successfully.
 - o Every new Internet application must pass a security review prior to production implementation.
17. The solution must include the ability to be compatible with the Esri ArcGIS Online technology.
18. ArcGIS/ArcSDE Geodatabase Desktop and Web Editing Applications
 - o All applications must work with the same version of ArcGIS that the County is using in its enterprise production environment or a newer planned upgrade version.\.
 - o Desktop editing applications should be integrated with Miami-Dade Editing Extension in order to leverage the County's geodatabase versioning mechanism. ITD will provide documentation and required technical support.
 - o Desktop editing applications should be deployed through CITRIX technology. If CITRIX is not a viable solution, the user department is responsible for coordinating the installation, maintenance, and upgrade of software in users' workstations.

- o Web editing applications should use a designated Read/Write ArcSDE instance for the Web, separate from the one used by desktop applications.
- o The GIS ArcSDE geodatabase being edited by the hosted editing application (desktop or web) should be loaded in a development instance and fully tested prior to its production implementation. ITD GIS staff will be responsible for loading the data from the development instance to production.
- o A copy of the ArcSDE enterprise architecture document will be provided before data loading.
- o Editing Web applications are required to use CAPTCHA, data field validation, and ACL (Access Control List) or an equivalent user permission mechanism.

Miami-Dade County Information Technology Department
Hosting Requirements

ITD will provide Enterprise Hosting Facilities and Technical Support to the Customer for monitoring and maintaining operations of infrastructure environments to include Application support.

Concept of Operations

- Refer to *Technology Model* document for supported hardware/software components.
- Changes to the Production environment shall be introduced through the change management procedures as described by the section *Change Management Process* in this document.
- The Customer's Test and Staging Environments will be hosted and supported by ITD; notification of downtime will be provided with as much advance notice as possible.
- All user-ids must be unique and created using the Miami-Dade County Central Registration System (CRS).
- Requested modifications in a shared environment may be restricted during prime time given their potential requirement for large system resources to execute. Changes of this nature will be scheduled at a time mutually agreed upon.
- Applications to be deployed to the Websphere Application Server (WAS) environment must be packaged for deployment using the Websphere Deployment Manager. For preparation of applications to be deployed on WebSphere Application Server see:
http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/index.jsp?topic=/com.ibm.websphere.expr ess.doc/info/exp/ae/tatk_create_ea.html
- ITD does not offer any type of remote shell access under any circumstances, including TELNET, Secure Shell Protocol (SSH), Secure File Transfer Protocol (SFTP) or Secure Copy Protocol (SCP).
- ITD is restricted from implementing changes during periods of "moratoriums" such as during countywide Elections and Tax Collection season. These moratorium periods are well established ahead of time and enforced through the *Change Management Process*.
- Vendors and contractors will be made aware of previously established production on-call procedures and will be asked to comply with them.
- Vendors must provide minimum hardware requirements.
- Vendors must provide recommended architecture.
- Vendors must have in-house staff with knowledge on technologies listed on the *Technology Model* document for system set-up and support.

- For vendor owned equipment housed in County facility (co-located) where the vendor supports and maintains the equipment while the County provides electricity, air conditioning and may swap out tape trays for backups:
 - For Intel-based equipment
 - Equipment must be rack mountable.
 - County can provide virtualized servers within the shared services infrastructure based on vendor supplied configurations.
 - For non Intel-based equipment
 - An environmental analysis will need to be conducted before the County can determine if space and the associated environmental requirements are available.
 - GSA (General Services Administration) will provision electricity at an associated cost.
 - All the currently billable costs for network connectivity to Metronet still apply.
 - County does not endorse equipment that requires stand-alone tape backup trays and prefers that the vendor solution can be integrated within the existing Veritas NetBackup shared infrastructure.

UNIX/Linux Environment

- Administrator and UNIX/Linux root privileges are limited to ITD Technical Support staff.
- rootvg volume group will not be used to house any databases or any non-operating system data. Databases, application data and logs will be stored in file systems created outside of rootvg.
- Installation of software that needs to be installed as root needs to be performed by or conjunction with ITD Technical staff.
- Application software is prohibited to run as root.
- O/S rootvg will be mirrored between 2 different physical disks.
- Applications must supply Startup and Shutdown scripts for both normal Startup/Shutdown and Emergency Shutdown.
- All connectivity to servers is accomplished through SSH. The following protocols are disabled Telnet, rsh and rcp.
- All OS or products or Tools must have support from vendor especially when it comes to remediation from Security Vulnerabilities

Database Management

- Access to the Production database environment with DBA/SA privileges is limited to the ITD authorized database support.
- It is the responsibility of ITD DBA staff to migrate new database objects to the production database (at times deemed appropriate).
- The application must encrypt the password in such a way that the particular user-id cannot be used for logon through some other third party tool using an Open Database Connectivity (ODBC) connection such as TOAD or Microsoft (MS) Access.
- Databases or portions thereof may not be transported offsite or copied to Test systems without the expressed authorization of the ITD Security Administrator.

Disaster Recovery

- Unless special provisions are made in advance for the implementation of Disaster Recovery/Business Continuity measures, Customer understands that recovery of IT hardware or data assets from this facility may not be possible. If recovery at ITD is possible, it will be on a best effort basis.

Security Requirements

- Operating system security patches are applied as soon as they are made available through an automated process. Custom patching windows can be created to accommodate availability needs.
- All systems will undergo initial application and host vulnerability scans, prior to being placed into production. High severity applications and systems vulnerability issues identified must be corrected prior to the system being placed into production. The County utilizes multiple vulnerability scanning products including but not limited to Qualys, WebInspect, Rational AppScan and MetaSploit.
- Regularly scheduled periodic rescans will be performed on the system and any deficiencies or vulnerabilities identified must be immediately remediated.
- Application vulnerability rescans must be requested of all new or updated application code prior to release to production. All critical vulnerabilities must be remediated before the application code will be authorized to be migrated to the production environment.

Software Release Levels Supported

- All vendor-supplied software supported by ITD must have an active vendor maintenance agreement and must be kept up to current release levels. Operating system security patches are applied as soon as they are made available.

Software License Renewal

- ITD will manage all infrastructure licensing and maintenance contracts. Versions of software which are not supported by the vendors will not be supported by ITD.

Application Test/Staging Environment

- All systems must have at least a Production and Test environment.
 - A Staging environment is recommended when multiple versions of system software and applications are required.
 - A separate reporting, batch or Staging environment can be established where there is a need and the budget allows it.
- Production and Test server-side software installation and upgrades will be performed by ITD staff and will follow ITD's *Change Management Process*
 - Maintenance services will include correction of any defect affecting any of the components of the infrastructure. Resolutions of problems may be delivered in the form of a patch, maintenance update, procedural work around or installation of a new release. Some corrections may be required to be implemented immediately. In those instances, the *Change Management Process* may be expedited. Changes or patches dealing with Security vulnerabilities are expedited and must be treated as very high priority.
- Support services for the Test/Staging environments are available through ITD with on-site support between the hours of 8 am and 5 pm Monday through Friday, excluding County Holidays, unless coordinated in advance. The Application Test database environment is available with support from the on call staff from 7 am to 7 pm, Monday through Friday, excluding County Holidays, unless coordinated in advance. The Test databases are restricted environments; schemas passwords are not published. The Staging database is not restricted; schema passwords are published.

Preventative Maintenance and System Upgrades

- The lengths of outages for non-routine maintenance are determined by the requirements of the maintenance procedure. Each outage will be planned and discussed at the weekly Hardware/Software Meeting held every Wednesday morning at 9 a.m. in the ITD Command Center Conference Room.
- All requests for software or hardware upgrades will be addressed in the Hardware/Software Meeting and must include a detailed plan.

Change Management Process

All requests to modify the Production and Test environments, such as for new Application releases and patches will require a *Change Management Request* form to be submitted using the system of record at the time which includes a description and schedule of the change, outage period, areas impacted, back out plan and on call personnel.

Security

- Vendors will be required to:
- Provide the ability for each user to be uniquely identified by ID.
- Provide basic authentication through use of passwords.
- Integration with and support Multi-factor authentication.
- Provide the ability to enforce password expiration.
- Provide the ability to require automatic password expirations when initially assigned or reset.
- Provide ability to configure password parameters such as password lengths, user access to expiration settings and other behaviors, enabling alphanumeric characters, etc.
- Provide the ability to encrypt transmitted data and authentication information over internal and external networks.
- Provide support for Transport Layer Security (TLS) and 256 bit encryption.
- Provide a password database encrypted in storage.
- Provide ability to protect audit logs for failed and successful access.
- Provide ability to log activities performed by specific user ID and IP address and to date-time stamp all activities.
- Provide ability to identify and log all subsequent access points to ensure accountability is maintained throughout session.
- Provide ability to limit concurrent sessions.
- Provide ability to log changes to administrative functions.
- Provide ability to automatically archive audit logs.
- Provide ability to set an unsuccessful access attempt limit and suspend IDs after reaching the unsuccessful access threshold.
- Provide ability to send alerts to administrators for unauthorized access attempts.
- Enable automatic logoff of ID after a defined period of session inactivity, and perform subsequent re- log-on password authentication.
- Provide ability to lock out user or group ID by date or time.
- Provide centralized administration, user authorization, registration and termination.
- Data that is protected through encryption is an individual's Personally Identifiable Information (PII). Items that may be considered PII include, but are not limited to, a person's:
 - Full name (if not common)
 - Social Security Number or National identification number
 - Telephone number
 - Street address
 - E-mail address
 - IP address (in some cases)
 - Vehicle license plate number
 - Driver's license number
 - Face, fingerprints, or handwriting

- Credit card numbers or credit card account information (billing address, account name, expiration date etc.)
- Bank Account Routing (RTN) and Account numbers
- Digital identity

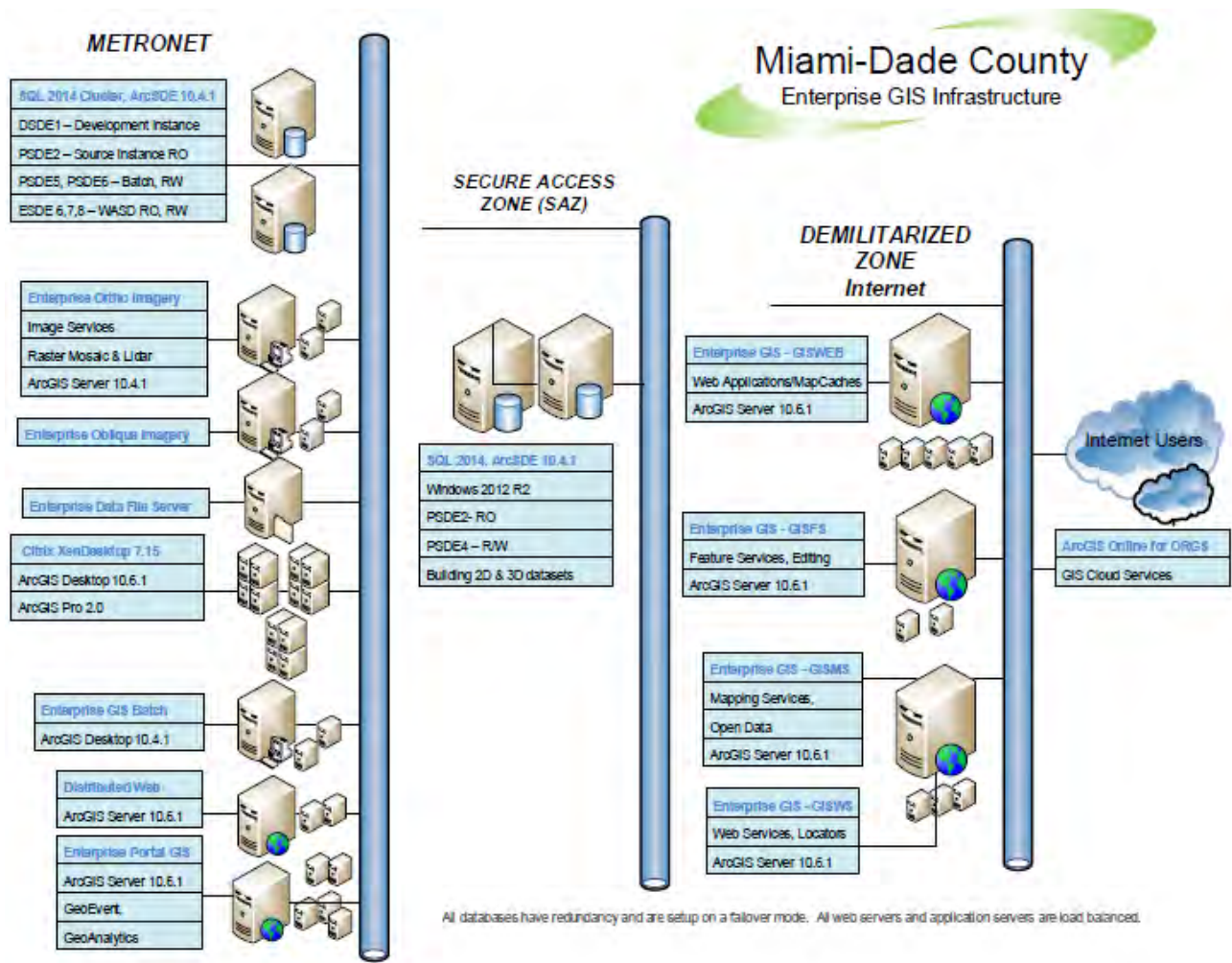
Geographic Information System (GIS)

- ArcGIS for Desktop/CITRIX Applications
 - Local application data that requires read/write access must be stored/and accessed from the centralized ITD CITRIX file shares. The application cannot require the end user to write to the servers' hard drive.
 - End user application customizations must be stored in the end users profile under documents and settings.
 - Applications (including ArcGIS for Desktop extensions) must be compatible with 64bit Windows Server operating systems.
 - Source code must be available.
- ArcGIS for Server Web Applications
 - Application must work with current version of ArcGIS for Server running in production servers or a newer planned upgrade version.
 - All applications should access data from ITD ArcSDE servers, and only specific datasets should be stored locally. A process should be implemented if data needs to be refreshed.
 - All errors should be written to a log folder in corresponding website directory created for each GIS application.
 - If application is found to contain errors that render it unusable or that present erroneous or misrepresented data, the GIS Web administrator will remove it immediately from production until such time as the application is fixed and tested successfully.
 - Every new Internet application must pass a security review prior to production implementation.
- ArcGIS/ArcSDE Geodatabase Desktop and Web Editing Applications
 - All applications must work with the same version of ArcGIS that the County is using in its enterprise production environment or a newer planned upgrade version.
 - Desktop editing applications should be integrated with Miami-Dade Editing Extension in order to leverage the County's geodatabase versioning mechanism. ITD will provide documentation and required technical support.
 - Desktop editing applications should be deployed through CITRIX technology. If CITRIX is not a viable solution, the user department is responsible for coordinating the installation, maintenance and upgrade of software in users' workstations.
 - Web editing applications should use a designated Read/Write ArcSDE instance for the Web, separate from the one used by desktop applications.
 - The GIS ArcSDE geodatabase being edited by the hosted editing application (desktop or web) should be loaded in a development instance and fully tested prior to its production implementation. ITD GIS staff will be responsible for loading the data from the development instance to production. A copy of the ArcSDE enterprise architecture document will be provided before data loading.
 - Editing Web applications are required to use CAPTCHA, data field validation, and ACL (Access Control List) or an equivalent user permission mechanism.
- Batch Server Jobs
 - Batch jobs must work with current version of ArcGIS desktop/SDE suite running in production servers or a newer planned upgrade version.
 - All batch jobs must comply with the GIS standards for jobs development and ITD job naming conventions and scheduling procedures.
 - Any temporary data should be created in the designated batch job folder within the Scratch Area.
 - All errors should be written to a log folder in corresponding job directory created for each batch processing job.
 - All applications should access data from ITD ArcSDE servers, and only specific datasets should be stored locally. A process should be implemented if data needs to be refreshed.
 - Jobs should be tested thoroughly in the development environment before a change management request is submitted to move job/job related components to the production batch processing servers.

- All changes to batch processing jobs in the production environment should be requested via change management procedures and should be implemented by the assigned GIS staff.

Appendices:

Appendix A



Appendix B

- Miami Dade County – USPS Address Standards**

An address has the following components; house number, pre-direction, street name (number), street type, post-direction, unit designators, city, state, and zip code. When formatting addresses into a database the address field should contain the house number, pre-direction, street name (number), street type and post-direction components. All other components should be contained within their own field. Zip code should be separated from the zip+4 designations. For the purposes of this document, we will parse the address from left to right. This document describes the address standards for all components of an address.

1 House Number

23456 SW 159th Ct

The first component of an address is the house number. The house number is from one to five numeric digits.

2 Pre-directional

345 NW 72nd Ave

The second component is pre-directional. Abbreviate according to the appropriate one or two character abbreviation:

<i>Direction</i>	<i>Abb.</i>	<i>Direction</i>	<i>Abb.</i>
North	N	Northeast	NE
South	S	Northwest	NW
East	E	Southeast	SE
West	W	Southwest	SW

3 Street Name

5680 SW 87th Ave

The third component is the street name. Numeric street names should be written using numeric characters and with the appropriate endings, for example, 7th, 72nd, 56th, 3rd. If a street name contains a direction it should be spelled out.

The following are standardized examples of the county, state, and local highways (see Table B for an expanded table).

Name
 COUNTY ROAD 20
 COUNTY HIGHWAY 140
 HIGHWAY 50
 INTERSTATE 680
 ROAD 123
 STATE HIGHWAY 335
 STATE ROUTE 39
 US HIGHWAY 70
 TOWNSHIP ROAD 20

4 Street Types

43789 NW 77th Cir

The fourth component is the street type. The street type of address should conform to the standard street type abbreviations listed in Table A.

43789 NW 77th Circle Pl

If an address has two consecutive words that appear on the street type table (Table A), abbreviate the second of the two words according to the street type table and place it in the street type position of the address. The first of the two words is part of the primary name. Spell it out and add it to the street name.

5 Post-directional

13700 Kendale Lakes Cr E

The fifth component is post-directional. See item 2 pre-directional for standardization.

6 Unit Designators

5576 S Miami Ave Apt 13

The sixth component is the unit designator. Unit designators, such as APARTMENT or SUITE should not be included in the address field of a database. The unit designation should conform to the standard abbreviations listed in Table C. The pound sign (#) should not be used as a secondary unit designator if the correct designation, such as APT or STE, is known.

7 City Names

The seventh component is the city name. Spell city names in their entirety.

8 State Names

The eight component of an address is the state name. The state name should be abbreviated to the standard two- letter abbreviation as listed in Table D.

9 Zip code

The ninth component of an address is the zip code. The zip code or zip+4 must be correctly applied according to the USPS postal service. The primary zip code should be stored separately from the zip +4.

Table A

Street Type Abbreviations

<i>Primary TypeStreet Type Name</i>	<i>Postal Service Standard Street Abbreviation</i>
ALLEY	ALY
ANNEX	ANX
ARCADE	ARC
AVENUE	AVE
BAYOU	BYU
BEACH	BCH
BEND	BND
BLUFF	BLF
BLUFFS	BLFS
BOTTOM BTM BOULEVARD	
BLVD BRANCH BR	
BRIDGE	BRG
BROOK	BRK
BROOKS	BRKS
BURG	BG
BURGS	BGS
BYPASS	BYP
CAMP	CP
CANYON CYN	
CAPE	CPE

CAUSEWAY	CSWY
CENTER CTR	
CENTERS CTRS	
CIRCLE	CIR
CIRCLES CIRS	
CLIFF	CLF
CLIFFS	CLFS
CLUB	CLB
COMMON CMN	
COMMONS	CMNS
CONCOURSE	CONC CORNER
COR	
CORNERS CORS	COURSE
CRSE	
COURT	CT
COURTS CTS	
COVE	CV
COVES CVS	
CREEK	CRK
CRESCENT	CRES
CREST	CRST
CROSSING	XING
CROSSROAD	XRD
CROSSROADS	XRDS
CURVE	CURV
DALE	DL
DAM	DM
DIVIDE	DV
DRIVE	DR
DRIVES	DRS
ESTATE	EST
ESTATES ESTS	EXPRESSWAY
EXPY	
EXTENSION	EXT
EXTENSIONS	EXTS
FALL	FALL
FALLS	FL
FERRY	FRY
FIELD	FLD
FIELDS	FLDS
FLAT	FLT
FLATS	FLTS
FORD	FRD
FORDS FRDS	
FOREST FRST	
FORGE	FRG
FORGES FRGS	
FORK	FRK
FORKS	FRKS
FORT	FT

FREEWAY FWY GARDEN	
GDN GARDENS GDNS	
GATEWAY GTWY	
GLEN	GLN
GLENS	GLNS
GREEN	GRN
GREENS	GRNS
GROVE	GRV
GROVES	GRVS HARBOR
HBR HARBORS	HBR
HAVEN	HVN
HEIGHTS HTS	HIGHWAY
HWY	
HILL	HL
HILLS	HLS
HOLLOW HOLW	
INLET	INLT
ISLAND	IS
ISLANDS	ISS
ISLE	ISLE
JUNCTION	JCT
JUNCTIONS	JCTS
KEY	KY
KEYS	KYS
KNOLL	KNL
KNOLLS	KNLS
LAKE	LK
LAKES	LKS
LAND	LAND
LANDING	LNDG
LANE	LN
LIGHT	LGT
LIGHTS	LGTS
LOAF	LF
LOCK	LCK
LOCKS	LCKS
LODGE	LDG
LOOP	LOOP
MALL	MALL
MANOR	MNR
MANORS	MNRS
MEADOW MDW	
MEADOWS	MDWS
MEWS	MEWS
MILL	ML
MILLS	MLS
MISSION MSN	MOTORWAY
MTWY	
MOUNT	MT
MOUNTAIN	MTN
MOUNTAINS	MTNS

NECK		NCK
ORCHARD	ORCH	
OVAL		OVAL
OVERPASS	OPAS	
PARK		PARK
PARKS		PARK
PARKWAY	PKWY	PARKWAYSPKWY
PASS		PASS
PASSAGE	PSGE	
PATH		PATH
PIKE		PIKE
PINE		PNE
PINES		PNES
PLACE		PL
PLAIN		PLN
PLAINS		PLNS
PLAZA		PLZ
POINT		PT
POINTS		PTS
PORT		PRT
PORTS		PRTS
PRAIRIE		PR
RADIAL		RADL
RAMP		RAMP
RANCH		RNCH
RAPID		RPD
RAPIDS		RPDS
REST		RST
RIDGE		RDG
RIDGES	RDGS	
RIVER		RIV
ROAD		RD
ROADS		RDS
ROUTE		RTE
ROW		ROW
RUE		RUE
RUN		RUN
SHOAL		SHL
SHOALS	SHLS	
SHORE		SHR
SHORES	SHRS	
SKYWAY		SKWY
SPRING		SPG
SPRINGS	SPGS	
SPUR		SPUR
SPURS		SPUR
SQUARE	SQ	
SQUARES	SQS	
STATION	STA	
STRAVENUE		STRA
STREAM	STRM	

STREET	ST
STREETS	STS
SUMMIT	SMT
TERRACE	TER
THROUGHWAY	
TRWY	
TRACE	TRCE
TRACK	TRAK
TRAFFICWAY	TRFY
TRAIL	TRL
TRAILER	TRLR
TUNNEL	TUNL
TURNPIKE	TPKE
UNDERPASS	UPAS
UNION	UN
UNIONS	UNS
VALLEY	VLV
VALLEYS	VLVS
VIADUCT	
VIA	
VIEW	VW
VIEWS	VWS
VILLAGE	VILL
VILLAGES	VLGS
VILLE	VL
VISTA	VIS
WALK	WALK
WALKS	WALK
WALL	WALL
WAY	WAY
WAYS	WAYS
WELL	WL
WELLS	WLS

Table B

Address Standardization - County, State, Local Highways

The following are examples of county, state, and local highway primary names and the recommended standardized format. These are not the only possible examples.

<i>Examples in Use</i>	<i>Standard</i>
COUNTY HIGHWAY 140	COUNTY HIGHWAY 140
COUNTY HWY 60E	COUNTY HIGHWAY 60E
CNTY HWY 20	COUNTY HIGHWAY 20
COUNTY RD 441	COUNTY ROAD 441
COUNTY ROAD 110	COUNTY ROAD 110
CR 1185	COUNTY ROAD 1185
CNTY RD 33	COUNTY ROAD 33
FL COUNTY RD 150	FL COUNTY ROAD 150
FLORIDA COUNTY	FL COUNTY ROAD 555
ROAD 555 (excessive characters)	
EXPRESSWAY 55	EXPRESSWAY 55
FARM to MARKET 1200	FM 1200

FM 187
HWY FM 1320
HIGHWAY 101
HIWAY 1080A
HWY 64
HWY 11 BYPASS
HWY 66 FRONTAGE ROAD
HIGHWAY 3 BYP ROAD
I10
INTERSTATE 40
IH280
INTERSTATE HWY 680
I 55 BYPASS
I 26 BYP ROAD
I 44 FRONTAGE ROAD
LOOP 410
RD 5A
ROAD 22
RT 88
RTE 95
ROUTE 1150EE
RANCH RD 620
ST HIGHWAY 303
STATE HWY 60
SR 220
ST RD 86
STATE ROAD 55
SR MM
ST RT 175
STATE RTE 260
TOWNSHIP RD 20
TSR 45
US 41 SW
US HWY 44
US HIGHWAY 70
FLORIDA 440
FLORIDA HIGHWAY 189
FL 1207
FL HWY 75
FL ST HWY 1
FL STATE HIGHWAY 24
FLORIDA STATE HIGHWAY 625
(excessive characters)

FM 187
FM 1320
HIGHWAY 101
HIGHWAY 1080A
HIGHWAY 64
HIGHWAY 11 BYP
HIGHWAY 66 FRONTAGE RD
HIGHWAY 3 BYPASS RD
INTERSTATE 10
INTERSTATE 40
INTERSTATE 280
INTERSTATE 680
INTERSTATE 55 BYP
INTERSTATE 26 BYPASS RD
INTERSTATE 44 FRONTAGE RD
LOOP 410
ROAD 5A
ROAD 22
ROUTE 88
ROUTE 95
ROUTE 1150EE
RANCH ROAD 620
STATE HIGHWAY 303
STATE HIGHWAY 60
STATE ROAD 220
STATE ROAD 86
STATE ROAD 55
STATE ROUTE MM
STATE ROUTE 175
STATE ROUTE 260
TOWNSHIP ROAD 20
TOWNSHIP ROAD 45
US HIGHWAY 41 SW
US HIGHWAY 44
US HIGHWAY 70
FL HIGHWAY 440
FL HIGHWAY 189
FL HIGHWAY 1207
FL HIGHWAY 75
FL STATE HIGHWAY 1
FL STATE HIGHWAY 24
FL STATE HIGHWAY 625

Note: When the name of a state is used as a portion of the Primary Street Name, the standard two-letter abbreviation is recommended as depicted in the previous examples. However, when the state name is the complete Primary Street Name, such as OKLAHOMA AVE, then the state name should be spelled out completely.

Table C

Unit Designator Abbreviations

<i>Description</i>	<i>Approved Abbreviation</i>
Apartment	APT
Basement	BSMT**
Blank, unable to determine*	
Building	BLDG
Department	DEPT
Floor	FL
Front	FRNT**
Hanger	HNGR
Key	KEY
Lobby	LBBY**
Lot	LOT
Lower	LOWR**
Office	OFC**
Penthouse	PH**
Pier	PIER
Rear	REAR**
Room	RM
Side	SIDE**
Slip	SLIP
Space	SPC
Stop	STOP
Suite	STE
Trailer	TRLR
Unit	UNIT
Upper	UPPR**
* Requires the pound sign (#) to be used on the mailpiece.	
** Does not require a Secondary RANGE to follow.	

Table D

State Abbreviations

<i>State/Possession</i>	<i>Abbreviation</i>
Alabama	AL
Alaska	AK
American Samoa	AS
Arizona	AZ
Arkansas	AR
California	CA
Colorado	CO
Connecticut	CT
Delaware	DE
District of Columbia	DC
Federated States of Micronesia	FM
Florida	FL
Georgia	GA
Guam	GU

Hawaii	HI
Idaho	ID
Illinois	IL
Indiana	IN
Iowa	IA
Kansas	KS
Kentucky	KY
Louisiana	LA
Maine	ME
Marshall Islands	MH
Maryland	MD
Massachusetts	MA
Michigan	MI
Minnesota	MN
Mississippi	MS
Missouri	MO
Montana	MT
Nebraska	NE
Nevada	NV
New Hampshire	NH
New Jersey	NJ
New Mexico	NM
New York	NY
North Carolina	NC
North Dakota	ND
Northern Mariana Islands	MP
Ohio	OH
Oklahoma	OK
Oregon	OR
Palau	PW
Pennsylvania	PA
Puerto Rico	PR
Rhode Island	RI
South Carolina	SC
South Dakota	SD
Tennessee	TN
Texas	TX
Utah	UT
Vermont	VT
Virgin Islands	VI
Virginia	VA
Washington	WA
West Virginia	WV
Wisconsin	WI
Wyoming	WY

Appendix C - Miami-Dade County Enterprise GIS Services

Base URL: https://gisms.miamidade.gov/arcgis/rest/services/MDC_Locators

Address Locator Services

Miami-Dade County's GIS address locator services are updated weekly and hosted on the GISMS ArcGIS Server platform. Services available are:

- GeoAddress
 - Designed the same as GeoAddress_75 however, the match scores are set higher to ensure a more exact match. This locator is more commonly used in batch processes.
- GeoAddress_75
 - Geocodes against the GeoAddress feature class. GeoAddress is a point feature class of all addresses in Miami-Dade County. Points are located in the centroid of each property except in the cases where there are multiple addresses. Multiple addresses are located over the respective buildings. Match scores are set to a very low 75, which ensures a match every time but not always the correct one. This locator is most commonly used in an interactive process where the data entry user is presented multiple addresses to select from while assigning a valid Miami- Dade address to a record.
- GeoStreet
 - Designed the same as GeoStreet_75 however, the match scores are set higher to ensure a more exact match. This locator is more commonly used in batch processes.
- GeoStreet_75
 - Geocodes against the GeoStreet feature class. GeoStreet is a line feature class which represents a street segment. An address range is assigned to each segment and the address is geo-located proportionately along with this range. Match scores are set to a very low 75, which ensures a match every time but not always the correct one. This locator is most commonly used in an interactive process where the data entry user is presented multiple addresses to select from while assigning a valid Miami-Dade address to a record.
- MD_Locator
 - A composite locator, addresses are first located against GeoAddress and if no match is found they are then located against GeoStreet.
- MD_Locator_75
 - A composite locator, addresses are first located against GeoAddress_75 and if no match is found they are then located against GeoStreet_75.

GIS WEB Services

Service Base URL: <https://gisws.miamidade.gov/gisaddress/>

Standardize

URL: <https://gisws.miamidade.gov/gisaddress/Standardize.asmx>

This XML Web service formats an input address with Miami-Dade County – USPS Address Standards. The following methods are available.

- [standardizeAddress](#)
This XML Web service method returns a standardized address from the input address.
- [standardizeAddressParsed](#)
This XML Web service method returns a standardized address from the parsed input address.
- [standardizeIntersection](#)

This XML Web service method returns a standardized intersection from the input intersection.

- [standardizeIntersectionParsed](#)

This XML Web service method returns a standardized intersection from the parsed input intersection.

Verify

URL: <https://gisws.miamidade.gov/gisaddress/Verify.asmx>

This XML Web service identifies whether a provided address is a valid Miami-Dade County address. It also standardizes the given address using the Standardize WEB Service.

The service returns the following codes: Y, N, D or S. Y

indicates a valid address.

N indicates an invalid address.

D indicates a valid address and that more than one address exists in the MDC address database.

S indicates that the address does not exist in the MDC address database but does exist within the MDC address range database.

The following methods are supported.

- [VerifyAddress](#)
This XML Web service method validates the input address.
- [VerifyAddressMunic](#)
This XML Web service method validates the input address and Municipality Code.
- [VerifyAddressParsed](#)
This XML Web service method validates the parsed input address.
- [VerifyAddressParsedMunic](#)
This XML Web service method validates the parsed input address and Municipality Code.
- [VerifyAddressParsedZip](#)
This XML Web service method validates the parsed input address and Zip Code.
- [VerifyAddressZip](#)
This XML Web service method validates the input address and Zip Code.
- [VerifyIntersectionParsed](#)
This XML Web service method validates the parsed input intersection.
- [VerifyIntesection](#)
This XML Web service method validates the input intersection.

AddrXY

URL: <https://gisws.miamidade.gov/gisaddress/AddrXY.asmx>

This XML Web service returns NAD 83 State Plane X and Y coordinate if provided a valid Miami-Dade County address.

The following methods are supported.

- [XYAddress](#)
This XML Web service method returns X, Y Coordinate(s) for the input address.
- [XYAddressMunicv](#)
This XML Web service method returns X, Y Coordinate for the input address and Municipality Code.
- [XYAddressParsed](#)
This XML Web service method returns X, Y Coordinate(s) for the parsed input address.
- [XYAddressParsedMunic](#)
This XML Web service method returns X, Y Coordinate for the parsed input address and Municipality Code.
- [XYAddressParsedZip](#)
This XML Web service method returns X, Y Coordinate for the parsed input address and Zip Code.
- [XYAddressZip](#)
This XML Web service method returns X, Y Coordinate for the input address and Zip Code.
- [XYIntersection](#)
This XML Web service method returns X, Y Coordinate(s) for the input intersection.
- [XYIntersectionParsed](#)
This XML Web service method returns X, Y Coordinate(s) for the parsed input intersection.
- [XYIntersectionStandardized](#)
This XML Web service method returns X, Y Coordinate(s) for the parsed input intersection.
- [XYIntersectionStandardizedParsed](#)
This XML Web service method returns X, Y Coordinate(s) for the parsed input intersection.
- [XYStreetParsedZip](#)
This XML Web service method returns X, Y Coordinate(s) for the parsed input address and Zip code geocoding against the street.
- [XYStreetZip](#)
This XML Web service method returns X, Y Coordinate(s) for the input address and Zip code geocoding against the street.

AddressWebService

URL: <https://gisws.miamidade.gov/gisaddress/AddressWebService.asmx>

This XML Web service combines the other WEB services (including standardize) to produce results. Results include standardized address parsed and non-parsed, identifies which geodatabase the address matched against, and if the address validated against the exact match database the service also returns x/y coordinates, folio, cluc, zip code, and munic_code.

- [Address](#)
This XML Web service method returns the first found X, Y Coordinate, Folio, Cluc, Standardized Address and Validation result for the input address.
- [AddressD](#)
This XML Web service method returns multiple X, Y Coordinate, Folio, Cluc, Standardized Address and Validation result for the duplicated address.
- [AddressMunic](#)
This XML Web service method returns X, Y Coordinate, Folio, Cluc, Standardized Address and Validation result for the input address and Municipality code.

- [AddressMunicParsed](#)
This XML Web service method returns X, Y Coordinate, Folio, Cluc, Standardized Address and Validation result for the Parsed input address and Municipality code.
- [AddressParsed](#)
This XML Web service method returns the first found X, Y Coordinate, Folio, CLUC, Standardized Address and Validation result for the Parsed input address.
- [AddressParsedD](#)
This XML Web service method returns multiple X, Y Coordinate, Folio, Cluc, Standardized Address and Validation result for the Parsed duplicated address.
- [AddressZip](#)
This XML Web service method returns X, Y Coordinate, Folio, Cluc, Standardized Address and Validation result for the input address and zip code.
- [AddressZipParsed](#)
This XML Web service method returns X, Y Coordinate, Folio, Cluc, Standardized Address and Validation result for the Parsed input address and zip code.
- [Intersection](#)
This XML Web service method returns the first found X, Y Coordinate, Standardized Intersection and Validation result for the input Intersection.
- [IntersectionD](#)
This XML Web service method returns multiple X, Y Coordinate, Standardized Intersection and Validation result for the duplicated Intersection.
- [IntersectionParsed](#)
This XML Web service method returns the first found X, Y Coordinate, Standardized Intersection and Validation result for the input Intersection.
- [IntersectionParsedD](#)
This XML Web service method returns multiple X, Y Coordinate, Standardized Intersection and Validation result for the Parsed duplicated Intersection.

FolioCluc

URL: <https://gisws.miamidade.gov/gisaddress/FolioCluc.aspx>

This XML Web service returns Folio number and CLUC value given a valid Miami-Dade County address. The following methods are supported.

- [FolCluc](#)
This XML Web service method returns FOLIO numbers and CLUC values for the input address.
- [FolClucMunic](#)
This XML Web service method returns FOLIO number and CLUC value for the input address and Municipality Code.
- [FolClucParsed](#)
This XML Web service method returns FOLIO numbers and CLUC values for the parsed input address.
- [FolClucParsedMunic](#)
This XML Web service method returns FOLIO number and CLUC value for the parsed input address and Municipality Code.
- [FolClucParsedZip](#)

This XML Web service method returns FOLIO number and CLUC value for the parsed input address and Zip Code.

- [FolClucZip](#)

This XML Web service method returns FOLIO number and CLUC value for the input address and Zip Code.

Condo

URL: <https://gisws.miamidade.gov/gisaddress/Condo.asmx>

This XML Web service returns condo folio numbers that are related with the provided a parent address or folio within Miami-Dade County.

The following methods are supported.

- [CondoAddressFolioMunic](#)

This XML Web service method returns condo folio numbers that are related to the given address and municipality code.

- [CondoAddressMunic](#)

This XML Web service method returns condo folio numbers that are related with the parent address and Municipality Code.

- [CondoAddressParsedMunic](#)

This XML Web service method returns condo folio numbers that are related with the parsed parent address and Municipality Code.

- [CondoAddressParsedZip](#)

This XML Web service method returns condo folio numbers that are related with the parsed parent address and Zip Code.

- [CondoAddressZip](#)

This XML Web service method returns condo folio numbers that are related with the parent address and Zip Code.

- [ParentChildFolio](#)

This XML Web service method returns children folio numbers and addresses information for the input parent folio number.

- [ParentFolio](#)

This XML Web service method returns parent folio number for the input child folio number.

GeoProperty

URL: <https://gisws.miamidade.gov/gisaddress/GeoProperty.asmx>

This XML Web service returns GeoProperty values: Subunit, zip code, condo flag, county land use code, township/range/section (ttrss), commissioner district, election precinct, census tract 2000, police grid, traffic analysis zone, community council, subarea, zoning code, flood zone, and state plane x/y coordinate if provided a valid Miami-Dade County addresses.

The following methods are supported.

- [GeoProperty](#)

This XML Web service method returns a standard address and other location identifiers for the input address and Zipcode through a geoprocess.

- [GeoPropertyParsed](#)

This XML Web service method returns a standard address and other location identifiers for the input address and Zipcode through a geoprocess.

GeoIntersect

URL: <https://gisws.miamidade.gov/gisaddress/GeoIntersect.aspx>

This XML Web service returns the attributes of the feature in the specified Feature Class that intersects the specified X and Y.

The following operations are supported.

- [GetAllFieldsRecords](#)
This XML Web service method returns a DataTable, with the values of all field for the feature(s) intersecting the specified x and y in the given polygon feature Class.
- [GetAllFieldsRecords_DS](#)
This XML Web service method returns a DataSet with a DataTable with the values of all field for the feature(s) intersecting the specified x and y in the given polygon feature Class.
- [GetAllFieldsRecords_DS_LocalData](#)
This XML Web service method returns a DataSet with a DataTable with the values of all field for the feature(s) intersecting the specified x and y in the given polygon feature Class. NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.
- [GetAllFieldsRecords_LocalData](#)
This XML Web service method returns a DataTable, with the values of all field for the feature(s) intersecting the specified x and y in the given polygon feature Class. NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.
- [GetAllFieldsRecords_XML](#)
This XML Web service method returns an XML document with the values of all field for the feature(s) intersecting the specified x and y in the given polygon feature Class.
- [GetAllFieldsRecords_XML_LocalData](#)
This XML Web service method returns an XML document with the values of all field for the feature(s) intersecting the specified x and y in the given polygon feature Class. NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.
- [GetSpecifiedFieldsRecords](#)
This XML Web service method returns a DataTable, with the values of the specified comma-separated fields for the feature(s) intersecting the specified x and y in the given polygon feature Class.
- [GetSpecifiedFieldsRecords_DSv](#)
This XML Web service method returns a DataSet with a DataTable with the values of the specified comma- separated fields for the feature(s) intersecting the specified x and y in the given polygon feature Class.
- [GetSpecifiedFieldsRecords_DS_LocalData](#)
This XML Web service method returns a DataSet with a DataTable with the values of the specified comma- separated fields for the feature(s) intersecting the specified x and y in the given polygon feature Class.
NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.
- [GetSpecifiedFieldsRecords_LocalData](#)
This XML Web service method returns a DataTable, with the values of the specified comma-separated fields for the feature(s) intersecting the specified x and y in the given polygon feature Class. NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.

- [GetSpecifiedFieldsRecords XML](#)

This XML Web service method returns an XML document with the values of the specified comma- separated fields for the feature(s) intersecting the specified x and y in the given polygon feature Class.

- [GetSpecifiedFieldsRecords XML LocalData](#)

This XML Web service method returns an XML document with the values of the specified comma- separated fields for the feature(s) intersecting the specified x and y in the given polygon feature Class. NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.

AlternateAddress

URL: <https://gisws.miamidade.gov/gisaddress/AlternateAddress.aspx>

This XML Web service allows finding alternate address information. The following operations are supported:

- [alternateStreetAddress](#)

This XML Web service method returns alternate street names, as well as validation results for the input address. Validation result definitions are = Y - matches against the address point layer, S - matches against the street layer, D – the address has two locations, and N = No match.

- [alternateStreetName](#)

This XML Web service method returns alternate street names for the input street name.

- [alternateValidStreetAddress](#)

This XML Web service method returns all valid alternate street names for the input address. Valid street names are those that match against GIS Street and Address layers. Validation result definitions are = Y - matches against the address point layer, S - matches against the street layer, and D – the address has two locations.

GeoAttribute

URL: <https://gisws.miamidade.gov/gisdata/GeoAttribute.aspx>

This XML Web service returns the attributes of the feature(s) or records in the specified Feature Class or Table, given a field to search on, and the field's value.

The following operations are supported.

- [GetAllFieldsRecordsGivenAFieldNameAndValue](#)

This XML Web service method returns a DataTable, with the values of all fields for the feature(s) or record(s) selected on the specified Feature class or Table, given the name of the field to search on, and the field's value. Valid field types to search on are Numeric, String or Date. If value type 'Date' is used the value string must be in the following format 'YYYY-MM-DD HH24:MI:SS' Example: '2008-07-08 10:25:03'.

If your request returns to many records you may need in your application to increase the time the XML Web Service client waits for synchronous XML Web Service request to complete (in milliseconds) by using 'Service.Timeout = -1' where Service is the object pointing to this Web Service. Use -1 to set an Infinite time out.

Also, you may need to increase your httpRuntime executionTimeout. One way to do it is adding the line <httpRuntime executionTimeout=(Here goes the number of seconds)/> between the <system.web> tabs in your Web.Config.

- [GetAllFieldsRecordsGivenAFieldNameAndValue DS](#)

This XML Web service method returns a DataSet with a DataTable, with the values of all fields for the feature(s) or record(s) selected on the specified Feature class or Table, given the name of the field to search on, and the field's value. Valid field types to search on are Numeric, String or Date. If value type 'Date' is used the value string must be in the following format 'YYYY-MM-DD HH24:MI:SS' Example: '2008- 07-08 10:25:03'.

If your request returns to many records you may need in your application to increase the time the XML Web Service client waits for synchronous XML Web Service request to complete (in milliseconds) by using 'Service.Timeout = -1' where Service is the object pointing to this Web Service. Use -1 to set an Infinite time out.

Also, you may need to increase your httpRuntime executionTimeout. One way to do it is adding the line <httpRuntime executionTimeout=(Here goes the number of seconds)/> between the <system.web> tabs in your Web.Config.

- [GetAllFieldsRecordsGivenAFieldNameAndValue_DS_LocalData](#)

This XML Web service method returns a DataSet with a DataTable, with the values of all fields for the feature(s) or record(s) selected on the specified Feature class or Table, given the name of the field to search on, and the field's value. Valid field types to search on are Numeric, String or Date. If value type 'Date' is used the value string must be in the following format 'YYYY-MM-DD HH24:MI:SS' Example: '2008- 07-08 10:25:03'.

If your request returns to many records you may need in your application to increase the time the XML Web Service client waits for synchronous XML Web Service request to complete (in milliseconds) by using 'Service.Timeout = -1' where Service is the object pointing to this Web Service. Use -1 to set an Infinite time out.

Also, you may need to increase your httpRuntime executionTimeout. One way to do it is adding the line <httpRuntime executionTimeout=(Here goes the number of seconds)/> between the <system.web> tabs in your Web.Config.

NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.

- [GetAllFieldsRecordsGivenAFieldNameAndValue_LocalData](#)

This XML Web service method returns a DataTable, with the values of all fields for the feature(s) or record(s) selected on the specified Feature class or Table, given the name of the field to search on, and the field's value. Valid field types to search on are Numeric, String or Date. If value type 'Date' is used the value string must be in the following format 'YYYY-MM-DD HH24:MI:SS' Example: '2008-07-08 10:25:03'.

If your request returns to many records you may need in your application to increase the time the XML Web Service client waits for synchronous XML Web Service request to complete (in milliseconds) by using 'Service.Timeout = -1' where Service is the object pointing to this Web Service. Use -1 to set an Infinite time out.

Also, you may need to increase your httpRuntime executionTimeout. One way to do it is adding the line <httpRuntime executionTimeout=(Here goes the number of seconds)/> between the <system.web> tabs in your Web.Config.

NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.

- [GetSpecifiedFieldsRecordsGivenAFieldNameAndValue](#)

This XML Web service method returns a DataTable, with the values of the specified fields for the feature(s) or record(s) selected on the specified Feature Class or Table, given the name of the field to search on, the field's value and a string of fields names to be returned separated by commas. Valid field types to search on are Numeric, String or Date. If value type 'Date' is used the value string must be in the following format 'YYYY-MM-DD HH24:MI:SS' Example: '2008-07-08 10:25:03'.

If your request returns to many records you may need in your application to increase the time the XML Web Service client waits for synchronous XML Web Service request to complete (in milliseconds) by using 'Service.Timeout = -1' where Service is the object pointing to this Web Service. Use -1 to set an Infinite time out.

Also, you may need to increase your httpRuntime executionTimeout. One way to do it is adding the line <httpRuntime executionTimeout=(Here goes the number of seconds)/> between the <system.web> tabs in your Web.Config.

- [GetSpecifiedFieldsRecordsGivenAFieldNameAndValue_DS](#)

This XML Web service method returns a DataSet with a DataTable, with the values of the specified fields for the feature(s) or record(s) selected on the specified Feature Class or Table, given the name of the field to search on, the field's value and a string of fields names to be returned separated by commas. Valid field types to search on are Numeric, String or Date. If value type 'Date' is used the value string must be in the following format 'YYYY-MM-DD HH24:MI:SS' Example: '2008-07-08 10:25:03'.

If your request returns to many records you may need in your application to increase the time the XML Web Service client waits for synchronous XML Web Service request to complete (in milliseconds) by using 'Service.Timeout = -1' where Service is the object pointing to this Web Service. Use -1 to set an Infinite time out.

Also, you may need to increase your httpRuntime executionTimeout. One way to do it is adding the line <httpRuntime executionTimeout=(Here goes the number of seconds)/> between the <system.web> tabs in your Web.Config.

- [GetSpecifiedFieldsRecordsGivenAFieldNameAndValue_DS_LocalData](#)

This XML Web service method returns a DataSet with a DataTable, with the values of the specified fields for the feature(s) or record(s) selected on the specified Feature Class or Table, given the name of the field to search on, the field's value and a string of fields names to be returned separated by commas. Valid field types to search on are Numeric, String or Date. If value type 'Date' is used the value string must be in the following format 'YYYY-MM-DD HH24:MI:SS' Example: '2008-07-08 10:25:03'.

If your request returns to many records you may need in your application to increase the time the XML Web Service client waits for synchronous XML Web Service request to complete (in milliseconds) by using 'Service.Timeout = -1' where Service is the object pointing to this Web Service. Use -1 to set an Infinite time out.

Also, you may need to increase your httpRuntime executionTimeout. One way to do it is adding the line <httpRuntime executionTimeout=(Here goes the number of seconds)/> between the <system.web> tabs in your Web.Config.

NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.

- [GetSpecifiedFieldsRecordsGivenAFieldNameAndValue_LocalData](#)

This XML Web service method returns a DataTable, with the values of the specified fields for the feature(s) or record(s) selected on the specified Feature Class or Table, given the name of the field to search on, the field's value and a string of fields names to be returned separated by commas. Valid field types to search on are Numeric, String or Date. If value type 'Date' is used the value string must be in the following format 'YYYY-MM-DD HH24:MI:SS' Example: '2008-07-08 10:25:03'.

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Also, you may need to increase your httpRuntime executionTimeout. One way to do it is adding the line <httpRuntime executionTimeout=(Here goes the number of seconds)/> between the <system.web> tabs in your Web.Config.

NOTE: This method searches a database stored locally in the same server as this WebService; not all the data currently in SDE is available locally.

XYLatLongConversionsClass

URL: <https://gisws.miamidade.gov/gisxyservices/XYLatLongConversions.aspx>

This XML Web service is a projection service between X/Y coordinates and Longitude and Latitude. The following operations are supported:

- [getLatLongDecFromXY](#)

This XML Web service method returns the longitude and latitude in decimal for the given X/Y coordinate as a double array. geographic WKID = 4152 (esriSRGeoCS_NAD1983HARN) and projected WKID = 2236 (esriSRProjCS_NAD1983SPCS_FLEastFT)

- [getLatLongDecFromXY_Array](#)
This XML Web service method returns a 1-dimensional array of longitude and latitude (in decimal) for the input arrays X and Y. It returns lon,lat pairs (ie lon1,lat1,lon2,lat2,lon3,lat3...,lonN,latN). geographic WKID = 4152 (esriSRGeoCS_NAD1983HARN) and projected WKID = 2236 (esriSRProjCS_NAD1983SPCS_FLEastFT)
- [getLatLongDecFromXY_Array_WKIDs](#)
This XML Web service method returns a 1-dimensional array of longitude and latitude (in decimal) for the input arrays X & Y, projected WKID and geographic WKID. It returns lon,lat pairs (ie lon1, lat1, lon2, lat2, lon3, lat3..., lonN,latN).
- [getLatLongDecFromXY_WKIDs](#)
This XML Web service method returns, as a double array, longitude/latitude (in decimal) for the given X/Y coordinate, projected WKID and geographic WKID.
- [getLatLongDegreeFromXY](#)
This XML Web service method returns, as a String Array, the longitude and latitude in Degrees Minutes format, for the given X/Y coordinates. geographic WKID = 4152 (esriSRGeoCS_NAD1983HARN) and projected WKID = 2236 (esriSRProjCS_NAD1983SPCS_FLEastFT)
- [getLatLongDegreeFromXY_Array](#)
This XML Web service method returns a 1-dimensional array of longitude and latitude in Degrees Minutes format (as string), for the input arrays X and Y. It returns lon,lat pairs (ie lon1,lat1,lon2,lat2,lon3,lat3...,lonN,latN). geographic WKID = 4152 (esriSRGeoCS_NAD1983HARN) and projected WKID = 2236 (esriSRProjCS_NAD1983SPCS_FLEastFT)
- [getLatLongDegreeFromXY_Array_WKIDs](#)
This XML Web service method returns a 1-dimensional array of longitude and latitude in Degrees Minutes format (as string), for the input arrays X & Y, projected WKID and geographic WKID. It returns lon,lat pairs (ie lon1,lat1,lon2,lat2,lon3,lat3...,lonN,latN).
- [getLatLongDegreeFromXY_WKIDs](#)
This XML Web service method returns, as a String Array, longitude/latitude (in Degrees Minutes format), for the given X/Y coordinates, projected WKID and geographic WKID.
- [getLatLongInDegMinSecFromXY](#)
This XML Web service method returns, as a String Array, the longitude and latitude in Degrees Minutes Seconds format, for the given X/Y coordinates. geographic WKID = 4152 (esriSRGeoCS_NAD1983HARN) and projected WKID = 2236 (esriSRProjCS_NAD1983SPCS_FLEastFT)
- [getLatLongInDegMinSecFromXY_Array](#)
This XML Web service method returns a 1-dimensional array of longitude and latitude in Degrees Minutes Seconds format (as string), for the input arrays X and Y. It returns lon,lat pairs (ie lon1,lat1,lon2,lat2,lon3,lat3...,lonN,latN). geographic WKID = 4152 (esriSRGeoCS_NAD1983HARN) and projected WKID = 2236 (esriSRProjCS_NAD1983SPCS_FLEastFT)
- [getLatLongInDegMinSecFromXY_Array_WKIDs](#)
This XML Web service method returns a 1-dimensional array of longitude and latitude in Degrees Minutes Seconds format (as string), for the input arrays X & Y, projected WKID and geographic WKID. It returns lon,lat pairs (ie lon1,lat1,lon2,lat2,lon3,lat3...,lonN,latN).
- [getLatLongInDegMinSecFromXY_WKIDs](#)
This XML Web service method returns, as a String Array, longitude/latitude (in Degrees Minutes Seconds format), for the given X/Y coordinates, projected WKID and geographic WKID.
- [getXYfromLatLongDec](#)

This XML Web service method returns, as a double array, the X/Y coordinate for the given longitude/latitude (in decimal). geographic WKID = 4152 (esriSRGeoCS_NAD1983HARN) and projected WKID = 2236 (esriSRProjCS_NAD1983SPCS_FLEastFT)

- [getXYfromLatLongDec WKIDs](#)
This XML Web service method returns, as a double array, the X/Y coordinate for the given longitude/latitude (in decimal), projected WKID and geographic WKID.
- [getXYfromLatLongDec WKIDs Array](#)
This XML Web service method returns a 1-dimensional array of X and Y (in decimal) for the input arrays Longitude and latitude (in decimal), projected WKID and geographic WKID. It returns x,y pairs (ie x1,y1,x2,y2,x3,y3...,xn,yn).
- [getXYfromLatLongDegree](#)
This XML Web service method returns, as a double array, the X/Y coordinates for the given longitude/latitude (in Degrees Minutes format). geographic WKID = 4152 (esriSRGeoCS_NAD1983HARN) and projected WKID = 2236 (esriSRProjCS_NAD1983SPCS_FLEastFT)
- [getXYfromLatLongDegree WKIDs](#)
This XML Web service method returns, as a double array, the X/Y coordinates for the given longitude/latitude (in Degrees Minutes format), projected WKID and geographic WKID.
- [getXYfromLatLongDegree WKIDs Array](#)
This XML Web service method returns a 1-dimensional array of X and Y (in decimal) for the input arrays Longitude and latitude (in Degrees Minutes format), projected WKID and geographic WKID. It returns x,y pairs (ie x1,y1,x2,y2,x3,y3...,xn,yn).
- [getXYfromLatLongInDegMinSec](#)
This XML Web service method returns, as a Double array, the X/Y coordinates for the given longitude/latitude (in Degrees Minutes Seconds format). geographic WKID = 4152 (esriSRGeoCS_NAD1983HARN) and projected WKID = 2236 (esriSRProjCS_NAD1983SPCS_FLEastFT)
- [getXYfromLatLongInDegMinSec WKIDs](#)
This XML Web service method returns, as a Double array, the X/Y coordinates for the given longitude/latitude (in Degrees Minutes Seconds format), projected WKID and geographic WKID.
- [getXYfromLatLongInDegMinSec WKIDs Array](#)
This XML Web service method returns a 1-dimensional array of X and Y (in decimal) for the input arrays Longitude and latitude (in Degrees Minutes Seconds format), projected WKID and geographic WKID. It returns x,y pairs (ie x1,y1,x2,y2,x3,y3...,xn,yn).

GetClosestFeatureClass

URL: <https://gisws.miamidade.gov/gisxyservices/GetClosestFeature.asmx>

This XML Web service has methods for returning attributes of the closest features to X/Y inputs. A list of the GIS feature classes can be found at [\\s0140158\geodatabase\Standards](#) and is called datainfo.xls. The following operations are supported:

- [GetClosestFeatureFromXY](#)
This XML Web service method returns an XML document with the closest Features (ordered by distance) for a given X/Y coordinate, an X integer in feet for the buffer to create around coordinate, and Feature Class name to query.***Specify named attributes by semi-colon delimited list
- [GetClosestFeatureFromXYAllAtrbts](#)
This XML Web service method returns a DataTable with the closest Features (ordered by distance) for a given X/Y coordinate, an X integer in feet for the buffer to create around coordinate, and Feature Class name to query.***All attributes returned

- [GetClosestFeatureFromXYAllAtrbts_LocalData](#)

This XML Web service method returns a DataTable with the closest Features (ordered by distance) from a given X/Y coordinate, an X integer in feet for the buffer to create around coordinate, and

Feature Class name to query.***All attributes returned. NOTE: This method searches a database stored locally in the same server as this WebService; Not all the data currently in SDE is available locally.

- [GetClosestFeatureFromXYAllAtrbts_XML](#)

This XML Web service method returns an XMLDataDocument with the closest Features (ordered by distance) for a given X/Y coordinate, an X integer in feet for the buffer to create around coordinate, and Feature Class name to query.***All attributes returned

- [GetClosestFeatureFromXYAllAtrbts_XML_LocalData](#)

This XML Web service method returns an XML document with the closest Features (ordered by distance) from a given X/Y coordinate, an X integer in feet for the buffer to create around coordinate, and Feature Class name to query.***All attributes returned. NOTE: This method searches a database stored locally in the same server as this WebService; Not all the data currently in SDE is available locally.

- [GetClosestFeatureFromXY_LocalData](#)

This XML Web service method returns an XML document with the closest Features(ordered by distance) for a given X/Y coordinate, an X integer in feet for the buffer to create around coordinate, and Feature Class name to query.***Specify named attributes by semi-colon delimited list. NOTE: This method searches a database stored locally in the same server as this WebService; Not all the data currently in SDE is available locally.

- [GetClosestFeatureFromXYandWhereClauseAllAtrbts_XML](#)

This XML Web service method returns an XMLDataDocument with the closest Features (ordered by distance) for a given X/Y coordinate, an X integer in feet for the buffer to create around coordinate, and Feature Class name to query.***All attributes returned

- [getFolioFromXY](#)

This XML Web service method returns top Folio Numbers for a given X/Y coordinate and a 500 feet buffer created around the coordinate.

- [getStreetIDFromXY](#)

This XML Web service method returns top Street IDs for a given X/Y coordinate and a 500 feet buffer created around the coordinate.

- *Map Cache Services*

Title	Description
MDC Imagery with Labels	Web Map used to display the 2018 MDC Raster Imagery with Labels basemap layer. https://mdc.maps.arcgis.com/home/item.html?id=d82e9d9fd4d024037b66346ca2388f4b3
MDC Street	Web Map used to display the MDC Street basemap layer. https://mdc.maps.arcgis.com/home/item.html?id=ffdb58518eb04e1db24341f3e35c00c6

- *Basemaps Services*

Title	Description
MDC Imagery	Web Map used to display the 2018 MDC Raster Imagery basemap layer. https://mdc.maps.arcgis.com/home/item.html?id=6f98ab2542dc4c6cab5c6634854cdf74
MDC Imagery 1999	Black-and-White Orthophotography covering approximately 1040 sq. miles of Miami Dade County. The data was captured by Woolpert, Inc. during the period of Feb 14, 1999, to June 25, 1999. https://mdc.maps.arcgis.com/home/item.html?id=8e70b7b31e12456d807f4d3c07f3d29e
MDC Imagery 2001	Black-and-White Orthophotography covering approximately 1040 sq. miles 926 sq. miles of Miami Dade County. The data was captured by Woolpert, Inc. during the period of Jan 25, 2001, to March 6, 2001. https://mdc.maps.arcgis.com/home/item.html?id=c85487da966a4dad81138dc9b25adbc2
MDC Imagery 2003	Black-and-White Orthophotography covering approximately 1040 sq. miles of Miami Dade County. The data was captured by Woolpert, Inc. during the period of Feb 2, 2003, to Oct 29, 2003. https://mdc.maps.arcgis.com/home/item.html?id=43d809c012b14932a156d4e9ebac769d
MDC Imagery 2005	Natural Color Orthophotography covering approximately 1136 sq. miles of Miami Dade County. The data was captured by Woolpert, Inc. during the period of Feb 11, 2005, to Feb 12, 2005. https://mdc.maps.arcgis.com/home/item.html?id=690e3efb19a84c4a9fc0c35e17e9af62

MDC Imagery 2006	Natural Color Orthophotography covering approximately 1244 sq. miles of Miami Dade County. The data was captured by Woolpert, Inc. during the period of Jan 15, 2006, to March 26, 2006. https://mdc.maps.arcgis.com/home/item.html?id=efbd6ff2c8bd4cbdaf27036db7e4c089
MDC Imagery 2007	Natural Color Orthophotography covering 1019 sq. miles of Miami Dade County. The data was captured by Woolpert, Inc. during the period of Dec 27, 2006, to March 18, 2007. https://mdc.maps.arcgis.com/home/item.html?id=715df616c3554804bd079655276d11a0
MDC Imagery 2008	This natural color orthophotography is an off-the-shelf product developed by Aerials Express covering approximately 1275 sq. miles. The data was captured by Aerials Express during the period of April 14, 2008, to April 16, 2008. https://mdc.maps.arcgis.com/home/item.html?id=19e01cb437d54800ac9d05e45d84b315
MDC Imagery 2009	Natural Color Orthophotography covering approximately 1171 sq. miles of Miami Dade County. The data was captured by Photo Science during the period of Jan 8, 2009, to Jan 9, 2009. https://mdc.maps.arcgis.com/home/item.html?id=58d66ec0763a4626832606bd71cf689b
MDC Imagery 2010	Natural Color Orthophotography covering approximately 1290 sq. miles of Miami Dade County. The data was captured by Woolpert, Inc. during the period of Jan 4, 2010, to June 25, 2010. https://mdc.maps.arcgis.com/home/item.html?id=a96d3dc8e23b4146ad9112da47287aba
MDC Imagery 2012	Natural Color Orthophotography covering 2428 sq miles of Miami Dade County. The data was captured by two companies: Woolpert, Inc. and Photo Science. https://mdc.maps.arcgis.com/home/item.html?id=272098d123a749be90b4ac96650eb52b
MDC Imagery 2013	Natural Color Orthophotography covering 1617 sq. miles of Miami Dade County. The data was captured by Aerial Cartographics of America, Inc.. during the period of Dec 18, 2012, to October 10, 2013. https://mdc.maps.arcgis.com/home/item.html?id=85721b1c4f10462e973f1afd66d1668b
MDC Imagery 2014	Natural Color Orthophotography covering 1612 sq. miles of Miami Dade County. It was captured by Aerial Cartographics of America, Inc. during the period of Dec 18, 2013, to Jan 28, 2014. https://mdc.maps.arcgis.com/home/item.html?id=fad32775b2f3412fa41cee8c9152c055

MDC Imagery 2015	Natural Color Orthophotography covering 2429 sq. miles of Miami Dade County. It was captured by The Sanborn Map Company, Inc. during the period of Dec 12, 2014, to Jan 19, 2015. https://mdc.maps.arcgis.com/home/item.html?id=9a900aed2e714c49bfee58fbee079aff
MDC Imagery 2015 Infrared	Color Infrared Orthophotography covering 2429 sq. miles of Miami Dade County. It was captured by The Sanborn Map Company, Inc. during the period of Dec 12, 2014, to Jan 19, 2015. https://mdc.maps.arcgis.com/home/item.html?id=40f8b36ab3eb4c009f7d2dca6b3a5a70
MDC Imagery 2016	Natural Color Orthophotography covering 2429 sq. miles of Miami Dade County. It was captured by Pictometry International Corp. during the period of Jan 7, 2016, to May 22, 2016. https://mdc.maps.arcgis.com/home/item.html?id=085199051c8a487086a5634ffceef297
MDC Imagery 2017	Natural Color Orthophotography covering 2429 sq. miles of Miami Dade County. It was captured by Kucera International Inc. during the period of Dec 29, 2016, to May 9, 2017. https://mdc.maps.arcgis.com/home/item.html?id=2f124dc0db90447ca7fe416047ac146a
MDC Imagery 2018	Natural Color Orthophotography covering 2428 sq. miles of Miami Dade County. It was captured by GPI during the period of December 2017 to June 2018. https://mdc.maps.arcgis.com/home/item.html?id=4b27983405dc47bd89b6a4032b688215

Appendix D -

- Miami-Dade County GIS Central Data Repository Layers*

Feature Dataset	Feature Class	Description
AdoptATree	TreeAdoptionHistory	Adopt A Tree registration history
AirportZoning	AirportInnerSafetyZone	MIA Inner Safety Zoning
AirportZoning	AirportNoSchoolZone	MIA NO School Zoning
AirportZoning	AirportOuterSafetyZone	MIA Outer Safety Zoning
BikeFacility	BikeLane	Bicycle Lanes
BikeFacility	PavedPath	Bicycle Paved Paths
BikeFacility	PavedShoulder	Bicycle Paved Shoulders

BikeFacility	WideCurbLane	Bicycle Wide Curb Lanes
Budget	CommunityBasedOrganization	Community-Based Organizations (CBO) funded during 2013-2019 fiscal year
Budget	CommunityBasedOrganization2012	Community-Based Organizations (CBO) funded during the 2011-2012 fiscal year
Budget	CommunityBasedOrganization2013	Community-Based Organizations (CBO) funded during the 2012-2013 fiscal year
Budget	CommunityBasedOrganization2014	Community-Based Organizations (CBO) funded during the 2013-2014 fiscal year
Budget	CommunityBasedOrganization2017	Community-Based Organizations (CBO) funded during the 2013-2014 fiscal year
BuildingCase	building violations	Building Violation Case Information
BuildingPlanimetric	BuildingFootprint2D	2D Building footprint derived from 2015 Lidar
BuildingPlanimetric	BuildingFootprint2D2017	2D Building footprint derived from 2015 Lidar
BuildingPlanimetric	LargeBuilding	2013 Large buildings planimetric footprint
BuildingPlanimetric	SmallBuilding	2012 Small Buildings Planimetric locations
Buildings2001	LargeBuilding2001	2001 Large Buildings Planimetrics

Buildings2001	SmallBuilding2001	2001 Small Buildings Planimetrics
Buildings2005	LargeBuilding2005	2005 Large Buildings Planimetrics
Buildings2005	SmallBuilding2005	2005 Small Buildings Planimetrics
CareService	AdultCareFacility	Adult Care Facilities
CareService	AdultLivingFacility	Adult Living Facilities
CareService	Daycare	Day Care Centers within Miami-Dade County
CareService	DCFFacility	DCF Facilities
CareService	GroupHome	A residential home that provides 1 - 5 individual personal care services
CareService	IntermediateCareFacility	IntermediateCareFacility

CareService	NursingHome	Nursing Homes
CartoLayers	CartoStreets	Cartographic Streets
CDMP	SMARTPlanCorridorBuffers	Strategic Miami Area Rapid Transit (SMART) Corridor buffers
CDMP	SMARTPlanCorridors	Strategic Miami Area Rapid Transit (SMART) Corridors
Census1990	Block90	1990 Census Blocks - Unaligned
Census1990	BlockGroup90	1990 Census Block Groups - Unaligned
Census1990	BlockStreet90	1990 Census Blocks created from Street Network
Census1990	Place90	1990 Census Places - Unaligned
Census1990	Tiger90_line	1990 Original Census Tiger Line
Census1990	Tiger90_poly	1990 Original Census Tiger Boundary
Census1990	Tract90AlignCoastal	1990 Census Tracts to Coastline - Aligned
Census1990	Tract90UnalignCoastal	1990 Census Tracts to Coastline - Unaligned
Census1990	Tract90UnalignFull	1990 Census Tracts Full Boundary - Unaligned
Census2000	Block	2000 Census Blocks - Aligned
Census2000	BlockGroup	2000 Census Block Groups - Aligned
Census2000	BlockSite	2000 Census Block Site
Census2000	DesignatedPlace	2000 Census Designated Places - Aligned
Census2000	LowModerateBlockGroup	2000 Census Low-Moderate (Community Development) Block Groups - Aligned

Census2000	Tract	2000 Census Tracts - Aligned
Census2010	Block10_Aligned	2010 Census Blocks - Aligned
Census2010	Block10Pop	2010 Census Blocks with 2010 Census Population figures
Census2010	Block10Pop_pnt	2010 Census Blocks Centroid with 2010 Census Population
Census2010	Block10PopDemographic	2010 Census Blocks with Demographics
Census2010	BlockGroup10_Aligned	2010 Census Block Groups - Aligned

Census2010	BlockGroup10_Unaligned	2010 Census Block Groups - Unaligned
Census2010	BlockGroup10Pop	2010 Census Block Groups with 2010 Census Population
Census2010	BlockGroup10Pop_pnt	2010 Census Block Groups Centroid with 2010 Census Population
Census2010	DesignatedPlace10_Aligned	2010 Census Designated Place - Aligned
Census2010	DesignatedPlace10Pop	2010 Census Designated Place with 2010 Census Population
Census2010	DesignatedPlace10Pop_pnt	2010 Census Designated Place Centroid with 2010 Census Population
Census2010	Tract10_Aligned	2010 Census Tracts - Aligned
Census2010	Tract10Pop	2010 Census Tracts with 2010 Census Population
Census2010	Tract10Pop_pnt	2010 Census Tracts Centroid with 2010 Census Population
CityDistrict	MiamiCityDistrict	City of Miami Commissioner Districts
CityDistrict	MiamiGardensDistrict	City of Miami Gardens Council Districts
CityDistrict	NorthMiamiDistrict	City of North Miami Council District
Contamination	ContaminatedSite	Contaminated Sites
Contamination	DERMEnforcementCase	DERM open and closed environmental enforcement case.
Contamination	LandFill	Landfill Sites
Contamination	MultiPropContaminatedSite_poly	Multi-Property Contaminated Site Boundary
Contamination	SuperFundSite	Superfund Sites (Hazardous Waste Facilities)
CorrectionRehabilitation	DetentionCenter	Detention Centers, Jails
CountyCityLimits	CommunityCouncil	Community Council
CountyCityLimits	CommunityCouncilSubarea	Community Council Subareas
CountyCityLimits	CountyOutline	County Outline Boundary
CountyCityLimits	MiamiDadeBoundary	Miami-Dade County, Outer Boundary

County/City Limits	Municipality_line	Municipal Boundary line (out to the water)
County/City Limits	Municipality_poly	Municipal Boundaries (out to the water)
County/City Limits	MunicipalityCoastal_line	Municipal Boundary line (up to the coastline)
County/City Limits	MunicipalityCoastal_poly	Municipal Boundaries (up to the coastline)
DERMCoastalPermit	Class4WetlandPermit	Property with RER/DERM Class iv permit, program used to protect wetlands.
DERMCoastalPermit	DERMClass1CoastalWetlandPermit	DERM Class1 Permits, Coastal Wetland Permits are required for construction in or near coastal wetlands. Most permits are for private docks or sea walls.
DERMPermits	DERMTreePermit	Tree Removal and Relocation Permit
DERMWWaterControl	CutFillBasin	Drainage basins where cut fill (construction) is taking place and regulated to minimize flooding
DERMWWaterControl	DERMCutFillReview	Construction projects where the Cut and Fill criteria is applicable within the Bird Drive, North Trail, and Basin B special drainage basin.
DERMWWaterControl	DERMWWaterControlClass2Permit	DERM Water Control Class 2 (permitted construction project of the Drainage system with overflow or outfall in, on or upon any water body) Permits
DERMWWaterControl	DERMWWaterControlClass3Permit	DERM Water Control Class3 (permitted construction project within County owned or controlled canal ROW, reservation or easement) Permits
DERMWWaterControl	DERMWWaterControlClass6Permit	DERM Water Control Class6 (permitted construction project of the drainage system of known soil or groundwater contamination or deals with hazardous materials.) Permit
DERMWWaterControl	SurfaceWaterMngGeneralPermit	DERM Surface Water Management General Permits (SWMGP) required for certain construction projects

DERMWaterSewer	DERMSewerAllocation	Water and Wastewater Capacity Certification (Sewer Allocations or Sanitary Sewer Certification) for new construction or flow increases
DERMWaterSewer	NoticeOfReqConnection_poly	Notice of Required Water and Sewer Connection
DERMWaterSewer	SanitarySewerPumpStation	County-wide utility and non-utility sanitary sewer pump stations
DERMWaterSewer	SewerExtension	DERM Sewer Extensions
DERMWaterSewer	SewerOverflow	Sewer Overflow Incident Cases
DERMWaterSewer	WaterExtension	DERM Water EDERM Water Extension areas where construction or alteration connects to water utility transmission lines.
DevelopmentArea	CharretteBoundary	Charrette boundaries study areas
DevelopmentArea	CommunityRedevelopmentArea	Community Redevelopment Areas
DevelopmentArea	MinorStatisticalArea	Planning & Zoning Minor Statistical Area
DevelopmentArea	NeighborhoodRevitalizationArea	Neighborhood Revitalization Area
DevelopmentArea	NeighborhoodStabilizationProg	Neighborhood Stabilization Program
DevelopmentArea	ShorelineDevelopmentBoundary	Shoreline Development
DevelopmentArea	TargetUrbanArea	Targeted Urban Area
DevelopmentArea	TargetUrbanAreaCorridor	Targeted Urban Areas Corridors
EdgeOfPavement	EdgeOfPavement	2013 Edge of Pavement planimetric lines
Educational	BookMobile	Library BookMobile
Educational	CharterSchool	Charter Schools
Educational	College	Colleges and Universities
Educational	HeadStart	Headstart and Early Headstart Centers
Educational	Library	Miami-Dade County Public Operated Libraries
Educational	MunicipalLibrary	Municipal Public Libraries
Educational	PrivateSchool	Private Schools including State Registered
Electoral	CommissionDistrict	2011 Commission Districts

Electoral	Commissioner District Office	Commissioner District Office
Electoral	Congressional District	2012 US House of Representatives (Congressional District)
Electoral	Early Voting Site	Elections Early Voting Site
Electoral	House District	2012 State House Districts
Electoral	Precinct	Voting Precincts
Electoral	Precinct Group	Precinct Groups
Electoral	School Board District	2012 Public School Board District
Electoral	Senate District	2012 State Senate Districts
Electoral History	Commission District 1992	1992 Commission Districts
Electoral History	Commission District 2001	2001 Commission Districts
Electoral History	Precinct 14_15	Voting Precinct from June 2014 to August 2015
Electoral History	School Board District 2000	2000 Public School Board District
Emergency Management	Evacuation Center	Evacuation Centers
Emergency Management	Evacuation Order	Evacuation Order
Emergency Management	Hurricane Bus Stop	Hurricane Bus Stop Locations
Emergency Management	Hurricane Debris Removal	Hurricane Debris Removal Routes
Emergency Management	Hurricane Evacuation Zone	Hurricane Evacuation Zone (Storm Surge Planning Zone)
Emergency Management	Primary Evacuation Route	Primary Evacuation Routes
Emergency Management	Turkey Point Area	Turkey Point Plume Exposure Pathway Evacuation Area
Emergency Management	Turkey Point Radii	Turkey Point Radius in Miles
Emergency Management	Turkey Point Sector	Turkey Point Sectors and Quadrants
Emergency Mngt Historical	Hurricane Evacuation Zone 2003_2012	Hurricane Evacuation Zone from 2003 to 2012
Emergency Mngt Restricted	Marina	Emergency Management Marinas
Empowerment Zone	Brownfield	Brownfield Locations
Empowerment Zone	Developable Site	1998 Developable Sites
Empowerment Zone	East Ward Ho	1998 East Ward Ho
Empowerment Zone	Empowerment Zone_Line	1998 Empowerment Zones Lines

EmpowermentZone	EmpowermentZone_poly	1998 Empowerment Zones Boundaries
EmpowermentZone	EmpowermentZoneCTract	1998 Empowerment Zones with Census Tracts
EmpowermentZone	EnterpriseZone	2006 Enterprise Zones
EmpowermentZone	QualifiedOpportunityZones	Qualified Opportunity Zones (QOZ)
Environmental	ArtificialReef	Artificial Reef Sites
Environmental	ArtificialReefSite	Artificial Reef Sites Boundary
Environmental	Bayanza	Bayanza clean-up event locations
Environmental	EightandHalfSqMileArea	Eight and Half Square Mile Area Water Management physical project
Environmental	EnvironmentalCovenant	Parcels with environmental covenant issued by Miami- Dade County RER/DERM.
Environmental	EnvQualityControlBoard	Environmental Quality Control Board Boundaries
Environmental	GasStation	Retail Gas Stations
Environmental	SaltWaterIntrusion95	Salt Water Intrusion line as of 95
Environmental	SoilWaterConservationDistrict	Soil and Water Conservation District
EnvironmentalComplaint	DERMTreeComplaint	environmental complaint case due to the removal, cutting or bulldozing of trees, including mangroves
EnvironmentalHealth	DOHSepticSystem	DOH Sewer Septic Systems within Miami-Dade County
EnvironmentalHealth	DOHWellPermit	The Well Permits, as provided by the Department of Health records.
EnvironmentalOdor	OdorComplaintLandmark	Odor Complaint landmarks
FDOT	Interstates	Interstates - Florida Department of Transportation
FDOT	StateRoads	State Roads - Florida Department of Transportation
FDOT	USRoads	US Roads - Florida Department of Transportation
FireDept	CountywideClostFireStationArea	Countywide Closest Fire Station Area
FireDept	FDStationTerritoryInhabited	Fire District Station Territories clipped to the extent of inhabited areas

FireDept	FireDistrictStationTerritory	Fire District Station Territories
FireDept	FireHydrantServiceArea	Fire Hydrant Service Areas
FireDept	FireRescueImpactFeeDistrict	Fire and Rescue Impact Benefit Fee District
FireDept	FireStation	Fire Stations
FireDept	LifeSafetyInspDistrict	Life Safety Inspection District

FireDept	MDFRAgencyFireHydrantTerritory	Fire Hydrant Territories utilized by Miami-Dade County Fire Rescue (MDFR) and five other Fire Agencies.
FireDept	MDFRAgencyFireHydrantTerritoryInhabited	Fire Hydrant Territories Inhabited areas utilized by Miami- Dade County Fire Rescue (MDFR) and five other Fire Agencies.
FireDept	MunicipalFireStation	Municipal Fire Stations
FloodInfrastructure	CoastalAZone	Coastal A Zones
FloodInfrastructure	CountyFloodCriteria	County Flood Criteria Contours
FloodInfrastructure	FEMAFloodZone	2009 FEMA Flood Zones
FloodInfrastructure	FEMAFloodZone1994	1994 FEMA Flood Hazard Zones
FloodInfrastructure	FEMAPanel	2009 FEMA Panel Flood Zones
FloodInfrastructure	FEMAPanel1994	1994 FEMA Panels (Flood Zones)
FloodInfrastructure	StormWaterLine	Stormwater drainage permits for construction projects that require a surface water management general permit
FloodInfrastructure	StormWaterPoint	Stormwater drainage structures such as manholes, catch basins, inlets, valves, weirs and canal cross sections in the drainage network
GeneralGovernment	CityHall	City Halls within Miami-Dade County
GeneralGovernment	Court	Courts
GeneralGovernment	ISDFleetFuelSite	ISD Fleet Fuel Sites
GeneralGovernment	ISDFleetShop	ISD Fleet Repair Shops

GeneralGovernment	MDCLeaseProperty	County Leased Properties
GeneralGovernment	MDCOwnProperty	County Owned Properties
GeneralGovernment	PostOffice	Post Office Locations
GeoAddress	GeoAddress	Geocoded Address Locations
GeoAddress	GeoAddressWCondo	GeoAddress with Condo Information
Geomatics	HomeOwnerAssocZoningMailer	HomeOwner Association Boundaries for Zoning Hearing Mailers
GeoStreets	GeoActualRanges	Street Network Actual Address Ranges

GeoStreets	GeoIntersection	Geocoded Street Intersections
GeoStreets	GeoStreets	Miami-Dade County Streets
GeoStreets	St_Dade	Miami-Dade County Streets (Coverage Structure)
HealthCenter	CorrectionalHealthClinic	Health Clinics within Correctional Facilities
HealthCenter	FederallyQualifiedHealthCenter	Federally Qualified Health Center
HealthCenter	FreeStandingClinic	Free Standing Clinics
HealthCenter	HIVTestingCenter	HIV Testing Center
HealthCenter	JacksonPrimaryCareCenter	Jackson Primary Care Centers
HealthCenter	MentalHealthCenter	Mental Health Centers
HealthCenter	SchoolBasedClinic	School-Based Clinics
HealthService	AmbulatorySurgicalCenter	Ambulatory Surgical Centers
HealthService	AmbulatorySurgicalCenter_poly	Ambulatory Surgical Centers property boundary
HealthService	DOHHealthCenter	Department of Health Center Locations
HealthService	DOHWICCenter	Department of Health Women, Infant & Children Centers
HealthService	Hospital	Hospitals
HealthService	Hospital_poly	Hospital location boundaries
HealthStatistic	CardiovascularMortality2006	2006 Cardiovascular Mortality by ZIPCode

HealthStatistic	CLRDMortality2006	2006 Chronic Lower Respiratory Disease (CLRD) Mortality
HealthStatistic	HospitalAdmission	Hospital Admission
HealthStatistic	InfantMortality2006	2006 Infant Mortality by ZIP Code
HealthStatistic	LowBirthWeight	2006 Low Birth Weight Percentage of babies born in Miami-Dade County
HealthStatistic	MedicaidEnrolled2007	2007 Medicaid Enrollment by ZIPCode
HealthStatistic	MortalityCount2006	2006 Mortality Count
HealthStatistic	PrenatalCare	2006 First Trimester Prenatal Care Percentage of births in Miami-Dade County
HealthStatistic	TeenBirths2006	Births by Teenaged Mothers
HealthStatistic	UninsuredByZipCode2004	2004 Uninsured by ZipCode

HealthStatistic2010	CardiovascularMortality2010	2010 Cardiovascular mortality
HealthStatistic2010	CLRDMortality2010	2010 CLRD Mortality
HealthStatistic2010	HospitalAdmission2010	2010 Hospital Admission
HealthStatistic2010	InfantMortality2010	2010 Infant Mortality
HealthStatistic2010	LowBirthWeight2010	2010 Low Birth Weight
HealthStatistic2010	MedicaidEnrolled2010	2010 Medicaid Enrolled
HealthStatistic2010	MortalityCount2010	2010 MortalityCount
HealthStatistic2010	PrenatalCare2010	2010 Prenatal Care
HealthStatistic2010	TeenBirths2010	2010 Teen Births
Historical	FocusArea1998	Focus Area
Historical	LowModerateBlockGroup2000	2000 Census Low-Moderate Block Groups - aligned - Community Development Block Group
Historical	UrbanInfillArea1998	1998 Urban Infill Area Line
Historical	UrbanInfillArea1998_poly	1998 Urban Infill Area polygon

Historical	Water1999	1999 Canals, Lakes, Streams and Coastline Planimetrics (Modified)
Historical	WaterP1999	Water Planimetrics derived from 1999 Aerial Photography
HistoricalPreservation	HistoricDistrict	Historic Districts
HistoricalPreservation	HistoricSite	Historic Preservation Areas
HistoricalProperty1990s	Property1999May	Property as of May 1999
HistoricalProperty2000s	Property2002Oct	Property as of October 2002
HistoricalProperty2000s	Property2003Oct	Property as of October 2003
HistoricalProperty2000s	Property2004Nov	Property as of November 2004
HistoricalProperty2000s	Property2005Oct	Property as of October 2005
HistoricalProperty2000s	Property2006Oct	Property as of October 2006
HistoricalProperty2000s	Property2007Oct	Property as of October 2007
HistoricalProperty2000s	Property2008Nov	Property as of November 2008
HistoricalProperty2000s	Property2009Jun	Property as of June 2009
HistoricalProperty2010s	Property2010Oct	Property as of October 2010

HistoricalProperty2010s	Property2011Nov	Property as of November 2011
HistoricalProperty2010s	Property2012Dec	Property as of December 2012
HistoricalProperty2010s	Property2013Jun	Property as of June 2013
HistoricalProperty2010s	Property2014Dec	Property (Parcel_poly) as of Dec 2014.
HistoricalProperty2010s	Property2015Dec	Property as of January 2016
HistoricalProperty2010s	Property2016Dec	Property as of December 2016
HistoricalProperty2010s	Property2017Dec	Property as of December 2017
Hydrology	Canal	Canals
Hydrology	Lake	Lakes
Hydrology	PrimaryCanalBasin	SFWMD Primary Canal Basin (CDMP Basin)
Hydrology	Stream	Streams

Hydrology	Water	Water (Canals, Lakes, Streams, and Coastline) Planimetrics Modified
Hydrology	WaterG	Water Planimetrics derived from 2012 Aerial Photography and water body to county limits (Generalized)
Hydrology	WaterP	Water Planimetrics derived from 2012 Aerial Photography
Hydrology/Historical	WaterP2007	Water Planimetrics derived from 2007 Aerial Photography
IndexBoundary	DMLIndex	DML Index Boundary
IndexBoundary	GISSection	GIS Section Boundary
IndexBoundary	STLIndex_poly	STL Index Boundary
IndexBoundary	Township	MDC Township Boundary
IndexBoundary	USNationalGrid	US National Grid System for Miami-Dade
IndexBoundary	USNationalGrid1K	US National Grid System 1 Kilometer Grid Sections for Miami-Dade
LandTopography	AmericanIndianLand	American Indian Lands and Native Entities in Florida
LandTopography	CoastalConstructionControlLine	Coastal Construction Control Line
LandTopography	Contour	Contour
LandTopography	CountyLandG	Miami-Dade County Land (Generalized)
LandTopography	Shoreline	Shoreline
LandTopography	SouthFloridaRegion	South Florida Region
LandTopography	USGS7Quad	USGS 7.5 minute Quad Sheet
LandTopography	USGSQuad	USGS Quads
LUMA	LUMALanduse	Existing Landuse derived from LandUse Mapping Application for the public.
MarineNavigationalAid	MarineBuoy	Marine Buoy within Miami-Dade County
MarineNavigationalAid	MarineObservationStation	Weather Marine Observation Station
MarineNavigationalAid	MarineTransportNavigationAid	Marine Transportation Navigation Aid

MarineNavigationalAid	MooringBuoy_poly	Mooring Buoy polygon
MarineNavigationalAid	PopularMarineInlet	Popular Marine Inlet in Miami Bay area
Miami_ParcelModel	Ease_line	Easement Lines
Miami_ParcelModel	Lot_line	Lot Lines
Miami_ParcelModel	Lot_poly	Lot Polygons
Miami_ParcelModel	Parcel_line	Parcel Lines
Miami_ParcelModel	Parcel_poly	Parcel Polygons
Miami_ParcelModel	Subd_line	Subdivision Lines
Miami_ParcelModel	Subd_poly	Subdivision Polygons
NOAA	HurricaneTrack	NOAA Hurricane track
ParkAdmin	ParkImpactFeeCollectionArea	Park Impact Fee Collection Area and Park Benefit Districts
PlanningZoning	BirdRoadDistrict	Bird Road Design & Industrial Zoning District as defined in Chapter 33 of the Zoning Code, Section 33-278 and reflected in Ordinance #09-71.
PlanningZoning	EastEvergladesMgtArea	East Everglades Management Areas under Chapter 33B (Zoning Overlay Ordinance) of the Zoning Code
PlanningZoning	MunicipalFutureLandUse	Municipal Future LandUse
PlanningZoning	PedestrianOrientedDevelopment	Pedestrian Oriented Development boundary entitle to Impact Fee reduction
PlanningZoning	RapidTransitZone	Rapid Transit Zone GIS layer
PlanningZoning	ROZABoundary	Rock Mining Overlay Zoning Area
PlanningZoning	UrbanDevelopmentBoundary	Urban Development Boundary
PoliceDept	MunicipalPoliceGrid	Municipal Police Grids
PoliceDept	MunicipalPoliceStation	Municipal Police Stations
PoliceDept	MunicipalPoliceStation_poly	Municipal Police Station boundary created using imagery
PoliceDept	PoliceCourtServiceZone	MDPD Court Service Zone
PoliceDept	PoliceDistrict	MDPD Police Districts

PoliceDept	PoliceDistrictUrban	MDPD Police Districts Urban Area
PoliceDept	PoliceGrid_poly	Miami-Dade Police Grids Boundaries
PoliceDept	PoliceGridUrban	Police Grids in Urban Area
PoliceDept	PoliceImpactFeeDistrict	Police Impact Fee District
PoliceDept	PolicePatrolArea	MDPD Police Patrol Areas
PoliceDept	PoliceStation	MDPD Police Stations
Ports	Port_Line	Air and Sea Ports Line
Ports	Port_poly	Air and Sea Ports Boundary
Ports	Ports	Air and Sea Ports
ProtectedLand	CoastalBarrierResourceSystem	Coastal Barrier Resources System (CBRS), designated undeveloped areas in accordance with the Coastal Barrier Resources Act
ProtectedLand	CriticalHabitat	US Fish and Wildlife Critical Habitat within Miami-Dade County
ProtectedLand	EELCovenant	Private properties with natural plant communities registered in the EEL Covenant program, which gives tax assessment for protecting these communities.
ProtectedLand	EELSite	DERM Environmentally Endangered Land Sites
ProtectedLand	NaturalForestCommunity	DERM Natural Forest Communities
ProtectedLand	NaturalForestCommunityCovenant	Private properties with natural forest communities. Trees cannot be removed without a permit.
ProtectedLand	Pineland1995	Pineland from 1995 study
ProtectedLand	SpecimenTreeCovenant	Properties with Specimen Trees which are protected by County code.
ProtectedLand	WellFieldProtectionArea	DERM Well Field Protection Areas
ProtectedLand	WetLandAOC	Wetland Area of Concern
ProtectedLand	WetlandBasin	Properties and areas that may contain wetlands defined by DERM
PublicSchool	ElementaryAttendanceBoundary	MDCPS Elementary Attendance Boundary

PublicSchool	HighAttendanceBoundary	MDCPS High Attendance Boundary
PublicSchool	MDCPSBusStop	Miami-Dade County Public School Bus Stops
PublicSchool	MiddleAttendanceBoundary	MDCPS Middle Attendance Boundary
PublicSchool	PreKAttendanceBoundary	MDCPS PreK Attendance Boundary
PublicSchool	SchoolImpactFeeDistrict	School Impact Fee District
PublicSchool	SchoolSite	Miami-Dade Public School sites
PublicWorks	Bridge	Bridges maintained by Public Works
PublicWorks	StreetMaint	Street Maintenance (Public Works)
Rails	MetroMover	MetroMover Routes
Rails	MetroMoverStations	MetroMover Stations
Rails	MetroRail	Metrorail Routes
Rails	MetroRailStations	Metrorail Stations
Rails	Rail	Railroads (Planimetric)
Rails	TriRail	Tri-Rail System
Recreational	Beach	Beach locations within Miami-Dade County
Recreational	Beach_poly	Beach location boundary within Miami-Dade County
Recreational	CountyOperatedPark	County Operated Park Locations
Recreational	CountyParkBoundary	County Operated Park Boundaries
Recreational	CultureVenue	Culture Venue managed by Miami-Dade County, Cultural Affairs
Recreational	GolfCourse	Golf Courses
Recreational	GolfCourse_poly	Golf Course boundary

Recreational	HotelMotelInn	Hotel, Motel and Inn Locations
Recreational	MajorMall	Major Malls
Recreational	MunicipalPark	Municipal Managed Park Locations
Recreational	MunicipalParkBoundary	Municipal Park Boundaries

Recreational	NatStateParkPreserve	National, State, Park Preserves
SpecialTaxingDistrict	CapitalImprovementSpTx	Capital Improvement within Special Taxing (Assessment) Districts
SpecialTaxingDistrict	CommunityDevelopmentDistrict	Community Development Districts
SpecialTaxingDistrict	MultipurposeMaintSpTxDistrict	Multipurpose Maintenance Special Taxing (Assessment) District boundary
SpecialTaxingDistrict	SecurityGuardHouseSpTx	Security Guard House locations within Special Taxing (Assessment) Districts
SpecialTaxingDistrict	SecurityGuardSpTxDistrict	Security Guard Special Taxing District boundary
SpecialTaxingDistrict	SpecialTaxingDistrictFolio	Property folio within Guard House, MultiPurpose and StreetLighting Special Taxing Districts
SpecialTaxingDistrict	StreetLightingSpTxDistrict	Street Lighting Special Taxing (Assessment) District boundary
SpecialTaxingDistrict	StreetLightingSpTxFixture	Street Lighting SpecialTaxing (Assessment District) Fixture location
SurveyControlPoint	HorizontalControlPoint	Surveyed Horizontal Control Points
SurveyControlPoint	VerticalControlPoint	Surveyed Vertical Control Points
TrafficAnalysis	TAD1992	1990 Traffic Analysis Districts
TrafficAnalysis	TAZ1992	1990 Traffic Analysis Zones
TrafficAnalysis	TAZ2000	2000 Traffic Analysis Zone
TrafficConcurrency	FDOTAnnualAvgDailyTraffic2014	FDOT Annual Average Daily Traffic 2014
TrafficConcurrency	MDCTrafficCountStation	Miami-Dade County, Traffic Count Station
TrafficConcurrencyHistorical	FDOTCountStation2014	FDOT Count Station provides Florida Portable Traffic Monitoring site information as of 2014
Transportation	BusRoutes	Bus Routes
Transportation	BusShelter	Miami-Dade County Bus Shelters
Transportation	BusStops	Bus Stops

Transportation	Highway	Main Highways
Transportation	MajorRoads	Major Streets & Highways
Transportation	RoadImpactFeeDistricts	Road Impact Fee Districts
Transportation	TPKMileMarkers	Turnpike Mile Markers
Transportation	TrafficSignals	Traffic Signals
UrbanCenter	UrbanCenter_poly	Urban Center boundaries
UrbanCenter	UrbanCenterDKendallStreetType	Downtown Kendall Urban Center Street Type
UrbanCenter	UrbanCenterOpenSpace	Open Space anchor points for Urban Centers and Urban Area Zoning Districts
UrbanCenter	UrbanCenterOpenSpaceArea	Open Space for Urban Center and Urban Area Zoning Districts
WASDCIS	CISCustomer	WASD Customer Information System Customer Location
WASDCIS	WSServicePoint	WASD CIS Customer Service location
WASDMaintenanceArea	PumpStationService	WASD Pump Station Service Areas
WASDPcts	PCTSLine	Project Control and Tracking System Lines
WASDPcts	PCTSLineCentroid	
WASDPsBasin	PumpStationBasin	WASD Pump Station Basin Areas
WASDSERVICEArea	SewerServiceArea	WASD Sewer Service Areas
WASDSERVICEArea	WaterServiceArea	WASD Water Service Areas
WASDStoryMap	WASDCapitalImprvProjectStoryMap	Miami-Dade Water and Sewer (WASD) Capital Improvement Projects Story Map locations
WASDUtilityDonation	WASDDonationSLine	Donations Sewer Lines
WASDUtilityDonation	WASDDonationSPoint	Donations Sewer Points
WASDUtilityDonation	WASDDonationWLine	Donations Water Lines
WasteManagement	DSWMServiceArea	Service Area for the Department of Solid Waste Management
WasteManagement	DumpSite	Solid Waste Management Sites (Landfill , Trash/Recycling Centers)

WasteManagement	GarbagePickupRoute	Solid Waste Management Garbage Pickup Route Boundaries
WasteManagement	RecyclingRoute	Curbside Recycling Route Boundaries
WasteManagement	RecyclingZone	Curbside Recycling Zones
WasteManagement	WCSArea	Waste Collection System Areas
WasteManagement	WCSBulkyBook	Waste Collection Service Bulky Books
WasteManagement	WCSDisposalFacilFeeAreaParcel	Waste Collection System (WCS) Disposal Facility Fee Area parcels
WasteManagement	WCSDisposalFeeFacilityArea	Disposal Fee Facility Area
WasteManagement	WCSZipcode	ZIPCode Zones used in WCS-GIS Daily batch jobs
Zoning_Model	MunicipalZone	Municipal Zones
Zoning_Model	Zone_poly_U	County zone boundaries and overlays derived from the Zoning
	BuildingPermit	Building Permits (Unincorporated)
	CCVIOL	Office of Neighborhood Code Compliance Violation Location
	Cemetery	Cemetery boundaries
	CommercialProperty	Commercial Property Locations
	DERMPermit	DERM Permit
	EOP_2001	2001 Edge of Pavement Lines
	EOP_cl_2001	2001 Edge of Pavement Centerlines
	GeoProp	Parcel Boundary with Geocoded Address Information
	Landmark_poly	Landmark boundaries
	LANDMRKS	Landmark locations
	MobileHome	Mobile Home & Trailer Park Locations
	PaGIS	Parcel location geoprocessed with Property Appraiser data

	PaParcel	Parcel boundary geoprocesed with Property Appraiser data

PermitsRequiringAllocation
Municipal Permits Requiring DERM Sanitary Sewer Capacity and WASD Water Supply Certifications
ROW_poly
Right of Way Polygons
SEXPRED
Sexual Predator Registered Address
SEXPRED_PROP
Parcel boundaries of the schools and daycares in the county used in the Sexual Predator Sexual Offender Residency
Search website
TreeAdoptionHistoryEvent_View
Tree Adoption History View
WASDAgreement
WASD New Customer Agreement SDE view
WASDLetterAvailability
WASD New Customer Letters of Availability SDE view
WASDOrdinanceLetter
WASD New Customer Ordinance Letter (Compliance letter for wholesale water and/or sewer customers development
for payment of connection charges)
WASDVerificationForm
WASD New Customer Verification Forms SDE view
ZipCode
ZIPCode Boundaries

EXHIBIT 7

CLOUD SERVICES USAGE POLICY

H.R. 5515

In accordance with US House of Representatives H.R. 5515 “National Defense Authorization Act for Fiscal Year 2019” House Bill, the Solution shall not utilize products or services from the manufacturers listed therein.

Use of Miami-Dade County Data and Systems:

1. **Access Control:** Miami-Dade County (MDC) employees, system users, contractors or those operating on their behalf are prohibited from incorporating or using AI-enabled services in such a way that Miami-Dade County data is uploaded or made available for data mining or usage. Uploading, copying, sharing, or transmitting any sensitive Miami-Dade created or managed data via methods or software not explicitly allowed are prohibited. This includes any PCI, PII, HIPAA, CJIS or other data that is created or managed by or on behalf of Miami-Dade County. Access controls are to be guided by the Miami-Dade County Enterprise Security Policy. The MDC Enterprise Security Policy is available to responsive bidders or upon request approved by the MDC Enterprise Security Office.
2. **Data Protection:** All data processed by Cloud-based or AI-enabled technologies must be protected from unauthorized access, theft, and misuse. Data must be encrypted in transit and at rest, and access controls should be in place to ensure that only authorized users can access the data. Data should be stored securely, and backups must be kept in a secure location. Usage of said data by the Cloud or AI provider must be communicated and agreed to, with consideration to transparency and with human oversight of use and potential abuse or misuse.
3. **Monitoring:** Any Cloud-based or AI-enabled technologies must be monitored for unusual activity or unauthorized access. Logs and alerts should be reviewed regularly, and security analytics should be used to identify potential threats.
4. **Vulnerability Management:** Any Cloud-based or AI-enabled technologies must be regularly assessed for vulnerabilities and weaknesses. Regular vulnerability scans and penetration testing must be conducted, and security assessments must be performed to identify areas of improvement.
5. **Incident Response:** Abuse or misuse to the extent that it engenders the security or privacy of Miami-Dade County citizens, users, data, personnel, or facilities must be reported according to the Miami-Dade County Enterprise Security Office Incident Response Plan.
6. **Training and Awareness:** All employees must receive training on the secure use of any Cloud-based or AI-enabled technologies. This should include best practices for data protection, access controls, and incident response.
7. **Compliance:** Any Cloud-based or AI-enabled technologies must be compliant with relevant laws and regulations, such as GDPR, HIPAA, and CCPA as well as compliant with Miami-Dade County Security Policy and the overall policies and procedures of Miami-Dade County. Regular audits should be conducted to ensure compliance.
8. **Risk Management:** A risk management program should be in place to identify and mitigate risks associated with the use of any Cloud-based or AI-enabled technologies. Risks should be regularly assessed, and appropriate controls should be put in place to mitigate those risks.
9. **Coordinated Vulnerability Disclosure:** Miami-Dade County follows a vulnerability disclosure model in which e is disclosed to the public only after the responsible parties have been allowed sufficient time to patch or remedy the vulnerability or issue.

Appendix No. B

Continuing Support Services (Maintenance and Support & Genfare Link Proration Plan)

For Phase 1, the parties agree that the acquisition and installation of Genfare provided Fare Collection Equipment for the South Dade Transitway shall be completed under Contract No. CIP1-155-DTPW19-DB, inclusive of a prorated initial year of Continuing Support Services in accordance with the provisions of Section 9 and prorated initial year of Subscription-based Licensed Software that conforms to the requirements for the MAS outlined within these Technical Specifications. Upon the expiration of such prorated initial year (September 30, 2025), the County will be invoiced for the next annual period (October 1, 2025 through September 30, 2026) per this contract.

In Phase 2, garage completion shall be used as the milestone payment for the equipment. Annual Continuing Support Services and Subscription-based Licensed Software charges will be divided by the number of garages (4), and prorated upon Beneficial Use for a completed garage to align to the established renewal date of October 1.

For example, if the Phase 2 maintenance and services charge was 800k, each garage would have a charge of 200k, to begin upon garage completion.

If the garages were completed in March, June, September, and November, the county would be billed for the prorated amount for 7, 4, 1, and 11 months (of the next year's rate) with each invoice. Then all Phase 1 and Phase 2 equipment would renew on the following October 1st.

The same approach will apply for Phase 3 equipment, with the milestone payment being the completion of a station/location. Once all hardware is installed, all County equipment will have an October 1st renewal date for Continuing Support Services and Subscription-based Licensed Software.

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Appendix No. B

FARE COLLECTION EQUIPMENT CONTRACT NO. RFP-EVN0001090

GENFARE - MIAMI-DTPW : Phase 1

Payment Milestones Phase 1:		Payment schedule	Contract value
P1-B2	Subscription based Licensed Software Fee		730,145.65
P1-B2.2	Year 2 - beginning 10/1/2025	139,513.99	
P1-B2.3	Year 3 - beginning 10/1/2026	143,965.26	
P1-B2.4	Year 4 - beginning 10/1/2027	148,560.70	
P1-B2.5	Year 5 - beginning 10/1/2028	151,508.37	
P1-B2.6	Year 6 - beginning 10/1/2029	146,597.33	
P1-F	Continuing Support Services -- Annual Maintenance and Services Charge		13,117,756.40
P1-F.2	Year 2 - beginning 10/1/2025	2,421,893.50	
P1-F.3	Year 3 - beginning 10/1/2026	2,518,769.24	
P1-F.4	Year 4 - beginning 10/1/2027	2,619,520.01	
P1-F.5	Year 5 - beginning 10/1/2028	2,724,300.81	
P1-F.6	Year 6 - beginning 10/1/2029	2,833,272.84	
Total Phase 1		13,847,902.05	13,847,902.05

Note: Amounts listed on this Milestone Payment Schedule relate to unit-priced items are based on the quantities shown in Appendix B-2 (Price Schedule). Per Article 10 of the Agreement, the quantity of unit-priced items are estimated and may vary and, as such, the milestone amounts may change due to variations in quantity of unit priced items.

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FARE COLLECTION EQUIPMENT CONTRACT NO. RFP-EVN0001090

GENFARE - MIAMI-DTPW : Phase 2 - Bus Fareboxes & Garages

Payment Milestones Phase 2:		Payment schedule		Contract value	Year 1 Phase 2
P1-A4 Installation testing Lab				319,878.45	319,878.45
P1-A4.1	Transfer of beneficial use Garage Equipment (22%)	95%	303,884.53		
P1-A4.2	Acceptance Phase 2	5%	15,993.92		
P1-A3 Equipment-Testing Lab (FB, Garages)				573,018.21	573,018.21
P1-A3.1	CDR submission	10%	57,301.82		
P1-A3.2	FDR approval	10%	57,301.82		
P1-A3.3	Beneficial Use milestone	75%	429,763.66		
P1-A3.4	Acceptance Phase 2	5%	28,650.91		
P2-A Equipment/Installation-Operation Center				845,509.04	845,509.04
P2-A.1	CDR submission	10%	84,550.90		
P2-A.2	FDR approval	10%	84,550.90		
P2-A.3	Transfer of Beneficial use	75%	634,131.78		
P2-A.4	Acceptance Phase 2	5%	42,275.45		
P2-A1 Equipment/Installation 3 garages				13,195,741.97	13,195,741.97
P2-A1.1	CDR submission	10%	1,319,574.20		
P2-A1.2	FDR approval	10%	1,319,574.20		
P2-A1.3	Beneficial use milestone per garage (billed by fare box at \$10,993.90/ea, # of fare boxes TBD)	75%	3,298,935.49		
P2-A1.4	Beneficial use milestone per garage (billed by fare box at \$10,993.90/ea, # of fare boxes TBD)	75%	3,298,935.49		
P2-A1.5	Beneficial use milestone per garage (billed by fare box at \$10,993.90/ea, # of fare boxes TBD)	75%	3,298,935.49		
P2-A1.7	Acceptance Phase 2	5%	659,787.10		
P2-B1 Genfare Link				793,297.42	793,297.42
P2-B1.1	FDR approval	40%	317,318.97		
P2-B1.2	UAT acceptance	60%	475,978.45		
P2-B2 Subscription based Licensed Software Fee		(billed at start of UAT, prorated to Oct 1)		1,313,314.04	
P2-B2.1	Contract Year 1 - ends 09/30/25 (not to exceed)*		203,461.05		203,461.05
P2-B2.2	Contract Year 2 - starts 10/1/25 (not to exceed)*		209,564.88		
P2-B2.3	Contract Year 3 - starts 10/1/26 (not to exceed)*		215,851.83		
P2-B2.4	Contract Year 4 - starts 10/1/27 (not to exceed)*		222,327.38		
P2-B2.5	Contract Year 5 - starts 10/1/28 (not to exceed)*		228,997.21		
P2-B2.6	Contract Year 6 - starts 10/1/29 (not to exceed)*		233,111.69		
P2-D Training & Documentation				42,000.00	42,000.00
P2-D.1	Approval of training documentations	50%	21,000.00		
P2-D.2	Completion of training (billed after completion of 1st garage beneficial use milestone)	50%	21,000.00		
P2-E1 Warranty 3 garages & operation center		(Billed annually on acceptance date)		592,207.87	
P2-E1.1	Year 1 - beginning after Acceptance Phase 2		197,402.62		197,402.62
P2-E1.2	Year 2 - beginning		197,402.62		
P2-E1.3	Year 3 - beginning		197,402.62		
P2-F Continuing Support Services -- Annual Maintenance and S		(billed at garage acceptance, prorated to Oct 1)		4,713,641.10	
P2-F.1	Contract Year 1 - ends 09/30/25 (not to exceed)^		710,637.50		710,637.50
P2-F.2	Contract Year 2 - starts 10/1/25 (not to exceed)^		739,063.00		
P2-F.3	Contract Year 3 - starts 10/1/26 (not to exceed)^		768,625.52		
P2-F.4	Contract Year 4 - starts 10/1/27 (not to exceed)^		799,370.54		
P2-F.5	Contract Year 5 - starts 10/1/28 (not to exceed)^		831,345.36		
P2-F.6	Contract Year 6 - starts 10/1/29 (not to exceed)^		864,599.18		
Total Phase 2				22,388,608.08	16,880,946.26

* Single invoiced, monthly-based proration per month to 10/1 invoiced on the first of the month following the start of User Acceptance Testing, according to the following table:

16,955.09 per month, up to 10/1/25
 17,463.74 per month, up to 10/1/26
 17,987.65 per month, up to 10/1/27

^ Single invoiced, monthly based proration per month, per garage to 10/1 invoiced on the first of the month following garage completion, according to the following table:

14,804.95 per month, per garage up to 10/1/25
 15,397.15 per month, per garage up to 10/1/26
 16,013.03 per month, per garage up to 10/1/27

Note: Amounts listed on this Milestone Payment Schedule relate to unit-priced items are based on the quantities shown in Appendix B-2 (Price Schedule). Per Article 10 of the Agreement, the quantity of unit-priced items are estimated and may vary and, as such, the milestone amounts may change due to variations in quantity of unit priced items.

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Appendix No. B

Appendix No. B

**FARE COLLECTION EQUIPMENT CONTRACT NO. RFP-EVN0001090
GENFARE - MIAMI-DTPW : Phase 3 - Rail Stations & TVMs**

Payment Milestones Phase 3:		Payment schedule		Contract value	Year 1 Phase 3
P3-A	Equipment/Installation-Rail station/Park & Ride			12,873,095.89	12,873,095.89
P3-A.1	CDR submission	10%	1,287,309.59		
P3-A.2	FDR approval	10%	1,287,309.59		
	Beneficial use milestone per rail station				
	Rail station ID				
P3-A.3	310 - Dadeland South	75%	710,297.99		
P3-A.4	300 - Dadeland North	75%	657,871.34		
P3-A.5	290 - South Miami	75%	354,427.34		
P3-A.6	280 - University	75%	241,024.94		
P3-A.7	270 - Douglas Road	75%	271,699.94		
P3-A.8	260 - Coconut Grove	75%	261,706.79		
P3-A.9	250 - Vizcaya	75%	220,343.09		
P3-A.10	240 - Brickell	75%	585,137.09		
P3-A.11	230 - Government Center	75%	1,023,735.15		
P3-A.12	220 - Overtown	75%	271,699.94		
P3-A.13	210 - Culmer	75%	294,147.14		
P3-A.14	200 - Civic Center	75%	459,976.19		
P3-A.15	190 - Santa Clara	75%	241,024.94		
P3-A.16	180 - Allapattah	75%	261,706.79		
P3-A.17	170 - Earlington Heights	75%	263,472.14		
P3-A.18	171 - MIC Rail Station	75%	772,343.55		
P3-A.19	160 - Brownsville	75%	241,024.94		
P3-A.20	150 - Martin Luther King	75%	261,706.79		
P3-A.21	140 - Northside	75%	261,706.79		
P3-A.22	130 - Tri-Rail	75%	270,630.14		
P3-A.23	120 - Hialeah	75%	261,706.79		
P3-A.24	110 - Okeechobee	75%	524,856.89		
P3-A.25	100 - Palmetto	75%	323,752.30		
	Beneficial use milestone group for Remote TVMs (up to 18 TVMs across up to 11 locations)				
P3-A.26	Remote TVMs - First 9	75%	309,411.51		
P3-A.27	Remote TVMs - Second 9	75%	309,411.50		
P3-A.28	Acceptance Phase 3	5%	643,654.70		
P3-E	FG & TVM warranty			1,284,515.62	
	Rail station ID				
P3-E.1	Year 1	1	428,171.88		428,171.88
P3-E.2	Year 2	1	428,171.87		
P3-E.3	Year 3	1	428,171.87		
	3 year warranty - billed yearly from the date of phase acceptance, or from the extent that the county has had Beneficial Use of any installed equipment for 6 months.				
P3-B1	Genfare Link			771,987.50	771,987.50
P3-B1.1	FDR approval	40%	308,795.00		
P3-B1.2	UAT acceptance	60%	463,192.50		
P3-B2	Subscription based Licensed Software Fee (billed at start of UAT, prorated to Oct 1)			1,368,466.20	
P3-B2.1	Contract Year 1 - ends 09/30/25 (not to exceed)*		211,238.38		211,238.38
P3-B2.2	Contract Year 2 - starts 10/1/25 (not to exceed)*		217,575.53		
P3-B2.3	Contract Year 3 - starts 10/1/26 (not to exceed)*		224,102.79		
P3-B2.4	Contract Year 4 - starts 10/1/27 (not to exceed)*		230,825.88		
P3-B2.5	Contract Year 5 - starts 10/1/28 (not to exceed)*		237,750.65		
P3-B2.6	Contract Year 6 - starts 10/1/29 (not to exceed)*		246,972.97		
P3-D	Training & documentation			26,585.00	26,585.00
P3-D.1	Approval of training documentations	50%	13,292.50		
P3-D.2	Completion of training (billed after completion of 1st station beneficial use milestone)	50%	13,292.50		
P3-F	Continuing Support Services -- Annual Milestones (at transfer of beneficial use per station)			4,510,174.58	
P3-F.1	Contract Year 1 - ends 09/30/25 (not to exceed)^		679,962.50		679,962.50
P3-F.2	Contract Year 2 - starts 10/1/25 (not to exceed)^		707,161.00		
P3-F.3	Contract Year 3 - starts 10/1/26 (not to exceed)^		735,447.44		
P3-F.4	Contract Year 4 - starts 10/1/27 (not to exceed)^		764,865.34		
P3-F.5	Contract Year 5 - starts 10/1/28 (not to exceed)^		795,459.95		
P3-F.6	Contract Year 6 - starts 10/1/29 (not to exceed)^		827,278.35		
Total Phase 3			20,834,824.79	20,834,824.79	14,991,041.15

* Single invoiced, monthly-based proration per month to 10/1 invoiced on the first of the month following the start of User Acceptance Testing, according to the following table:
18,131.29 per month, up to 10/1/26
18,675.23 per month, up to 10/1/27

^ Single invoiced, monthly based proration per month, per station to 10/1 invoiced on the first of the month following station completion, according to the following table:
2,357.20 per month, per station up to 10/1/26
2,451.49 per month, per station up to 10/1/27

Note: Amounts listed on this Milestone Payment Schedule relate to unit-priced items are based on the quantities shown in Appendix B-2 (Price Schedule). Per Article 10 of the Agreement, the quantity of unit-priced items are estimated and may vary and, as such, the milestone amounts may change due to variations in quantity of unit priced items.

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Appendix No. B

Appendix No. B FARE COLLECTION EQUIPMENT CONTRACT NO. RFP-EVN0001090

GENFARE - MIAMI-DTPW : Phase 1

Annual Percent Increase - Item Nos. 1 through 13 (Not to Exceed 5%): 3%

Category	Miami Item No.	Scope Category	Payment Code	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Notes
software	18	Ongoing MAS Services	P1-B2	Includes annual subscription for Genfare Link (MAS), software support agreement	1	Year 2	139,513.99	139,513.99	
software	19	Ongoing MAS Services	P1-B2	Includes annual subscription for Genfare Link (MAS), software support agreement	1	Year 3	143,965.26	143,965.26	
software	20	Ongoing MAS Services	P1-B2	Includes annual subscription for Genfare Link (MAS), software support agreement	1	Year 4	148,560.70	148,560.70	
software	21	Ongoing MAS Services	P1-B2	Includes annual subscription for Genfare Link (MAS), software support agreement	1	Year 5	151,508.37	151,508.37	
software	22	Ongoing MAS Services	P1-B2	Includes annual subscription for Genfare Link (MAS), software support agreement	1	Year 6	146,597.33	146,597.33	
maintenance	34	Annual Maintenance and Services Charge	P1-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 2	2,421,893.50	2,421,893.50	
maintenance	35	Annual Maintenance and Services Charge	P1-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 3	2,518,769.24	2,518,769.24	
maintenance	36	Annual Maintenance and Services Charge	P1-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 4	2,619,520.01	2,619,520.01	
maintenance	37	Annual Maintenance and Services Charge	P1-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 5	2,724,300.81	2,724,300.81	
maintenance	38	Annual Maintenance and Services Charge	P1-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 6	2,833,272.84	2,833,272.84	
Total Phase 1								13,847,902.05	

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Appendix No. B

Appendix No. B FARE COLLECTION EQUIPMENT CONTRACT NO. RFP-EVN0001090

GENFARE - MIAMI-DTPW : Phase 2 - Bus Fareboxes & Garages

Annual Percent Increase - Item Nos. 1 through 20 (Not to Exceed 5%): 3%

Category	Miami Item No.	Scope Category	Payment Code	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Notes
equipment	P1-39	Fare Collection Equipment (maint testing lab)	P1-A3	FBS Garage Device (Any hardware required for on-premise FBS) - (Proposer to insert further description)	3	EA	52,709.88	158,129.63	Warranty included
equipment	P1-40	Fare Collection Equipment (maint testing lab)	P1-A3	Electronic Verifying Cash-Only Farebox w/Cashbox - Training and Testing Only	18	EA	13,292.50	239,265.00	Warranty included
equipment	P1-41	Fare Collection Equipment (maint testing lab)	P1-A3	Standalone Revenue Receiver with Vault, Housing and one Mobile Safe (Bin) - Training and Testing Only	3	EA	47,579.99	142,739.98	Warranty included
equipment	P1-42	Fare Collection Equipment (maint testing lab)	P1-A3	Data Probes and Cabling Hardware Per Revenue Receiver (Proposer to insert further description)	3	EA	10,961.20	32,883.60	Warranty included
installation	P1-47	Installation Testing Lab	P1-A4	Maintenance Testing Lab Installation, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	1	EA	410,100.58	319,878.45	Farebox and Vault part of the lab
equipment	1	Farebox	P2-A1	FBS Garage Device (Any hardware required for on-premise FBS) - (Proposer to insert further description)	3	EA	45,501.25	136,503.75	NE,CW, CE
equipment	2	Farebox	P2-A1	Electronic Verifying Cash-Only Farebox w/Cashbox	900	EA	12,781.25	11,503,125.00	NE,CW, CE
equipment	3	Farebox	P2-A1	Standalone Revenue Receiver with Vault, Housing and one Mobile Safe (Bin)	9	EA	47,579.99	428,219.93	NE,CW, CE
equipment	4	Farebox	P2-A1	Data Probes and Cabling Hardware Per Revenue Receiver - (Proposer to insert further description)	9	EA	10,961.20	98,650.80	NE,CW, CE
equipment	5	Farebox	P2-A1	Portable Farebox Probe Equipment - (Proposer to insert further description)	3	EA	21,983.75	65,951.25	NE,CW, CE
equipment	5	Farebox	P2-A1	Portable Farebox Probe Equipment - (Proposer to insert further description)	1	EA	21,983.75	21,983.75	NE,CW, CE
equipment	6	Farebox	P2-A1	Cashbox Transport Carts	9	EA	1,533.75	13,803.75	NE,CW, CE
equipment	7	Farebox	P2-A	FBS Garage Device (Any hardware required for on-premise FBS) - (Proposer to insert further description) - South Dade Transitway Operations Center	1	EA	45,501.25	45,501.25	BRT Garage - Operation Ctr
equipment	8	Farebox	P2-A	Electronic Verifying Cash-Only Farebox w/Cashbox - South Dade Transitway Bus Fleet	40	EA	12,781.25	511,250.00	BRT Garage - Operation Ctr
equipment	9	Farebox	P2-A	Standalone Revenue Receiver with Vault, Housing and one Mobile Safe (Bin) - South Dade Transitway Operations Center	3	EA	47,579.99	142,739.98	BRT Garage - Operation Ctr
equipment	10	Farebox	P2-A	Data Probes and Cabling Hardware Per Revenue Receiver - (Proposer to insert further description) - South Dade Transitway Operations Center	3	EA	10,961.20	32,883.60	BRT Garage - Operation Ctr
equipment	11	Farebox	P2-A	Portable Farebox Probe Equipment - (Proposer to insert further description) - South Dade Transitway Operations Center	2	EA	21,983.75	43,967.50	BRT Garage - Operation Ctr
equipment	12	Farebox	P2-A1	Cashbox Transport Carts - - South Dade Transitway Operations Center	3	EA	1,533.75	4,601.25	BRT Garage - Operation Ctr
software	21	FareBox Backend System	P2-B1	Genfare Link (configured for the farebox)	1	Configuration Fee	506,997.42	506,997.42	
software	22	FareBox Backend System	P2-B1	Program Management	1	Implementation Fee	286,300.00	286,300.00	
software	28	Ongoing FBS Services	P2-B2	Includes annual subscription for Genfare Link (FBS), software support agreement	1	Year 1 - Prorated to 10/1 begin upon completion of implementation	203,461.05	203,461.05	
software	29	FareBox Backend System	P2-B2	Includes annual subscription for Genfare Link (FBS), software support agreement	1	Year 2	209,564.88	209,564.88	
software	30	FareBox Backend System	P2-B2	Includes annual subscription for Genfare Link (FBS), software support agreement	1	Year 3	215,851.83	215,851.83	
software	31	FareBox Backend System	P2-B2	Includes annual subscription for Genfare Link (FBS), software support agreement	1	Year 4	222,327.38	222,327.38	
software	32	FareBox Backend System	P2-B2	Includes annual subscription for Genfare Link (FBS), software support agreement	1	Year 5	228,997.21	228,997.21	
software	33	FareBox Backend System	P2-B2	Includes annual subscription for Genfare Link (FBS), software support agreement	1	Year 6	233,111.69	233,111.69	
documentation	34	Training and Documentation	P2-D	Training and Documentation	1	All	42,000.00	42,000.00	
installation	35	Installation	P2-A1	FBS Garage Installation - Inclusive of ALL costs and components required for Farebox operations (i.e. infrastructure/civil work, project management, overhead, etc.) excluding any components which require installation on buses	3	Per Garage	32,479.41	97,438.24	NE,CW, CE
installation	36	Installation	P2-A	FBS Garage Installation - Inclusive of ALL costs and components required for Farebox operations (i.e. infrastructure/civil work, project management, overhead, etc.) excluding any components which require installation on buses - South Dade Transitway Operations Center	1	Per Location	32,479.41	32,479.41	BRT Garage - Operation Ctr
installation	37	Installation	P2-A1	Electronic Verifying Cash-Only Farebox w/Cashbox Installation - Inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	900	Per Bus	917.18	825,464.25	NE,CW, CE

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Appendix No. B FARE COLLECTION EQUIPMENT CONTRACT NO. RFP-EVN0001090

GENFARE - MIAMI-DTPW : Phase 2 - Bus Fareboxes & Garages

Annual Percent Increase - Item Nos. 1 through 20 (Not to Exceed 5%): 3%

Category	Miami Item No.	Scope Category	Payment Code	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Notes
installation	38	Installation	P2-A	Electronic Verifying Cash-Only Farebox w/Cashbox Installation - Inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.) - South Dade Transitway Bus Fleet	40	Per Bus	917.18	36,687.30	BRT Garage - Operation Ctr
warranty	40	Farebox Warranty	P2-E1	FBS Garage Device (Any hardware required for on-premise FBS) - 3 years	3	EA	2,730.08	8,190.22	NE,CW, CE
warranty	40	Farebox Warranty	P2-E1	FBS Garage Device (Any hardware required for on-premise FBS) - 3 years	1	EA	2,730.08	2,730.08	BRT Garage - Operation Ctr
warranty	41	Farebox Warranty	P2-E1	Electronic Verifying Cash-Only Farebox w/Cashbox - 3 years	900	EA	575.16	517,640.63	NE,CW, CE
warranty	41	Farebox Warranty	P2-E1	Electronic Verifying Cash-Only Farebox w/Cashbox - 3 years	40	EA	575.16	23,006.25	BRT Garage - Operation Ctr
warranty	42	Farebox Warranty	P2-E1	Standalone Revenue Receiver with Vault, Housing and one Mobile Safe (Bin) - 3 years	9	EA	2,860.14	25,741.23	NE,CW, CE
warranty	42	Farebox Warranty	P2-E1	Standalone Revenue Receiver with Vault, Housing and one Mobile Safe (Bin) - 3 years	3	EA	2,860.14	8,580.41	BRT Garage - Operation Ctr
warranty	43	Farebox Warranty	P2-E1	Data Probes and Cabling Hardware Per Revenue Receiver - (Proposer to insert further description) - 3 years	9	EA	102.25	920.25	NE,CW, CE
warranty	43	Farebox Warranty	P2-E1	Data Probes and Cabling Hardware Per Revenue Receiver - (Proposer to insert further description) - 3 years	3	EA	102.25	306.75	BRT Garage - Operation Ctr
warranty	44	Farebox Warranty	P2-E1	Portable Farebox Probe Equipment (Proposer to insert further description) - 3 years	3	EA	439.68	1,319.02	NE,CW, CE
warranty	44	Farebox Warranty	P2-E1	Portable Farebox Probe Equipment (Proposer to insert further description) - 3 years	2	EA	439.68	879.35	BRT Garage - Operation Ctr
warranty	44	Farebox Warranty	P2-E1	Portable Farebox Probe Equipment (Proposer to insert further description) - 3 years	1	EA	439.68	439.68	NE,CW, CE
warranty	45	Farebox Warranty	P2-E1	Cashbox Transport Carts - 3 years	12	EA	204.50	2,454.00	
maintenance	46	Annual Maintenance and Services Charge	P2-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 1 - Prorated to begin upon completion of implementation	710,637.50	710,637.50	
maintenance	47	Annual Maintenance and Services Charge	P2-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 2	739,063.00	739,063.00	
maintenance	48	Annual Maintenance and Services Charge	P2-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 3	768,625.52	768,625.52	
maintenance	49	Annual Maintenance and Services Charge	P2-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 4	799,370.54	799,370.54	
maintenance	50	Annual Maintenance and Services Charge	P2-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 5	831,345.36	831,345.36	
maintenance	51	Annual Maintenance and Services Charge	P2-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 6	864,599.18	864,599.18	
Total Phase 2								22,388,608.10	

FARE COLLECTION EQUIPMENT CONTRACT NO. RFP-EVN0001090

Appendix No. B

Appendix No. B FARE COLLECTION EQUIPMENT CONTRACT NO. RFP-EVN0001090
GENFARE - MIAMI-DTPW : Phase 3 - Rail Stations & TVMs

Annual Percent Increase - Item Nos. 1 through 13 (Not to Exceed 5%): 3%

Category	Miami Item No.	Scope Category	Payment Code	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Notes
equipment	1	Fare Gate	P3-A	Type 1 - Right End console, Type 1 (1 long paddle on the left side and only CSCR for entry	74	EA	21,626.90	1,600,390.42	
equipment	2	Fare Gate	P3-A	Type 2 Accessible console with 2 long paddle or panel and CSCRs for entry	122	EA	27,575.80	3,364,247.91	
equipment	3	Fare Gate	P3-A	Type 3 Left end console with 1 long paddle or panel and no CSCR	74	EA	21,626.90	1,600,390.42	
equipment	4	Ticket Vending Machine	P3-A	Full Service Ticket Vending Machine	120	EA	40,900.00	4,908,000.00	
software	14	Monitoring and Alerting System (MAS)	P3-B1	Genfare Link (configured to MAS requirements)	1	Genfare Link (configured to MAS requirements)	485,687.50	485,687.50	
software	15	Monitoring and Alerting System (MAS)	P3-B1	Program Management	1	Program Management	286,300.00	286,300.00	
software	17	Ongoing MAS Services	P3-B2	Annual Subscription and Software Support Agreement	1	Year 1 - Prorated to begin upon completion of implementation	211,238.38	211,238.38	
software	18	Ongoing MAS Services	P3-B2	Annual Subscription and Software Support Agreement	1	Year 2	217,575.53	217,575.53	
software	19	Ongoing MAS Services	P3-B2	Annual Subscription and Software Support Agreement	1	Year 3	224,102.79	224,102.79	
software	20	Ongoing MAS Services	P3-B2	Annual Subscription and Software Support Agreement	1	Year 4	230,825.88	230,825.88	
software	21	Ongoing MAS Services	P3-B2	Annual Subscription and Software Support Agreement	1	Year 5	237,750.65	237,750.65	
software	22	Ongoing MAS Services	P3-B2	Annual Subscription and Software Support Agreement	1	Year 6	246,972.97	246,972.97	
documentation	23	Training and Documentation	P3-D	Training and Documentation	1	All	26,585.00	26,585.00	
installation	24	Installation	P3-A	6 Stations, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	6	Per Station	57,007.38	342,044.29	
installation	25	Installation	P3-A	6 Stations, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	6	Per Station	57,007.38	342,044.29	
installation	26	Installation	P3-A	6 Stations, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	6	Per Station	57,007.38	342,044.29	
installation	27	Installation	P3-A	5 Stations, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	5	Per Station	57,007.38	285,036.91	
installation	28	Installation	P3-A	11 Park and Ride Locations - TVM Installation, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	11	Per Location	8,081.58	88,897.35	
warranty	30	Fare Gate Warranty	P3-E	Type 1 Devices 3 Years	74	EA	1,917.19	141,871.88	
warranty	31	Fare Gate Warranty	P3-E	Type 2 Devices 3 Years	122	EA	1,917.19	233,896.87	
warranty	32	Fare Gate Warranty	P3-E	Type 3 Devices 3 Years	74	EA	1,917.19	141,871.88	
warranty	33	Ticket Vending Machine Warranty	P3-E	3 Years	120	EA	6,390.63	766,875.00	
maintenance	34	Annual Maintenance and	P3-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 1 - Prorated to begin upon completion of implementation	679,962.50	679,962.50	
maintenance	35	Annual Maintenance and	P3-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 2	707,161.00	707,161.00	
maintenance	36	Annual Maintenance and	P3-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 3	735,447.44	735,447.44	
maintenance	37	Annual Maintenance and	P3-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 4	764,865.34	764,865.34	
maintenance	38	Annual Maintenance and	P3-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 5	795,459.95	795,459.95	
maintenance	39	Annual Maintenance and	P3-F	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 6	827,278.35	827,278.35	
Total Phase 3								20,834,824.79	

Attachment B1 – Sample Template Milestone Completion Report

This document ("Milestone Completion Report") confirms that the Contractor has completed the task(s) identified in the table below to an acceptable quality level as determined by the Contract between the County and the Contractor

Milestone Name: Station Grouping 1	Date Completed
Deliverable 1: TVMs Qty 10	
Deliverable 2: Station 1 Installation	
Deliverable 3: Right End Fare Gate Qty 10	
Deliverable 4: Station 2 Installation	

By signing this document, I acknowledge that the stated tasks were completed on the stated date and any deliverable(s) are of agreed quality levels per the Contract. Acceptance is **not** assumed if the document remains unsigned by either party for more than ten (10) business days after date of first signature.

Acceptance Granted:

	Contractor	Miami-Dade County
Printed Name		
Signature		
Job Title		
Date		

Conditional Acceptance Granted:

(To be completed in the event of Conditional Acceptance of any Deliverable(s) associated with this Milestone)

Description of Conditional Acceptance (to be completed by the County): (Include a description of what must be submitted in order to achieve partial payment and pending actions to be taken to complete the Deliverable(s) to achieve Acceptance)

Partial Payment
Amount:

	Contractor	Miami-Dade County
Printed Name		
Signature		
Job Title		
Date		

Contractor Name: _____

Genfare, LLC

Appendix B-2

	CONTRACT NO. EVN0001090 PRICE SCHEDULE FARE COLLECTION EQUIPMENT

SUMMARY OF PRICING REQUIREMENTS	
Item No.	A. General Requirements
1	The estimated quantities shown are approximate and represent estimated quantities based on historical or comparable project needs. The County reserves the right to increase, or decrease the quantities, or to delete any of the items for which there is no need throughout the term of the Contract.
2	Unit prices are inclusive of all labor, material, equipment, overhead, profit, and out-of-pocket expenses required to furnish and install items identified.
3	The Total Proposal Price shall represent the Contractor's total price offer to the County. The Contractor shall not be entitled to an amount for compensation in excess of the Total Proposal Prices, except as amended by an executed contract modification.
Item No.	B. Pricing Requirements for Tabs C1 through C6
4	Form C1, C2, C3, and C4 – Unit Prices – These forms are listing of equipment and services that are reflected as unit price items. Unit prices are defined as the cost per single unit for each item. When the item's estimated quantity is "Lump Sum" this quantity amount is equal to a single unit. The County will complete payment for items under C4 on an as-needed basis. The County shall determine an appropriate funding allowance to be incorporated into the Contract award to be used for the purchase of parts. This does not eliminate the obligation of the Contractor to maintain a spare parts inventory in accordance with the Technical Specifications.
5	Form C1, Item No. 27 - Given that the Fare Collection Application provider will not yet be identified as of the Award Date, Tab C-1, Phase 1, Item No. 27 required an hourly rate. Fare Collection Application Interface/Integration Development and Deployment has a fixed number of hours (200).
6	Form C5 – Labor Rates – Contractor provided the billable hourly rates for key specialized labor categories that will be used to support the full deployment. Labor rates are fully loaded, inclusive of benefits, overhead, profit, and out-of-pocket expenses.
Item No.	Based on the tally of total pricing from Forms C1, C2, and C3 the total proposal price offered by the Proposer is as follows:
7	Proposal Price: \$57,071,334.96

FORM C1 - PHASE 1							
Total (Item Nos 14 through 16):				#REF!			
Item No.	Scope Category	Description - Contractor to define recurring cost based upon Licensing Model (i.e. Annual Subscription Cost, Annual Support and Maintenance Cost, etc.)	Proposed Quantity - Contractor to list quantity required to meet the technical specifications based on License Type	Unit	Unit Price	Item Total	Comments
18		Annual Subscription and Software Support Agreement	1	Year 2	\$139,513.99	\$139,513.99	Includes annual subscription for Genfare Link (MAS), software support agreement
19		Annual Subscription and Software Support Agreement	1	Year 3	\$143,965.26	\$143,965.26	Includes annual subscription for Genfare Link (MAS), software support agreement
20		Annual Subscription and Software Support Agreement	1	Year 4	\$148,560.70	\$148,560.70	Includes annual subscription for Genfare Link (MAS), software support agreement
21		Annual Subscription and Software Support Agreement	1	Year 5	\$151,508.37	\$151,508.37	Includes annual subscription for Genfare Link (MAS), software support agreement
22		Annual Subscription and Software Support Agreement	1	Year 6	\$146,597.33	\$146,597.33	Includes annual subscription for Genfare Link (MAS), software support agreement
Total (Item Nos 17 through 22):						\$730,145.66	
34		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 2	\$2,421,893.50	\$2,421,893.50	
35		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 3	\$2,518,769.24	\$2,518,769.24	
36		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 4	\$2,619,520.01	\$2,619,520.01	
37		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 5	\$2,724,300.81	\$2,724,300.81	
38		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 6	\$2,833,272.84	\$2,833,272.84	
Total (Item Nos 29 through 38):						\$13,117,756.40	
Total Phase 1:						\$13,847,902.07	

FORM C2 - PHASE 2						
Fare Collection Equipment - Hardware						
Annual Percent Increase - Item Nos. 1 through 20 (Not to Exceed 5%)			3%			
Item No.	Scope Category	Item Description	Estimated Quantity	Units	Unit Price	Item Total
1	Farebox	FBS Garage Device (Any hardware required for on-premise FBS) - (GDS)	3	EA	\$45,501.25	\$136,503.75
2		Electronic Verifying Cash-Only Farebox w/ Cashbox	900	EA	\$12,781.25	\$11,503,125.00
3		Standalone Revenue Receiver with Vault, Housing and one Mobile Safe (Bin)	9	EA	\$47,579.99	\$428,219.93
4		Data Probes and Cabling Hardware Per Revenue Receiver - (6 new net probes since 3 are included with the vaults from Phase 1)	9	EA	\$10,981.20	\$98,650.80
5		Portable Farebox Probe Equipment - (4 new PDU's)	4	EA	\$21,983.75	\$87,995.00
6		Cashbox Transport Carts	9	EA	\$1,533.75	\$13,803.75
7		FBS Garage Device (Any hardware required for on-premise FBS) - (GDS and PDU) - South Dade Transitway Operations Center	1	EA	\$45,501.25	\$45,501.25
8		Electronic Verifying Cash-Only Farebox w/ Cashbox - South Dade Transitway Bus Fleet	40	EA	\$12,781.25	\$511,250.00
9		Standalone Revenue Receiver with Vault, Housing and one Mobile Safe (Bin) - South Dade Transitway Operations Center	3	EA	\$47,579.99	\$142,739.98
10		Data Probes and Cabling Hardware Per Revenue Receiver - (6 new net probes) - South Dade Transitway Operations Center	3	EA	\$10,981.20	\$32,883.60
11		Portable Farebox Probe Equipment - (2 new PDU's) - South Dade Transitway Operations Center	2	EA	\$21,983.75	\$43,967.50
12		Cashbox Transport Carts - - South Dade Transitway Operations Center	3	EA	\$1,533.75	\$4,601.25
13	Ancillary Equipment - Contractor to describe any other equipment required to deliver the functionality outlined in the Technical Specifications	(Contractor to Insert description)	0	EA	\$0.00	\$0.00
14		(Contractor to Insert description)	0	EA	\$0.00	\$0.00
15		(Contractor to Insert description)	0	EA	\$0.00	\$0.00
16		(Contractor to Insert description)	0	EA	\$0.00	\$0.00
17		(Contractor to Insert description)	0	EA	\$0.00	\$0.00
18		(Contractor to Insert description)	0	EA	\$0.00	\$0.00
19		(Contractor to Insert description)	0	EA	\$0.00	\$0.00
20		(Contractor to Insert description)	0	EA	\$0.00	\$0.00
Total (Item Nos 1 through 20):					\$13,049,181.81	
Fare Collection Equipment - Software						
Item No.	Scope Category	Description - Software Product Name, Version, Licensing Model (i.e. Hosted Subscription, On-premises, Annual, Perpetual, etc.)	Proposed Quantity - Contractor to list quantity required to meet the technical specifications based on License type	License Type / Description - Contractor to explain type of license proposed (i.e. Site, Per User, Per Device, Concurrent, etc.)	Unit Price	Item Total
21	FareBox Backend System	Genfare Link (configured for the farebox)	1	Configuration Fee	\$506,997.42	\$506,997.42
22		Program Management	1	Implementation Fee	\$286,300.00	\$286,300.00
23		(Contractor to Insert description)	0		\$0.00	\$0.00
24		(Contractor to Insert description)	0		\$0.00	\$0.00
25		(Contractor to Insert description)	0		\$0.00	\$0.00
26		(Contractor to Insert description)	0		\$0.00	\$0.00

27	(Contractor to insert description)					0	\$0.00	\$0.00	\$0.00	
Total (Item Nos 21 through 27):										
	Scope Category	Description - Contractor to define recurring cost based upon Licensing Model (i.e. Annual Subscription Cost, Annual Support and Maintenance Cost, etc.)	Proposed Quantity - Contractor to list quantity required to meet the technical specifications based on License Type	Unit	Unit Price	Item Total	Comments			
28	Ongoing FBS Services	Annual Subscription and Software Support Agreement	1	Year 1 - Prorated to begin upon completion of implementation	\$203,461.05	\$203,461.05	Includes annual subscription for Genfare Link (FBS), software support agreement			
29		Annual Subscription and Software Support Agreement	1	Year 2	\$209,564.88	\$209,564.88	Includes annual subscription for Genfare Link (FBS), software support agreement			
30		Annual Subscription and Software Support Agreement	1	Year 3	\$215,851.83	\$215,851.83	Includes annual subscription for Genfare Link (FBS), software support agreement			
31		Annual Subscription and Software Support Agreement	1	Year 4	\$222,327.38	\$222,327.38	Includes annual subscription for Genfare Link (FBS), software support agreement			
32		Annual Subscription and Software Support Agreement	1	Year 5	\$228,997.21	\$228,997.21	Includes annual subscription for Genfare Link (FBS), software support agreement			
33		Annual Subscription and Software Support Agreement	1	Year 6	\$233,111.69	\$233,111.69	Includes annual subscription for Genfare Link (FBS), software support agreement			
Total (Item Nos 28 through 33):										
	Fare Collection Equipment - Training									
Item No.	Scope Category	Item Description	Estimated Quantity	Units	Total Price	Comments				
34	Training and Documentation	Training and Documentation	1	All	\$42,000.00					
Fare Collection Equipment - Installation										
Item No.	Scope Category	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Comments			
35	Installation	FBS Garage Installation - Inclusive of ALL costs and components required for Farebox operations (i.e. infrastructure/civil work, project management, overhead, etc.) excluding any components which require installation on buses	3	Per Garage	\$32,479.41	\$97,438.24				
36		FBS Garage Installation - Inclusive of ALL costs and components required for Farebox operations (i.e. infrastructure/civil work, project management, overhead, etc.) excluding any components which require installation on buses - South Dade Transitway Operations Center	1	Per Location	\$32,479.41	\$32,479.41				
37		Electronic Verifying Cash-Only Farebox w/Cashbox Installation - Inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	900	Per Bus	\$917.18	\$825,464.25				
38		Electronic Verifying Cash-Only Farebox w/Cashbox Installation - Inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.) - South Dade Transitway Bus Fleet	40	Per Bus	\$917.18	\$36,687.30				
39	(A) Percentage of Installation Unit Price (Item Nos 35 through 38) - Trade Labor (subject to a CPI adjustment, in accordance with Article 9 of the Agreement):		74%	(B) Percentage of Installation Unit Price (Item Nos. 35 through 38) - Non-trade labor, project management, equipment (hand tools), overhead, profit, out of pocket expenses, and other applicable costs (Not subject to any adjustment):		26%	Note: The total of the two percentages provided shall equal 100%.			
Total (Item Nos 35 through 38):										
Fare Collection Equipment - Services										
Item No.	Scope Category	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Comments			
40	Farebox Warranty	FBS Garage Device (Any hardware required for on-premise FBS) - 3 years	4	EA	\$2730.08	\$10,920.30				
41		Electronic Verifying Cash-Only Farebox w/Cashbox - 3 years	940	EA	\$575.16	\$540,646.88				
42		Standalone Revenue Receiver with Vault, Housing and one Mobile Safe (Bin) - 3 years	12	EA	\$2,860.14	\$34,321.64				
43		Data Probes and Cabling Hardware Per Revenue Receiver - (Contractor to insert further description) - 3 years	12	EA	\$102.25	\$1,227.00				
44		Portable Farebox Probe Equipment (Contractor to insert further description) - 3 years	6	EA	\$439.68	\$2,638.05				
45		Cashbox Transport Carts - 3 years	12	EA	\$204.50	\$2,454.00				
46	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications		1	Year 1 - Prorated to begin upon completion of implementation	\$710,637.50	\$710,637.50				

47	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 2	\$739,063.00	\$739,063.00	
48	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 3	\$766,625.52	\$766,625.52	
49	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 4	\$799,370.54	\$799,370.54	
50	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 5	\$831,345.36	\$831,345.36	
51	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 6	\$864,599.18	\$864,599.18	
Total (Item Nos 40 through 51):						\$5,305,848.97
Maintenance Testing Lab						
52	FBS Garage Device (Any hardware required for on-premise FBS) - (includes Virtual GDS and PDU)	3	EA	\$52,709.88	\$158,129.63	3 Virtual GDS + 3 PDU
53	Electronic Verifying Cash-Only Farebox w/Cashbox - Training and Testing Only	18	EA	\$13,292.50	\$239,265.00	18 Fareboxes set up for UAT
54	Standalone Revenue Receiver with Vault, Housing and one Mobile Safe (Bin) - Training and Testing Only	3	EA	\$47,579.99	\$142,739.98	3 full mobile vaults include 3 bins
55	Data Probes and Cabling Hardware Per Revenue Receiver (3 vaults, 3 probes, need 6 more but 3 are included with the vault, so total of 6 needed)	3	EA	\$10,961.20	\$32,883.60	Priced for 6 net probes
56	Maintenance Testing Lab Installation, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	1	EA	\$319,878.46	\$319,878.46	
Total (Item Nos 52 through 56):						\$892,896.66
Total Phase 1:						\$22,388,606.10

FORM C3 - PHASE 3									
Fare Collection Equipment - Hardware									
Annual Percent Increase - Item Nos. 1 through 13 (Not to Exceed 5%):			3%						
Item No.	Scope Category	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Comments		
1	Fare Gate	Type 1 - Right End console, Type 1 (1 long paddle on the left side and only CSCR for entry)	74	EA	\$21,626.90	\$1,600,390.42			
2		Type 2 Accessible console with 2 long paddle or panel and CSCRs for entry	122	EA	\$27,575.80	\$3,364,247.91			
3		Type 3 Left end console with 1 long paddle or panel and no CSCR	74	EA	\$21,626.90	\$1,600,390.42			
4	Ticket Vending Machine	Full Service Ticket Vending Machine	120	EA	\$40,900.00	\$4,908,000.00			
5		(Contractor to insert description)	0	EA	\$0.00	\$0.00			
6	Ancillary Equipment - Contractor to describe any other equipment required to deliver the functionality outlined in the Technical Specifications	(Contractor to insert description)	0	EA	\$0.00	\$0.00			
7		(Contractor to insert description)	0	EA	\$0.00	\$0.00			
8		(Contractor to insert description)	0	EA	\$0.00	\$0.00			
9		(Contractor to insert description)	0	EA	\$0.00	\$0.00			
10		(Contractor to insert description)	0	EA	\$0.00	\$0.00			
11		(Contractor to insert description)	0	EA	\$0.00	\$0.00			
12		(Contractor to insert description)	0	EA	\$0.00	\$0.00			
13		(Contractor to insert description)	0	EA	\$0.00	\$0.00			
Total (Item Nos 1 through 13):					\$11,473,028.74				
Fare Collection Equipment - Software									
Item No.	Scope Category	Description - Software Product Name, Version, Licensing Model (i.e. Hosted Subscription, On-premises, Annual, Perpetual, etc.)	Proposed Quantity - Contractor to list quantity required to meet the technical specifications based on License Type	License Type / Description - Contractor to explain type of license proposed (i.e. Site, Per User, Per Device, Concurrent, etc.)	Unit Price	Item Total	Comments		
14	Monitoring and Alerting System (MAS)	Genfare Link (configured to MAS requirements)	1		\$485,687.50	\$485,687.50			
15		Program Management	1		\$286,300.00	\$286,300.00			
16		(Contractor to insert description)	0		\$0.00	\$0.00			
Total (Item Nos 14 through 16):					\$771,987.50				
Item No.	Scope Category	Description - Contractor to define recurring cost based upon Licensing Model (i.e. Annual Subscription Cost, Annual Support and Maintenance Cost, etc.)	Proposed Quantity - Contractor to list quantity required to meet the technical specifications based on License Type	Unit	Unit Price	Item Total	Comments		
17	Ongoing MAS Services	Annual Subscription and Software Support Agreement	1	Year 1 - Prorated to begin upon completion of implementation	\$211,238.38	\$211,238.38			
18		Annual Subscription and Software Support Agreement	1	Year 2	\$217,575.53	\$217,575.53			
19		Annual Subscription and Software Support Agreement	1	Year 3	\$224,102.79	\$224,102.79			
20		Annual Subscription and Software Support Agreement	1	Year 4	\$230,825.88	\$230,825.88			
21		Annual Subscription and Software Support Agreement	1	Year 5	\$237,750.65	\$237,750.65			
22		Annual Subscription and Software Support Agreement	1	Year 6	\$246,972.97	\$246,972.97			
Total (Item Nos 17 through 22):					\$1,368,466.21				
Fare Collection Equipment - Training									
Item No.	Scope Category	Item Description	Estimated Quantity	Units	Total Price		Comments		
23	Training and Documentation	Training and Documentation	N/A	All	\$26,585.00				
Fare Collection Equipment - Installation									

Item No.	Scope Category	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Comments
24	Installation	6 Stations, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	6	Per Station	\$57,007.38	\$342,044.29	
25		6 Stations, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	6	Per Station	\$57,007.38	\$342,044.29	
26		6 Stations, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	6	Per Station	\$57,007.38	\$342,044.29	
27		5 Stations, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	5	Per Station	\$57,007.38	\$285,036.91	
28		11 Park and Ride Locations - TVM Installation, inclusive of ALL costs (i.e. infrastructure/civil work, project management, overhead, etc.)	11	Per Location	\$8,081.58	\$88,897.35	
29	(A) Percentage of Installation Unit Price (Item Nos. 24 through 28) - Trade Labor (subject to a CPI adjustment, in accordance with Article 9 of the Agreement):		63%	(B) Percentage of Installation Unit Price (Item Nos. 24 through 28) - Non-trade labor, project management, equipment (hand tools), overhead, profit, out of pocket expenses, and other applicable costs (Not subject to any adjustment):		37%	Note: The total of the two percentages provided shall equal 100%.
Total (Item Nos 24 through 28):							\$1,400,067.15
Fare Collection Equipment - Services							
30	Fare Gate Warranty	Type 1 Devices 3 Years	74	EA	\$1,917.19	\$141,871.88	
31		Type 2 Devices 3 Years	122	EA	\$1,917.19	\$233,896.88	
32		Type 3 Devices 3 Years	74	EA	\$1,917.19	\$141,871.88	
33	Ticket Vending Machine Warranty	3 Years	120	EA	\$6,390.63	\$766,875.00	
34	Annual Maintenance and Services Charge	Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 1 - Prorated to begin upon completion of implementation	\$679,962.50	\$679,962.50	
35		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 2	\$707,161.00	\$707,161.00	
36		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 3	\$735,447.44	\$735,447.44	
37		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 4	\$764,865.34	\$764,865.34	
38		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 5	\$795,459.95	\$795,459.95	
39		Annual Maintenance and Services charge, inclusive of ALL costs to provide those services listed in Section 9 of the Technical Specifications	1	Year 6	\$827,278.35	\$827,278.35	
Total (Item Nos 30 through 39):						\$5,794,690.20	
Total Phase 3:						\$20,834,824.79	

FORM C4 - Spare Parts Inventory									
Annual Percent Escalation Rate: 3%									
Item No.	Description	Price Type (Unit Price or Lump Sum)	Unit	Quantity	Unit Price	Total Line Price	Optional or Required	Notes/Comments	
1	Electronic Verifying Cash-Only Farebox w/Cashbox	Unit Price	EA	100	\$12,500.00	\$1,250,000.00			
2	FBS Garage Device	Unit Price	Each	4	\$51,550.00	\$206,200.00		Virtual GDS and PDU	
3	Data Probe, cabling and interface box	Unit Price	Each	14	\$10,720.00	\$150,080.00			
4	Additional Mobile Safe (Bin)	Unit Price	Each	24	\$17,313.00	\$415,512.00			
5	Bill Cashbox	Unit Price	Each	180	\$0.00	\$0.00			
6	Coin Cashbox	Unit Price	Each	90	\$0.00	\$0.00			
7	Dollar Coin hopper	Unit Price	Each	90	\$0.00	\$0.00			
8	Quarter coin hopper	Unit Price	Each	90	\$0.00	\$0.00			
9	Nickel coin hopper	Unit Price	Each	90	\$0.00	\$0.00			
10	Fast Fare - 25 Pedestal Board	Unit Price	Each	90	\$342.59	\$30,833.44			
11	Fast Fare - 25 Cashbox ID transceiver	Unit Price	Each	90	\$99.22	\$8,929.69			
12	Fast Fare 25 - Bill Transport	Unit Price	Each	90	\$834.03	\$75,062.81			
13	Fast Fare - 25 Controller Board	Unit Price	Each	90	\$738.22	\$66,439.69			
14	Fast Fare - 25 DC-DC converter	Unit Price	Each	90	\$363.75	\$32,737.50			
15	Fast Fare -25 Backplane Board	Unit Price	Each	90	\$314.28	\$28,285.31			
16	Fast Fare -25 Lid Harness	Unit Price	Each	90	\$28.25	\$2,542.50			
17	Fast Fare -25 Coin Validator	Unit Price	Each	90	\$413.56	\$37,220.63			
18	Fast Fare -25 Bill Validator	Unit Price	Each	90	\$948.72	\$85,384.69			

Item No.	Description	Price Type (Unit Price or Lump Sum)	Unit	Quantity	Unit Price	Total Line Price	Optional or Required	Notes/Comments
19	Fast Fare -25 Cover Assembly	Unit Price	Each	90	\$1,046.16	\$94,154.06		
20	Fast Fare -25 Lid Board	Unit Price	Each	90	\$429.34	\$38,640.94		
21	Fast Fare -25 Passenger Display LCD	Unit Price	Each	90	\$103.97	\$9,357.19		
22	Fast Fare -25 Passenger Display touch board	Unit Price	Each	90	\$128.03	\$11,522.81		
23	Fast Fare -25 Antenna	Unit Price	Each	90	\$7.81	\$703.13		
24	Fast Fare -25 Cashbox	Unit Price	Each	90	\$1,231.56	\$110,840.63		
25	Fast Fare 25 OCU	Unit Price	Each	90	\$1,510.63	\$135,956.25		
26	Fast Fare -25 Smart Card Reader	Unit Price	Each	90	\$852.41	\$76,716.56		
27	TVM coin validator	Unit Price	Each	15	\$303.00	\$4,545.00		
28	TVM Smart Card Dispenser	Unit Price	Each	15	\$4,378.00	\$65,670.00		
29	TVM LuCC Dispenser	Unit Price	Each	15	\$5,833.00	\$87,495.00		
30	TVM Bill Recirculator	Unit Price	Each	15	\$4,143.00	\$62,145.00		
31	Smartcard Reader/Encoder	Unit Price	Each	15	\$505.00	\$7,575.00		
32	TVM Receipt Printer	Unit Price	Each	15	\$949.00	\$14,235.00		
33	TVM Main Circuit Board	Unit Price	Each	15	\$2,409.00	\$36,135.00		
34	TVM Supplemental Power Supply	Unit Price	Each	15	\$182.00	\$2,730.00		
35	TVM Customer Display and Cabling	Unit Price	Each	15	\$2,677.00	\$40,155.00		
36	TVM Bill Validator	Unit Price	Each	15	\$2,852.00	\$42,780.00		
37	MGC+ Logic Controller for MPH	Unit Price	Unit	5	\$2,177.28	\$10,886.40		

Item No.	Description	Price Type (Unit Price or Lump Sum)	Unit	Quantity	Unit Price	Total Line Price	Optional or Required	Notes/Comments
38	Secondary/Aux. Power sply 24V/10A DIN Rail	Unit Price	Unit	3	\$1,043.28	\$3,129.84		
39	MHC-134A-E701 drive unit motor	Unit Price	Unit	3	\$1,995.84	\$5,987.52		
40	Primary/Controller Power Supply 24V/15A+1A	Unit Price	Unit	3	\$1,073.52	\$3,220.56		
41	Barrier, 23" Lane	Unit Price	Unit	10	\$2,310.00	\$23,100.00		
42	Barrier, 36" Lane	Unit Price	Unit	10	\$2,478.00	\$24,780.00		
43	Gate End Display (Green Arrow/Red X)	Unit Price	Unit	4	\$804.72	\$3,218.88		
44	Tension Spring Replacement, kWing	Unit Price	Unit	200	\$43.68	\$8,736.00		
45	DIN RAIL BATTERY BACKUP	Unit Price	Unit	5	\$2,698.08	\$13,490.40		
46	(Contractor to insert description)		Unit	0	\$0.00	\$0.00		
47	(Contractor to insert description)		Unit	0	\$0.00	\$0.00		
48	(Contractor to insert description)		Unit	0	\$0.00	\$0.00		
Total (C4):						\$3,327,134.41		

FORM C5 - LABOR RATES										
		Annual Percent Escalation Rate:								
		3%								
Staff Position Title/Role	Position Description	Hourly Rate (Yr 1)	Hourly Rate (Yr 2)	Hourly Rate (Yr 3)	Hourly Rate (Yr 4)	Hourly Rate (Yr 5)	Hourly Rate (Yr 6)			
Program Manager	Manages programs	\$200.00	\$206.00	\$212.18	\$218.55	\$225.10	\$231.85			
Project Manager	Manages projects	\$200.00	\$206.00	\$212.18	\$218.55	\$225.10	\$231.85			
Technical Analyst	Provides technical assistance to the program	\$180.00	\$185.40	\$190.96	\$196.69	\$202.59	\$208.67			
Integration Developer 1	Assists with any integration efforts	\$180.00	\$185.40	\$190.96	\$196.69	\$202.59	\$208.67			
Integration Developer 2	Assists with any integration efforts	\$180.00	\$185.40	\$190.96	\$196.69	\$202.59	\$208.67			
Trainer 1	Provides training assistance	\$175.00	\$180.25	\$185.66	\$191.23	\$196.96	\$202.87			
Trainer 2	Provides training assistance	\$175.00	\$180.25	\$185.66	\$191.23	\$196.96	\$202.87			
Hardware Engineer	Responsible for mechanical changes to hardware	\$180.00	\$185.40	\$190.96	\$196.69	\$202.59	\$208.67			
Software Engineer	Responsible for software changes	\$200.00	\$206.00	\$212.18	\$218.55	\$225.10	\$231.85			
Infrastructure Engineer	Responsible for system architecture and networking changes	\$190.00	\$195.70	\$201.57	\$207.62	\$213.85	\$220.26			
Other Position Title		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
Other Position Title		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			

FORM C7 - OPTIONAL ITEMS									
Per Section 2.5.1 - Fare Collection Equipment - Hardware									
Annual Percent Increase - Item Nos. 1 through 10 (Not to Exceed 5%):			3%						
Item No.	Scope Category	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Comments		
1	Ticket Vending Machine	Full Service Ticket Vending Machine	32	EA	\$40,900.00	\$1,308,800.00			
2		(Contractor to Insert description)	0	EA	\$0.00	\$0.00			
3		(Contractor to Insert description)	0	EA	\$0.00	\$0.00			
4		(Contractor to Insert description)	0	EA	\$0.00	\$0.00			
5	Ancillary Equipment - Contractor to describe any other equipment required to deliver the functionality outlined in the Technical Specifications	(Contractor to Insert description)	0	EA	\$0.00	\$0.00			
6		(Contractor to Insert description)	0	EA	\$0.00	\$0.00			
7		(Contractor to Insert description)	0	EA	\$0.00	\$0.00			
8		(Contractor to Insert description)	0	EA	\$0.00	\$0.00			
9		(Contractor to Insert description)	0	EA	\$0.00	\$0.00			
10		(Contractor to Insert description)	0	EA	\$0.00	\$0.00			
					Total (Item Nos 1 through 10):		\$1,308,800.00		
Fare Collection Equipment - Software									
Item No.	Scope Category	Description - Software Product Name, Version, Licensing Model (i.e. Hosted Subscription, On-premises, Annual, Perpetual, etc.)	Proposed Quantity - Contractor to list quantity required to meet the technical specifications based on License Type	License Type / Description - Contractor to explain type of license proposed (i.e. Site, Per User, Per Device, Concurrent, etc.)	Unit Price	Item Total	Comments		
11	Monitoring and Alerting System (MAS)	(Contractor to Insert description) ONLY TO BE INCLUDED IF ADDITIONAL LICENSING IS REQUIRED BEYOND WHAT IS INCLUDED IN PHASE 1, 2, OR 3	0		\$0.00	\$0.00			
12		(Contractor to Insert description) ONLY TO BE INCLUDED IF ADDITIONAL LICENSING IS REQUIRED BEYOND WHAT IS INCLUDED IN PHASE 1, 2, OR 3	0		\$0.00	\$0.00			
13		(Contractor to Insert description) ONLY TO BE INCLUDED IF ADDITIONAL LICENSING IS REQUIRED BEYOND WHAT IS INCLUDED IN PHASE 1, 2, OR 3	0		\$0.00	\$0.00			
					Total (Item Nos 11 through 13):		\$0.00		
Fare Collection Equipment - Training									
Item No.	Scope Category	Description - Contractor to define recurring cost based upon Licensing Model (i.e. Annual Subscription Cost, Annual Support and Maintenance Cost, etc.)	Proposed Quantity - Contractor to list quantity required to meet the technical specifications based on License Type	Unit	Unit Price	Item Total	Comments		
14	Ongoing MAS Services	Annual Subscription and Software Support Agreement	1	Year 1 - Priorated to begin upon completion of implementation	\$50,000.00	\$50,000.00	Incremental cost increase		
15		Annual Subscription and Software Support Agreement	1	Year 2	\$50,000.00	\$50,000.00	Incremental cost increase		
16		Annual Subscription and Software Support Agreement	1	Year 3	\$50,000.00	\$50,000.00	Incremental cost increase		
17		Annual Subscription and Software Support Agreement	1	Year 4	\$50,000.00	\$50,000.00	Incremental cost increase		
18		Annual Subscription and Software Support Agreement	1	Year 5	\$50,000.00	\$50,000.00	Incremental cost increase		
19		Annual Subscription and Software Support Agreement	1	Year 6	\$50,000.00	\$50,000.00	Incremental cost increase		
					Total (Item Nos 14 through 19):		\$300,000.00		
Fare Collection Equipment - Installation									
Item No.	Scope Category	Item Description	Estimated Quantity	Units	Total Price		Comments		
20	Training and Documentation	Training and Documentation	1	All	\$0.00				
Fare Collection Equipment - Installation									
Item No.	Scope Category	Item Description	Estimated Quantity	Units	Unit Price	Item Total	Comments		

		Fare Collection Equipment - Services						

PROPOSAL TO

Miami-Dade County

Miami, Florida



Fare Collection Equipment

RFP # EVN0001090

November 16, 2023

Proposal to:

Miami-Dade County
Miami, Florida



Fare Collection Equipment

RFP # EVN0001090

Prepared and submitted by:

GENFARE 

Genfare, LLC
800 Arthur Avenue
Elk Grove Village, IL 60007
Phone: 847.871.1231
Fax: 847.758.4997

Contact:

Jennille Logan
Business Development Director,
Southeast Region
757.506.8792
Jennille.Logan@spx.com

November 16, 2023





Simplify
the experience



Empower
equity



Connect
communities

Mission

Genfare elevates public transit by building mobility solutions that simplify the rider experience, empower equity, and connect communities.

GENFARE 

November 16, 2023

Brian Webster
Procurement Contracting Officer
Miami-Dade County Department of Transportation & Public Works
111 NW 1st Street, Suite 1300
Miami, FL 33128

RE: RFP EVN0001090 – Fare Collection Equipment

Dear Mr. Webster,

Genfare, LLC, a subsidiary of SPX Technologies, Inc., is pleased to present the Miami-Dade Department of Transportation and Public Works (“DTPW”) with this proposal for Fare Collection Equipment. We believe our solution offers exceptional value and will provide DTPW with the reliability and flexibility your fare collection system needs, while simplifying the transit experience for your riders.

We are enthusiastic about the opportunity to support the delivery of DTPW’s fare collection solution and look forward to continued discussions about how our approach best supports Miami Dade’s vision for *Shift305*. As an incumbent to the County with Genfare fareboxes currently in service, we are excited to present to you our latest market-proven technology designed to empower a seamless journey across Miami-Dade’s network of transportation. Our approach will exceed the Department’s requirements as stated in the solicitation, and elements of our proposal that differentiate Genfare from other bidders will afford substantive benefits to both DTPW and your riders. Those include:

- *Futureproofed technology* in our durable, reliable suite of fare collection equipment and ticketing solutions built for a modern and sustainable environment like Miami-Dade County
- *An enterprise cloud-based open architecture platform*, Genfare Link, to manage the Monitoring Alerting System and Farebox functions in one configurable back office that will empower DTPW to make data-driven decisions
- *A single system that will connect all payments*, including open payments if desired, leveraged across all of the equipment
- *A flexible and robust reporting platform* that monitors operational and maintenance data to provide situational awareness to all levels of management
- *Ongoing services that prioritize preventive maintenance* across equipment and place local technicians supporting DTPW’s reactive maintenance needs
- *A partner and team that understands Miami-Dade’s transit system*, culture and expectations
- *A Program Management Office (PMO) located in Miami-Dade*, delivering a superb level of customer service with a local team that understands Miami’s goals
- *A team with deep fare collection equipment and revenue management knowledge* and experience to ensure certainty of delivery and to provide world class operations

The Genfare team is excited to work with two locally headquartered partners to deliver this program and change the landscape of the Miami-Dade County transit system. Consolidated Parking Equipment (CPE) will be responsible for the installation and maintenance of the faregates and ticket vending machines. CPE has extensive experience installing and maintaining faregates and parking gates and has been a longstanding partner of Miami-Dade County for the past two decades. Transportation America (TA) has provided Miami-Dade County residents with best-in-class service in paratransit, shuttle, and on-demand services since 1995.

In addition to our locally headquartered partners, Genfare is pleased to have chosen Magnetic AutoControl USA (Magnetic) for the faregate component of our solution. Magnetic is an internationally renowned, Buy America compliant faregate provider with their US office located in central Florida. Magnetic is ready to deliver your gates on schedule and to specification.

If selected, you will be a flagship account for Genfare. DTPW has our commitment that we will prioritize our partnership and development to ensure we meet every requirement and need DTPW has, throughout our entire organization.

Genfare welcomes the opportunity to demonstrate our solution and answer DTPW's questions during the next steps of this procurement. I am confident DTPW will appreciate the benefits of the Genfare approach. If there are questions, please contact Jennille Logan, Business Development Director, at 757-506-8792 or Jennille.Logan@spx.com.

Genfare thanks DTPW for the opportunity to submit this proposal and looks forward to further conversations on this exciting project.

Sincerely,



Eric Kaled
President

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Executive Summary



1. EXECUTIVE SUMMARY

The Department of Transportation and Public Works (DTPW) in Miami-Dade County has a track record of forward thinking, most recently demonstrated by its ambitious SMART Program. This plan will expand and enhance the County's public transit infrastructure while accommodating the region's growing population and employment expansion outlook.



The first phase of this vision is the 2025 launch of the South Corridor Bus Rapid Transit (BRT) project, which will demonstrate how new transportation options can leverage existing infrastructure while integrating technology at the highest levels. This project, combined with several additional rapid transit corridors planned over the next decade, will transform how people travel throughout Miami. As communities throughout Miami-Dade County await these trailblazing developments, DTPW is seeking to maximize the benefits of its transit system's assets and create a more efficient, accessible, and sustainable transportation system that meets the needs of its residents while building public and political support for the future of transit in the region.

With this procurement, DTPW is setting an example for transit agencies across the United States with astute responsiveness to pressures converging upon the country's public transit network. DTPW understands that a significant capital investment in modernization, backed by the potential of federal grant funding and local tax dollars, will help the agency meet public expectations for a modern, simplified transit experience – one that lets riders purchase fares with whatever form of payment is in their pocket while delivering robust real-time data to empower intelligent operations.



Figure 1: Miami's Metromover passing through downtown

With its strategic vision to provide enhanced, affordable, and equitable mobility options that reduce congestion and manage community growth, it is imperative that DTPW choose an experienced partner who can translate today's challenges into an exemplary showcase of an evolutionary transit system valued by travelers and taxpayers alike. In short, change is imminent, but the critical component is *controlled* transformation alongside a sophisticated partner with an accomplished record and a visionary solution.

If selected as your partner, Genfare is committed to serving the people of Miami-Dade County and the Department of Transportation and Public Works as a flagship account. Genfare will usher the Miami-Dade County transit system into a new era in which technology, innovation, and operational excellence are at the forefront.

1.1 Why Genfare is the Ideal Partner to DTPW

Genfare is one of the most respected and trusted public transit equipment and fare collection solution providers in North America. Genfare has safely and efficiently supplied more than 85% of the fareboxes in use in the United States today. Our ticket vending machines are used in more than 75 transit agencies across the country. Additionally, our open architecture cloud-based backend fare collection solution, Genfare Link®, has been implemented in more than 50 projects. Genfare proudly serves customers across all segment sizes, including most of the mega cities today, Miami included.

Genfare plans to leverage its 15-year history with Miami as the incumbent farebox provider with a modern and updated solution including the Fast Fare® 25 farebox, Vendstar® 5 ticket vending machine, and Magnetic kWing faregate. All equipment will be connected to the Genfare Link platform which performs all the required monitoring and alerting system and farebox back-office system functions. Genfare brings the right experience to:

- Elevate the customer experience
- Improve the maintenance, reliability, and cost of fare collection
- Leverage modern technology
- Retain the existing operation and reporting infrastructure
- Support and integrate with current and future fare collection applications
- Align aesthetics with the South Dade Transitway

1.2 Strategic Local Partnerships to Ensure Success

The Genfare team includes strategic partnerships with Florida-based companies Consolidated Parking Equipment, Transportation America, and Magnetic AutoControl USA. Each has the insight, knowledge, and demonstrated ability to work in an effective partnership for the delivery of operational excellence to DTPW and the public.



Figure 2. Florida-based strategic partners

Consolidated Parking Equipment (CPE) is a Miami-based company that is currently seeking small business enterprise certification and has provided procurement of equipment, installation, and field services to Miami-Dade County since the company's inception. CPE has an intimate and comprehensive understanding of the County and deep knowledge of the local transit network, ensuring it can deliver and exceed the County's expectations.

Transportation America provides a myriad of ground transportation services in a variety of public and private sector business relationships, including experience across passenger-based services in modalities such as paratransit, trolley, shuttle, executive transportation, taxi, medical transportation, and ambulance. The company also has four 24-hour Southeast Florida maintenance centers, tow trucks, collision repair shops, and a call center. Transportation America is the current paratransit provider for Miami-Dade County, performing more than 6,000 daily trips, and also services Miami International Airport and provides municipal trolley and circulator service. Transportation America's

experienced local team, in partnership with Genfare, will create a safety and quality program that enhances how service is delivered throughout Miami Dade’s transit program.

Magnetic AutoControl USA is the Florida-based arm of an international faregate company trusted throughout Miami-Dade County for off-street parking operations with a strong reputation for durability, reliability, and low operating costs. Their faregates are deployed throughout Europe, the Middle East, and Asia. The combination of local knowledge with national and international deployment experience will provide DTPW ideal competence.

1.3 Genfare’s Framework of Collaboration, Commitment, and Trust

Genfare’s internal and external project team is built with a vested interest in success – one that draws on national and global expertise and resources ensuring that this journey meets and surpasses DTPW’s objectives set out in the Better Bus Shifts into Gear and the SMART Programs.

Genfare is intent on taking projects to the highest level of performance by working collaboratively with our government customers while introducing innovation, expertise, and an unrivalled management focus. Local Miami communities will be literally and virtually more connected through improved transit networks and payment systems that create a seamless journey.

Most importantly, our customers trust Genfare because of our shared ethos to serve the community. We are committed to elevating public transit by building mobility solutions that simplify the rider experience, empower equity, and connect communities. While this DTPW procurement has key elements of technology, engineering, equipment, and operations, transit is, first and foremost, an essential public service. Every aspect of this effort must be infused with the guiding principle of serving the rider.

This commitment, discipline, and passion for service is not merely a platitude; it is an uncompromising framework for how Genfare operates. Simply put, it’s why we show up every day to get the job done. Genfare’s equitable mindset serves the rider best while our legacy of providing durable equipment and reliable services to transit agency customers across America for the entirety of our history safeguards DTPW’s interests.

1.4 What Genfare Will Deliver

The following proposal lays out a compelling case for how the Genfare team’s unrivaled experience, service mindset, tested and proven methods, technical expertise, and determination to innovate and improve will translate into tangible benefits and an unmatched value for DTPW and the riders it serves. The Genfare team will deliver:

1. **High performing, reliable and durable equipment.** kWing faregates, Vendstar 5 ticket vending machines, and Fast Fare 25 fareboxes will modernize the fare collection experience for all customers across the various modes of transportation.
2. **Customer satisfaction.** Genfare’s approach to employee competency, along with a culture that empowers employees and embeds ownership, ensures a high level of satisfaction from our agency partners and the communities they serve.



3. ***A pledge of continuous improvement and adaptation to change.*** As a solutions provider, Genfare continuously improves and adapts to drive innovation and ensure our products and services remain best-in-class as technology and trends evolve.
4. ***A true partnership.*** Collaboration, problem-solving and future planning are cornerstones of Genfare's partnerships with transit agencies. This drives our top-down commitment to transparency, cooperation, accountability, and shared purpose.
5. ***An unrivaled commitment to safety.*** Safety is infused into all elements of the operation, from every piece of equipment installed to each keystroke across the platform.
6. ***High value at low cost.*** A very high level of asset utilization and equipment availability enables Genfare to jointly maximize network throughput, a critical capability when operational budgets are strained against a growing demand for services.

1.5 A Tailored Solution for the Miami-Dade Transit Experience

A project of this complexity demands that the partner team not just be best-in-class but perform at the highest level at all times. The core capabilities Genfare demonstrates include:



Proven technology. For more than 40 years, Genfare has earned the trust of more than 400 transit agencies with proven fare collection solutions, including equipping DTPW with its current fareboxes.



Future-proofed. Genfare's equipment and platform are built with the future in mind – from ergonomic design to artificial intelligence-powered algorithms to warranted credit card-sized motherboards – to support DTPW's enhancements across vehicle types and payment systems, no matter what the future may bring.



Fit for budget, schedule, and environment. The proposed solution is tailored to meet DTPW's budget, schedule, and environmental constraints, and all equipment delivered is built to meet Miami's needs. The entire Genfare team is committed to delivering on budget and schedule.



Continuous innovation. Genfare's approach centers on building the capacity of the system for the long term, driving sustainable improvements to equipment and services. Genfare relentlessly seeks continuous improvement in process, technique, and technology to drive performance enhancements and operating efficiencies.



Interoperability. Genfare Link will serve as the Monitoring Alert System and Farebox Backend System in a single, open architecture, cloud-based platform, ensuring interoperability across Miami-Dade County's transit network, no matter what hardware or software is introduced in the future.



Continuity of operations. Maintenance and monitoring are at the core of Genfare's operational, maintenance, and program management response. The overall approach focuses on targeting asset uptime by monitoring asset health and analyzing causes and actions to be implemented.



Risk management. Genfare’s approach to minimizing risk starts with “extreme planning” – identifying risk by assessing systems, methods, and operating conditions not just by how they should work, but by what could possibly go wrong, then implementing mitigations. In all cases, Genfare uses metrics to ensure the risk profile is minimized.



Measurement. Genfare believes in measuring what matters and making sure that what matters is measured to ensure performance objectives are aligned with strategic goals and performance against those objectives is visible throughout the program.



Competency management. Genfare’s approach to competency ensures that the requisite skills are identified, the right people are recruited, the right skills are trained and developed, and the right things are assessed. Genfare coaches, mentors, and retrains in a continuous cycle.



Customer relationships. Genfare places great value on developing enduring relationships with DTPW and will provide single points of contact with the team. Genfare also supports the cutover with key personnel who know the County’s teams and stakeholders.

1.6 The Future is Bright in South Florida

With Genfare as its partner, DTPW can meet the burgeoning demand and expectations of its riders through the delivery of outstanding and reliable equipment, software, and ongoing services. In addition, Genfare is a uniquely flexible, agile, and open partner that can achieve complicated integrations with an unknown future back-office partner. We fully understand and appreciate the complexity of such an undertaking – knowing how the equipment, training, systems, technology, and management are interwoven to deliver a service that continues to earn the respect and confidence of the public. Genfare has built a reputation around the country for doing just that.

This is the first of two procurements that will help shape the ambitious vision for DTPW’s fare collection system to simplify the riders experience by accepting whatever’s in their pocket and to connect communities unlike ever before. This will likely include integrations with on-demand services, such as the ability to pay for paratransit with the next generation Easy Smartcard, or better yet, with open payment.

Genfare was recently selected to negotiate with the South Florida Regional Transit Authority (SFRTA) for a fare collection back-office suite to collect payments and issue and validate Tri-Rail’s fare products, as well as a regional transit mobile application to allow riders to plan trips and purchase fares across SFRTA, Palm Tran, Miami-Dade County (DTPW), and Broward County Transit (BCT) systems. This great example of interoperability is part of South Florida’s vision to simplify the experience wherever riders travel throughout the region, with Miami-Dade County being a pinnacle stakeholder.

With Genfare as its partner, DTPW can meet present-day demands with a progressive eye toward the future. We possess the operational savvy to put this system in motion with deep insights into change management, focused vision, and practical experience. Genfare embraces the vision and welcomes the challenge.

Project Approach



2. PROJECT APPROACH

The Genfare approach to delivering solutions focuses on meeting agency needs, improving operations, and achieving the overall satisfaction of DTPW. The result is a partnership that ensures DTPW's objectives are met on schedule and with minimal operational impact.

2.1 Project Implementation

Genfare's comprehensive project management approach establishes and carries out hardware installation, development activities, and ongoing maintenance work, and maps them to phased deliverables to migrate the DTPW existing system to the new fare collection system. The core pillars of this approach are comprehensive schedule development, communication with agency stakeholders, and tracking ongoing risks and issues as these strategies are implemented for each phase of the project.

Every effort is made to maintain the schedule while minimizing any interruption of service. The Genfare philosophy emphasizes that one of the most important aspects of a successful project is a hands-on approach and a commitment to work alongside agency personnel from the start of the project through system go-live and the ongoing maintenance period.



Figure 3: Project management triangle

2.1.1 Project Management Methodology

The Genfare project management methodology includes the following key strategies, implemented independently for each of the three phases of the project:

- A rigorous up-front planning, design, and **schedule** review, outlining the stages and key milestones for the phase.
- Open communication and clearly defined **communication** protocols between the parties, including all stakeholders.
- Definition of roles and responsibilities and governance, which will vary by phase of the project between the BRT, bus and rail divisions.
- Proactive management of **issue tracking**, actions, and risks, through vigorous collaborative issue tracking via a collaborative web-based environment.

Consensus building throughout each phase of the project will ensure that contractual obligations are met and that expectations for delivery are achieved.



Figure 4. Implementation plan

Each phase of the project will focus on four key components of the Genfare Implementation Plan outlined in Figure 4. The three core principles of **scheduling**, **communication**, and **issue tracking** are present in each step, the glue of the Genfare Implementation Plan which includes four steps:

1. **Plan & Design** – A thorough design review and schedule build-out listing all steps to successful implementation
2. **Configure & Build** – Development of a user acceptance test and construction of assets at scale while providing hands-on feedback and training
3. **Rollout & Release** – The execution of the installation plan by field staff and the release of updated front- and back-end software
4. **Closure & Support** – Each phase wraps together the training and ongoing support as issues are closed.

The Genfare Program Management Office (PMO) will manage the project to ensure all work is completed to the satisfaction of the DTPW. Genfare will need a project contact at DTPW to coordinate internal stakeholders, gain approvals of the design review deliverables, and coordinate activities. Genfare will manage each phase and interface directly with the assigned staff of the DTPW.

The PMO will be led by [Mike Haynes](#), based at Genfare’s headquarters. [Rogelio Vicencio](#) will be a locally-based full-time project manager for this project. Mike will lead the PMO and coordinate the overall program including schedule, issue management, and risk management, bringing relevant staff together for design review, training, and installation site visits. Rogelio, the on-site project manager, will manage the testing, equipment fulfillment, and training activities and will handle all interactions with subcontractors and DTPW field staff. Rogelio will be full-time for this project while Mike will be partially dedicated.

[Other members of the PMO](#) include the safety manager, quality assurance manager, technology expert, trainer, installation manager, and a team of equipment experts. The team extends to installers and technicians for preventive and reactive maintenance. This PMO is built specifically to meet the needs of the Fare Collection Equipment by providing high quality equipment that is easily maintained and exceeds the reported asset lifecycle.

The [schedule](#), as outlined in [section 2.2](#) and formalized in the design review process, outlines the stages and milestones of the project. The [issue tracking](#) process, as outlined in [section 2.1.2](#) will handle any change of scope management over the implementation process as well as risk mitigation discussed in [section 2.1.8](#). Training is outlined in [section 2.1.3](#). While the whole program begins with a concept and final design review process, each phase will start with a kickoff to [communicate](#) the [schedule](#), [issue tracking](#), and key details of the phase.

The critical success factors of the project include:

- On-time delivery and installation of TVMs and faregates for the BRT stations
- Successful maintenance data system and backend systems
- Training staff on the ease of operation and maintenance of all components
- Installation of new Fast Fare 25 fareboxes
- Installation of rail station Vendstar 5 TVMs and kWing faregates

Together, Genfare and DTPW will drive this program to success by focusing on a common vision to deliver best-in-class equipment and ongoing services.

2.1.2 Project Management Responsibilities

A core aspect of a complex project is a clear delineation of responsibilities for each task of the project. The plan to base a full-time Genfare project manager on-site in Miami is indicative of the criticality of ensuring that all parts of the project are completed on time and to the satisfaction of DTPW. Rogelio Vicencio, a lean management expert and MBA-holding business analyst, has transformed the repair department by implementing digital process improvements, resulting in enhanced quality and expedited turnaround times. Rogelio is a native Spanish speaker who will leverage his lean management principles to seamlessly coordinate between Genfare staff, subcontractors, and DTPW staff at various levels, ensuring high quality and efficient project execution.

DTPW is responsible for identifying a contract manager and a project contact which may vary by project phase. Genfare will seek these key contacts as the Concept Design Review (CDR) is prepared and will maintain a program contact list by phase for all parties to rely upon throughout the entire project.

Table 1 presents the major schedule milestones (as outlined in [section 2.2](#)) with an assigned primary and secondary responsibility. A more detailed and final version of the roles and responsibilities will be presented in the design review process.

Task	Primary Responsibility	Secondary Responsibility
Equipment Ordering	Genfare – Miami	Genfare – Remote
TVM and Farebox Builds	Genfare – Remote	Subcontractors
MDS and FBS Design and Development	Genfare – Remote	
Notice to Proceed	DTPW	Genfare – Remote
Concept Design Review (CDR)		
CDR - Presentation & Agenda	Genfare – Miami	Genfare – Remote
CDR - On-site	Genfare – Miami	DTPW
CDR - Minutes Provided	Genfare – Miami	Genfare – Remote
CDR - Response	DTPW	DTPW
CDR - Resubmittal	Genfare – Miami	DTPW
Final Design Review (FDR)		
FDR Provided	Genfare – Miami	Genfare – Remote
FDR Response	DTPW	
FDR Presentation & Agenda	Genfare – Miami	Genfare – Remote
FDR - On-site	Genfare – Miami	DTPW
FDR - Minutes Provided	Genfare – Miami	DTPW
FDR Approval	DTPW	
Permits Requested	DTPW	Genfare – Miami
Genfare Link - Cash Link UAT Setup	Genfare – Remote	Genfare - Implementation
Bus Installation Plans Provided	Genfare – Miami	DTPW
Delivery of Training Units, PDUs	Genfare – Remote	DTPW
Response to Bus Plan	DTPW	
Genfare Link - Cash Link PROD Setup	Genfare – Remote	Genfare - Implementation
Resubmittal of Bus Plans	Genfare – Remote	DTPW
Set up TVM & Farebox Training and Lab	Genfare – Remote	DTPW
Maintenance Data System Installation	Genfare – Remote	DTPW
Initial System Training	Genfare – Remote	DTPW - Garage Staff
BRT Bus Pilot Installation	Genfare – Miami	DTPW - Garage Staff
Phase 1 - BRT TVM's & Faregates	Genfare - Miami	Subcontractors
Phase 1 - OPTIONAL - TVMs at Local Bus Stops	Genfare - Miami	Subcontractors
Phase 2 - Bus Farebox Installations	Genfare - Miami	
Train the Trainer for Operators	Genfare	DTPW - Garage Staff
Garage Vault Installation	Genfare - Miami	DTPW - Garage Staff
BRT Bus Install (40 Buses)	Genfare - Miami	DTPW - Garage Staff
BRT Service Goes Live	DTPW	Genfare – Miami
NE - Train the Trainer for Operators	Genfare	DTPW - NE Garage Staff
NE - Garage Vault Installation	Genfare - Miami	DTPW - NE Garage Staff
NE - Bus Wiring and Installation	Genfare - Miami	DTPW - NE Garage Staff
CE - Train the Trainer for Operators	Genfare	DTPW - CE Garage Staff
CE - Garage Vault Installation	Genfare - Miami	DTPW - CE Garage Staff
CE - Bus Wiring & Installation	Genfare - Miami	DTPW - CE Garage Staff

Task	Primary Responsibility	Secondary Responsibility
CW - Train the Trainer for Operators	Genfare	DTPW - CW Garage Staff
CW - Garage Vault Installation	Genfare - Miami	DTPW - CW Garage Staff
CW - Bus Wiring & Installation	Genfare - Miami	DTPW - CW Garage Staff
Phase 3 - Rail Stations	Genfare - Miami	Subcontractors
Phase 3 - Remote Locations	Genfare - Miami	Subcontractors

Table 1. Project management responsibilities

2.1.3 Training

The Genfare approach to training recognizes that effective training is essential to successful operation of the system. The Genfare training team strives to make information on Genfare equipment easily accessible to all stakeholders.

The training team works closely with the project manager and agency personnel on each implementation to identify the types of training needed and how best to deliver it. At Genfare, there is a saying that one must hear and learn something at least nine times before it is fully understood and are committed to providing extraordinary training to all needed DTPW personnel until they are comfortable operating and maintaining the equipment and platform.



Genfare provides professional onsite and online training that includes the appropriate level of technical and system operations knowledge for different categories of agency personnel. Proposed training includes all labor, instruction, materials, and services necessary to enable agency personnel to efficiently transition to and operate the components of the fare collection system. Training consists of hands-on, in-person training, self-paced on-line training, and webinar-based training on Genfare Link (the proposed platform to perform the monitoring and alerting and farebox system functions).

Training starts at the **plan & design** step of each phase as Genfare demonstrates the capabilities and discover the requirements. Training continues with hands-on activity during the user acceptance testing process of the **configure & build** step. Formalized training occurs within the **roll out & release** step and is followed up with ongoing on-line materials in the customer portal during the **closure & support** step of each phase of the project. The total number of training hours will be outlined in the design review process as staff are identified and solutions around train-the-trainer or direct one-on-one training programs are built. *At a minimum Genfare expects to provide one hundred hours of training for DTPW staff.*

Table 2 outlines proposed hands-on training hours for project management staff and field staff. Genfare anticipates conducting at least three training sessions for each phase, with one being recorded for use in a review or with new staff. Genfare trainers prefer to keep class sizes small at just five to ten individuals, so everyone gets a chance to absorb the full detail.

Hands-on Training Components	Program Staff	Maintenance Staff	Operations Staff
TVM	8 hours	25 hours	4 hours
Farebox & Vault Equipment	6 hours	25 hours	2 hours
Bus Operator Train-the-Trainer			1 hour
Faregates	4 hours	15 hours	2 hours
Back-end & Genfare Link	8 hours	1 hour	8 hours

Table 2. Hands-on training

2.1.3.1 Hands On / In Person Training

All Genfare training courses emphasize hands-on experience using the training lab outlined in [section 2.1.9.2](#). The above-listed training hours, totaling an estimated 100 hours with over half being hands-on technical training, are recommended by Genfare to help staff utilize the system effectively and maintain the overall system to maximize its adoption and value. The Genfare training program includes:

- **Instructors.** Genfare will provide experienced and qualified instructors to teach courses in person at DTPW, at Genfare headquarters, or virtually. Instructor resumes can be provided on request. Instructors have the experience, skills, and knowledge appropriate to the subject matter being taught and the intended audience.
- **Training materials.** Training materials are prepared internally at Genfare by the same personnel who develop all customer documentation, providing consistent terminology in training aids and customer reference manuals. Outlines for all training material are presented during the design review. Each outline will include topics to be covered, descriptions of training media to be used, training time expected, identification and credentials of the instructor, and identification of audience type. Emphasis will be made to create video and online refresher content so staff can be kept up to date and simplify new personnel onboarding. Training materials will be submitted for approval before training begins.
- **Instructor guide.** The instructor guide is a more detailed version of student material. An expansion of the material is included along with instructor notes and discussion guides.
- **Instructional material.** In addition to the training summary, Genfare will use appropriate manuals as the primary reference for each course. Included in these manuals are drawings, descriptions, and procedures necessary to ensure that all learning objectives are met in an orderly and timely manner. Training aids, as discussed below, are another major source for student reference.

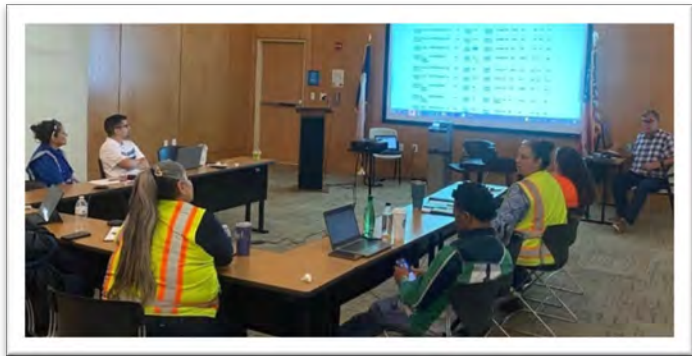


Figure 5: In person training at agency

- **Training aids.** Maximum use is made of visual aids for each course. Hands-on training with actual equipment is employed extensively. All operating equipment, tools, and testing devices needed for the training program will be furnished by Genfare.

2.1.3.2 Operational Training

Genfare is well positioned to create operational training materials for field staff including bus operators and station attendants. Genfare will create a train-the-trainer program with simple handouts for bus operators using the farebox and station attendants for the operation of the ticket vending machines and faregates. These handouts will supplement hands-on training with training fareboxes maintained at each bus garage and a classroom setup of a fully functioning TVM and faregate system pointed to a test instance to keep the data isolated from production. Genfare will also create video materials specific to Miami using equipment in the field for operations staff and customer-facing how-to video shorts suitable for presentation to the public.

2.1.3.3 Self-Paced Online Training

In 2021, Genfare released an exciting new addition to the customer portal, GenEd Training, a self-paced online training site. Patterned after the training approach used by Salesforce, Genfare's online training consists of modules grouped in training "trails," guided learning paths through modules and projects that help agency staff cover the most ground in the shortest amount time. Trails can be selected for a given role like Customer Service, a particular piece of hardware like the Fast Fare 25 farebox, or software such as Genfare Link. Learners can also group modules together to create a custom trail based on their specific needs.



Figure 6: Screen grab from training videos

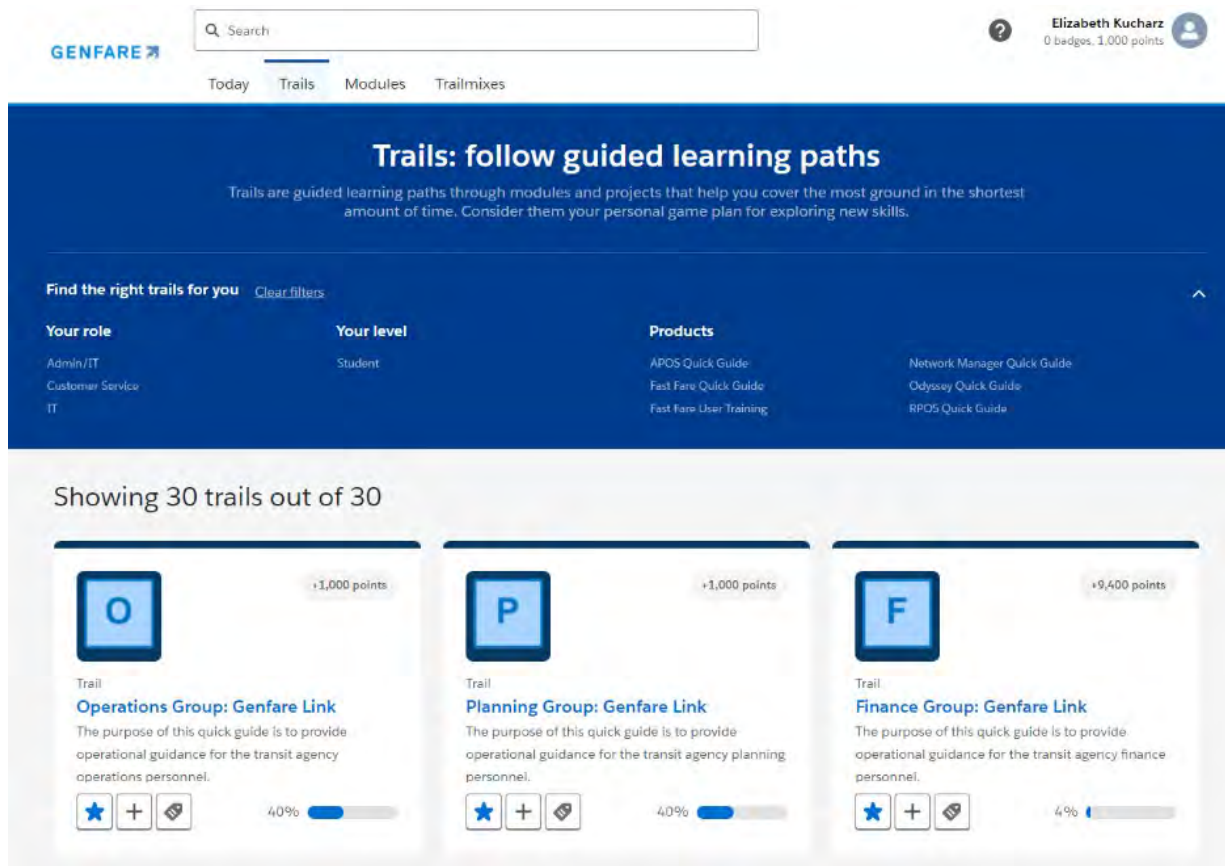


Figure 7. GenEd training trails

A sample training module that demonstrates how to perform maintenance on the bill validator found in the Fast Fare farebox can be [viewed here](#).

Online training also includes a series of videos, like [this one](#) on how to operate the Fast Fare farebox as a bus operator. Though this is a Fast Fare rather than the proposed Fast Fare 25, it is a relevant example as they operate very similarly.

2.1.3.4 Genfare Link Training

Genfare uses a structured certification process to train personnel in the operation of the backend system, Genfare Link. Genfare provides detailed documentation to guide the Genfare Link training. Our instructors will use this documentation to train County managerial and training staff, who in turn can train other end users at DTPW. The following materials are provided for each Genfare Link module:

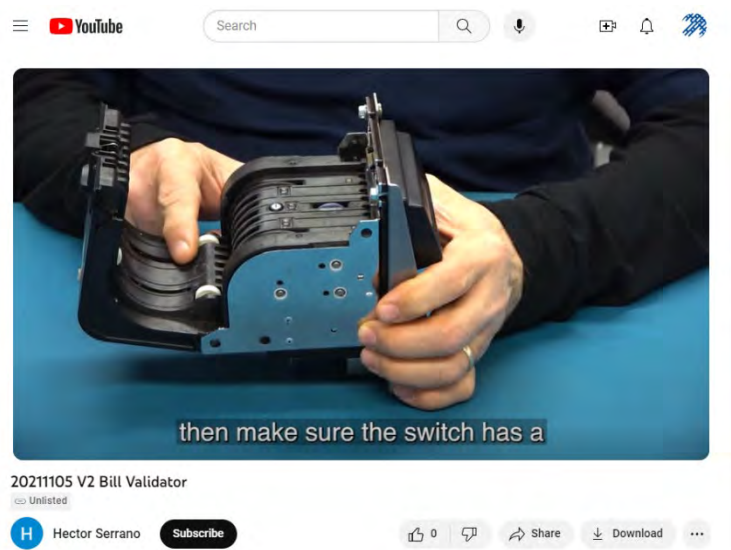


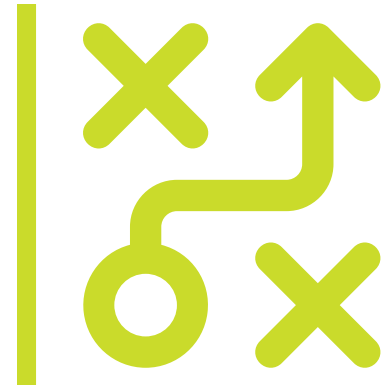
Figure 8. Training video on bill validator

- **User guide.** A comprehensive technical manual explaining all aspects of the module.
- **Instructor guide.** A digest of the most important material in the user guide, which instructors may use when providing training.
- **Student certification guide.** A multiple-choice test administered to students at the conclusion of training. The test takes about 30 minutes. Upon successful completion of the test, students receive a certificate of proficiency in the module.
- **Answer guide.** Used by instructors to grade the certification test.

2.1.4 Knowledge Transfer & Change Management

Genfare's approach to knowledge transfer and change management aims to minimize disruptions and maximize the value derived from the project implementation.

The implementation plan is the core of the knowledge transfer and change management strategy. A draft of the implementation plan is provided as [an appendix](#). The training process is a key component of the transfer of knowledge from Genfare to the DTPW. Knowledge transfer, change management and escalation of issues are outlined in the sections below.



2.1.4.1 Knowledge Transfer Strategy

As part of the **plan & design** step, Genfare will document existing processes, best practices, and system functionalities. The **configure & build** step will generate the technical details of the implementation, and all will be structured in an accessible format and made available through a centralized SharePoint based repository. The documentation of the as-built system is updated throughout the **rollout & release** step of each phase and submitted as part of the **closure & support** process.

As outlined in [section 2.1.3](#), Regular training workshops and materials will educate the project team and end-users on using the new system effectively. These sessions will include hands-on demonstrations and interactive discussions to promote a practical understanding of the system. Regular performance evaluations and feedback will measure the effectiveness of the knowledge transfer efforts. Continuous improvement based on feedback will ensure optimal retention and utilization.

2.1.4.2 Change Management

The **plan & design** step of each phase will allow Genfare to understand the organization and the barriers to change. Genfare will conduct a thorough assessment involving key stakeholders to identify potential challenges and enable us to tailor the change management plan accordingly. We will establish a clear **communication** plan to engage stakeholders at all levels. Weekly project meetings and monthly status reporting are an integral component of the change management philosophy.

The Genfare team will carefully assess the impact of any proposed changes on processes, roles, and responsibilities. A detailed impact analysis will be used to develop targeted change strategies and training plans.

The establishment of a network of change champions within the organization will facilitate peer-to-peer support, knowledge sharing, and encourage adoption among colleagues. These champions will act as

advocates for change and assist their peers throughout the transition. We will look to DTPW staff to identify the “change makers” and offer them a chance to lead their colleagues to the new technology.

2.1.4.3 Escalation Process

Genfare recognizes the vital role that DTPW plays in the timely and successful execution of this project, and we understand that DTPW active participation and collaboration are crucial for meeting the project’s objectives and timelines. The collaborative program management approach is designed to mitigate the need to escalate issues to Genfare or to escalate issues within the DTPW. Genfare will work directly with internal communication protocols and any preferred methods for escalation, ensuring that our actions align with DTPW procedures and result in prompt attention and resolution of any issues. Mike will manage interactions with the DTPW staff and organizational structure to ensure that participation is provided to meet the needs of the project.

As stated in [section 2.0](#), **issue tracking** is one of the pillars of the Genfare solution. As issues are tracked with a collaborative web portal, it is easy for both Genfare and DTPW to add items as well as to see exactly where all parties stand on a given issue. Per the **communication** pillar of the Genfare program management methodology, should escalation of an issue arise, the first step is to simply raise the issue on during our ongoing weekly check-in meetings or directly contact the Genfare local project manager. Mike will work directly with DTPW staff outside of the weekly check-in meetings to ensure timely resolution and participation of staff.

2.1.5 Removal of Existing Equipment

Genfare will assess the existing equipment to determine its condition, functionality, and potential for repurposing or resale prior to or during the site survey. Genfare will first reach out to any existing vendors to determine if the equipment can be repurposed or resold. If not, then Genfare will follow appropriate disposal methods to minimize environmental impact. Genfare intends to recycle equipment to the extent possible and otherwise to dispose of the equipment in compliance with local regulations and guidelines. More information on Genfare’s approach to environmental impact is found in [section 2.1.14](#).

2.1.6 Employee Breakdown

Genfare has more than 150 employees working directly on the Fare Collection Equipment being proposed. Consolidated Parking has more than 20 employees working directly on relevant equipment for installation and managing parking contracts in Miami-Dade County and Florida. Transportation America has more than 5 employees working directly on relevant services for fare collection. Magnetic has more than 40 employees directly working on transit faregates in Florida today.



Figure 9. Equipment for recycling

Staff Type	% of Total Staff
Sales	18%
Research and Development	59%
Support Services	44%

Table 3. Genfare staff by area

The Genfare team is robust and well-rounded to meet the full needs of DTPW, whether it's for the procurement of hardware and systems, installation, or professional services.

2.1.7 Certifications

The Technical Specifications do not call out any third-party system providers for integration by name, as the procurement for the DTPW's new back-office system has not been released yet. There is an optional integration to the current system provided by Cubic. Genfare has successfully completed several integrations with Cubic in a variety of ways. In DTPW's current system, the Cubic smart card reader has been integrated into Genfare's Odyssey® farebox and cash and coin revenue information has been integrated into the Cubic back-office.

Genfare has many different partnerships with third-party system providers that are integrated into the Genfare Link platform. Several of them are certified because of the security needs of the partnership and others are partnerships because they are a good fit for the platform. They include:

Partner	Function	Certification Status
Amazon Web Services (AWS)	Cloud Platform	Active
Token	Mobile Ticketing Application	Active
Unwire	Mobile Ticketing Application	Active
Moovit	Mobility as a Service Application	Active
CAD-AVL	AVL – Partnered with a Dozen CAD AVL Providers	Active
PCI	PA-DSS, P2Pe, SSF	Active
Chase	Payment	Active
NMI	Payment	Active
AZ Security	Cyber Security	Active
Coalfire	Security	Active
Nexpose	Cyber Security	Active
First Data	Payment	Active
Cybersource	Payment	Active
Paypage	Payment	Active
Allpaid	Payment	Active
Moneris	Payment	Active
Cubic	Validator, Farebox	Active

Table 4. Certification partners

2.1.8 Risk Management and Implementation

Genfare's approach to minimizing risk starts with "extreme planning"—assessing systems, methods, and operating conditions not just by how they should work, but by what could possibly go wrong. The plan is to identify the risk, assess or evaluate the risk, then plan and implement mitigations. In all cases, metrics are used to ensure the risk profile is minimized.

Figure 10. Issue/risk intake form

Genfare views every issue raised as a risk, which is why the creation of a web-based issue tracking solution is paramount to the success of the program across all phases. Using an industry-accepted Smartsheet platform form, as shown in figure 10, allows Genfare to capture risks and issues from any source at any time. The issue and risk register are monitored and allow users to add comments and update the status as items are addressed. Email updates reinforce the **communication** pillar of Genfare Program Management success.

In this approach to risk management, Genfare holds regular project reviews, and a comprehensive issue tracking process ensures that all potential risks are promptly identified and addressed. This collaborative ethos encourages input from all stakeholders, fostering a holistic view of the project landscape and enabling a collaborative approach to assessing risks based on their impact and probability. This inclusive and proactive strategy ensures that Genfare is identifying risks from a technical or managerial standpoint as well as considering the valuable perspectives of end users, field operators, and other stakeholders, leading to a more robust and resilient risk management process.

2.1.8.1 Most Significant Risks

Genfare will conduct weekly formal reviews of all risks to each phase of the program. From those reviews, the team will develop detailed mitigation plans. As these plans are executed, the continuous improvement practice means that active monitoring and improvements go on throughout the transition process. This process ensures that additional risks are identified and dealt with as they arise.

Using this approach, Genfare will have identified, assessed, scored, and identified key management actions to mitigate or manage risk during the transition and operational period. Examples of the most significant key risks, impacts, and mitigation are listed in table 5. Genfare can provide DTPW with a comprehensive Risk Register on request.

The final design review (FDR) document will contain the full Risk Register of the project by phase, including milestones, deliverables, roles, risks, and success factors. The Implementation Plan in the [appendix](#) serves as a baseline for the first phase of the program. The draft [schedule](#) provided in [section 2.2](#) and the roles and responsibilities previously presented in [section 2.1.2](#) provides the fundamental overview of the proposed methodology for project management.

Risk Category	Specific Risk	Risk Level	Mitigation Strategy
Installation	Unforeseen site-specific challenges (e.g., inadequate space, electrical supply issues, structural limitations)	Low to High (phase)	Conduct thorough site assessments and engage with site stakeholders to address potential challenges in advance.
Schedule	Discovery to design to delivery to install to production is on a very tight schedule to meet Phase 1 BRT needs	High Based on SLA	Plan, prioritize and set goals collectively to achieve schedule.
Design Agreement	Acceptance of the Conceptual and Final Design Review	Medium	Despite an aggressive schedule we have a plan for at least weekly meetings and multiple days on-site.
Equipment Compatibility and Configuration with Back Office	Scope of work required to integrate with unknown back office today	High	Current system designed to be open and to plug and play but without knowing what the back-office vendor will need.
Regulatory Compliance and Permits	Delays in obtaining necessary permits or complying with local regulations	Low	Engage with regulatory authorities early, understand permit requirements, and proactively work on obtaining the necessary approvals.
Weather and Environmental Factors	Adverse weather conditions or environmental factors disrupting shipping, installation, or causing damage to the ticket vending machines	Low	Develop contingency plans for adverse weather scenarios and consider protective measures for the machines during transit and installation.
Staffing	Recruiting and retraining qualified and competent staff	Low	Maintain a healthy culture of training and competency management to help retention while managing a pipeline of candidates

Table 5. Key management actions to mitigate or manage risk.

2.1.8.2 Recommended Implementation Plan per Phase

The Genfare-recommended implementation plan per phase is based on industry best practices and our previous experience. The Genfare project management schedule outlined previously in [section 2.1.1](#) incorporates SaaS and hardware delivery. Each phase of hardware delivery is managed by our core project management principles of **schedule**, **communication**, and **issue tracking** which underpin the four steps of **plan & design**, **configure & build**, **rollout & release**, and **closure & support** as previously outlined. Implementation is a critical part of the program management lifecycle. This project with DTPW is large and complex and requires extensive organization and communication with many different stakeholders. The DTPW carefully laid out its intention in how the solution would be implemented by phase:

- **In Phase 1**, Genfare will implement the Monitoring and Alerting System (MAS) through the Genfare Link platform. In this phase, faregates and ticket vending machines will be installed along the BRT and 18 fareboxes will be available for the lab environment.
- **In Phase 2**, Genfare will configure the farebox back office in the Genfare Link platform. The MAS and farebox back office will be delivered as a single platform and Genfare will configure the different elements of the phases as needed for all the equipment to perform optimally. The fareboxes will be installed on the bus network while the farebox infrastructure will be upgraded in the garages.
- **In Phase 3**, Genfare will complete the configuration for any additional functionality needed to the MAS as part of the Genfare Link platform and install the remaining equipment for faregates and ticket vending machines throughout the transit network as designed by this program.

Throughout each of these phases, Genfare will provide maintenance services for preventive maintenance for the equipment as well as training assistance to DTPW for reactive maintenance. As each phase is being implemented, the PMO will finalize a schedule of events.

Implementation Steps

The delivery of the Software as a Service (SaaS) is refined during the implementation phase into processes involving:

- Initiation (**planning & design**)
- Internal and customer acceptance testing setup
- Internal acceptance testing execution
- Customer acceptance testing execution (**configure & build**)
- Move to production (**rollout & release** and **closure & support**)

The implementation initiation provides the combined DTPW and Genfare team with a thorough understanding of the proposed SaaS solution and defines lower-level milestone delivery dates. The refined schedule is agreed upon by the team.

Both Genfare's internal and customer acceptance testing labs are the focus of the next step in the implementation process. Genfare sets up an internal acceptance testing lab that will replicate DTPW's fare collection and backend environments and will assist in setting up DTPW's acceptance testing lab. Following completion of Genfare's internal acceptance testing, Genfare implementation team members will be onsite to provide training and initiate customer acceptance testing with DTPW tool champions.

Upon DTPW approval of acceptance testing, Genfare will begin the move to production. The production environment is set up with the current environment plus the new solution, ensuring current operations are not negatively affected. Genfare will support DTPW's pilot testing and rollout to riders.

Upon completion of rollout, Genfare's implementation team will convene a transition meeting providing all relevant information to Genfare's Technical Services team.

Effectively, implementation milestones to be tracked include:

- Initiation completion
- Internal acceptance
- Testing lab setup
- Customer acceptance testing lab setup
- Internal acceptance testing completion

- Customer acceptance testing completion
- Production environment setup
- Production pilot
- Production rollout to riders
- Transition to Genfare Technical Services

2.1.8.3 Proposed Methodology

Implementing a program is a major undertaking for any organization, with substantial change for both the organization and the people involved. Where there is major change, there is complexity and risk, a number of interdependencies to manage, and likely conflicting priorities to resolve. DTPW needs a partner who understands this and has the right experience and vision to work with DTPW to achieve stated goals. *Having worked with DTPW for decades as a subcontractor to Cubic as part of the initial fare collection program, Genfare understands how DTPW operates and wants to enrich our culture with the methodology proven to provide a best practice framework for program management.* Genfare draws on a national portfolio of extensive experience with delivering successful transformations in transit.

A central challenge of this Fare Collection Equipment program is designing a comprehensive program management approach that can not only deliver and oversee today's operations within mission critical constraints, but that can continually evolve the service toward the future state through a change management approach that is sensitive to local needs and objectives. In short, a comprehensive management approach for a comprehensive solution is needed. This requires a Program Management Office (PMO) that can connect fully with the work at the County to understand daily mission imperatives and pressures, and that can step beyond operational concerns to address DTPW's strategic needs.

As part of this approach, Genfare assigns an experienced project team to each project. Genfare has a staff of highly skilled program managers, system engineers, and project engineers to support projects of any size and complexity. From this [experienced staff](#), Genfare has dedicated a PMO to carry out DTPW's project.

2.1.8.4 Proposed Project Milestones

The project milestones are listed in [Section 2.2](#) with deliverables of each phase outlined. The final schedule is part of the final design review document. Major milestones include:

- Conceptual design review
- Final design review
- Start of Phase 1 installation
- Maintenance data system installation
- BRT go live
- Start of phase 2 farebox installation
- Completion of farebox installs
- Start of phase 3 faregate and Vendstar 5 ticket vending machine installation
- Completion of Phase 3 installation

2.1.8.5 Team Roles

The Genfare team is steeped in skills and experiences relevant to this project. In addition, this project's subcontractors recognize Genfare's leadership role in fare collection equipment and are equally committed to the standard of performance and values in delivering on their role for this contract.

Team	Role
GENFARE	Prime contractor providing farebox and ticketing vending machine solutions, Genfare Link for MAS and farebox back office
CONSOLIDATED Parking Equipment	Installation and field services lead
TA Transportation America	Safety and quality assurance program lead
mAGNETIC [®] ACCESS TO PROGRESS	Faregate subcontractor

Table 6. Organization and role definition

Genfare is excited to work with local partners Consolidated Parking Equipment, Transportation America, and Magnetic AutoControl – they all provide an excellent balance of local understanding, experience, and advisory to Genfare, the fare collection equipment expert. Together, this is a powerful team that will fulfill the needs that DTPW has to improve their transit network with updated and modern technology to provide for riders throughout the County.

Consolidated Parking Equipment

Consolidated Parking Equipment (CPE) has more than 20 years of experience procuring, installing, and maintaining transportation equipment for contracts across Florida including Miami-Dade County, Broward County and beyond. CPE will take the lead on installation for all equipment, alongside Genfare's installation team for fareboxes and lead the on-call and on-site maintenance services. Consolidated Parking Equipment was founded in June of 2005 by a small group of people who have over 80 years combined experience in the parking industry. Today, this family-owned and operated business continues to grow based on its values of quality, service, and integrity. It strongly believes in promoting from within and growing its employees through schooling, training, industry trade shows, and seminars. CPE also provides benefits like health, dental, vision, and 401K while paying more than a living wage for its entry-level employees.



Figure 11. Consolidated Parking technician

This investment in CPEs workforce has helped it retain highly trained staff with a broad depth of knowledge and experience, providing customers with exemplary service and support. The workforce is made up of 17 service and maintenance personnel, each with their own take-home service vehicle with spare parts. Technicians are factory trained and certified.

CPE and its employees take pride in their ability to maintain quality service with a rapid response time that is second to none in the local parking industry. In most cases service is delivered within 2 hours of notification. CPE maintains a Miami-Dade warehouse with an extensive inventory of parts and. CPE has never been involved in any litigation due to its performance.

Transportation America

Transportation America is a leader in paratransit and microtransit services throughout Miami-Dade County and South Florida, putting safety of their passengers and operators at the heart of their program. Their leadership will help drive a best-in-class Safety and Quality Program to accomplish a Zero Accident Program while at the same time drive high quality in every equipment piece received, installed, and operational.

The local family-operated company is known for instituting strong program controls that promote a culture of safety, honesty, and commitment to service integrity and has earned the “Operator of the Year” award from the Florida Commission for the Transportation Disadvantaged. Transportation America also has four 24-hour full mechanical maintenance garages in southern, central, and northern Miami-Dade County.

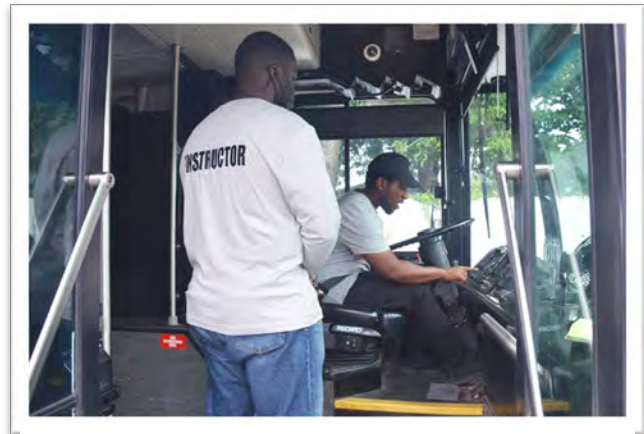


Figure 12. Transportation America instructor

Magnetic AutoControl USA

Magnetic AutoControl is a pioneer in access and border control automation, specializing in the design, manufacture, and commissioning of complete pedestrian access control solutions for customers around the world. Magnetic has successfully delivered security, immigration, and departure boarding gates for airport applications. Also, they have supplied access gates for security applications in corporate offices and fare collection gates for city metros, subways, and railways.

The design and engineering headquarters of Magnetic AutoControl is located in Schopfheim, Germany, with six subsidiaries in Australia, China, India, Malaysia, Brazil, and the USA. Magnetic AutoControl has been a business unit of The FAAC Group since 2012. Magnetic operates in concert with the global Magnetic AutoControl Group and has a long history of design, manufacturing, and project delivery of vehicle barrier gates, security gates, turnstiles, vehicle access systems, and related pedestrian access control technologies.



Figure 13. Magnetic AutoControl faregates in Dubai

2.1.8.6 Deliverables

These major deliverables ensure that the project is executed effectively, meets the requirements, and standards, and provides DTPW with a fully functional and reliable fare collection system.

Deliverable	Summary
Project Plan and Schedule	A detailed project plan outlining tasks, timelines, dependencies, and resources required for successful implementation
	A project schedule with milestones and deadlines
System Requirements Documentation	Comprehensive documentation of system requirements, including functional and non-functional specifications
Design Documents	System architecture and design documents that outline the technical design of the TVMs, faregates, and fareboxes
	User interface (UI) and user experience (UX) design documents
Testing Plan and Test Cases	A testing plan outlining the overall testing strategy, including test phases, objectives, and resources
	Test cases and scripts for unit testing, integration testing, user acceptance testing, performance testing, security testing, accessibility testing, usability testing, and regression testing
System Implementation	Fully developed and configured Ticket Vending Machines (TVMs), faregates, and fareboxes

Deliverable	Summary
	Integration of these components into the transit system's infrastructure
Training Programs	Training materials and programs for transit agency staff, including operators and maintenance personnel, on the operation and maintenance of the fare collection system
Documentation and Manuals	Comprehensive system documentation, including user manuals, installation guides, and maintenance guides for TVMs, faregates, and fareboxes
Testing Reports	Detailed reports for each testing phase, including test results, identified issues, and resolutions
Compliance and Certification Documents	Documentation demonstrating compliance with relevant transit regulations, standards, and certifications
Data Privacy and Security Documentation	Documentation outlining data privacy and security measures, including encryption and access controls
User Feedback and Usability Reports	Reports summarizing user feedback and usability testing results, along with recommendations for improvements
Operational and Maintenance Plans	Plans for the ongoing operation and maintenance of the fare collection system, including maintenance schedules and procedures
Emergency Response Plans	Plans for handling emergency scenarios, such as system failures or security breaches
Vendor Deliverables	Any deliverables from vendors or suppliers, including hardware components, software licenses, and support agreements
Final Acceptance and Sign-off	Formal acceptance and sign-off documents indicating the completion and acceptance of the project by DTPW
User Acceptance and Training Completion	Documentation confirming the successful completion of user acceptance testing and training programs
Warranty and Support Agreements	Agreements outlining the warranty and post-implementation support services provided by vendors or contractors
As-Built Drawings and Documentation	As-built drawings and documentation reflecting the actual configuration and installation of TVMs, faregates, and fareboxes

Table 7. Implementation deliverables

2.1.8.7 Risks

The major risks for implementation are outlined in [Section 2.1.8.1](#) and are mitigated at a review addressing all items on a risk register on at least a weekly basis.

2.1.8.8 Critical Success Factors

This project is extensive and complex – Genfare must be responsible for robust planning to execute the scope of work on time and budget. These factors are essential to ensure the successful implementation of the fare collection system.

	Critical Success Factor	Rationale
Robust Project Planning and Management	A well-structured project plan with clear milestones, timelines, and roles and responsibilities is essential. Effective project management ensures that all tasks are coordinated, monitored, and executed according to the plan.	Effective project planning and management provide the foundation for the successful implementation of fare collection equipment. A detailed project plan helps in identifying potential issues early and enables proactive mitigation.
Stakeholder Engagement and Collaboration	Active engagement and collaboration with all stakeholders, including the transit agency, contractors, vendors, and end users, are critical. Building strong partnerships and fostering open communication channels are essential.	Involving stakeholders from the outset ensures that project objectives align with their needs and expectations. Collaboration promotes transparency and facilitates the resolution of issues and conflicts effectively.
Comprehensive User Training	Thorough user training programs with videos for the transit agency staff and end users are essential. Training should cover all the fare collection equipment, maintenance, and troubleshooting.	Well-trained staff and users ensure smooth operations, reduce the risk of user-related issues, and enhance customer satisfaction. Adequate training contributes to the successful adoption of the fare collection system.
Quality Assurance and Testing	Implementing rigorous quality assurance and testing procedures throughout the project is crucial. This includes unit testing, integration testing, user acceptance testing, and usability testing.	Quality assurance ensures that the fare collection equipment meets specified standards and functions as intended. Thorough testing helps identify and rectify issues before deployment, minimizing post-installation disruptions.
Regulatory Compliance	Strict adherence to regulatory requirements and compliance standards is paramount. This includes adhering to payment card industry (PCI) data security standards and accessibility regulations (e.g., ADA).	Compliance with regulations and standards is non-negotiable. Failure to meet these requirements can lead to legal and financial consequences, as well as reputational damage.
Data Security and Privacy Protection	Robust data security measures, including encryption and protection of user data, are essential. Privacy policies and practices must be in place to safeguard sensitive information.	Protecting user data and ensuring data security are critical for maintaining user trust and avoiding security breaches or privacy violations.
Effective Change Management	Implementing a change management strategy is crucial to address potential resistance to the new fare collection system. Effective communication, training, and addressing user concerns are key components.	Change management ensures a smooth transition to the fare collection equipment, minimizing disruption and promoting user acceptance.

	Critical Success Factor	Rationale
Vendor Reliability and Performance	Choosing a reputable and reliable vendor with a track record of delivering quality fare collection equipment is essential. Vendor performance and financial stability should be monitored.	The vendor's reliability directly impacts the success of the project. A dependable vendor ensures timely delivery, product quality, and ongoing support.
Contingency Planning	Developing contingency plans for potential risks and challenges is crucial. These plans should outline alternative approaches and actions to take if unexpected issues arise.	Contingency plans provide a safety net, ensuring that the project can adapt to unforeseen circumstances without significant disruption or delays.
User Feedback and Continuous Improvement	Establishing mechanisms for gathering user feedback and incorporating it into system improvements is vital. This includes usability testing and feedback loops.	User feedback drives continuous improvement, enhancing the user experience and ensuring that the fare collection system evolves to meet changing needs.

Table 8. Risk management critical success factors

A successful project is dependent on where the program management approach begins – with **schedule, communication**, and **issue tracking** to create a high-quality program that is delivered on budget and schedule.

2.1.8.9 Assumptions

Assumptions are useful for clarifying expectations and conditions surrounding the implementation of new ticket vending machines, faregates, and fareboxes. Here is a detailed list of assumptions that can be chosen for the document, including support from the DTPW staff in executing the final design review:

	Assumption
Project Funding and Budget	The project budget is fully funded, and necessary financial resources are available for the successful implementation of ticket vending machines, faregates, and fareboxes.
Timely Approval and Permits	All required permits, approvals, and clearances from relevant authorities will be obtained promptly, ensuring that the project adheres to local regulations and guidelines.
Vendor Selection and Contractual Agreements	The transit agency has selected Genfare for the supply and installation of ticket vending machines, faregates, and fareboxes, and contractual agreements are in place.
County Staff Support	County staff will provide necessary support in executing the final design review as agreed upon within three months of the notice to proceed. This support includes timely reviews, feedback, and approvals to facilitate project progress.
Site Preparation and Modifications	Any required site preparation and modifications, such as electrical connections, network infrastructure, and physical changes to station layouts, will be completed as necessary prior to equipment installation.

	Assumption
User Training	Comprehensive training programs for transit agency staff, including operators, maintenance personnel, and station attendants, will be delivered to ensure proficient operation and maintenance of the new equipment.
Regulatory Compliance	The project team will adhere to all relevant regulatory and compliance requirements, including but not limited to payment card industry (PCI) data security standards and Americans with Disabilities Act (ADA) accessibility standards.
Change Management	An effective change management plan will be in place to address any potential resistance to the new fare collection system among staff and users, ensuring a smooth transition.
Quality Assurance and Testing	Rigorous quality assurance and testing, including unit testing, integration testing, user acceptance testing, and security testing, will be conducted to verify the functionality, reliability, and security of the fare collection system.
Contingency Planning	Contingency plans for mitigating unforeseen risks and issues will be developed and readily available for implementation as needed.
User Feedback and Continuous Improvement	Mechanisms for gathering user feedback will be established, and feedback will be actively used to drive continuous improvement in the fare collection system's usability and functionality.
Project Schedule	The project schedule, as outlined in the contract, is achievable, with key milestones and deadlines met as planned.
Maintenance and Support	Ongoing maintenance and support services from Genfare will be available after the installation phase to ensure the long-term functionality and reliability of the fare collection system.

Table 9. Assumptions

2.1.9 Testing

Genfare's approach to testing is to do everything possible at every step of the way to make sure that as DTPW embarks on a transformative journey to elevate its fare collection systems, the integration of new ticket vending machines (TVMs), faregates, and fareboxes with Genfare Link is seamless. By embracing a test-to-fail philosophy, the testing plan is designed to ensure that these critical touchpoints not only function independently with reliability and user accessibility, but also communicate effectively with the central system, providing a cohesive and efficient public transportation service.



2.1.9.1 Overview and Introduction

The overarching goal of the comprehensive testing regimen is to verify that each component of the fare collection system—TVMs, faregates, and fareboxes—operate in harmony with Genfare Link, ensuring operational excellence, robust security, and high reliability. By aligning these systems with the DTPW mission, Genfare aims to deliver a frictionless and outstanding transit experience that resonates with the daily lives of Miami-Dade's residents and visitors. This plan is a commitment to integrating cutting-edge technology with user-centric service, fostering a connected and intuitive travel environment.

2.1.9.2 Outline of Testing Strategy

The Genfare-led testing strategy encompasses a series of methodical phases, each designed to validate the functionality and integration of the system's components. Testing will begin at Genfare where unit level testing will occur at the component level (farebox, software module, etc.). System-level testing will be completed on the internal User Acceptance Testing lab. Testing starts at the unit level to ensure each hardware and software element performs to design specifications. Comprehensive integration testing will confirm interoperability within the fare collection ecosystem. Genfare deploys a blend of expert developers, QA engineers, and cybersecurity professionals, utilizing state-of-the-art tools and methodologies to guarantee that every aspect of the system meets the input requirements and clearly defined success criteria.

The collaborative testing strategy with DTPW encompasses a comprehensive suite of tests developed in cooperation with DTPW and designed to ensure the fare collection system's functionality, accessibility, and usability meet the highest standards.

UAT engages both transit agency staff and external users over two weeks to validate real-world performance. Concurrently, Accessibility Testing focuses on compliance with ADA standards, involving testers with disabilities to ensure the system's usability over a one-week period. Usability Testing then takes center stage, with a dedicated team of experts, designers, and representative users working together for two weeks to validate the user interface and experience. Details follow.

2.1.9.3 Testing Phase Objectives, Scope, Duration, Resources, Tracking, and Success Criteria *Genfare-led Testing Phases*

The tables below provide an overview of the Genfare-led testing phases, objectives, scope, durations, resources, and success criteria, ensuring a transparent and accountable testing process.

Aspect	Details
Objective	Verify the integrity and correctness of individual components
Scope	Independent evaluation of each component
Duration	Approximately four weeks
Resources	Developers and QA engineers
Team Size	Developers: 5-10, QA Engineers: 5-10
Issue Tracking	JIRA software
Success	100% of test cases pass

Table 10. Unit testing phase details

Aspect	Details
Objective	Ensure system updates do not impact existing functionality
Scope	Continuous performance and functionality assessment
Duration	Ongoing throughout development and maintenance
Resources	Testers and automated testing tools
Team Size	Testers: 5-10
Issue Tracking	JIRA software
Success	100% of test cases pass

Table 11. Regression testing phase details

Aspect	Details
Objective	Assess system performance to meet benchmarks and SLAs
Scope	Responsiveness, throughput, scalability
Duration	Approximately two weeks
Resources	Performance testers, load generators, network admins
Team Size	Integration Engineers: 5-10, Testers: 5-10, System Architects: 1-2
Issue Tracking	JIRA software
Success	100% of test cases pass

Table 12. Performance testing phase details

Aspect	Details
Objective	Identify and mitigate system vulnerabilities
Scope	Security, encryption, access controls, cyber threats
Duration	Approximately two weeks
Resources	Cybersecurity professionals
Team Size	Cybersecurity Professionals: 3-5
Issue Tracking	JIRA software
Success	100% of test cases pass

Table 13. Security testing phase details

Aspect	Details
Objective	Confirm interoperability within the fare collection ecosystem
Scope	Interactions and data flow between components
Duration	Approximately two weeks
Resources	Integration engineers, testers, system architects
Team Size	Integration Engineers: 5-10, Testers: 5-10, System Architects: 1-2
Issue Tracking	JIRA software
Success	100% of test cases pass

Table 14. Integration testing phase details

Collaborative Testing Phases

The tables below provide a structured format for presenting the collaborative testing efforts between DTPW and Genfare, detailing the objectives, scope, duration, resources, team sizes, issue tracking mechanisms, and success criteria for each testing phase.

Aspect	Details
Objective	Evaluate system functionality and usability from the perspectives of transit agency staff and external users
Scope	Simulate real-world scenarios with transit agency staff and external users
Duration	Approximately two weeks
Resources	End users (transit agency staff), external users
Team Size	Integration engineers: 5-10, testers: 5-10, system architects: 1-2
Issue Tracking	Smartsheet shared with DTPW, JIRA for engineering issues
Success	Collaborative severity and response determination for issues

Table 15. User acceptance testing phase details

Aspect	Details
Objective	Ensure system usability by individuals with disabilities, in compliance with ADA standards
Scope	DTPW assesses accessibility features for ADA certified devices
Duration	Approximately one week
Resources	Accessibility testers, individuals with disabilities
Team Size	Accessibility Testers: 3-5
Issue Tracking	Smartsheet shared with DTPW, JIRA for engineering issues
Success	Collaborative severity and response determination for issues

Table 16. Accessibility testing phase details

Aspect	Details
Objective	Evaluate the user interface and overall user experience for improvements
Scope	Usability tests with end users to assess ease of use
Duration	Approximately two weeks
Resources	Usability experts, interface designers, representative end users
Team Size	Usability experts: 2-3, user interface designers: 1-2, representative end users: 3-5
Issue Tracking	Smartsheet shared with DTPW, JIRA for engineering issues
Success	Collaborative severity and response determination for issues

Table 17. Usability testing phase details

2.1.9.4 Systems Function Testing

This comprehensive list of system functions covers all aspects of the fare collection system, ensuring that it functions seamlessly, securely, and in compliance with regulatory and accessibility standards. Testing each of these functions is crucial to delivering a reliable and user-friendly public transportation system for DTPW.

Test Category	Test Activities
Ticket Purchase	Verify ticket purchase options (single ride, daily, weekly, monthly passes). Test various payment methods (cash, cards, NFC).
Fare Calculation	Validate accurate fare calculation. Ensure proper fare display.
Ticket Printing and Dispensing	Confirm correct ticket printing and dispensing. Test ticket readability (QR codes, barcodes).
User Interface	Assess TVM interface user-friendliness. Verify clarity of instructions and options.
Accessibility Features	Test screen reader compatibility, keyboard navigation. Ensure compliance with accessibility standards.
Error Handling	Verify error handling (card declines, jams). Test recovery procedures.
Integration	Ensure communication with faregates and other TVMs. Test fare data synchronization and validation.

Table 18. Systems function testing TVM

Test Category	Test Activities
Access Control	Test access control based on valid tickets. Verify response to unauthorized access.
Ticket Validation	Validate ticket reading and processing. Ensure smooth passage for valid tickets.
Security Features	Test anti-tailgating, alarms. Ensure detection of fare evasion.
User Interface and Feedback	Assess clarity of instructions and feedback. Verify functioning of indicators.
Accessibility Compliance	Confirm accessibility for passengers with disabilities. Test features for wheelchairs, mobility aids.

Table 19. Systems function testing faregates

Test Category	Test Activities
Fare Collection	Validate cash collection mechanisms. Ensure accurate fare handling.
Cash Processing	Test processing of cash and coins. Verify response to counterfeit/foreign coins.
Data Recording	Confirm accurate transaction data recording. Test data transmission to backend systems.
User Interface	Assess interface for drivers and passengers. Ensure clear fare display and instructions.
Integration with Backend Systems	Test integration with central systems. Validate data synchronization and reporting.
Security and Anti-Fraud Measures	Verify security features against tampering/theft. Test fraud prevention mechanisms.
Accessibility Features	Confirm accessibility compliance. Test features for passengers with disabilities.

Test Category	Test Activities
Complete Journey Testing	Simulate complete passenger journeys. Test seamless passenger flow through the system.
Interoperability Testing	Validate interoperability of TVMs, faregates, fareboxes. Test multi-component scenarios.
Payment and Reporting Integration	Test integration with payment and reporting systems. Ensure accurate records and reporting.
Emergency Scenarios	Test responses to emergencies. Verify emergency exit procedures.
Scalability and Load Testing	Assess performance under various loads. Validate handling of high passenger volumes.
Security and Data Protection	Conduct security testing for vulnerabilities. Ensure passenger data security.
Compliance and Regulations	Validate compliance with transit regulations. Ensure adherence to fare collection standards.
Usability and Passenger Experience	Collect user feedback on usability and experience. Assess overall system usability.

Table 20. Systems function testing fareboxes and end-to-end testing

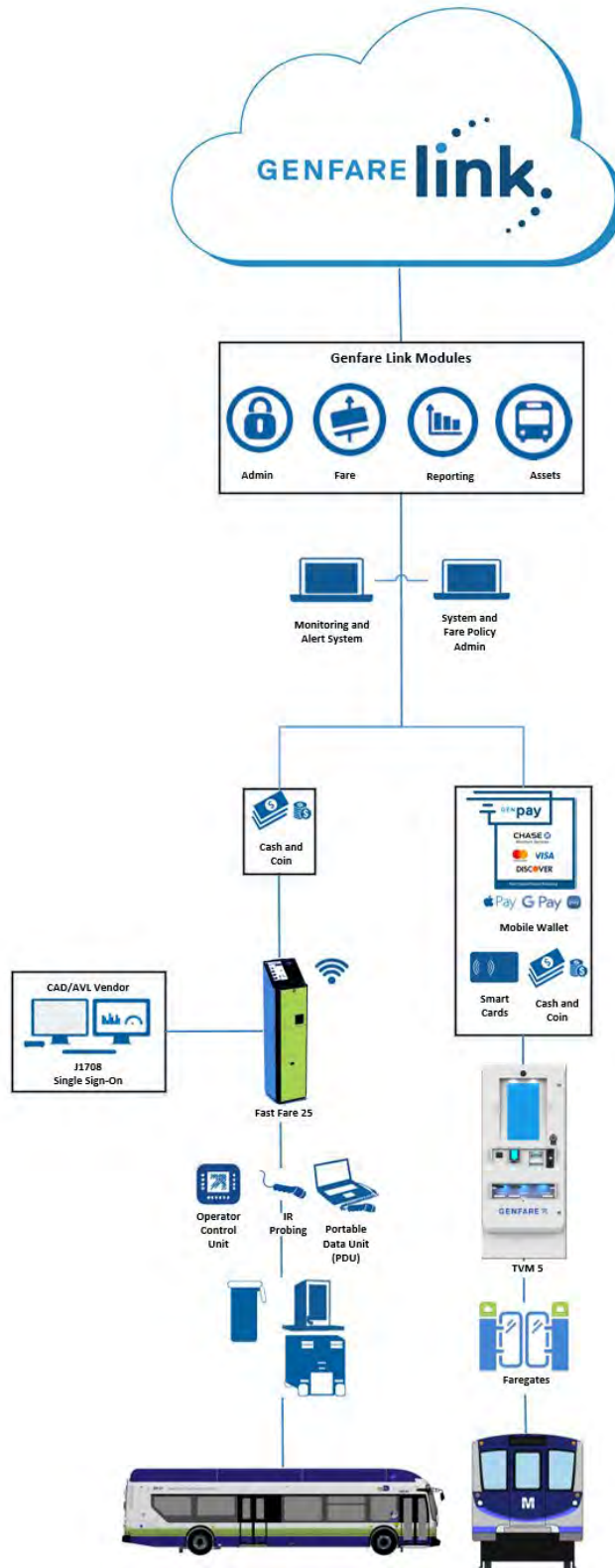


Figure 14. System under test

2.1.9.5 Test Case Detail Level Description

The tables below provide an overview regarding test case development. The detailed test cases and scripts will ensure thorough testing of the fare collection system from individual components to end-to-end scenarios while facilitating efficient testing and issue tracking throughout the project.

Testing Type	Level of Detail for Test Cases	Scripts for Testing
Unit Testing	Individual components, functions, modules. Granular with specific inputs and outputs. Thoroughly tests edge cases and error scenarios. Includes description, input data, expected results, and prerequisites.	Developed with appropriate frameworks. Automates execution with detailed steps. Organized for maintenance.
Regression Testing	Covers all previously tested functions. Includes positive and negative scenarios. Organized by functional areas.	Automates test cases. Validates existing functionality. Reports deviations.
Performance Testing	Defines load scenarios and performance metrics. Tests variations in load including peak and sustained.	Simulates various load scenarios. Captures performance metrics during tests.
Security Testing	Covers aspects like authentication and data protection. Identifies vulnerabilities and security threats.	Automates execution of security cases. Emulates attacks and assesses system resistance.
Integration Testing	Focuses on interactions between components. Covers data exchange and communication protocols. Documents with input data and expected outcomes.	Orchestrates component interactions. Verifies data exchange and error handling.
User Acceptance Testing	User-centric language, real-world scenarios. Aligns with user requirements. Encompasses end-to-end user journeys.	Guides testers through scenarios. Includes detailed steps and deviations documentation.
Accessibility Testing	Aligns with accessibility standards. Focuses on usability with technologies and navigation. Includes compliance testing with standards.	Guides testers with disabilities. Details interactions and documents findings.
Usability Testing	Scenario-based, user-centric. Describes tasks and goals for participants.	Provides detailed scenarios for participants. Documents observations and feedback for improvement.

Table 21. Test case detail levels

2.1.9.6 Test Data

Test data is described throughout [section 2.1.9.3](#).

2.1.9.7 Special Equipment

In the testing and development process, Genfare prioritizes code quality and efficiency by leveraging automated tools and robust frameworks. The approach includes continuous integration and static code analysis to ensure the software is both high-performing and secure.

By maintaining an agile environment, Genfare supports a cycle of development, testing, and deployment that adapts swiftly to user requirements and technological advancements. This methodology allows us to consistently deliver reliable and user-centric software solutions. All testing will occur in the UAT lab, which will have all the required equipment, software, and data.

Category	Tools
Programming Languages	JAVA, Gherkin for scenario creation
Frameworks	Spring Boot, Cucumber
Tools	JPA, Selenium, Junit, Jenkins, Maven
Servers	Tomcat
Tools and IDE	My Eclipse
Operating System	Windows, Linux
Source Control and Build	Maven, Gradle, Log4j, GIT

Table 22. Testing equipment

Tool	What It Does
SonarQube	It is an automatic code review tool to detect bugs, vulnerabilities, and code smells in your code.
SonarCloud	It is an open-source platform developed by SonarSource for continuous inspection of code quality to perform automatic reviews with static analysis of code to detect bugs and code smells on 29 programming languages.
Amazon CodeGuru	It is a developer tool that provides intelligent recommendations to improve code quality and identify an application's most expensive lines of code.
Coverity	It is a proprietary static code analysis tool from Synopsys that enables engineers and security teams to find and fix software defects.

Table 23. Tools to manage code quality

2.1.9.8 Resolution Tracking

Across all phases, issue tracking is meticulously managed through a shared Smartsheet with DTPW, with engineering-specific issues escalated through JIRA. This structured approach guarantees a responsive, user-centric system with a collaborative framework for addressing and prioritizing issues effectively. See [section 2.1.9.3](#) for details.

2.1.9.9 Completion Criteria

See [section 2.1.9.3](#) for a description of the criteria that will be used to determine whether tests have been satisfactorily passed for each phase of Genfare-led and collaborative testing.

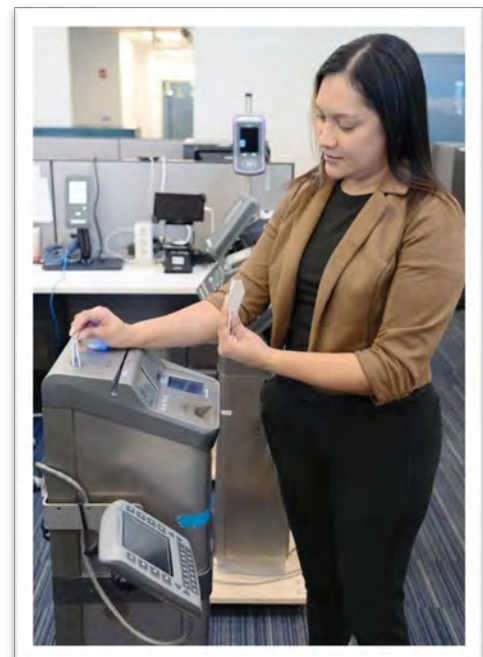


Figure 15. Genfare engineer performing integration testing

2.1.10 Cutover Plan

Given that the system is currently operational with fareboxes on buses, vault equipment at garages, and faregates and TVMs at rail stations, it is imperative to carefully orchestrate the phasing in of new equipment. The first phase of the project, the BRT TVMs and faregates, is easier due to the nature of the new construction; however, it is anticipated that customers will already be utilizing the space. A draft of Genfare's implementation plan for Phase 1, including the process for cutover, is provided as an [appendix](#).



Genfare will update the implementation plan for Phase 1 document as part of the design review and prepare installation and cutover plans for the other two phases. The plans presented as part of the conceptual design review and final design review process will allow for detailed accounting of required DTPW resources for individual tasks. Genfare anticipates significant discussions on the tradeoffs for how to minimize the impact of installing new systems on the ridership of DTPW, BRT, bus, and rail customers.

The project in this request focuses on physical infrastructure that needs to both work with the current infrastructure and set the stage for new options outlined in a future request for proposals. Genfare intends to set up the DTPW for success with an interim back-office solution that is integrated with the existing system to the extent possible and portends a seamless integration to future fare collection technologies.

In each phase, Genfare will work with DTPW to define the configurations parameters required to make the equipment for that phase work as desired. Once defined, the Genfare implementation team will configure the system and test the configuration in a Genfare lab. Then DTPW will be asked to verify the configuration using equipment in a User Acceptance Testing lab. Once the configuration is confirmed as correct in UAT, the configuration will be pushed to the production environment, where it can be confirmed on a single piece of equipment or a collection of equipment. After confirmation, the configuration will be rolled out to all equipment.

In Phase 1, equipment can be installed in parallel to the software configuration work. Once the configuration is confirmed, it will be rolled out to all installed equipment, which can then be put into revenue service. In Phases 2 and 3, software configuration will be done parallel to equipment installation planning. Since Phases 2 and 3 require the replacement of revenue service equipment, it is required that the configuration be completed prior to the beginning of installation. Once confirmed, each piece of equipment installed will be placed into revenue service immediately. The one exception to this is the replacement of the revenue transfer and collection equipment in Phase 2. Genfare's updated vaulting equipment is backwards-compatible with DTPW's currently installed Odyssey fareboxes and can be replaced at any time in Phase 2.

2.1.11 Safe Working Conditions

Genfare and its contractors are committed to ensuring the safety and well-being of all employees. The team understands the importance of providing proper training on safety protocols and procedures to everyone on the team. All employees are familiar with the correct usage of equipment and machinery and educated on potential hazards and how to prevent accidents.

At Genfare, safety is not just a priority; it is a core value that guides actions and decisions. The team is committed to upholding the highest standards of safety in all aspects of the operation. Through ongoing training, regular maintenance checks, provision of PPE, and accessibility accommodations, the team strives to create a workplace where every employee can thrive.



- **Implement safety protocols.** Establish clear safety guidelines and protocols that all employees and contractors must follow. This may include providing safety training and conducting regular safety meetings to reinforce these guidelines.
- **Providing necessary safety equipment.** Make sure that all employees have access to and are trained in the proper use of necessary safety equipment such as personal protective equipment (PPE), fire extinguishers, first aid kits, other safety devices necessary to perform work, ensuring that the workplace is free from hazards and potential risks that could cause harm to the workers.
- **Conduct regular safety inspections.** Regularly inspect the workplace to identify any potential hazards or risks. This should include checking for proper lighting, ventilation, work surfaces, vehicle risk hazards, and ergonomic conditions.
- **Emergency preparedness.** Have a well-defined emergency response plan in place, including evacuation plans, emergency contact information, and regular drills to ensure that employees know what to do in case of an emergency. We will work in partnership with transit and other contractors to adhere to transit site protocols.
- **Open communication between transit and contractors.** Implement a culture where employees can report potential hazards or suggest improvements to the working conditions without fear of retaliation.
- **Review and update safety measures.** Ensure that they remain effective and relevant throughout the entire project.

Furthermore, Genfare strives to make the workplace accessible to all employees, including those with disabilities. The team recognizes the importance of providing necessary accommodations to ensure equal opportunities for everyone and be ADA compliant. This includes installing wheelchair ramps and other aides to assist employees with mobility challenges. By removing barriers and creating an inclusive environment, Genfare promotes diversity and enables all employees to contribute their skills and talents effectively.

By prioritizing safe and accessible working conditions, Genfare aims to create a positive work environment that fosters employee well-being and productivity. When employees feel safe and supported, they are more likely to perform at their best. That's why we continuously evaluate the safety measures and seek feedback from employees to identify areas for improvement.

2.1.12 Wages & Benefits

SPX Technologies

SPX is Genfare's parent company and follows a total rewards philosophy that includes market competitive wages. Wage rates are assessed annually following careful study of market conditions to ensure that they are compliant with local and federal laws and competitive with the market in which the role will be based.

The determination of rates begins by establishing the job classification within the company, such as laborer and other related classifications. Each job classification begins with an hourly rate, determined by our compensation chart produced through market analysis and the SPX philosophy on an annual basis. The analysis of employer benefit payments for each classification is then conducted.

The benefit payment is currently 33%. The combined value for a full-time employee is then correlated in comparison with the labor market of the contract function area (e.g., Miami) and the prevailing wages of each position within job classifications.



Job Classification	Hourly Rate	Benefits (33%)	Combined Value for FTE	UNAT (National average of classification/ position)	Comparable to job market data of functioning contract (Chicago +5%)	
Group 1	\$18	0.33	\$23.94	\$20.00	\$21.00	Above prevailing wages
Group 2	\$25	0.33	\$33.25	\$31.00	\$32.55	Above prevailing wages
Group 3	\$35	0.33	\$46.55	\$42.00	\$44.10	Above prevailing wages
Group 4	\$55	0.33	\$73.15	\$65.00	\$68.25	Above prevailing wages

Table 24. Genfare wage structure

Consolidated Parking

Consolidated Parking exceeds the minimum wage stipulated in Miami Dade County. Additionally, all employees will earn a raise and bonus at the end of this quarter. Consolidated Parking's wage structure is as follows:

Job Classification	Per Hour Wage Rate	Per Hour Health Benefit	Per Hour 401K	Combined Dollar Value
Laborers	\$19.00	\$4.25	\$3.41	\$26.66
Employees (Average)	\$35.93	\$3.21	\$1.10	\$40.24

Table 25. Consolidated Parking wage structure

Transportation America

For public contracts with Miami-Dade, at a minimum, Transportation America complies with the County's Living Wage Ordinance, which requires that covered employees must be paid not less than the wage rate in the schedule posted with the Living Wage Notice. Transportation America offers competitively higher wage structures and benefits for supervisors, managers, and senior level personnel.

2.1.13 Innovative Technologies

The primary environmental impact from the fare collection equipment comes from the manufacturing of the components within. Needing to use more components, be they individual devices, printed circuit boards, or wiring harnesses, increases the environmental cost of manufacturing.

Over time, Genfare's fare equipment has evolved to accept all forms of payment, going beyond cash and coin to include electronic payment methods such as smart cards, mobile ticketing, and bank cards. This has required an increase in the number of components contained in the equipment. However, Genfare has been innovative in combining multiple functions into fewer devices as available technology has matured. The equipment proposed here is the next generation of fully-featured fare collection products. Compared to the last generation, Genfare is using 37% fewer printed circuit boards and individual devices to accept all forms of payment and can do it faster, more securely, and on a technology stack that can adapt as the needs of DTPW change.

As Genfare has rolled out new products, it has always worked to ensure that the latest generation of products are built with new materials that will outlast the vehicles they are installed on. The Fast Fare 25 has fewer plastic components than previous fareboxes, as plastic is less easily recycled versus metal. The metal components are manufactured to tight tolerances, improving the IP rating of the farebox, ticket vending machine, and faregates, keeping harmful dust and liquids from entering the equipment. New products are designed to be backwards compatible, allowing agency partners to upgrade over time as old equipment surpasses its useful life, as opposed to disposing of equipment that is still functional. Genfare equipment routinely lasts longer than 15 years in revenue service, with some agencies in North America still running the original generation of fareboxes designed more than 40 years ago.

Genfare is leveraging new technologies internally to digitize and automate documentation and processes within our operations. Our engineering, development, implementation, and testing teams leverage Jira, a paperless ticketing system, Confluence, a paperless documentation system, and Zephyr, a paperless testing system, to track and automate their work. Our Return Material Authorization (RMA) process has recently undergone a digitization exercise to completely remove paper from the flow. Now our customers can request an RMA through a web-based form, which falls into an automated approval process until the RMA is issued.

Our customer care team has also gone through a digital transformation; all manuals, training content, videos, and knowledge articles are available digitally, accessible by our agency partners 24/7. The manuals for all the equipment in this procurement would be over 2,000 printed pages, and historically our customers have asked for between five and ten copies of every manual. Like our internal teams, customer care cases are managed completely paperless in an automated system. Customers can access the customer care portal and enter a case from anywhere at any time, and updates will be provided electronically.

2.1.14 Durable Products

Genfare will perform the work required in this project by using durable products, reusable products, and products (including those used in services) that contain the maximum level of post-consumer waste, post-industrial, and/or recyclable content, without significantly affecting the intended use of the goods or services required. There are several programs that Genfare employs to exemplify how products are designed, built, and manufactured with the highest standards that minimally impact the environment.



Genfare supplier packaging recycle/reusable and eco-source requirement program

Genfare is committed to promoting sustainable practices throughout its operations, including the procurement and packaging processes. This supplier packaging recycle/reusable and eco-source requirement program aims to ensure that suppliers align with Genfare's sustainability goals and contribute to reducing environmental impact. By implementing this program, Genfare seeks to significantly reduce waste generation, promote recycling, and encourage the use of environmentally friendly materials in packaging.

Genfare supplier sustainable sourcing initiative

Genfare is committed to promoting sustainability and environmental responsibility in every aspect of business. This commitment extends to suppliers, recognizing the importance of partnering with companies that have shared values and contribute to a more sustainable future. To achieve this, the Genfare supplier sustainable sourcing program was developed.

Stainless steel metals: recyclability

Metal is highly recyclable compared to plastic and other materials. It can be recycled indefinitely without losing its inherent properties. This means that metal can be recycled and reused to create new products, requiring minimal processing and energy compared to the production of virgin metals. Additionally, the recycling of metals helps conserve natural resources, reduce greenhouse gas emissions, and decrease the amount of waste going to landfills. In contrast, plastic recycling is more complex and challenging due to variations in plastic types, contamination, and the need for advanced sorting technologies. Plastic recycling rates are generally lower than those for metals.

Metal recycle client initiative

Genfare recognizes the importance of sustainability and environmental stewardship. That is why the launch of the Genfare metal recycle client initiative campaign is so significant, aimed at encouraging customers to participate in metal recycling efforts and help create a healthier planet.

2.2 Project Schedule

Genfare's approach to project scheduling considers the many variables we have learned to expect in our 40+ years of implementing fare collection solutions.

Genfare recognizes the importance of completing this project, especially Phase 1, on-time. The critical deadline is to get the ticket vending machines and faregates installed in time for the South Dade TransitWay Corridor BRT launch. Provided with an award date no later than June 24, 2024, the proposed schedule gets Phase 1 complete in ample time for the January 2, 2025, launch of the BRT corridor. Bus farebox installations start with the BRT buses in mid-2025 and continue to the rest of the fleet by the end of 2025. The installation of TVMs and faregates at the rail stations occurs in the heart of 2025 with the goal of completing all work prior to the end of 2025.

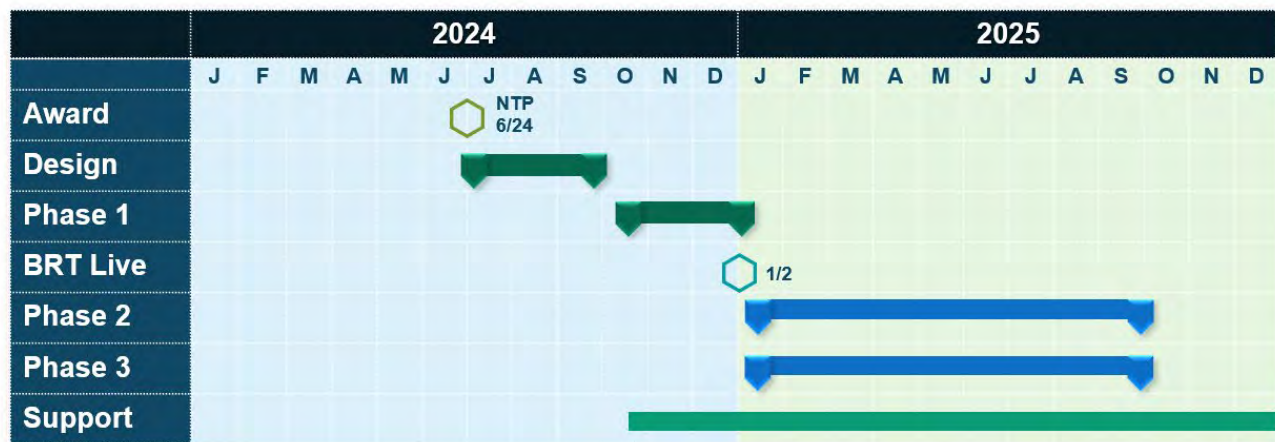
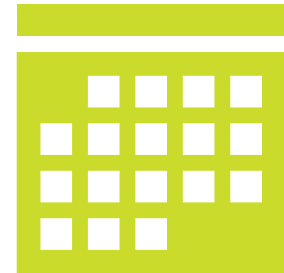


Figure 16. Project schedule overview

The project's initial tasks center around the contracting and equipment ordering aspects, the concept design review (CDR) and the final design review (FDR). The submission of installation plans and setting up training and testing labs along with the initial set up of the Maintenance Data System (MDS) are included in the tasks performed prior to starting Phase 1.

	Start	Finish
Award Date	06/24/2024	06/24/2024
Phase 1 – BRT – TVMs and Faregates	06/24/2024	12/20/2024
Phase 2 – Bus Fareboxes	01/06/2025	09/30/2025
Phase 3 – Rail Station – TVMs and Faregates	01/06/2025	09/19/2025

Table 26. Key schedule milestones

2.2.1 Phase 1

The focus of the first phase is the installation of the TVMs and faregates at the BRT stations on the South Dade TransitWay Corridor.

	Days	Start	Finish
Phase 1 – Kickoff Meeting	1d	06/24/2024	
Concept Design Review (CDR)		06/24/2024	07/31/2024
CDR Presentation Provided	1d	07/02/2024	
CDR Agenda Provided	1d	07/05/2024	
CDR - On-site	2d	07/09/2024	07/10/2024
CDR - Minutes Provided	1d	07/16/2024	
CDR - Response	1d	07/26/2024	
CDR - Resubmittal	1d	07/31/2024	
Final Design Review (FDR)		08/09/2024	08/30/2024
FDR Provided	1d	08/09/2024	
FDR Presentation Provided	1d	08/14/2024	
FDR Response	1d	08/19/2024	
FDR Agenda Provided	1d	08/20/2024	
FDR - On-site	2d	08/26/2024	08/27/2024
FDR - Minutes Provided	1d	08/30/2024	
Permits Requested	1d	09/03/2024	
Genfare Link - Cash Link UAT Setup	15d	09/09/2024	09/23/2024
Delivery of Training Units, PDUs	1d	09/19/2024	
Genfare Link - Cash Link PROD Setup	15d	09/24/2024	10/08/2024
Set up TVM and Farebox Training and Lab	2d	09/30/2024	10/01/2024
Maintenance Data System Installation	4d	10/07/2024	10/10/2024
Maintenance/Training Setup (18 FB, 2 TVM, 1 Gate)	4d	10/07/2024	10/10/2024
Initial System Training	3d	10/15/2024	10/17/2024
Phase 1 – BRT - TVM's & Faregates	28d	10/22/2024	12/13/2024
Installation at BRT Station 104th St.	2d	10/22/2024	10/23/2024
Installation at BRT Station 136th St.	2d	10/24/2024	10/25/2024
Installation at BRT Station 152nd St.	2d	10/29/2024	10/30/2024
Installation at BRT Station 168th St.	2d	10/31/2024	11/01/2024
Installation at BRT Station 184th St.	2d	11/05/2024	11/06/2024
Installation at BRT Station Marlin Rd	2d	11/07/2024	11/08/2024
Installation at BRT Station 200th St.	2d	11/12/2024	11/13/2024
Installation at BRT Station 112th Ave.	2d	11/14/2024	11/15/2024
Installation at BRT Station 244th St.	2d	11/19/2024	11/20/2024
Installation at BRT Station 264th St.	2d	11/21/2024	11/22/2024
Installation at BRT Station 296th St.	2d	12/03/2024	12/04/2024

	Days	Start	Finish
Installation of BRT Station 312th St.	2d	12/05/2024	12/06/2024
Installation at BRT Station Civic Ct.	2d	12/10/2024	12/11/2024
Installation at BRT 177th St.	2d	12/12/2024	12/13/2024
Phase 1 – Acceptance & Signoff	1d	12/20/2024	
South Dade TransitWay Corridor BRT Go Live	1d	01/02/2025	

Table 27. Phase 1 milestones

2.2.2 Phase 2

The second phase begins with the installation of fareboxes on the BRT buses before moving to the three other garage locations.

	Days	Start	Finish
Phase 2 – Kickoff Meeting	1d	01/06/2025	
Concept Design Review (CDR)		01/06/2025	01/31/2025
CDR - On-site	2d	01/13/2025	01/14/2025
CDR - Response	1d	01/24/2025	
CDR - Resubmittal	1d	01/31/2025	
Final Design Review (FDR)		02/10/2025	02/28/2025
FDR Provided	1d	02/10/2025	
FDR Response	1d	02/20/2025	
FDR - On-site	2d	02/25/2025	02/26/2025
Genfare Link - Cash Link UAT Review	1d	03/05/2025	
Genfare Link - Cash Link PROD Update	1d	03/12/2025	
Bus Installation Plans Provided	15d	04/07/2025	04/25/2025
Resubmittal of Bus Plans	1d	05/23/2025	
Bus Pilot Installation	1d	06/02/2025	
Phase 2 - Bus Farebox Installations		07/07/2025	09/16/2025
TRAIN-THE-TRAINER for Operators	2d	07/07/2025	07/08/2025
Garage Vault Installation	1d	07/07/2025	
BRT Bus Wiring and Installation	7d	07/08/2025	07/15/2025
NE - TRAIN-THE-TRAINER for Operators	1d	07/15/2025	
NE Garage Vault Installation	1d	07/16/2025	
NE - Bus Wiring and Installation (20/night)	16d	07/17/2025	08/04/2025
CE - TRAIN-THE-TRAINER for Operators	1d	08/04/2025	
CE Garage Vault Installation	1d	08/05/2025	
CE - Bus Wiring and Installation (20/night)	16d	08/06/2025	08/23/2025
CW - TRAIN-THE-TRAINER for Operators	1d	08/22/2025	
CW - Garage Vault Installation	1d	08/25/2025	
CW - Bus Wiring and Installation (20/night)	16d	08/26/2025	09/16/2025
Phase 2 – Acceptance & Signoff	1d	09/30/2025	

Table 28. Phase 2 milestones

2.2.3 Phase 3

The third phase is the installation of the TVMs and faregates at the rail stations and TVMs at remote locations in the region.

	Days	Start	Finish
Phase 3 – Kickoff Meeting	1d	01/07/2025	
Concept Design Review (CDR)		01/07/2025	01/31/2025
CDR - On-site	2d	01/15/2025	01/16/2025
CDR - Response	1d	01/24/2025	
CDR - Resubmittal	1d	01/31/2025	
Final Design Review (FDR)		02/10/2025	02/28/2025
FDR Provided	1d	02/10/2025	
FDR Response	1d	02/20/2025	
FDR - On-site	2d	02/27/2025	02/28/2025
Permits Requested	1d	03/03/2025	
Genfare Link - Cash Link UAT Review	1d	03/06/2025	
Genfare Link - Cash Link PROD Update	1d	03/13/2025	
Phase 3 - Rail Stations		04/22/2025	08/08/2025
Dadeland South (8-TVMs, 23-Gates)	4d	04/22/2025	04/26/2025
Dadeland North (6-TVMs, 23-Gates)	4d	04/29/2025	05/03/2025
South Miami (4-TVMs, 10-Gates)	3d	05/06/2025	05/09/2025
University (3-TVMs, 6-Gates)	2d	05/10/2025	05/13/2025
Douglas Road (3-TVMs, 6-Gates)	2d	05/14/2025	05/16/2025
Coconut Grove (3-TVMs, 7-Gates)	2d	05/17/2025	05/20/2025
Vizcaya (3-TVMs, 5-Gates)	2d	05/21/2025	05/23/2025
Brickell (7-TVMs, 18-Gates)	3d	05/29/2025	06/01/2025
Government Center (11-TVMs, 35-Gates)	4d	06/03/2025	06/07/2025
Overtown (4-TVMs, 6-Gates)	2d	06/10/2025	06/12/2025
Culmer (3-TVMs, 9-Gates)	2d	06/13/2025	06/15/2025
Civic Center (6-TVMs, 13-Gates)	3d	06/17/2025	06/21/2025
Santa Clara (3-TVMs, 6-Gates)	2d	06/24/2025	06/26/2025
Allapattah (3-TVMs, 7-Gates)	2d	06/27/2025	06/29/2025
Earlington Heights (2-TVMs, 9-Gates)	2d	07/01/2025	07/03/2025
MIC Rail Station (8-TVMs, 26-Gates)	3d	07/08/2025	07/11/2025
Brownsville (3-TVMs, 6-Gates)	2d	07/15/2025	07/17/2025
Martin Luther King (3-TVMs, 7-Gates)	2d	07/18/2025	07/20/2025
Northside (3-TVMs, 7-Gates)	2d	07/22/2025	07/24/2025
Tri-Rail (3-TVMs, 7-Gates)	2d	07/25/2025	07/27/2025
Hialeah (3-TVMs, 7-Gates)	2d	07/29/2025	07/31/2025
Okeechobee (6-TVMs, 17-Gates)	3d	08/01/2025	08/05/2025

	Days	Start	Finish
Palmetto (3-TVMs, 10-Gates)	2d	08/06/2025	08/08/2025
Phase 3 - Remote Locations		08/09/2025	08/23/2025
Golden Glades (2-TVMs)	1d	08/09/2025	08/09/2025
Homestead Station (1-TVM)	1d	08/12/2025	08/12/2025
344th St. P&R (1-TVM)	1d	08/13/2025	08/13/2025
I-75 P&R (1-TVM)	1d	08/14/2025	08/14/2025
Tamiami P&R (2-TVMs)	1d	08/15/2025	08/15/2025
Panther Station (2-TVMs)	1d	08/16/2025	08/16/2025
Omni-Mover Hub (2-TVMs)	1d	08/19/2025	08/19/2025
Aventura (3-TVMs)	1d	08/20/2025	08/20/2025
Miami Beach City Hall (1-TVM)	1d	08/21/2025	08/21/2025
7th Ave. Transit Village (1-TVM)	1d	08/22/2025	08/22/2025
Dolphin Mall P&R (2-TVMs)	1d	08/23/2025	08/23/2025

Table 29. Phase 3 milestones

2.3 Ongoing Maintenance

With proper maintenance, Genfare solutions provide decades of reliable service; that's why they are backed by a comprehensive approach to ongoing maintenance. Genfare provides ongoing preventive maintenance by experienced onsite Genfare technicians, along with offering comprehensive maintenance training to our transit agency partners, regular updates to software and firmware, partnerships with third-party vendors, and a well-maintained stock of replacement parts, not just upon implementation, but for the life of the fare collection solution.



2.3.1 Continuing Support Services Overview

As requested in section 9 of the technical specifications, Genfare will provide DTPW with the following support services:

- **Fare collection application integration.** Genfare will work with DTPW's selected vendor to integrate the fare collection equipment solution proposed here with the fare collection application and coordinate the necessary testing to ensure that the integration is fully functional and operating in accordance with the technical specifications.
- **Training.** Genfare will provide DTPW with comprehensive training on all the equipment provided under this contract. Detailed information on this training can be found in [section 2.1.3](#).
- **Staffing.** As requested, for the term of the contract, including any extensions or renewals, Genfare will provide DTPW with two onsite technicians to assist staff in assessment, repairs, and continuing training.
- **Firmware and software updates.** Genfare will provide all software and firmware updates for the proposed fare collection equipment. Genfare will establish a communication protocol to ensure that all DTPW and Information Technology Department (ITD) staff are notified of

software or firmware updates. All updates will be pre-scheduled and pre-approved by DTPW and ITD staff prior to deployment. Any installation instructions, plans, and packages will be provided for review and approval at least two weeks prior to deployment.

- **Parts inventory and storage.** Genfare will procure and store a minimum of 10% of all parts at our own site for the term of the contract, including any extension or renewal periods. As part of the conceptual design review, Genfare will provide DTPW with a list of parts to be included in the part inventory. Parts from inventory will be delivered to designated DTPW locations within 45 minutes of request. Genfare will coordinate with assigned DTPW personnel on the inventory and sourcing of high turnover parts and long lead-time items. All parts outside of the predetermined inventory will be available within 10 business days of request. Genfare will inspect and confirm in writing that all spares are of the same mechanical and software version as those currently installed. Any spares not meeting this requirement will be replaced.
- **Maintenance test station.** Genfare will set up a maintenance test station that will include one TVM, one faregate, one accessible faregate, four fareboxes, one revenue vault, one receiver, and an instance of Genfare Link for testing purposes. The maintenance test station will be installed at a location designated by DTPW prior to conducting installation testing and inspection and will remain in place at the facility.
- **Preventive maintenance.** Genfare will perform preventive maintenance in cooperation with DTPW staff on all equipment a minimum of four times per year for the life of the contract, including any extensions or renewals. In advance of each cycle, Genfare will provide a comprehensive preventive maintenance plan including specific units and parts to be maintained and the schedule and sequence to be followed.
- **Reactive maintenance support.** Genfare will provide support DTPW with technicians for training for reactive maintenance on all equipment.
- **Equipment or part obsolescence.** During the life of the contract, Genfare will notify DTPW in writing at least six months prior if any of the components or other hardware for the Fare Collection Equipment are being discontinued or reaching end of life. Genfare will supply DTPW with a replacement part or system to ensure no interruption of service in accordance with the parts inventory requirements. DTPW will be responsible for the cost of such replacement parts and the parties will act in good faith to negotiate pricing for such parts, up to and including credits for existing inventory.

2.3.1.1 Maintenance Approach

The Genfare team's equipment maintenance approach puts processes in place to systematically operate, maintain, upgrade, and expand DTPW's transit assets effectively throughout their lifecycle to:

- *Preserve and enhance the DTPW's transit infrastructure*
- *Improve stewardship of the County's infrastructure investment*
- *Optimize resource allocation and utilization*
- *Lower total cost of ownership*
- *Enable improved integration with emerging technologies.*

This approach will provide DTPW benefits including:

- A comprehensive view of the current state of DTPW transit assets
- Required levels of service and performance delivery

- Identification and confirmation of the assets that are critical to sustained performance delivery
- Development of the best investment strategies for operations, maintenance, replacements, and improvement
- Experienced and highly competent technicians with local knowledge
- Cooperative development of the best long-term funding strategy

A thorough, well-executed preventive maintenance (PM) program is a critical component in protecting the investments of capital and resources made by all parties over the long term. This protection is accomplished by minimizing unscheduled device downtime and service calls and by extending the field equipment's useful life. PM, however, is not to be considered in a silo; rather, it is part of the comprehensive maintenance of the asset.

The Genfare maintenance solution provides comprehensive maintenance through the regionally experienced transit maintenance staff and Maintenance and Inventory Management System (MIMS), that includes a robust PM capability that generates schedules, develops appropriate checklists (device and/or location specific), initiates work orders, tracks parts and consumable inventory, and records activities within the data repository for reporting and/or display utilizing Genfare Link and the reporting platform.

Genfare will provide maintenance services for DTPW at a Genfare location in Miami that ideally is close to major transit centers and arterials for quick access along the transportation network. The facility will be outfitted to accommodate office staff, maintenance space, and storage for spares and repairs. Genfare believes there are advantages to co-locating near DTPW, at least initially, since this partnership is dependent on training and working together to optimize the equipment along the many transit modes. Genfare will work with DTPW to determine the optimal model for supporting DTPW's staff.

Genfare staff will provide ongoing on-call and on-site services as needed to keep uptime of all equipment as high as possible throughout the life of the contract. Consolidated Parking is accustomed to on-call services and will provide technicians that will be available and on-site within one hour of call. If enhanced resources are needed, the Genfare team will support the need within five business days of written request.

During the planning of go-live for each phase, Genfare will have an on-call technology expert, [Steven Taylor](#), onsite within two hours of the call to address any issues related to technology, integration, or MAS or FBS functionality/reporting for the Genfare Link platform. Steven will also be available for at least 30 days following Final Acceptance of each phase. He will remain on-call and accessible remotely within one hour and can be onsite within two business days during the implementation of the Fare Collection Application and for one year after the go-live. Given the three phases and the planning requirements asked from DTPW, Steven is ready and excited to be the technology expert for the long haul, giving peace of mind to DTPW that its Fare Collection Application is in reliable hands.

Steven is further supported by a technical support team that has decades of experience with Genfare technology and understands Miami's needs and requirements.

2.3.1.2 System Enhancements

Genfare has made the investment across the product portfolio to utilize the latest technologies, simplify solutions, and infuse quality from design through implementation. Genfare's investment includes internal process improvements as well as a commitment to listen to customers and work to understand their wants and needs and accommodate through technology.

Genfare was an early adopter of account-based fare systems and has worked to normalize account-based systems for all sizes of customers. Historically, fare collection has been proprietary. Genfare has been a leader in the market move to open architecture and plans to continue this push to allow plug-and-play with any functionality a customer requests.

Genfare Link is both the Monitoring and Alerting System as well as the Farebox Backend System. Data is piped directly from our hardware to Genfare Link. Genfare Link utilizes Amazon Web Services (AWS) capabilities to process the data and provide analytics for all hardware. Data flow is bidirectional so configuration and software updates can be done remotely, from one location across the fleet.

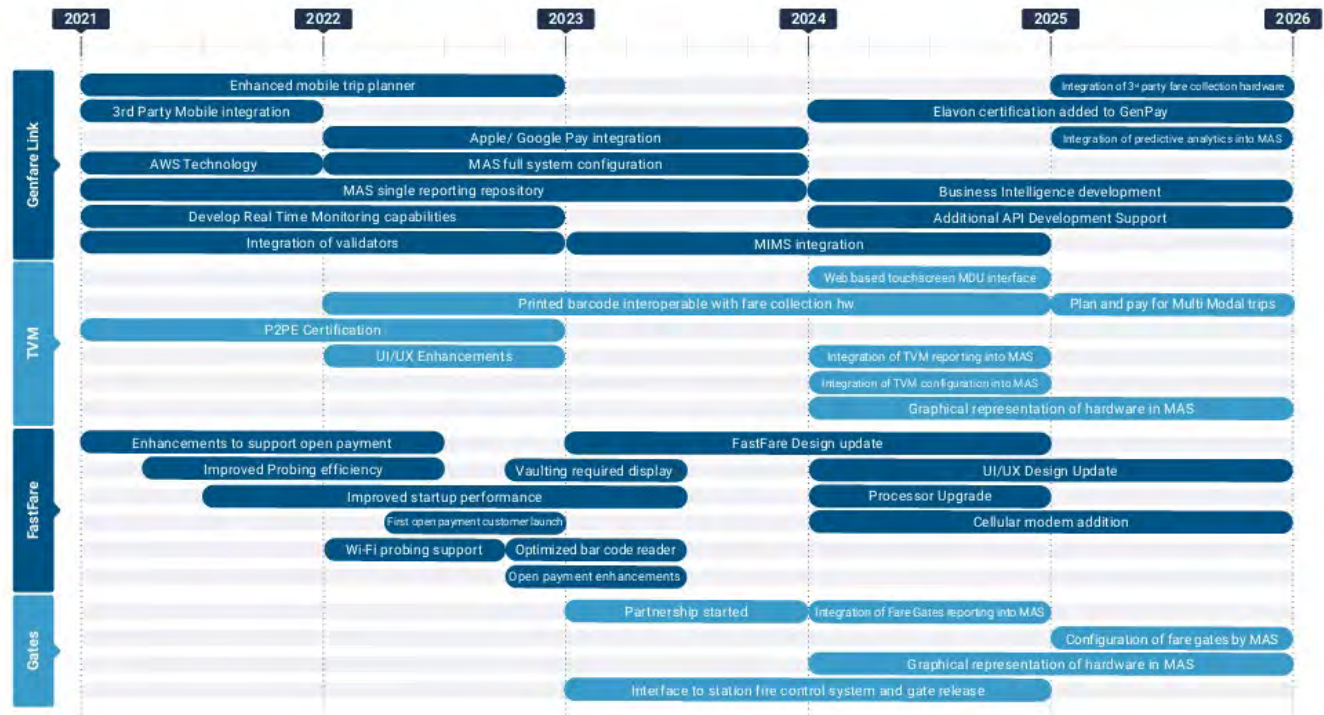


Figure 17. Genfare product roadmap overview

2.3.1.3 Last Two Years

For the past two years, Genfare has implemented the latest in technology offerings to be able to monitor and communicate with all fare collection hardware in real or near real time. See [section 3.3.1](#) for screenshots of our current dashboards. Enhancements include:

- Utilized the latest AWS technologies in Genfare Link
- Made Genfare Link a single location for configuration and reporting across the fare collection system
- Removed the reliance on agency IT for Genfare products
- Ensured accurate data from each point-of-sale device by creating a direct pipe to the cloud
- Automated implementation to ensure quality and improve deployment times
- Introduced more rigorous testing cycles, negative test cases, and test automation
- Simplified configuration and concentrated on usability to make the system more intuitive
- Enhanced security and supported the latest in security enhancements
- Achieved full PCI certification

- Provided full cash reconciliation dashboards that allow users to enter cash counted and automatically flag discrepancies
- Created maintenance dashboards that allow staff to easily track and predict when maintenance is required
- Created corrective action dashboards to highlight issues on a per bus and per farebox basis
- Removed hardware and older software technologies such as SQL, SyBase, and Windows
- Gained the ability to tie third party reporting and data into the system using API
- Offered complete Maintenance & Inventory Management System (MIMS) capability
- Gained the ability to monitor the fleet in real time

2.3.1.4 Planned Enhancements

In the next two years, Genfare will continue to enhance our technology by introducing updated fareboxes and ticket vending machines, as well as faregates; all will be built using the latest technology platforms incorporating Genfare Link. This will allow transit agencies to more easily utilize robust data collected across the system for predictive and business analytics and optimize operations. Product releases and enhancements planned for 2025 include:

- Fast Fare 25 fareboxes, Vendstar 5 ticket vending machines, and a new faregates offering with direct data connection to Genfare Link for reporting, maintenance, and configuration
- Visual dashboards of all hardware with color-coded fault conditions that can be drilled down to component levels
- Customizable alert levels across hardware to email and text when conditions are met
- Additional capabilities to troubleshoot remotely and decrease trips to the field
- Software standardization across products to increase quality, ensure security, and decrease training
- Increased preventive maintenance monitoring for all hardware
- Increased monitoring for corrective maintenance across all hardware and hardware components
- Easy integration for third-party maintenance tools
- The latest Amazon BI tools for predictive analytics
- The latest in artificial intelligence for predictive and corrective analytics
- Dashboards that track most common faults across the system and assign priority for preventive and corrective actions for fareboxes, TVMs, and faregates
- Automatic security updates across all hardware
- Optimized data transfer solutions from Genfare Link to hardware and vice versa
- Automated data transfer from Genfare Link to hardware
- Data-based determination of when maintenance is due
- Full API for interfacing with other vendors and solutions

More detailed roadmaps are available in [section 4.7](#).

2.3.2 Technical Support

Genfare's approach to technical support is centered on continuous monitoring to identify potential issues early, triage of reported issues to determine how critical they are, and appropriate responsiveness to solve problems quickly and prevent downtime. All this is provided by experienced engineers who are, in some cases, available around the clock.

Genfare's experienced technical support team is led by a seasoned manager and engineer, Sabeena Haridas, who has held multiple roles within the organization and is well-versed in addressing complex challenges and delivering tailored solutions to meet DTPW's specific requirements. The Genfare technical support team of engineers monitors the daily performance of Genfare's cloud-based software and works directly with customers to resolve their hardware and software issues.

The cases are prioritized based on severity and the response is tailored accordingly. Customers can either directly access the Genfare portal to report cases or can email or phone their customer care partner to report issues. Salesforce is used to create and track cases internally and allows customers to monitor progress and provide comments and feedback.

Customers with software support agreements, like DTPW, will receive 24/7/365 support. Additionally, technical support engineers are available for travel to customer locations when there are escalations and onsite troubleshooting is required. The technical support team has extensive experience in troubleshooting all Genfare products.

Critical cases, those issues that bring down the entire fare collection system, are acknowledged in 15 minutes or less. All other cases are acknowledged within 30 minutes based on severity; customers are contacted within an hour to twenty-four hours by an experienced technical support engineer. Our response and resolution metrics are reported to the company monthly. Customers can escalate issues directly with any representative of the company and all escalations are reviewed bi-weekly by the executive group and others.

Daily monitoring and notifications are used to check the health of the different Amazon Web Services (AWS) resources and production servers. Uptime and Genfare Link web portal availability data is shared within the company daily and customers are notified preemptively if there are potential issues.

2.3.3 Software Maintenance

An important part of any software solution is regular updating. Genfare's approach to software maintenance is focused on improving the software that all our agency partners use, be that fixing minor issues, responding to feature requests from our clients, or incorporating new technology.

Genfare has moved into a software-as-a-service (SaaS) model, providing frequent updates to clients with active subscriptions. This model provides valuable updates to our agency partners without burdening any one agency with the development cost and allows for best practices to be shared between agencies.



Genfare Link and all equipment firmware is on a quarterly release schedule. Features defined in the respective roadmaps are estimated, prioritized, and then scheduled into one of these releases. During release planning, each feature will be broken down into sub tasks and scheduled into sprints, and test scripts will be performed when development is complete. Once development and initial QA has been completed, Genfare has strict internal end-to-end testing protocols to ensure the final release is ready for production. Genfare will also set up a User Acceptance Testing (UAT) at each agency so that our customers can test releases prior to their going to production.

Genfare uses Agile Software Development principles including 2-week sprints, weekly standups for cross functional teams, and multiple testing levels to ensure quality. Once sprint testing is completed by the development team, the software is provided to our QA team for regression testing. Both sprint and regression testing are managed in Jira for issue tracking and Zephyr for test plan tracking and the results are reviewed across teams. Genfare has a full internal lab setup where our customers' data and configuration are loaded, and testing can be done from any piece of equipment – from the farebox, ticket vending machine, or faregate to Genfare Link. Only after sprint, regression, and internal lab testing are complete, can the software move to User Acceptance Testing. Once the software is approved for UAT, the implementation team will begin testing in their lab, which trains them for future deployments. After this signoff, the software is approved for customer UAT lab testing and then moves to production.

Sprint deliverables are set the quarter prior and are based on customer or internal enhancement requests. Change requests or enhancements are logged in an engineering request form. Each week, teams come together to evaluate the importance and work required to implement each of the new requests. Requests are then prioritized based on these criteria and are added to future sprints based on workload. Dates are provided to the requesting customer on when to expect the change.

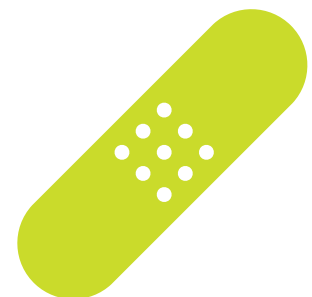
Once a release is ready for UAT, a quarterly release notification will be generated, sent to all customers, and posted to the Genfare Customer Portal. The quarterly release notification is where customers can find more information about any software upgrades, updates, patches, bug fixes, and optional software features that are accessible throughout the platform. These are all included in the Genfare offering as defined in Genfare's Software Support Agreement, Warranty and Extended Warranty outlined in [section 2.3.9](#).

2.3.4 Patch Management

While quarterly releases cover an array of updates, there are times when immediate updates are required and addressed. Should bug fixes or patches be needed for critical function, these fixes are prioritized as raised by project teams and customers. Genfare anticipates that while it has high performance in both equipment and software, patches will be needed occasionally to accommodate different use cases and edge cases.

Patch management is a vital part of every vulnerability management solution as the process of distributing and applying updates to software.

These patches are often necessary to correct errors in the software. If an issue is found after a release is moved to production, the issue will be root caused and a full root cause analysis (RCA) will be completed.



Genfare employs leading industry-standard Common Vulnerabilities and Exposures (CVE) scanning tools to continuously assess its infrastructure for known vulnerabilities and generate notification channels to get notified directly about the latest CVEs. This scanning is integrated into routine monitoring processes, allowing for rapid identification and response to potential risks.

All patches go through a full suite of testing from sprint to regression to UAT and can be pushed to all customers once approved.

Once patches have successfully passed testing phases, they are promoted to the production environments. This promotion typically occurs during scheduled maintenance windows to minimize disruption to ongoing operations.

All remote fare collection devices are patched as well. Each patch will be validated internally by Genfare and then will be staged and pushed to each individual customer using the Asset and Real Time Monitoring Modules in Genfare Link. Genfare will stage the firmware on its enterprise platform and provide reports to track the current firmware versions actively running on all the fare collection devices.

Genfare maintains detailed documentation of the patching process, including a log of patches applied, their dates, and the specific servers or systems affected. All the patch requests go through change management process and are documented and audited. Release notes for all Patch updates will be made available to stake holders before the updates are made to the equipment or backend.

2.3.5 System Administration

Genfare's approach to system administration relies on a robust monitoring protocol that continuously analyses the performance of the system and issues alerts when health and performance does not meet established thresholds for optimum performance. This includes adoption of multiple levels of monitoring tools developed to ensure the system remains reliable, even in the face of intrusion attempts and other threats, as well as third-party testing to uncover and fix any vulnerabilities before they cause issues.



Genfare employs a diverse set of mechanisms to actively monitor the health and performance of its servers and application, ensuring seamless operations and enhanced reliability. Genfare Link is built on Amazon Web Services (AWS) and Genfare leverages the AWS GuardDuty and Cloud Watch tools to monitor the health of the various services that are running. AWS GuardDuty continuously monitors workloads for malicious activity and generates alerts for remediation. Notifications from Cloud Watch are sent to the DevOps team that monitors the Genfare Link system 24/7.

Simultaneously, Genfare has also developed its own monitoring tools that go deeper into the functionality of the services. With this tool set, we can ensure that the system is up and running properly, be notified when it is not, and react quickly to rectify the situation. Genfare further enhances its monitoring capabilities by utilizing the Pingdom service to oversee application uptime. There are also self-correction toolsets that can help reset the system. Monitoring tools regularly perform health checks to confirm that applications are available and responsive, providing real-time alerts when any downtime is detected. Genfare has site availability pages for stakeholders to review the status of services and platform.

This proactive approach to monitoring guarantees that potential issues are identified and addressed promptly, thereby contributing to a consistent and reliable user experience. Genfare has established specific performance metrics and defined threshold levels to monitor application and server health. The metrics are reviewed and evaluated on a quarterly basis and updated as necessary.

The platform also has an automated monitoring system in place, which is deployed across all the endpoints for detection and reporting of critical security controls. This monitoring system is designed to automatically detect any intrusion attempts and proactively block the income traffic as well as record the activity to event logs as evidence collection in addition to alerting all the SRE's with notifications. All the logs are protected and preserved via an audit management system.

Genfare utilizes third party penetration testers to further ensure the security of the system. On a quarterly basis, these companies perform a series of tests and provide reports back to Genfare. Any issues are ranked by risk and remedied in accordance with that risk level.

2.3.6 Cyber Security

Genfare's approach to cyber security is to provide the highest level of protection possible from a broad range of risks, from energy and data theft to malware attacks, today and into the future. Genfare understands that the damage caused by intentional and accidental loss of data carries a high cost, not just financially and operationally, but reputationally.



To achieve this level of security, Genfare relies on proven, trusted processes, procedures, and certifications to inform our cyber security compliance efforts. All Genfare's products, from hardware to enterprise systems, are compliant with:

- PCI DSS
- Risk assessment for TSS cyber security framework
- ISO 27001

Genfare's approach to cyber security incorporates three main principles.

- Building security into products through a Secure Software Development Lifecycle (SSDLC) process
- Active monitoring for any threats
- Responding to incidents

2.3.6.1 Secure Software Development Lifecycle

All software applications are developed using National Institute of Standards and Technology (NIST) guidelines. The Secure Software Development Lifecycle (SSDLC) for all product development has an integrated software security framework. We review the security architecture for each release and conduct a secure code review using automated tools and manual reviews.

Genfare's SSDLC approach is based on PCI SSF and OWASP guidelines. Genfare maintains an information security policy, information security framework, and an information policy handbook. Elements of this approach include:

- As part of onboarding, all engineers are required to complete information security training.
- Security requirements are captured along with functional requirements in the early phase for all releases.

- All code changes are reviewed via automated static and dynamic code analyzers.
- Manual peer reviews of code are enforced through automation.
- Code review ensures no backdoors, and hardcoded passwords are used.
- All communication across modules is encrypted and TLS 1.3 is used for communication to web servers or API calls.
- All assets and data are classified as public, internal, confidential, or restricted and different policies are applied based on the classification.

2.3.6.2 Threat Monitoring

The platform is continuously monitored by active threat monitoring services. Each public endpoint is individually monitored. In addition, we leverage third party approved scan vendors to conduct quarterly penetration tests.

The platform site reliability team extends the responsibilities of monitoring and updating the systems to the latest software based on the reported vulnerabilities for each component, including remote hardware. Genfare has constructed its cyber security framework around AWS infrastructure, following a shared responsibility model between Genfare and AWS.

Monitoring for threats includes.

- Monthly vulnerability scanning by external approved scanning vendor
- Monthly internal scan using Rapid7 and Expose
- Monthly operation security reviews of firewall rules, alerts, and change management process
- Quarterly network segmentation tests
- Half-yearly internal and external penetration testing
- Quarterly review with SPX CIO and CISO
- Bi-weekly review with AWS for any new external threats
- Yearly tabletop exercises to review response to a simulated threat.

2.3.6.3 Incident Response

For any identified threats, Genfare follows the SPX incident response plan, which includes:

- Classification or identification of the incident
- Logging and categorization
- Incident triage
- Internal and external notifications
- Response time guidelines
- Incident after action review

2.3.6.4 Protecting Rider Information

No credit card information is stored in Genfare devices or web-based software. All data necessary to process credit card transactions, whether on a Vendstar 5 ticket vending machine, farebox, or faregate—is tokenized. Only the receiving bank can access the credit card information for processing. All fare collection data belongs to the agency; Genfare never sells rider data collected from the riding public.

2.3.6.5 Protecting Agency Data

Complete data that transits or gets stored within the platform is maintained by a data life cycle management process to monitor its encryption at rest and transit, storage, archival and deletion. Data discovery tools are used to validate all the logs and data stores to identify any non-compliance. Additionally, firmware in Genfare devices such as fareboxes, TVMs, and faregates is routinely updated

to ensure that all devices are running the latest version of the firmware with all critical security patches in place.

2.3.6.6 Disaster Recovery and Data

Genfare will comply with its current practices regarding disaster recovery described in this section. Preventing data loss and assuring data integrity are top priorities and Genfare employs an array of techniques to limit risk related to data corruption or loss:

- **Availability.** Genfare's service level agreement (SLA) with Amazon Web Services (AWS) guarantees 99.9% availability. In practice, Genfare has consistently achieved 99.99% availability – that is, less than one hour of unscheduled downtime per year.
- **Autoscaling.** If extra storage, processing power, or communications bandwidth is required due to short- or long-term increases in traffic, additional resources can be readily brought online. Virtually unlimited data storage is available.
- **Multiple database replicas.** Genfare Link employs a multi-datacenter failover strategy to minimize the impact of server, storage, or database failure. Multiple instances of the Genfare Link database and supporting software are continuously maintained in geographically separate data centers. Genfare Link synchronously replicates all transactions to all database instances and each instance is continuously monitored. In the event of a database failure, the system automatically transfers database connectivity to a standby replica – a process known as failover. A new backup instance is spun up and all data is copied over to it. The process requires no manual involvement and in most cases is invisible to the user. This reduces the risk that database failure will impact day-to-day business activity. Failover occurs automatically in the following situations:
 - Datacenter outage
 - Primary database failure, including loss of network connectivity to primary site, failure of the compute unit at the primary site, or storage failure at the primary site
 - Database patching issues
 - Manual reboot of the database instance
- **Data warehousing.** To reduce the load on the server, Genfare creates a read-only copy of the central database to be used for heavy read operations such as complex reports, ensuring that the activity will not impact other central Genfare Link back-office system operations – see the Genfare Link architecture diagram (figure 22) below.
- **Automated data backup.** Automated data backup and retention for Genfare databases includes full-data snapshots of the Genfare database, which are stored in Amazon Simple Storage Service (Amazon S3) data buckets. S3 backups can be used to restore the primary database to a prior state if it becomes corrupted or other problems occur. Backups can be retained indefinitely or for any desired time to be determined in consultation with DTPW. Data is actively backed up during this retention period and can be recovered to any point within five minutes of the current time.
- **Optional archiving.** As an option, Genfare can provide periodic archiving of selected data to low-cost long-term storage. It should be noted that the fare collection footprint is relatively small, less than 200 GB, and the cost of maintaining it in readily accessible form is modest. Genfare is happy to discuss options, including the desired retention period.

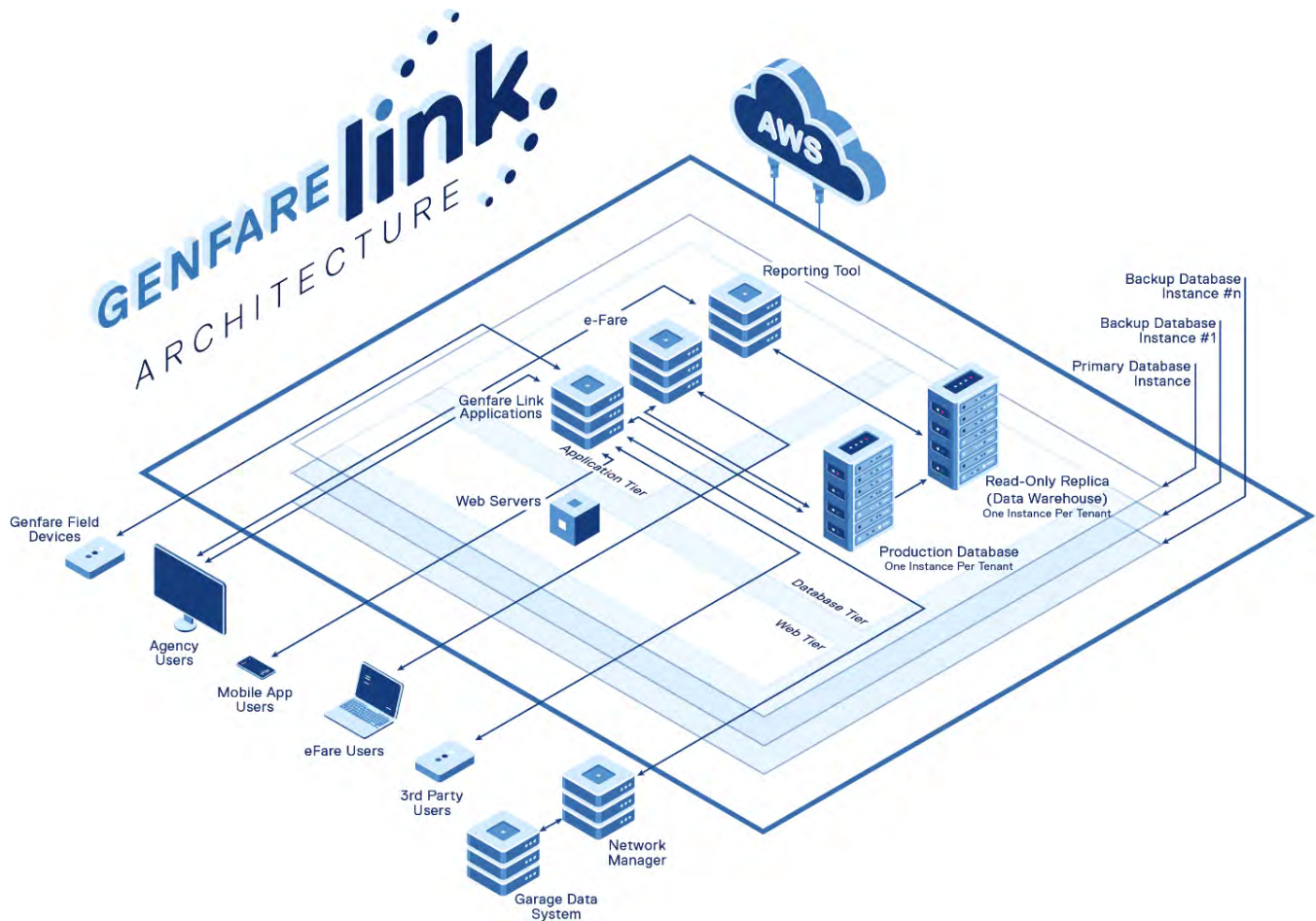


Figure 18. Genfare Link architecture

- **Dedicated database instances.** Each Genfare Link tenant is provided with an independent database instance – there is no commingling of data between tenants. This segregated private data store ensures data security and integrity.
- **Dual region disaster recovery.** To protect against the rare case of a regional outage, Genfare maintains a “warm site” in the AWS U.S. West region – see figure 23 below. This consists of a continuously synchronized replica of the production database plus provisioning for the necessary hardware and communications bandwidth. In the event of disaster on the east coast, Genfare personnel would take immediate steps to spin up the west coast Genfare Link implementation (including primary and backup sites) and transfer connectivity to it. The process, which has been tested multiple times, takes 2-4 hours. No DTPW participation is required. Each piece of equipment has ample storage capacity to securely store transaction and event records until Genfare Link is available again to receive data. Vaulting operations can continue as all data stored on the local garage computer will be kept until it is successfully transmitted to Genfare Link.

Link's cloud architecture provides multiple levels of redundancy

- East - Production Site
 - Database instances distributed over 3 availability zones in US East region (Virginia)
- West - Disaster Recovery Site
 - 1 Zone - US West (Oregon)



"Warm Site" kept ready for disaster recovery

- Continuous RDS/DB replication between East and West
- No data loss if U.S. East goes down (e.g., regional blackout)
- West coast instances spun up, back online in 2-4 hours



Figure 19. Genfare Link redundancy and disaster recovery

2.3.7 Supply Chain

Genfare uses an MRP (Material Resource Planning) system and best practices in planning and purchasing processes to manage supply chain delivery and quality. Because of the processes used, Genfare does not currently have pandemic-related supply chain issues. Nevertheless, Genfare acknowledges that supply chain and/or pandemic-related issues shall not constitute Force Majeure or an allowed delay for this project.

2.3.8 Spare Parts

Spare parts distribution is handled by Genfare's technical support department out of its Elk Grove Village, Illinois plant. This location is a ten-minute drive from O'Hare International Airport and is convenient to airfreight and other package delivery facilities, enabling Genfare to ship parts quickly in an emergency.

Most of the hardware proposed for this procurement consists of standard products in regular production. Commonly used parts are kept in stock and Genfare receives new deliveries on a regular basis from vendors. Genfare has historically been lean in terms of procurement. Recent challenges in the supply chain have required Genfare to modify its approach, placing orders for key parts further in advance and at sometimes higher prices than is typical to ensure sufficient parts are on hand to manufacture equipment to meet customer needs through 2025.



Genfare uses a variety of reliable sources for spare parts for products. These include a selection of approved distributors, authorized resellers, and local dealerships who specialize in Genfare spare parts. Additionally, Genfare has established partnerships with reputable manufacturers and suppliers who ensure the availability of high-quality spare parts.

Leveraging the experience in establishing service centers and integrating them with our Elk Grove Village, Illinois plant, Genfare commits to maintaining a 10% inventory of all essential parts at our local facility, adhering to manufacturer's storage guidelines throughout the contract, including extensions or renewals. A comprehensive parts list will be submitted for DTPW approval at the conceptual design review, ensuring transparency and alignment. Rogelio will develop and facilitate a delivery process to transport parts to DTPW locations within 45 minutes upon request.

In collaboration with DTPW personnel, Genfare will efficiently manage high-turnover and long-lead-time parts, adhering to availability within 10 business days. All delivered spares will undergo a standard inspection process to ensure compatibility with the Fare Collection Equipment.

2.3.9 Warranty

Genfare is proud to provide reliable equipment that has demonstrated decades of durability for hundreds of transit agencies across North America for the last 40 years. Fare Collection Equipment is expensive and somewhat niche in the market with the intended lifespan of 10-12 years of service. Genfare's approach to warranty is to remedy manufacturing defects rather than issues relating to the proper operation of devices or systems. Warranties typically cover costs for new hardware for a period with options for extended warranties. Genfare will provide warranties for the three different types of equipment.



2.3.9.1 Warranty Policy

Genfare performs warranty work at its plant in Elk Grove Village, Illinois, except for repairs to revenue collection vaults or the data system, which are generally done onsite.

Genfare will provide DTPW with hardware warranty services for its three different types of equipment:

- Genfare Fast Fare 25 fareboxes, vaults, and vault equipment have a warranty for a period of one year after the installation and acceptance of each piece of equipment. The warranty covers all parts and labor associated with the factory repair of the equipment during the warranty period.
- Genfare Vendstar 5 ticket vending machines have a warranty for a period of one year after the installation and acceptance of each piece of equipment.
- Magnetic kWing faregates have a warranty for a period of two years or 2,000,000 cycles after the installation and acceptance of each piece of equipment.

The warranty covers all parts and labor associated with the factory repair of the equipment during the warranty period. The remedial work to correct all potential deficiencies includes repairing or replacing equipment, components, devices, and/or materials. It is understood that Genfare will be responsible for the costs of all materials and labor.

The agency must operate and maintain the equipment in accordance with the instructions provided by

Genfare to maintain the warranty. The warranty does not apply to any equipment that has been repaired and/or altered without knowledge or consent of Genfare and/or conflicts with Genfare's instructions, and for which repair or altering affected its stability, reliability, or operating performance.

The warranty does not apply to any equipment damaged by accident or negligence or subjected to other than normal use under conditions prevalent on buses. Temperature, humidity, bus vibration, and ambient electric conditions are considered normal operating conditions for this equipment.

The warranty does not cover the replacement of normal consumable items or items replaced in usual and scheduled preventive maintenance program, such as lightbulbs.

2.3.9.2 How to Make a Warranty Claim

The procedure for submitting warranty claims for a faregate, farebox, vault, or TVM is simple:

1. If an item of equipment malfunctions or fails in normal use within the applicable warranty period, DTPW will promptly notify Genfare of the problem, the original sales order number, and the serial number, if applicable, of the defective item.
2. Genfare will, at its option, either resolve the problem over the telephone or via email or provide DTPW with a Return Material Authorization (RMA) to ship the defective item to Genfare.
3. If Genfare provides DTPW with an RMA to ship the defective item to Genfare, DTPW will include, in the RMA, a description of the fault. DTPW will, at its cost, properly pack the item to be returned, prepay the insurance and shipping charges, and ship the item to the specified Genfare service center with a copy of the RMA; parts or equipment damaged during shipment that were not properly packaged are the responsibility of the DTPW. The return label must include the RMA number. Genfare reserves the right to return items sent to the Genfare service center without an RMA, and DTPW will reimburse Genfare for its costs in returning the items.
4. Genfare will, at Genfare's option, either repair or replace the returned item. The replacement item may be new or refurbished; if refurbished, it will be equivalent in operation to new equipment. If a returned item is replaced by Genfare, DTPW agrees that the returned item will become the property of Genfare.
5. Genfare will, at its cost, ship the repaired item or replacement to DTPW. If DTPW has requested express shipping, the DTPW will pay Genfare an expediting fee.

A failure is defined as a device or component in the equipment that is inoperative and/or unsuitable for the intended purpose. It is understood that Genfare is responsible for the costs of all materials and labor, except as provided herein.

2.3.9.3 Returns & Materials Authorization Process

The Return Material Authorization (RMA) policy details the rights and obligations that govern the process of returning products or parts for credit or repair between Genfare and the customer that first purchased the product (purchaser). The RMA process allows the seller to track, document, invoice, and credit when appropriate, for goods or services provided to the purchaser.

DTPW may return a product that is not defective if: (a) the product does not correspond to the products ordered in the agreement (a return), or (b) the product has been ordered in error by DTPW and Genfare has granted written permission to DTPW to remedy its mistake by ordering the correct equipment or software and returning the product (an exchange).

The RMA process is simple: The party liable for all shipping, insurance, and any other expenses incurred by DTPW in returning the product pursuant to the preceding sentence and for all loss or

damage to the product until received by Genfare, shall be Genfare for returns and DTPW for exchanges.

If DTPW returns the product in accordance with these procedures in an undamaged condition, in the original configuration and, where appropriate, in the original packing, before the later of 21 days after the date of the invoice for that product; and the date of substantial completion of installation of the product by Genfare, Genfare shall:

- For returns, issue a credit to DTPW for the full Invoice price of the returned product; or
- For exchanges, issue a credit to DTPW for the full invoice price of the returned product less:
 - o a restocking fee of 25% of the Invoice price; and
 - o the original shipping and insurance cost as shown on the invoice.

If DTPW does not comply with the procedures in this section for returns and exchanges, DTPW shall pay the full amount of the Invoice.

Genfare has recently undergone a kaizen to improve the RMA process. Results demonstrate an overall improvement, from information gathered about the return to make sure the diagnosis is highly accurate to improved return turnaround time to get the part back to the customer. Figure 24 outlines the RMA process.

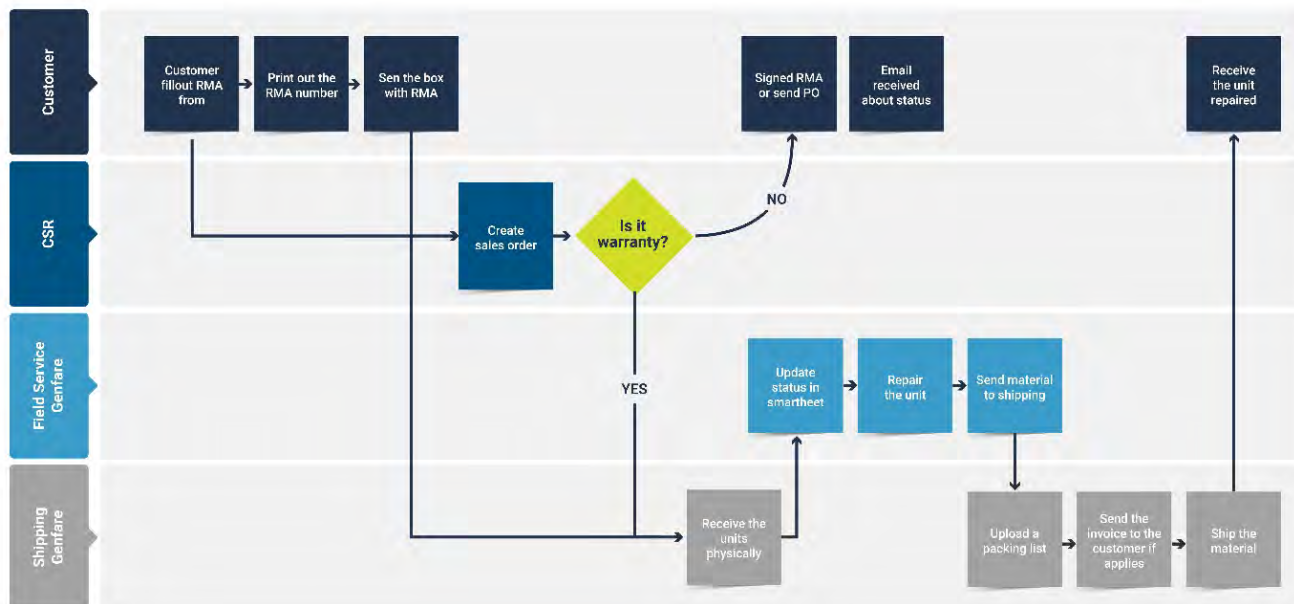


Figure 20. Repair and maintenance agreement process map

The new Genfare RMA process has significantly improved the communication and flow of returning parts to Genfare. Spare parts will be available and as parts are returned for repairs emails are sent to immediately provide an RMA identification number which allows for faster shipment of return parts. The system also sends emails out when the repair is complete, and the part is on its way back. Genfare customers are pleased with the updated process, and we continue to adjust our processes.

2.3.10 Value-Added Services

There are several value-added services Genfare is excited to offer as part of ongoing maintenance.

2.3.10.1 Maintenance and Inventory Management System

Genfare will leverage its Maintenance and Inventory Management System (MIMS) to ensure a successful delivery of the ongoing maintenance services of this contract. This system utilizes sensory data within our equipment to determine possible error codes, cycle time of components, and various connection and power points. The purpose of these sensory data points is to enable faster troubleshooting and preventive maintenance algorithms. Essentially, this is our first step toward AI solutions.



Genfare will utilize the information to track, report, and monitor our equipment and enable communication through Real Time Monitoring features of Genfare Link, automate work orders, and track spare parts inventory. This will ensure Genfare stays ahead of maintenance issues and always has an ample spares inventory on hand. DTPW would also have access to this system to see exactly what is going on, submit cases for issues, and ensure that Genfare is meeting its KPI obligations.

The information from the equipment will also be used with the Team to ensure safety, quality, and delivery throughout the installation process. Genfare has partnered with Consolidated Parking for the installation and preventive maintenance portions of this procurement. Consolidated Parking is familiar with DTPW's operations, having worked with DTPW on its parking projects. Having a local partner that is familiar to DTPW offers another resource to DTPW should DTPW require more support for reactive maintenance tasks to the products proposed here.

2.3.10.2 Continuous Improvement

Another value-added service is our process-oriented continuous improvement culture. This model is to self-reflect and improve people, process, and technology. An example of this value-added service specific to DTPW is the approach to analysis between each phase of the implementation and installation.

During Phase 1, Genfare will work with Transportation America to develop a safety and quality program that will outline our check steps during the installation and implementation of equipment at each of the transit sites. Our standard process during Phase 1 will be to self-reflect and complete a kaizen event (Japanese for 'change for the better') to determine improvement steps that can be implemented during the remainder of Phase 1 installations and carry over to Phase 2 and Phase 3. The improvement events utilize data from our third-party groups to determine weaknesses in all areas (people, process, technology). Genfare will document and present our changes in our process to DTPW to illustrate process improvements. The pieces standard process model is shown in figure 21.

This culture of continuous improvement is embedded into how Genfare operates and reflects our work culture.

Standard Process Model: Summary Checklist		GENFARE
Future State ☐ Future State map completed	Implementation ☐ All tools created ☐ Mistake-proofing embedded ☐ Hand-offs automated ☐ Visual controls implemented ☐ Tool usage documented ☐ New tools activated /implemented	
Documentation ☐ Work Instruction / SOP created from FS map ☐ Process owner identified ☐ Approvals secured (if any)		
Training and Transition ☐ Training requirements identified ☐ Training developed ☐ Training delivered or scheduled ☐ Transition requirements identified ☐ Transition plan developed ☐ Transition plan implemented ☐ Communication of changes to all stakeholders completed or scheduled	Assessment & Measurement ☐ Critical process measurement points identified ☐ Process measurement and management targets defined ☐ Data-gathering methods defined ☐ Data reporting tools developed ☐ Data reporting methodology created and ready ☐ Visual management owner identified ☐ Visual management tools created ☐ Visual management documented	

Figure 21. Summary checklist

2.3.10.3 Installation Tracking

Genfare uses an industry leading project management platform called Smartsheet and can track the status of installations as field staff complete installs. Using cloud-based tools that are easily accessible from technician smartphones, updates are sent as TVMs, faregates, and fareboxes are installed. This data is used to present a progress dashboard to easily visualize the completion progress and store any notes or issues with the installation.

Figure 22. Installation tracking log

Fare Collection Equipment Functionality



3. FARE COLLECTION EQUIPMENT FUNCTIONALITY

For 40 years, Genfare has been the leading provider of American made fare collection equipment to transit agencies throughout North America. Miami's current farebox and garage vaulting equipment is provided by Genfare. For this procurement, Genfare is proud to offer Miami the latest generation of its fare collection solution, which builds upon the foundation of secure and reliable equipment while leveraging the latest payment technologies with a modern design.

Genfare's approach for Miami is to provide next-generation equipment that will be implemented in 2025 through 2031 and be fit for purpose through 2040. Therefore, we are proud to provide Miami with our sixth-generation farebox (Fast Fare 25) and our fifth-generation ticket vending machine (Vendstar 5). We have also evaluated four different gate manufacturers based on safety, quality, cost, and delivery to choose one that best fits Miami's requirements.

Fare Media	Sales Channels	Fare Acceptance	Rider-Facing Applications	Agency-Facing Applications
Coin	Farebox	Farebox	Farebox	Genfare Link Configuration
Cash	Ticket Vending Machine	Open Link Validator	Mobile App	Genfare Link Business Intelligence
Magnetic Stripe	Retail Point of Sale	Handheld Validator	eFare Self Service	Garage Data System
Limited Use Tickets	Customer Service	Gates		Network Manager
Smart Card	eFare Self Service	Mobile App		
Mobile App	Mobile App			
Credit Card	Handheld Validator			
Mobile Wallets	Administrative Point of Sale			
Wearables				

Figure 23. Genfare fare collection portfolio overview

Farebox Equipment

The Fast Fare 25 takes the lessons Genfare has learned over the past 40 years and applies them to cash collection while enabling electronic payment methods. Miami has the option to select a bare steel industrial look or a more modern coated appearance. No matter what choice is made, the Fast Fare 25

has the same footprint as the existing Odyssey fareboxes, simplifying the installation process. The Fast Fare 25 has removed the need for a physical probe by leveraging an onboard or in-garage internet connection to transfer data. The cashbox door can be opened with an employee smart card once the data has been transferred. If DTPW still desires a physical probe, that can alternatively be supported on the Fast Fare 25. Genfare looks forward to working with DTPW during design review to reach a final decision. On-premises garage computers will be replaced with a simple computer and an installed application that transfers data from the vaults to the cloud, reducing the ongoing IT burden to DTPW.

Ticket Vending Machine

The Vendstar 5 also builds upon Genfare's history and offers a simple user experience so a rider can quickly purchase or reload fare media. Like the Fast Fare 25, the Vendstar 5 supports the latest electronic payment methods and Miami can choose between a bare steel industrial look or modern coated appearance. The Vendstar 5 ensures revenue security with external and internal cameras, alarms when accessed, and high security key sets that secure revenue and maintenance functions separately.

Faregates

Genfare is proud to partner with Magnetic, a worldwide provider of secure gate solutions, to offer a state-of-the-art faregate solution for Miami's BRT and rail operations. We chose Magnetic after evaluating multiple gate providers. The gate providers were scored on ten criteria: capital and operational costs, total cost of ownership, hardware and software quality, ease and ability to integrate, support, user experience, and their ability to deliver on time. Genfare believes Magnetic provides the best overall value to DTPW, with lower operational costs, the highest hardware and software quality, and available local support resources. The faregates provided by Magnetic are known to be serviceable for over 15 years.

The faregates from Magnetic are produced in Rockledge, Florida. Magnetic faregates are designed to quickly permit paid riders to enter and exit the system while preventing fare evasion. Integrated sensors ensure only one rider enters from the prescribed direction. Mechanical interlocks prevent riders from pushing through. Genfare will leverage the same validator, barcode reader, and processor from the Fast Fare 25 in the faregate which limits the number of different spare components that are required to keep the system operational.

All hardware being provided is ADA compliant, verified by third party organizations that specialize in helping to ensure people with disabilities can access the services they need. The Fast Fare 25, Vendstar 5, and Magnetic's kWing faregates will all be accessible by someone in a wheelchair, with guides to help passengers with visual impairments. The Vendstar 5 will be able to support multiple languages, both in displayed text and spoken words, to allow riders who are more comfortable in a language other than English to readily use the machine.



Figure 24. Fast Fare 25 farebox shown with custom colorization (not in stock)



Figure 25. Vendstar 5 shown with custom colorization (not in stock)

3.1 Fare Collection Equipment Overview

Genfare is proposing a robust set of fare collection hardware and software that delivers against the timeline required for Phase 1 to ensure the timely completion of the South Dade Transitway BRT line in 2024. The table below details the fare collection equipment to be provided in each of the three phases of the project and provides DTPW a fare collection system that addresses current need while also offering expansion opportunities in the future.

Fare Collection Equipment	Phase 1: South Dade Transitway	Phase 2: Bus Farebox Replacement	Phase 3: Metrorail Station Fare Collection Equipment Replacement
Vendstar 5 Ticket Vending Machines - Production	32		120
Vendstar 5 Ticket Vending Machines – Maintenance Testing Lab	2		
Magnetic kWing Faregates - Production	Left: 14 Center: 14 Right: 14		Left: 74 Center: 122 Right: 74
Magnetic kWing Faregates – Maintenance Testing Lab	Left: 1 Center: 1 Right: 1		
Genfare Fast Fare 25 Farebox - Production		940	
Genfare Fast Fare 25 Farebox - Maintenance Testing Lab	18		
Genfare Mobile Revenue Collection Vault - Production		12	
Genfare Mobile Revenue Collection Vault – Maintenance Testing Lab	3		
Probe Lanes - Production		12	
Probe Lanes – Maintenance Testing Lab	3		
Cashbox Transport Carts		12	
Portable Data Units (PDU)		6	
On Premises Vault and Probe Data Pipe – Maintenance Testing Lab	1		
On Premises Vault and Probe Data Pipe - Production		4	
Farebox Backend System (FBS): Genfare Link		1	
Monitoring and Alert System (MAS): Genfare Link	1		1

Table 30. Fare collection equipment overview

3.2 Demonstration Videos

These demonstration videos were selected for a variety of reasons:

- Customers all over the country have already made fantastic videos to learn from
- Demonstrates the high configurability of each piece of equipment
- Used as illustrative since each major equipment piece will be configured for DTPW

The Magnetic kWing faregate is used all over the world and most recently went into revenue service with HART in Honolulu, Hawaii. The operational videos were taken in the lab for the same gate configuration offered here for Miami, while the maintenance videos offer deep and helpful information to troubleshoot the mechanics of gate operation.

The Vendstar 5 ticket vending machine is the latest update to Genfare's long standing Vendstar line of ticket vending machines. Its predecessor (Vendstar 4), filmed here, echoes many of the processes and components that will be used and refined in the Vendstar 5.

The Fast Fare 25 farebox is highly configurable – from cash and coin to smart cards and open payment acceptance. The Fast Fare 25 is a refreshed farebox in the middle stages of development. Its predecessor (Fast Fare), filmed here, echoes many of the processes and components that will be used and refined in the Fast Fare 25. The main changes are the look and feel.

The videos below show how the Fast Fare farebox and the Vendstar 4 TVM are being used by several of our customers today. (Videos of the Vendstar 5 are not yet available.)

e-Gate Faregate	Vendstar 5 Ticket Vending Machine	Fast Fare farebox
Functionality – Single Entry and Exit Station	CATS TVM Operations	St Cloud Farebox Operations
Functionality – Outbound Intrusion	St Cloud TVM Operations	CDTA Farebox Operations
Functionality – Tailgating Demonstration with Alarm	Genfare TVM Maintenance Overview	Genfare Farebox Maintenance Overview
Functionality – Attempted Fraud Locking Mechanism	Genfare TVM Maintenance - Cabinet	Genfare Fast Fare Maintenance – Bill Validator
Functionality – Wheelchair Entry Alone	Genfare TVM Maintenance – TRiM® Hardware	Genfare Fast Fare Maintenance – Cashbox Assembly
Functionality – Wheelchair Entry with Assistance	Genfare TVM Maintenance – Coin & Cash Box/Vault	Genfare Fast Fare Maintenance – Coin Validator
Maintenance – Changing I O Controller		
Maintenance – Changing Main Power Supply		
Maintenance – Changing MGC+ Logic Controller		
Maintenance – Changing Motor Power Supply		
Maintenance – Changing Motor		

Table 31. Equipment operation and maintenance videos

3.3 Genfare Link: FBS and MAS

Genfare Link is Genfare's full backend fare collection solution, capable of monitoring all hardware and point-of-sale devices, including TVMs, fareboxes and faregates. The technical specifications describe the Farebox Backend System (FBS) and the Monitoring and Alert System (MAS) as two distinct systems. Genfare proposes leveraging Genfare Link to provide the functionality required by DTPW for both systems.



Figure 26. Genfare Link

All equipment provided by Genfare will communicate with Genfare Link to receive configuration parameters, transfer all transaction data, and report current status back to a single system. Monitoring is real-time when devices are connected to the system via Ethernet, Wi-Fi, or cellular modem. When issues are encountered, Genfare Link sends an alert to an assigned person via text or email. Dashboards use color codes to display the location and severity of issues encountered.

Genfare Link supports the full range of modern fare collection needs in one location. These include:

- Account-based client management
- Website and portal support
- Client service functions
- Distribution network management
- An extensive set of standard and custom reports

Genfare Link has four main modules that users can be assigned to depending on their function, including Admin, Reports, Fare, and Asset.

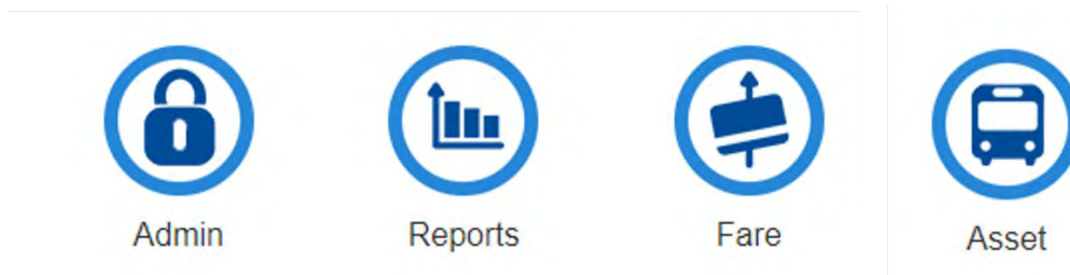


Figure 27. Genfare Link modules

Each module is comprised of the components listed below. Users can be provided access to the appropriate components based on their role with DTPW.

Module	Component	Function
Admin	User Management	Add a user and grant access.
Admin	Role Management	Allow or disallow access per role.
Reporting	Ridership Reports	View total ridership and ridership per route, run, product, and media type.

Reporting	Cash Reconciliation Reports	Ability to import cash counts and shows difference between what hardware reports as well as any metrics on why there was a discrepancy.
Reporting	Revenue Reports	View all revenue streams in one location including unclassified revenue by garage.
Reporting	Maintenance Reports	Includes preventive and corrective dashboards. preventive tracks cycle counts on each farebox. Corrective lists top 20 issues per day.
Fare	Product Management	Assign products to be sold.
Fare	Fare Structure Management	Manage fare structure that is pushed to fareboxes.
Fare	Fare Configuration	Add a new fare, view, export, sort, edit list of all fares including OCU display, status, group, designator, TTP, etc.
Asset	Device Management	Overview of all devices with locations and status, largest issues encountered, and connection signal.
Asset	Device Details	Ability to see the device specifics, when activated, software version, probe status, and any errors. Can activate or deactivate device from here.
Asset	Device Software Management	View all software versions for all devices in the system. Able to push software remotely.

Table 32. Genfare Link modules and components

Genfare Link allows for control of access to all modules and functionalities of the system by assigning roles and access levels in the Admin module. Roles can be easily added during implementation per agency requests. As a default, Genfare offers the following access levels to be assigned to new users:

Access Level	Functionality
Transit Admin	Access to all modules including Admin, Fare, Reporting and Asset
Reporting Access	Access to full Reporting module
Asset Access	Access to Asset module
Cash Reconciliation Clerk	Access to enter cash counted either manually or by upload for comparison with backend data
Maintenance Asset Access	Access to Asset module and Maintenance reporting dashboard

Table 33. Genfare Link user access levels

3.3.1 Genfare Link: Farebox Backend System

To meet DTPW's requirements for a backend and central system to facilitate data exchange between the fareboxes and vaults, provide standard reporting capabilities, and allow DTPW to copy all fare transaction data into the DTPW reporting database, Genfare offers its cloud-hosted Genfare Link solution.

Genfare Link provides end-to-end tracking of activity by all fare media, with time-stamped details of each transaction and event and is in service or in various stages of implementation at 50 transit agencies – more than any other web-based fare processing system. Genfare Link is available in several configurations and functionality can be added easily as needs evolve – providing DTPW flexibility in configuring its fare collection system.

Genfare has a long history of supporting DTPW and other North American transit agencies with a wide range of fare structures and policies. In Genfare's previous on-premises solution, agencies had to manipulate the fare table using a rudimentary graphical user interface (GUI) on a garage computer. As agencies expanded fare structures to accommodate more fare codes, pass types, and peak pricing models, this method of managing fare structure became cumbersome and limiting. Genfare has incorporated the functionality of its legacy on-premises hardware and software—namely, the Garage Data System (GDS) and Network Manager (NM)—into Genfare Link. This transition away from on-premises software to a web-based solution will provide DTPW with many advantages including:

- **All data in one place.** All transaction, ridership, and device monitoring data from the farebox will reside in a single platform readily accessible to the administrative, operational, planning, finance, and maintenance teams. The benefits to DTPW include cost savings and enabling better service for clients because usage patterns are better understood.
- **Reduced IT burden.** Genfare Link reduces the burden on agency staff, who no longer need to be concerned with routine system maintenance. Genfare Link is automatically monitored 24/7 and problems are immediately resolved, in most cases without local intervention or awareness. Backup, archiving, troubleshooting, repairs, and the like are performed by automated processes or Genfare staff.
- **Ongoing hardware and software updates at no additional cost.** Local hardware eventually becomes obsolete and requires replacement. The same is true of the operating system and application software. However, with the Genfare Link solution, all hardware and operating system updates are handled without agency involvement. Genfare provides DTPW details of each new software release for advance review, but handles all tasks related to installation.

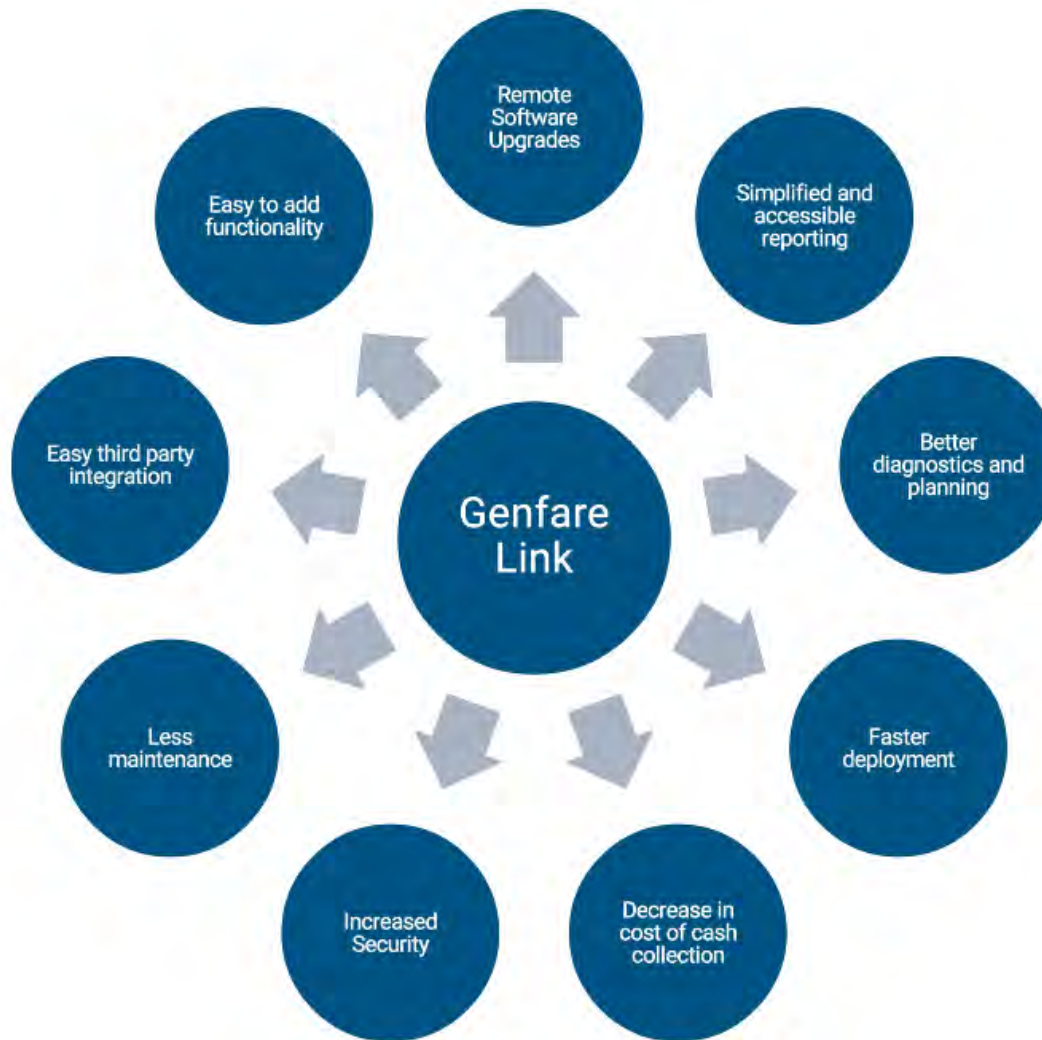


Figure 28. Genfare Link benefits

- **Greater reliability and availability.** Genfare’s service level agreement (SLA) with Amazon Web Services (AWS) guarantees 99.9% availability exclusive of scheduled maintenance downtime, and Genfare metrics indicate that in practice 99.99% availability is typically achieved. In Genfare Link, multiple database instances are maintained in geographically separate data centers. If the primary instance fails or falters, connectivity is automatically shifted to the backup instance and a new backup is spun up.
- **Open architecture with RESTful APIs.** Genfare’s software structure is built with open architecture in mind. This approach makes it easy to integrate Genfare Link with third-party devices and systems, enabling new capabilities to be added as agency needs evolve. For example, DTPW might leverage this functionality to combine the data from the farebox system with data from other fare collection streams such as mobile ticketing, open payments, or retail transactions into a single warehouse.
- **Greater security.** Compared to on-premises hardware and software, Genfare Link provides greater protection of DTPW’s essential operational data. In the event of a natural disaster,

Genfare Link and DTPW's data are safer in the cloud than in an on-premises system. Additionally, DTPW will still have the ability to install different anti-virus software on the Cloud Link computers should it choose to do so.

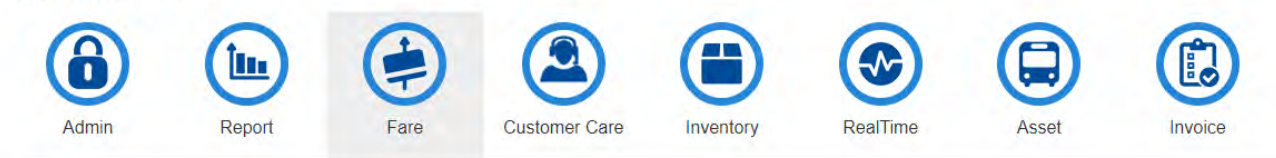
- **Easier access.** On-premises systems, such as the Garage Data System and Network Manager, are typically only available at a single workstation with client applications required to access them. With a cloud-based system, agency personnel have access to the system from any web-enabled device.
- **Faster deployments.** Genfare has automated much of the tenant creation and farebox configuration to ensure faster deployment with fewer issues.
- **Decreased cost of cash collection.** With accurate and comprehensive data, DTPW can determine when to probe and vault its cash boxes as well and when service is required. These decisions can be made prior to the bus arriving at the depot in order to optimize bus service and decrease time. Large discrepancies in cash reported and counted are time stamped and tracked, which saves time and discourages theft.

3.3.1.1 Fare Module

The Fare Module of Genfare Link allows authorized users to configure fare tables, fare policies, and pricing structures. The components of the Fare Module and the major functions performed in each are as follows:

- **Product Management.** Create, update, enable, or disable a fare product.
- **Channel Management.** Manage the availability of fare products in distribution channels (for example, those sold via the TVM or farebox).
- **Fare Structure Management.** Manage the agency's fare structure.
- **OCU Wizard.** Facilitates key definition on the farebox operator control unit (OCU).
- **Promotion Management.** Set up promotions such as a code like "Fall2025" to receive 20% off.

My Modules



Component

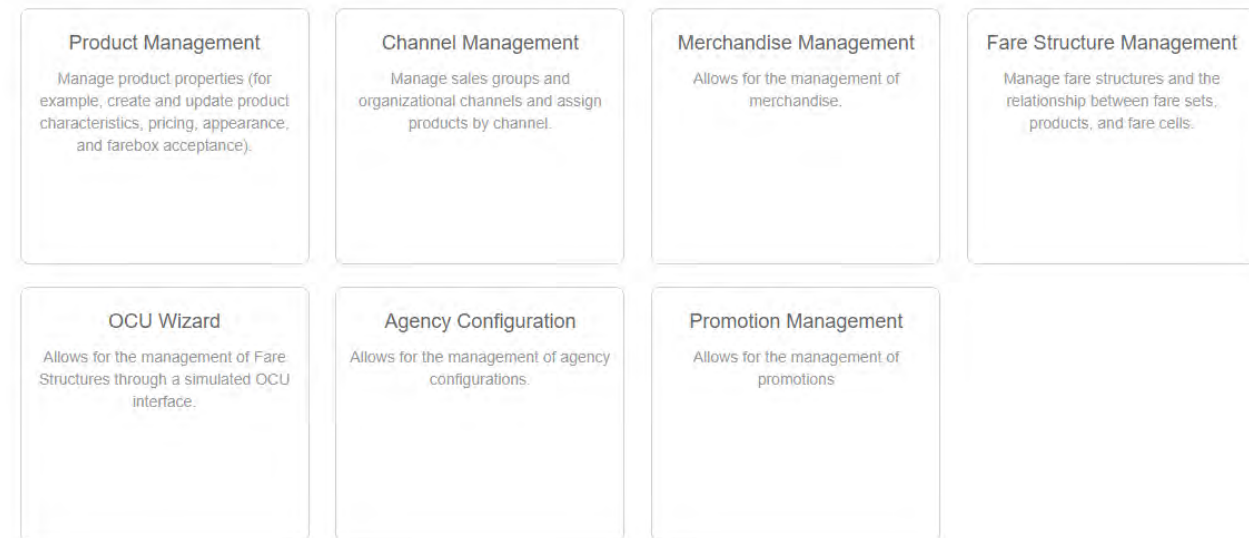


Figure 29. Genfare Link fare module components

Advantages of the Fare Module compared to previous-generation fare table editors include:

- **Single location for revisions.** Updates to all fares and fare products on all devices using all media, including cash and electronic, can be completed in one place. It is no longer necessary to input revisions using separate interfaces for each device or system (e.g., validator, mobile app, or online ticketing portal).
- **Ease of use.** Genfare Link is more intuitive than previous-generation technology and makes it easy to implement fare changes without contractor involvement. Genfare is always happy to provide technical consultation when requested.
- **Fewer limitations.** Many previous fare management restrictions have been loosened, providing greater flexibility when implementing fare policy. For example, the maximum number of non-cash fare items (ticket/token/passes or TTPs) has been increased from 48 to 255, the maximum number of passes has been increased from 32 to 240, and so on.

Like DTPW, many transit agencies are seeking innovative ways to simplify their fare policies while maintaining equity and rider convenience. Genfare supports this goal by making it easier for agencies to define their fare structure and implement it throughout the fare collection system while assisting agencies with modifying fare structures as new needs arise.

Products

Add a New Product +

Export ▾

Show/Hide Column ▾

Reset

View/Modify

Show 50 ▾ entries

Product Name	OCU Display	Product Type	Product Subtype	Value	Price	Group	Designator	Rider Classification	TTP	Status	Account Type
Single Ride	SINGLE	Mobile Activation	--	\$- -	\$2.00	3	50	Full	50	Active	Card-Based, Account Based
Senior Open Pay	SENOP	Stored Value	--	\$- -	\$1.00	3	64	Senior	64	Active	Account-Based
Semester Pass	SEMPASS	Period Pass	Rolling Start	180 days	\$0.00	1	33	Student, Faculty	33	Active	Card-Based, Account Based
Roanoke Pass	Roanoke	Period Pass	Fixed	3 days	\$7.00	1	4	Full, Senior, Youth, Veteran	23	Active	Card-Based, Account Based
Period Pass Brownsville	Day Pass	Period Pass	Rolling Start	1 day	\$2.50	1	2	Full, Senior, Youth	18	Active	Card-Based, Account Based
Pay As You Go	PAYGO	Stored Value	--	\$- -	\$1.00	3	11	Full, Half	27	Active	Card-Based, Account Based
Open Payment	OPENPAY	Stored Value	--	\$- -	\$0.00	3	5	Full	102	Active	Account-Based
Monthly pass youth	Monthly	Period Pass	Rolling Start	0 days	\$2.50	1	0	Youth	14	Active	Card-Based, Account Based
Monthly Pass Farebox	Month Ps	Period Pass	Rolling Start	31 days	\$0.00	1	16	Full, Senior, Youth	16	Active	Card-Based, Account Based
Monthly Pass	MONTHPAS	Period Pass	Rolling Start	31 days	\$40.00	1	32	Full	32	Active	Card-Based, Account Based

Figure 30. Genfare Link fare configuration dashboard

The Fare Module of Genfare Link has all of the functionality an agency needs to manage the fare products it wants to support, which rider classifications have access to which fare products, where the products can be purchased, and finally, where those products are accepted. Instead of managing this from an antiquated interface on a computer in the garage, fare management is all done from a web browser, from anywhere, at any time. The interface walks the user through the process, ensures required fields are completed, and alerts the user to any issues with the configuration. Updates are immediately provided to connected devices, and any devices that only get updates periodically will be updated on the next connection.

Genfare provides agencies assistance with fare structure modifications as part of its Software Support Agreement.

3.3.2 Genfare Link: Monitoring and Alerting System

Genfare Link will serve as the Monitoring and Alerting System for the equipment proposed. All equipment proposed connects to Genfare Link to receive its configuration parameters and report current component status back to Genfare Link. Any issues with field equipment can be recorded, trigger an alert to the appropriate personnel, and record when the equipment returns to a normal state. Genfare Link has incorporated artificial intelligence insights to generate alerts when components are

starting to behave in a way that indicates they may need corrective maintenance and helps plan when equipment will be due for preventive maintenance so it can be scheduled appropriately.

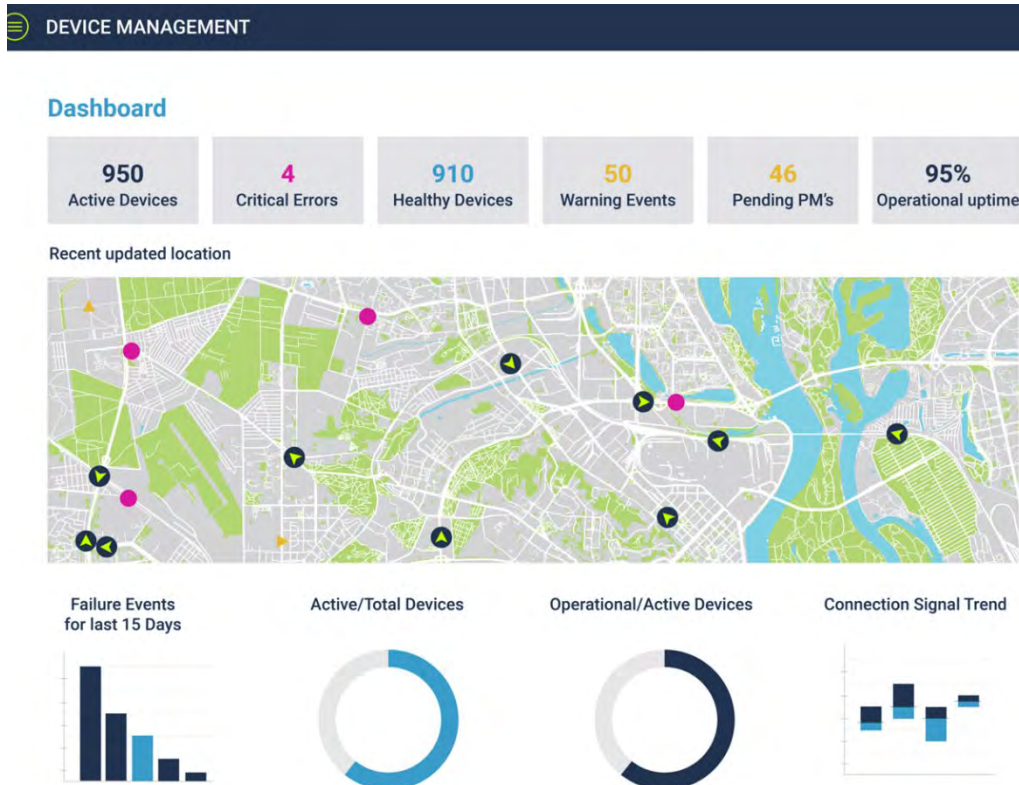


Figure 31. Genfare Link device management dashboard

From the device management dashboard shown above, agency personnel can drill down to a specific device for more detailed information, shown below.

Device ID 1327

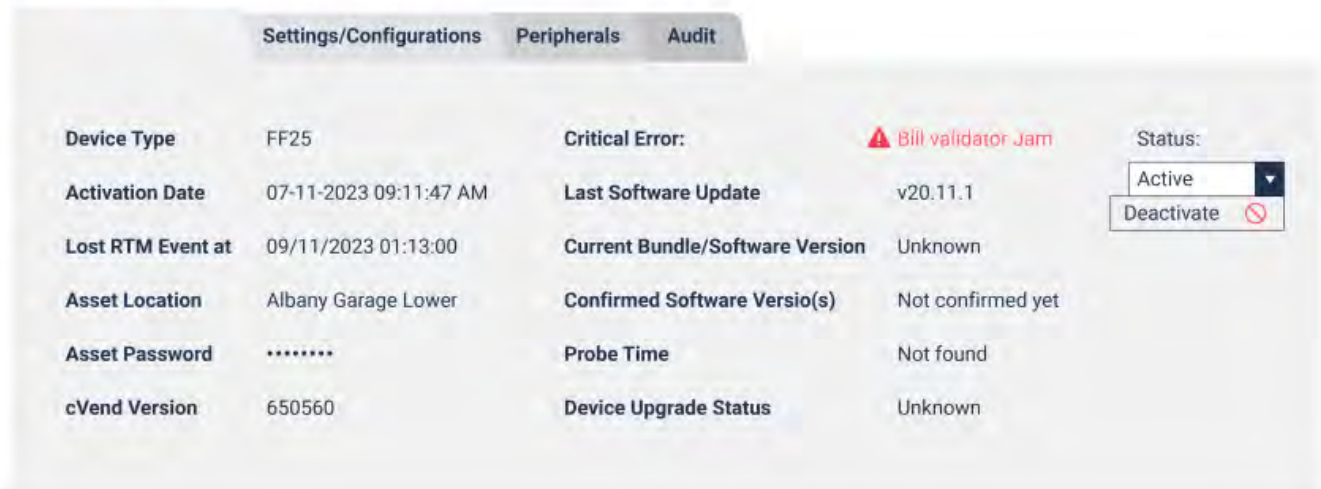


Figure 32. Genfare Link device details

3.3.2.1 Corrective Maintenance

Corrective Maintenance dashboards track issues that occur in the fare collection system in real time. The data shows daily issues on a per hardware basis as well as trends over time. All data can be searched, sorted, and downloaded into .csv file. Alarms can be configured to text or email specific people when configurable criteria are met.

Genfare is embedding artificial intelligence functionalities that can detect potential issues before they become critical. Artificial intelligence has the power to monitor not only the installed hardware, but also supplier and manufacturing issues, to alert customers to issues before they occur.

Bus Number	Farebox ID	Coin Count	Coin Error Count	Error Percent
5509	1859	8,529	2,974	34.87%
5506	1887	9,750	2,921	29.96%
4220	1882	4,148	1,187	28.62%
4175	1898	9,711	1,148	11.82%
6021	2013	4,436	796	17.94%
4172	1989	7,131	776	10.88%
4179	1971	5,812	528	9.08%
4072	2010	6,761	378	5.59%
5503	1857	6,521	354	5.43%
4167	2006	8,161	334	4.09%
6005	2060	9,063	329	3.63%
6012	2014	7,389	303	4.10%
5001	1040	5,001	201	4.02%

Figure 33. Genfare Link coin error report

Bus Number	Bill Mech Error	Coin Mech Error	Event Overflow	Hardware Clock Failure	Warm Start	Total
193					1	1
195					1	1
202					1	1
330					1	1
331					1	1
333					1	1
77					1	1
78					1	1
					8	8

Figure 34. Genfare Link daily issues log

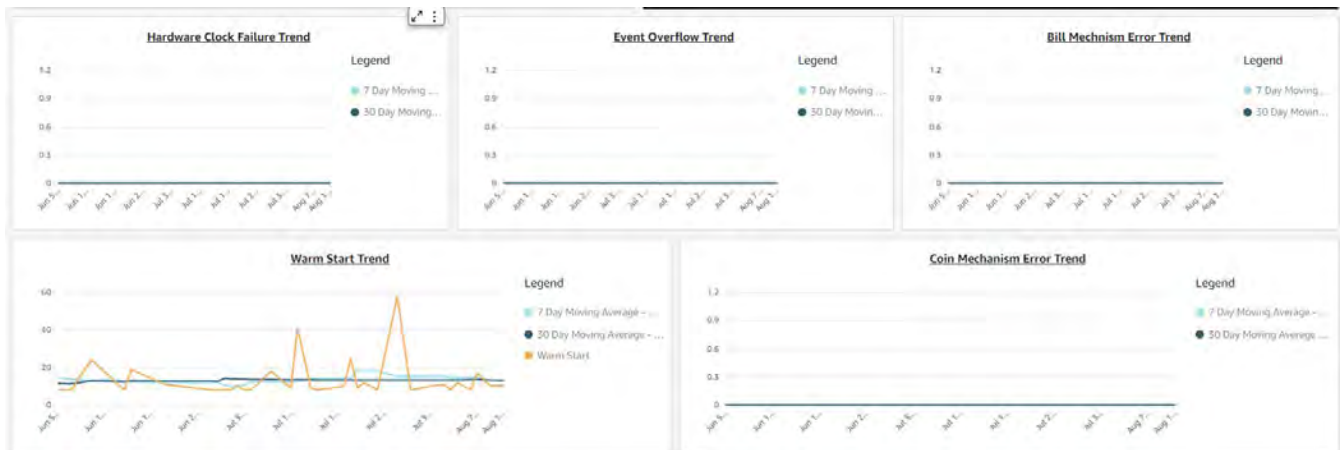


Figure 35. Genfare Link trend data

3.3.2.2 Preventive Maintenance

Preventive Maintenance dashboards track when components on the farebox or TVM need to be serviced on a last maintenance date and by cycle counts. All data can be searched, sorted, and downloaded into a .csv file. Alarms can be configured to text or email specific people when configurable criteria are met.

In a similar manner to corrective maintenance, artificial intelligence can maximize preventive maintenance and keep the fleet running. AI utilizes knowledge databases to predict which equipment needs maintenance prior to an issue arising, leading to concise preventive maintenance schedules. Significant time savings is expected from staff training, diagnosing issues, and determining criticality.

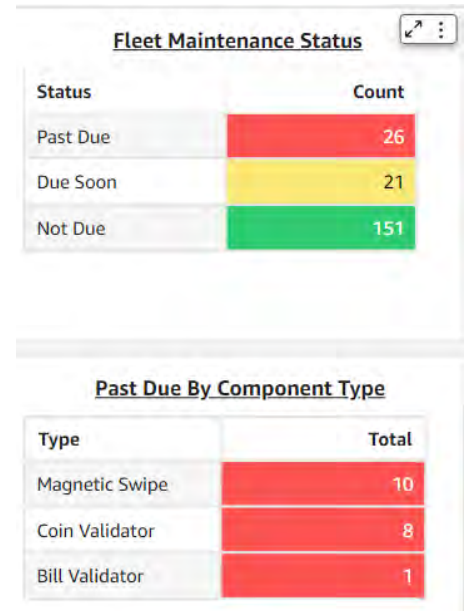


Figure 36. Genfare Link high level maintenance status

Bus Number	Farebox ID	Maintenance Due Date	Cumulative Coin Count	Coin Validator Last Maintenance Date	Cumulative Magnetic Swipe	Magnetic Swipe Last Maintenance Date	Cumulative Bill Paper Count	Bill Validator Last Maintenance Date
122	11071	Oct 23, 2023	0	Aug 2, 2023	27	Aug 6, 2023	0	Jul 29, 2023
190	13654	Dec 13, 2023	11	Sep 22, 2023	40	Sep 26, 2023	4	Sep 18, 2023
1900	6442	Dec 8, 2023	18,939	Sep 17, 2023	26,914	Sep 21, 2023	6,775	Sep 13, 2023
1901	6439	Sep 23, 2023	14,819	Jul 3, 2023	20,363	Jul 7, 2023	5,113	Jun 29, 2023
1903	2023	Oct 3, 2023	16,913	Jul 13, 2023	25,044	Jul 17, 2023	6,049	Jul 9, 2023
1904	2001	Oct 7, 2023	204	Jul 17, 2023	263	Jul 21, 2023	69	Jul 13, 2023
1905	1969	Sep 3, 2023	10,093	Jun 13, 2023	14,413	Jun 17, 2023	3,742	Jun 9, 2023
1906	15621	Dec 14, 2023	5,069	Sep 23, 2023	9,344	Sep 27, 2023	1,932	Sep 19, 2023
1907	1944	Dec 9, 2023	692	Sep 18, 2023	1,376	Sep 22, 2023	267	Sep 14, 2023
191	11073	Dec 11, 2023	3,088	Sep 20, 2023	5,002	Sep 24, 2023	1,043	Sep 16, 2023
192	11089	Dec 11, 2023	3,770	Sep 20, 2023	5,967	Sep 24, 2023	1,315	Sep 16, 2023
194	2061	Nov 2, 2023	14,628	Aug 12, 2023	7,187	Aug 16, 2023	4,773	Aug 8, 2023

Figure 37. Genfare Link preventive maintenance detail

3.4 Genfare Link: Reporting

Genfare Link's reporting capability empowers DTPW to generate reports as necessary to operate and maintain the fare collection equipment and analyze revenue and ridership data.

Genfare Link's reporting has been redesigned to offer more meaningful operating dashboards and benefits from a significantly streamlined data flow to a single database. Fare collection data is sent directly from the Cloud Link application during farebox data transmission events to Genfare Link's Data Lakehouse. From there the data can be interrogated and processed by QuickSight, Amazon Web Services' scalable business intelligence service. Genfare Link's reporting provides interactive dashboards and data visualizations to enable DTPW to make smarter data-driven decisions.



Genfare Link's reporting is provided with pre-defined reports and dashboards that help an agency visualize what is happening in its fare collection system and complete the required federal reports. Users can design a customized dashboard showing the metrics critical to their jobs. When a team member launches a new session, the dashboard makes the latest information available. Each component of the dashboard can be exported for quick inclusion in a board packet, and for power users who prefer to see the raw data, that can be exported as well.

In addition to the pre-defined reports, Genfare offers custom or ad hoc reporting capabilities so a customer can customize and save data in whatever format they choose. These reports can be scheduled to run at specific intervals.

All reports can be exported to certain users at a certain time and range, so each member of the team receives the information they need in the format that they choose.

Genfare Link's reporting expresses data graphically to help users better understand patterns, trends, and insights. The ability to see and manipulate data enables:

- More effective and informed decision making
- Increased marketing opportunities
- Instant trend recognition
- Exposure of anomalies and irregularities
- Simpler team communications

The scalable, highly available cloud environment provided by QuickSight, combined with Genfare Link's robust architecture, provides the ideal foundation for valuable reporting. The reporting database is continually updated to reflect current fare collection activity while enabling simultaneous generation of reports.

The Genfare Link Data Lakehouse is the "single source of truth," in IT terms, providing a central repository in which all revenue management data resides. Transaction and event records generated by fareboxes are individually recorded in the Data Lakehouse, including data on ridership and revenue, system administration, account activity, and equipment performance.

Although Genfare Link's reporting is a powerful tool capable of managing millions of transactions, it is built around straightforward concepts:

- **Collect.** Data from events at each level of the revenue system are recorded with high precision via the real-time network. This data includes transaction status, operating conditions, administrative activity, system performance, and more.
- **House.** The data lake resides in the AWS cloud, providing high security while remaining accessible to authorized users from any web-enabled computer or mobile device. Users can be assigned rights and permissions appropriate to their jobs.
- **Interpret.** The business intelligence tools can provide data in both tabular and graphical form. The self-service reporting portal is a no-code solution enabling management and system administrators to analyze and compare datasets in any desired combination without technical assistance. For example, ridership and revenue data may be plotted on the same chart to provide instant visibility of rider activity trends.
- **Act.** The goal of data analysis is to facilitate decisions leading to better service and an improved client experience. The Genfare Link Report Module allows analysis over varying time periods and datasets, providing rapid feedback on the effectiveness of management initiatives.

3.4.1 Genfare Link: Farebox Backend System Reporting

Genfare continues to improve reporting dashboards based on feedback and requests from agencies. Genfare's reporting is capable of filtering, exporting to csv, searching, and sorting records.

Reporting includes the following:

- Ridership Dashboard
- Revenue Dashboard
- Cash Reconciliation by garage, by vault, and by bus
- Custom Design

Sample dashboards are shown to illustrate data visualizations and ability to drill down to more detailed information on ridership, revenue, and farebox events like alarms and bypass.

3.4.1.1 Ridership Dashboards

Ridership can be displayed per date, route, product type, vehicle type, media type, organization, customer type, and product category. Trends can be displayed graphically on any of the filtering options.



Figure 38. Genfare Link ridership by date range

Utilizing GPS information, ridership by stop can be displayed graphically to determine most used routes and future stop planning:

*Only includes Transactions with Stop data

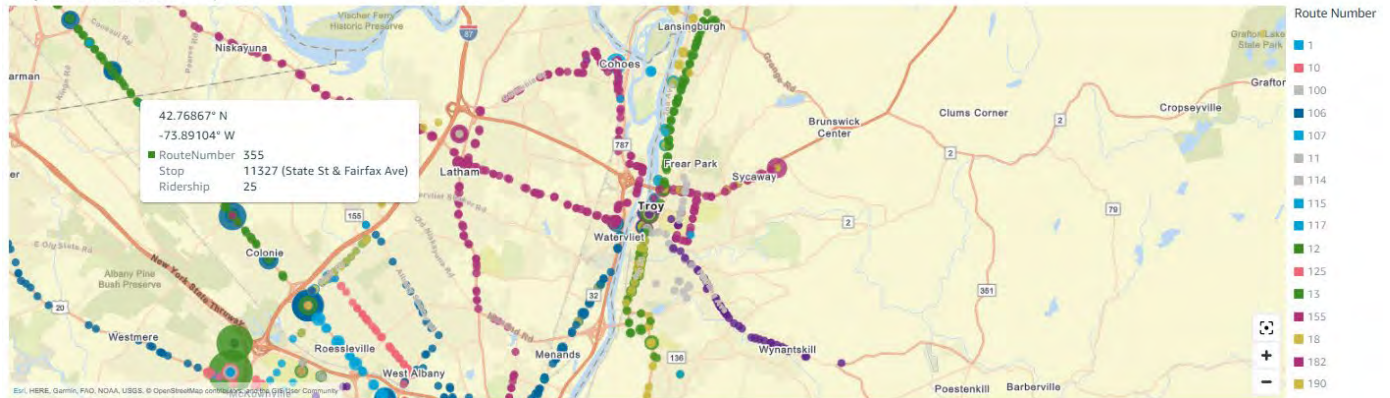


Figure 39. Genfare Link ridership by stop

3.4.1.2 Revenue Dashboards

Revenue can be graphically represented and filtered based on cash from each garage in each denomination:

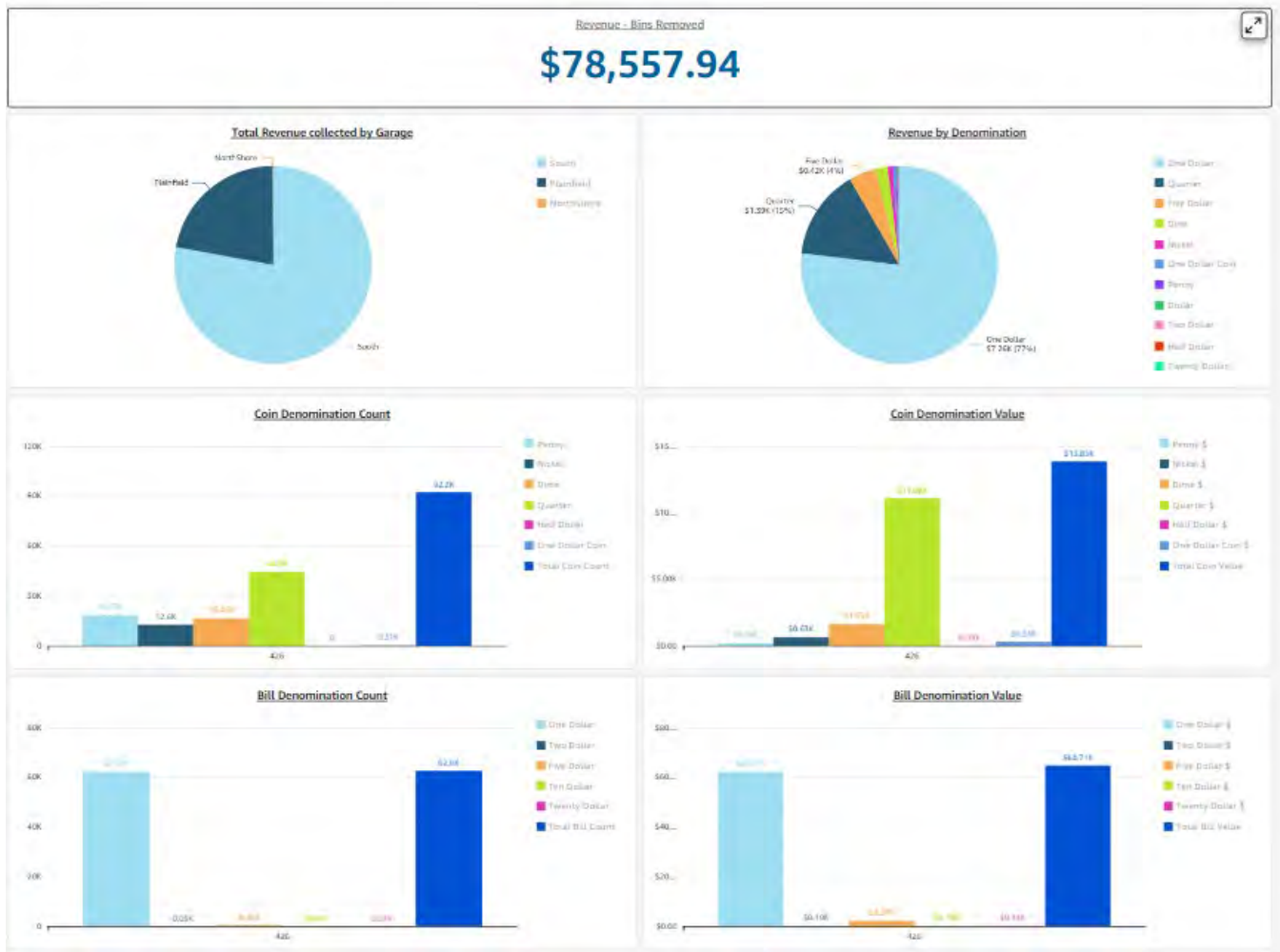


Figure 40. Genfare Link revenue dashboard

Tracking revenue per bin in real time allows DTPW to know when to each bus should be vaulted, which has the potential to save time and simplify nightly bus procedures:

Garage	Vault ID	Bin ID	Revenue	Total Col...	Coin \$	Penny	Penny \$	Nickel	Nickel \$	Dime	Dime \$	Quarter	Quarter \$	Half Dollar	Half Dollar \$	Dollar	Dollar \$
Plainfield	1	24	\$391.76	489	\$78.76	91	\$0.91	55	\$2.75	106	\$10.60	230	\$57.50			7	\$7.00
Plainfield	2	20	\$523.87	601	\$100.87	87	\$0.87	93	\$4.65	86	\$8.60	331	\$82.75			4	\$4.00
South	1	53	\$2,269.97	2,657	\$392.97	492	\$4.92	469	\$23.45	456	\$45.60	1,228	\$307.00			12	\$12.00
NorthShore	1	41	\$32.00	58	\$9.00	5	\$0.05	8	\$0.40	18	\$1.80	27	\$6.75				
South	1	53	\$413.63	497	\$58.63	133	\$1.33	110	\$5.50	83	\$8.30	170	\$42.50			1	\$1.00
Plainfield	2	25	\$3,206.26	3,986	\$718.26	566	\$5.66	394	\$19.70	619	\$61.90	2,368	\$592.00			39	\$39.00
Plainfield	1	22	\$2,355.64	3,081	\$479.64	664	\$6.64	342	\$17.10	489	\$48.90	1,572	\$393.00			14	\$14.00
South	1	58	\$51,993.81	60,014	\$9,667.63	12,838	\$128.38	8,539	\$426.95	11,038	\$1,103.80	27,494	\$6,863.50			145	\$145.00
Plainfield	2	24	\$5,092.48	4,050	\$650.48	783	\$7.83	410	\$20.50	674	\$67.40	2,171	\$542.75			12	\$12.00
Plainfield	1	20	\$2,327.38	2,881	\$462.38	458	\$4.58	297	\$14.85	512	\$51.20	1,603	\$400.75			11	\$11.00
South	1	53	\$6,412.80	7,396	\$1,044.80	1,620	\$16.20	1,240	\$62.00	1,296	\$129.60	3,204	\$801.00			36	\$36.00
Plainfield	2	22	\$2,881.32	3,400	\$606.32	447	\$4.47	325	\$16.25	541	\$54.10	2,074	\$518.50			13	\$13.00
Plainfield	1	23	\$2,557.20	3,092	\$558.20	350	\$3.50	321	\$16.05	534	\$53.40	1,869	\$467.25			18	\$18.00
			\$78,557.94	92,202	\$13,847.94	18,534	\$185.34	12,603	\$630.15	16,452	\$1,645.20	44,301	\$11,075.25	0	\$0.00	312	\$312.00

Figure 41. Genfare Link revenue by bin

Dashboards include full vaulting and probing details across the system:

Vaulting details							Probing details							
Garage	Bus	Vault ID	Bin ID	Cashbox ID	Cashbox Removed	Revenue	Garage	Bus	Vault ...	Bin ID	Cashbox ...	Probed Type	Probed Time	Revenue
South	17520	1	53	1402	10-18-2023 6:47 am	\$65.00	Plainfield	22307	1	24	1160	PDU	10-17-2023 8:48:00 pm	\$73.86
South	18507	1	53	1370	10-18-2023 6:23 am	\$58.91	South	17551	1	53	1418	PDU	10-17-2023 8:40:53 pm	\$39.60
South	17516	1	53	1335	10-18-2023 6:21 am	\$45.45	Plainfield	6959	2	20	1142	IR	10-17-2023 8:40:48 pm	\$3.00
South	17530	1	53	1331	10-18-2023 5:47 am	\$0.00	Plainfield	6972	1	24	1170	PDU	10-17-2023 8:38:39 pm	\$9.00
South	15506	1	53	1368	10-18-2023 5:22 am	\$38.14	South	18509	1	53	1363	PDU	10-17-2023 8:32:08 pm	\$73.56
South	17543	1	53	1385	10-18-2023 4:41 am	\$2.00	Plainfield	2764	1	24	1149	PDU	10-17-2023 8:31:23 pm	\$30.24
South	18508	1	53	1426	10-18-2023 4:00 am	\$63.13	Plainfield	22314	2	20	1169	IR	10-17-2023 8:28:37 pm	
South	15509	1	53	1342	10-18-2023 2:21 am	\$24.69	Plainfield	22314	2	20	1169	IR	10-17-2023 8:28:31 pm	
South	17556	1	53	1334	10-18-2023 2:07 am	\$33.17	Plainfield	22314	2	20	1169	IR	10-17-2023 8:28:25 pm	\$51.89
South	17508	1	53	1348	10-18-2023 2:00 am	\$55.78	Plainfield	6974	1	24	1141	PDU	10-17-2023 8:25:14 pm	\$5.00
South	20504	1	53	1371	10-18-2023 1:56 am	\$64.85	Plainfield	6953	2	20	1132	IR	10-17-2023 8:15:13 pm	\$16.20
South	20501	1	53	1412	10-18-2023 1:54 am	\$25.17	South	17565	1	53	1494	PDU	10-17-2023 8:10:29 pm	\$34.66
South	20502	1	53	1425	10-18-2023 1:43 am	\$74.01	Plainfield	22320	2	20	1167	IR	10-17-2023 8:04:00 pm	\$51.39
South	17569	1	53	1339	10-18-2023 1:42 am	\$1.00	South	17524	1	53	1424	PDU	10-17-2023 7:50:06 pm	\$32.95
South	17549	1	53	1405	10-18-2023 1:38 am	\$38.70	Plainfield	6970	1	24	1185	PDU	10-17-2023 7:20:46 pm	\$14.00
South	17534	1	53	1423	10-18-2023 1:31 am	\$10.76	South	17517	1	53	1333	PDU	10-17-2023 7:20:12 pm	\$83.06
South	20500	1	53	1417	10-18-2023 1:20 am	\$50.17	Plainfield	6950	2	20	1165	IR	10-17-2023 7:14:17 pm	\$5.00
South	17509	1	53	1357	10-18-2023 1:08 am	\$53.22	South	17531	1	53	1384	PDU	10-17-2023 7:12:01 pm	\$50.60
South	17529	1	53	1374	10-18-2023 12:55 am	\$22.35	Plainfield	6978	1	24	1137	PDU	10-17-2023 7:10:32 pm	
South	18501	1	53	1299	10-18-2023 12:53 am	\$61.42	Plainfield	6973	2	20	1499	IR	10-17-2023 7:10:17 pm	\$14.00
						\$78,557.94								\$78,557.94

Figure 42. Genfare Link vaulting and probing details

By utilizing Wi-Fi and cellular probing options, DTPW can know how much cash is in each bus across the system:

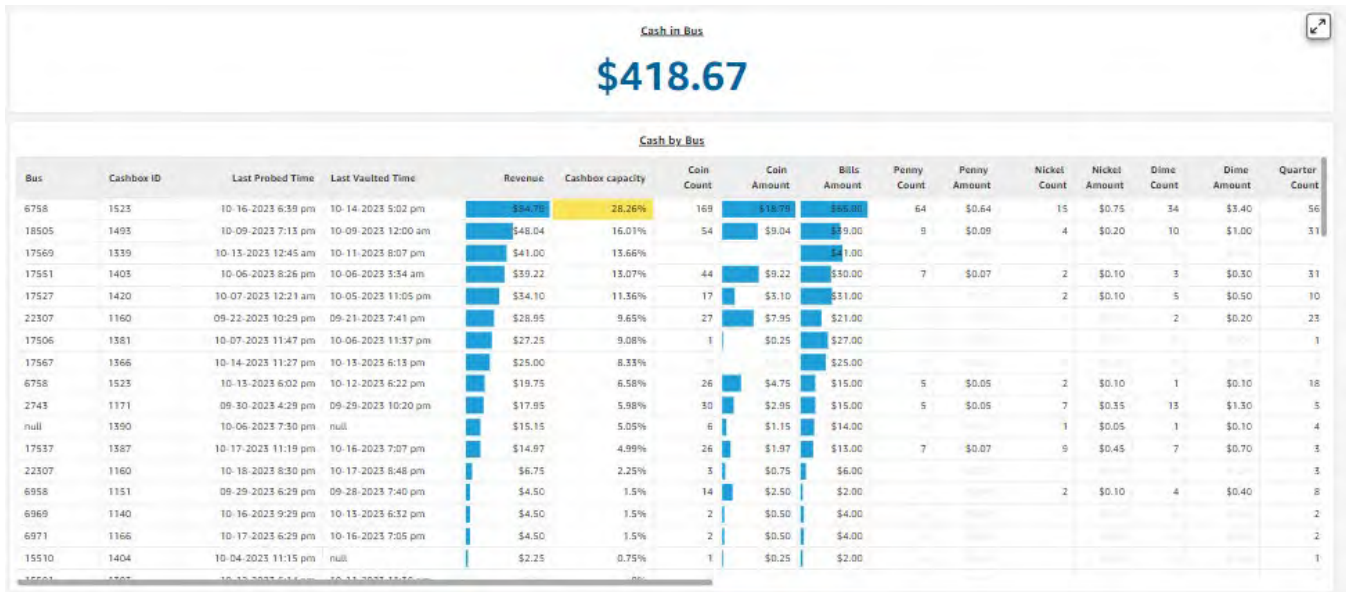


Figure 43. Genfare Link cash in bus

DTPW can also track the cash in the vaults to know when to count the cash or call on a cash-in-transit (CIT) service.



Figure 44. Genfare Link vault capacity graphical view

Cash by Bin

Garage	Vault ID	Bin ID	Revenue	Total Coin	Coin \$	Penny	Penny \$	Nickel	Nickel \$	Dime	Dime \$	Quarter	Quarter \$	Half Dollar	Half Dollar \$	Dollar	Doll
North	2	36	\$5,355.06	6,890	\$1,161.06	996	\$9.96	820	\$41.00	1,176	\$117.60	3,874	\$968.50			24	\$2
North	2	61	\$1,636.40	2,384	\$368.40	470	\$4.70	328	\$16.40	383	\$38.30	1,192	\$298.00			11	\$1
NorthShore	1	41	\$1,021.92	1,169	\$197.92	137	\$1.37	140	\$7.00	228	\$22.80	663	\$165.75			1	\$
Plainfield	1	24	\$1,705.24	2,290	\$352.24	559	\$5.59	243	\$12.15	305	\$30.50	1,172	\$293.00			11	\$1
Plainfield	1	25	\$541.24	628	\$106.24	64	\$0.64	96	\$4.80	113	\$11.30	354	\$88.50			1	\$
Plainfield	2	20	\$2,517.62	3,305	\$579.62	422	\$4.22	366	\$18.30	561	\$56.10	1,940	\$485.00			16	\$1
Plainfield	2	22	\$560.35	738	\$125.35	90	\$0.90	101	\$5.15	123	\$12.30	420	\$105.00			2	\$
South	1	53	\$7,483.01	7,880	\$1,141.01	1,571	\$15.71	1,193	\$59.65	1,459	\$145.90	3,623	\$905.75			14	\$1
South	1	53	\$1,011.97	1,244	\$154.97	342	\$3.42	198	\$9.90	229	\$22.90	475	\$118.75				
South	1	57	\$880.47	1,036	\$139.47	267	\$2.67	146	\$7.30	180	\$18.00	442	\$110.50			1	\$
			\$22,363.28	27,544	\$4,326.28	4,918	\$49.18	3,633	\$181.65	4,757	\$475.70	14,155	\$3,538.75	0	\$0.00	81	\$8

Figure 45. Genfare Link vault capacity table view

3.4.1.3 Cash Reconciliation Dashboards

Genfare provides three dashboards for Cash Reconciliation:

- Main Cash Reconciliation
- Vault Status / Bins in Service
- Non-vaulted Cash Boxes / Cashboxes in Service

The main cash reconciliation dashboard allows counted cash to be imported into the system either by a clerk or by CIT. This data is then compared to the cash that the Genfare Link shows in the data gathered. Genfare Link runs a statistical analysis to determine if the cash counted and reported falls in line with historical reporting.

Summary KPIs are provided to show what caused discrepancies and remediation efforts. Some of the KPIs captured include vaulted not probed, probed not vaulted, cashbox ID not read, bill reclassification by the operator, coin bypass count, and short vaultings.

Vaulting and probing details are included on this dashboard.

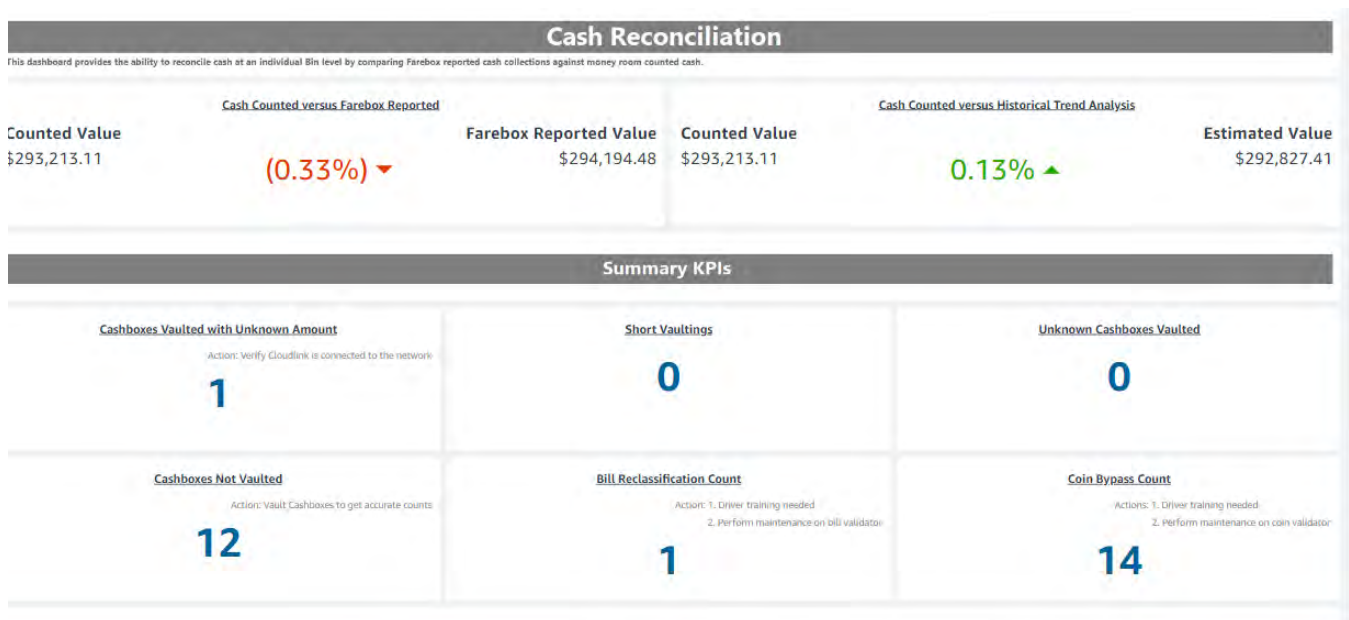


Figure 46. Genfare Link cash reconciliation overview

Vault status is shown per garage on the next dashboard. This shows total cash by vault as well as by garage. The total number of buses probed is also listed.

Each vault has a threshold that can be set and viewed to see when each vault needs to be serviced. Vaulting and probing details are also included on this dashboard.

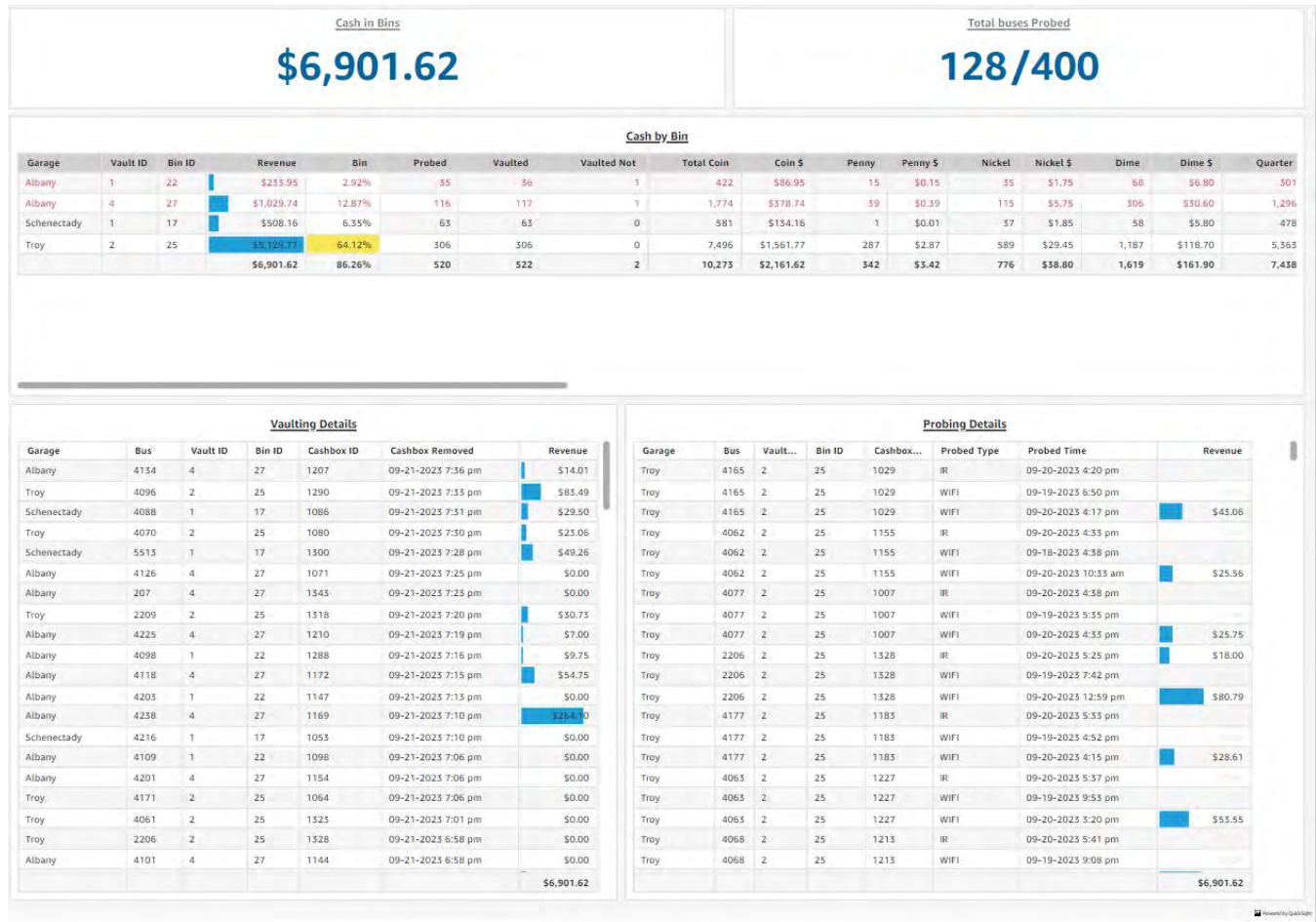


Figure 47. Genfare Link vault and probe details

Cashboxes in service shows details on how much cash is on each bus and can be filtered, sorted, downloaded. Thresholds can be set for when the bus is flagged to be emptied:

Cash in Bus

\$252,626.53

⌵ ⌶ ⌷

Cash by Bus

Bus	Cashbox ID	Last Probed Time	Last Vaulted Time	Revenue	Cashbox capacity	Coin Count	Coin Amount	Bills Amount	Penny Count	Penny Amount	Nickel Count	Nickel Amount	Dime Count	Dime Amount	Quarter Count
5509	1079	10-08-2023 5:32 pm	09-16-2023 7:16 pm	\$2,636.52	878.67%	1,777	\$304.32	\$2,222.00	52	\$0.52	129	\$6.45	271	\$27.10	1,275
5517	1182	10-09-2023 12:01 am	09-21-2023 1:55 am	\$2,620.78	873.5%	1,871	\$394.78	\$2,226.00	108	\$1.08	158	\$7.90	273	\$27.30	1,298
5514	1269	10-08-2023 11:25 pm	09-21-2023 12:27 am	\$2,515.35	804.37%	1,853	\$392.39	\$2,021.00	114	\$1.14	180	\$9.00	280	\$28.00	1,233
5515	1035	10-06-2023 7:14 pm	09-21-2023 4:13 pm	\$2,297.85	765.9%	1,588	\$355.95	\$1,942.00	100	\$1.00	131	\$6.55	214	\$21.40	1,088
5512	1102	10-08-2023 10:53 pm	09-20-2023 7:26 pm	\$2,210.98	736.9%	1,693	\$373.98	\$1,837.00	83	\$0.83	140	\$7.00	219	\$21.90	1,209
5506	1075	10-08-2023 5:54 pm	09-20-2023 11:07 pm	\$2,208.85	734.88%	1,678	\$360.85	\$1,848.00	103	\$1.03	124	\$6.20	271	\$27.10	1,138
5501	1225	10-09-2023 12:07 am	09-20-2023 8:51 pm	\$2,166.00	722.04%	1,484	\$325.40	\$1,841.00	90	\$0.90	102	\$5.10	204	\$20.40	1,052
5508	1107	10-08-2023 10:42 pm	09-21-2023 2:06 am	\$2,166.20	721.97%	1,752	\$369.20	\$1,797.00	85	\$0.85	137	\$6.85	230	\$23.00	1,282
5502	1331	10-08-2023 9:46 pm	09-21-2023 5:50 pm	\$2,131.95	710.45%	1,610	\$358.55	\$1,773.00	70	\$0.70	127	\$6.35	290	\$29.00	1,094
5513	1500	10-07-2023 9:21 pm	09-21-2023 7:28 pm	\$2,080.41	693.37%	1,552	\$337.41	\$1,743.00	101	\$1.01	107	\$5.35	238	\$23.80	1,065
5505	1059	10-07-2023 10:44 pm	09-21-2023 6:45 pm	\$2,008.56	668.79%	1,399	\$336.56	\$1,672.00	56	\$0.56	64	\$3.20	128	\$12.80	1,108
4076	1052	10-08-2023 12:02 am	08-25-2023 6:42 pm	\$1,843.18	648.24%	3,357	\$606.18	\$1,237.00	143	\$1.43	294	\$14.70	443	\$44.30	2,455
5504	1162	10-08-2023 5:57 pm	09-21-2023 4:57 pm	\$1,811.74	610.47%	1,558	\$313.74	\$1,498.00	144	\$1.44	122	\$6.10	237	\$23.70	1,030
6012	1166	10-08-2023 6:37 pm	09-21-2023 4:55 pm	\$1,806.45	602.04%	2,934	\$546.45	\$1,260.00	105	\$1.05	179	\$8.95	357	\$35.70	2,267
6018	1202	10-07-2023 12:33 am	09-19-2023 11:46 pm	\$1,491.82	600.53%	2,850	\$599.82	\$1,002.00	112	\$1.12	239	\$11.95	335	\$33.50	2,121
6013	1165	10-09-2023 12:28 am	09-20-2023 4:40 pm	\$1,362.56	587.46%	2,847	\$591.56	\$1,171.00	116	\$1.16	236	\$11.80	356	\$35.60	2,128

Figure 48. Genfare Link cashboxes in service

3.4.2 Genfare Link: Monitoring and Alerting System Reporting

Reporting dashboards continue to improve based on feedback and requests from customers. For the MAS system, Genfare currently offers both Preventive and Corrective Maintenance Dashboards. Genfare's reporting is capable of filtering, exporting to csv, searching, and sorting records.

Corrective Maintenance monitors Genfare fare collection equipment and reports issues. Issues are presented as most critical to least with remediation suggestions. Detailed data is included to facilitate troubleshooting. Thresholds can be set for criticality and when alerts are received. These alerts can be configured to text or email certain people. The following information is available:

- System view of occurrences that exceed thresholds
- Specific day view for when thresholds were exceeded
- Dashboards for top issues experienced
- Tracking of battery issues, hardware clock failures, event overflow, and bill and coin mech issues
- Misread issues by error count and percentage as well as by bus and probe time

Preventive Maintenance includes the following information per bus number and farebox ID:

- Tracking of last maintenance date for commonly maintained parts
- Bill counts
- Coin counts
- Magnetic swipe counts
- Totals of past due, due soon, and not due across fleet and garage
- Past due maintenance tallies by hardware type
- Statistics on errors encountered



See [section 3.3.1.1](#) for a sample Corrective Maintenance Dashboard and [section 3.3.1.2](#) for a sample Preventive Maintenance dashboard.

3.5 System Architecture

All equipment provided in this procurement interfaces with Genfare Link, Genfare's cloud hosted back-office system. Genfare Link performs the operations that DTPW has listed in the MAS and FBS system requirements on a simplified, single platform.

Fareboxes, TVMs, and faregates communicate directly with Genfare Link over an internet connection on the bus or in each station. The fare collection vaults are connected to a local, on-premises, garage computer which serves as a store and forward device and uses an internet connection in each garage to send and receive data to and from Genfare Link.

Genfare Link is a fully cloud-hosted solution, with the only local computers required located in garages. Genfare Link cannot be hosted in an on-premises or hybrid environment; therefore, there is not an option to transfer licenses. The garage computers may be virtualized or in a DTPW-controlled cloud environment. DTPW will receive a software license for each garage. If DTPW chooses to move those systems between cloud and on-premises platforms in the future, the license would transfer as well.

The diagram below illustrates the centrality of Genfare Link to the proposed solution, the equipment to be installed at each phase of the project, and the wide array of fare payment methods DTPW can offer riders now and in the future.

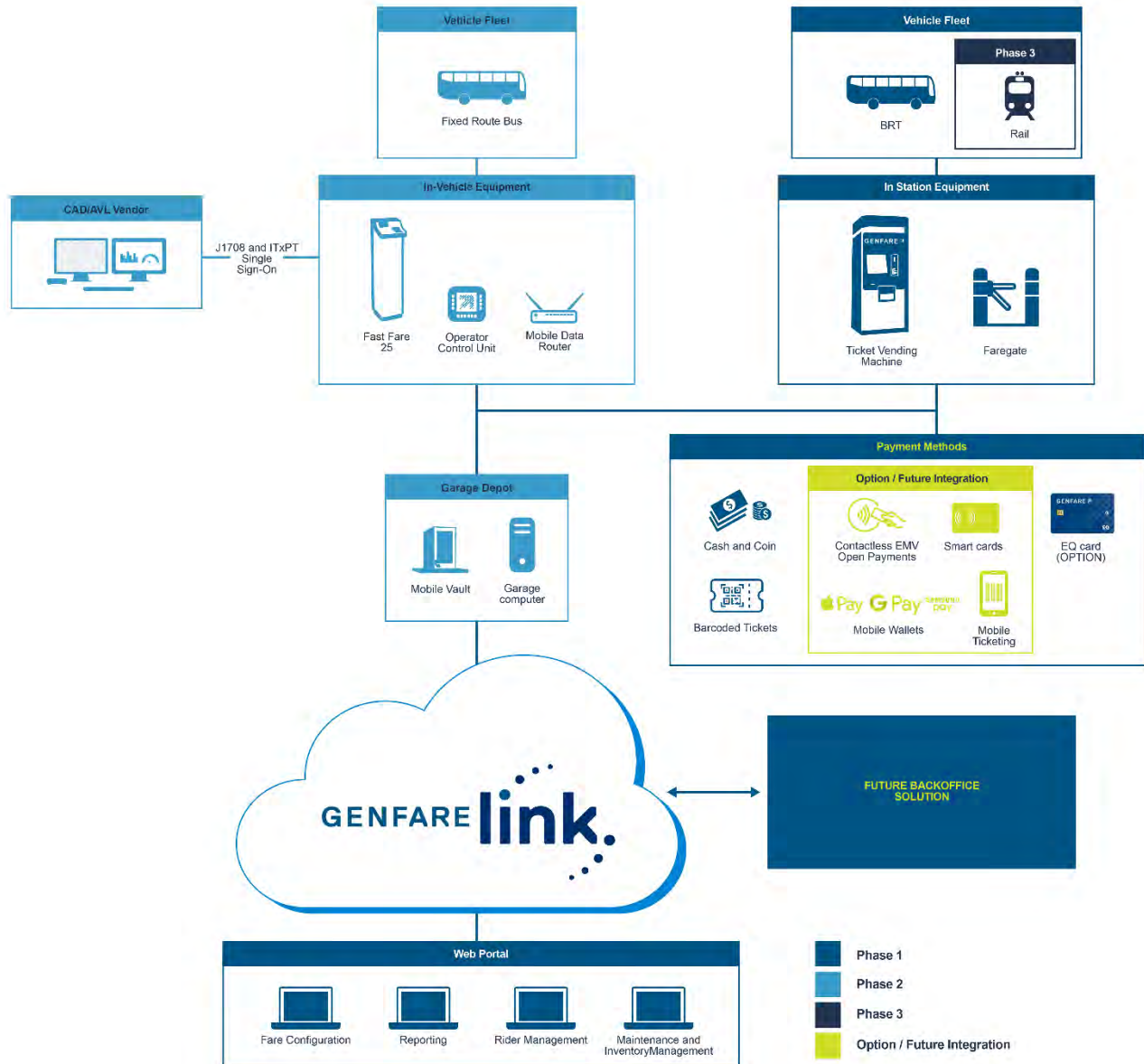


Figure 49: Fare collection system architecture

3.5.1 Minimum Hardware Requirements

Genfare Link is designed to operate over a broad range of internet-connected hardware. For optimum performance, the following minimum requirements are recommended:

Supported operating systems. The Genfare Link platform can be accessed from any web-capable device, using any major browser. The garage computer will leverage Windows for its operating system.

CPU. Each garage computer will have a 6 core CPU with a base frequency of 2.3GHz.

Memory. Each garage computer will have 16GB of RAM.

Disk space. Each garage computer will have a 480GB SSD.

Cloud process limitations or enhancement. Genfare has incorporated the functionality of its legacy on-premises hardware and software—namely, the Garage Data System (GDS) and Network Manager (NM)—into Genfare Link. This transition away from on-premises software to a web-based solution will provide DTPW with many advantages including:

- All data in one place
- Reduced IT burden
- Ongoing hardware and software updates at no additional cost
- Greater reliability and availability
- Open architecture with RESTful APIs
- Greater security
- Easier access
- Faster deployments
- Decreased cost of cash collection

Bandwidth requirements -- agent to cloud console updates, logging, and malware analysis.

Genfare recommends a 100mbps connection from the garage system to Genfare Link and estimates that 5KB of data will be exchanged on each vaulting action.

Scaling guide -- maximum clients supported versus server specifications. Genfare Link automatically scales resources as needed based on usage. These resources will scale back down as the load subsides.

Server component installation. The server components are installed and managed by Genfare, with no agency involvement. For components that are installed in the garage, they could be installed on one machine provided that the vaulting equipment can communicate to it over the network. Genfare recommends that each garage have its own machine.

Communication ports used between components. The garage equipment only needs a standard https port (443) to communicate to Genfare Link.

Databases included with the server installation package. No databases are installed in the garage system. The Genfare Link solution leverages MySQL for storage of configuration parameters and S3/Hudi for the Amazon Web Services Data Lakehouse.

Databases supported. Databases are provisioned and managed by Genfare within the Genfare Link AWS instance. No on-premises machines use databases.

3.5.2 Alternative Methods for MAS

The technical specifications list the Monitoring and Alert System (MAS) and the Farebox Backend System (FBS) as two distinct systems. Genfare proposes leveraging Genfare Link to provide the functionality of both systems. All equipment provided by Genfare will communicate with Genfare Link to receive configuration parameters, transfer all transaction data, and report current status back to single system. Genfare believes this provides a better user experience for DTPW staff with only one system to interact with that serves as a single configuration point source of truth for all equipment in the system.

3.5.3 Data Communications Equipment

All proposed fare collection equipment will communicate with Genfare Link over the internet. The vaulting equipment is the only equipment that will send its data to a local computer first. The vaulting equipment will send the data to a computer in the garage that will store and forward that data to Genfare Link. All other equipment will communicate directly to Genfare Link over the internet.

The faregates and TVMs are designed to connect via Ethernet to a local router located in the station where they are installed. Only one cabinet in a faregate array needs to be connected to the local router, the rest of the cabinets in the array will be daisy-chained to the first one.

The fareboxes can be hardwired via Ethernet to an onboard router for real time monitoring. The fareboxes are also able to communicate via Wi-Fi, generally to a network installed in a garage/depot area but can also be connected to an onboard router if configured properly. If there are no ports available on the router, or DTPW desires, a cellular connection can be added to the Fast Fare 25 to allow it to have its own data connection.

3.5.4 Data Redundancy

Preventing data loss and assuring data integrity are top priorities so Genfare employs an array of techniques to limit risk related to data corruption or loss:

- **Multiple database replicas.** Genfare Link employs a multi-datacenter failover strategy to minimize the impact of server, storage, or database failure. Multiple instances of the Genfare Link database and supporting software are continuously maintained in geographically separate data centers. Genfare Link synchronously replicates all transactions to all database instances. Each instance is continuously monitored. In the event of a database failure, the system automatically transfers database connectivity to a standby replica – a process known as failover. A new backup instance is spun up and all data is copied over to it. The process requires no manual involvement and in most cases is invisible to the user. This reduces the risk that database failure will impact day-to-day business activity.

Failover occurs automatically in the following situations:

- Datacenter outage
- Primary database failure including loss of network connectivity to primary site, failure of compute unit on primary site, or storage failure on primary site
- Database patching issues
- Manual reboot of the database instance
- **Data warehousing.** To reduce the load on the server, Genfare creates a read-only copy of the central database to be used for heavy read operations such as complex reports, ensuring that the activity will not impact other central data system operations – see the Genfare Link architecture diagram in figure 52.
- **Automated data backup.** Automated data backup and retention for Genfare databases includes full-data snapshots of the Genfare database, which are stored in Amazon Simple Storage Service (Amazon S3) data buckets. S3 backups can be used to restore the primary database to a prior state if it becomes corrupted or another problem occurs. Backups can be retained indefinitely or for any desired time to be determined in consultation with DTPW. Data is actively backed up during this retention period and can be recovered to any point within five minutes of the current time.
- **Optional archiving.** As an option, Genfare can provide periodic archiving of selected data to low-cost long-term storage. Note that the fare collection footprint is small, less than 200 GB, and the cost of maintaining it in readily accessible form is modest. Genfare is happy to discuss options, including the desired retention period.

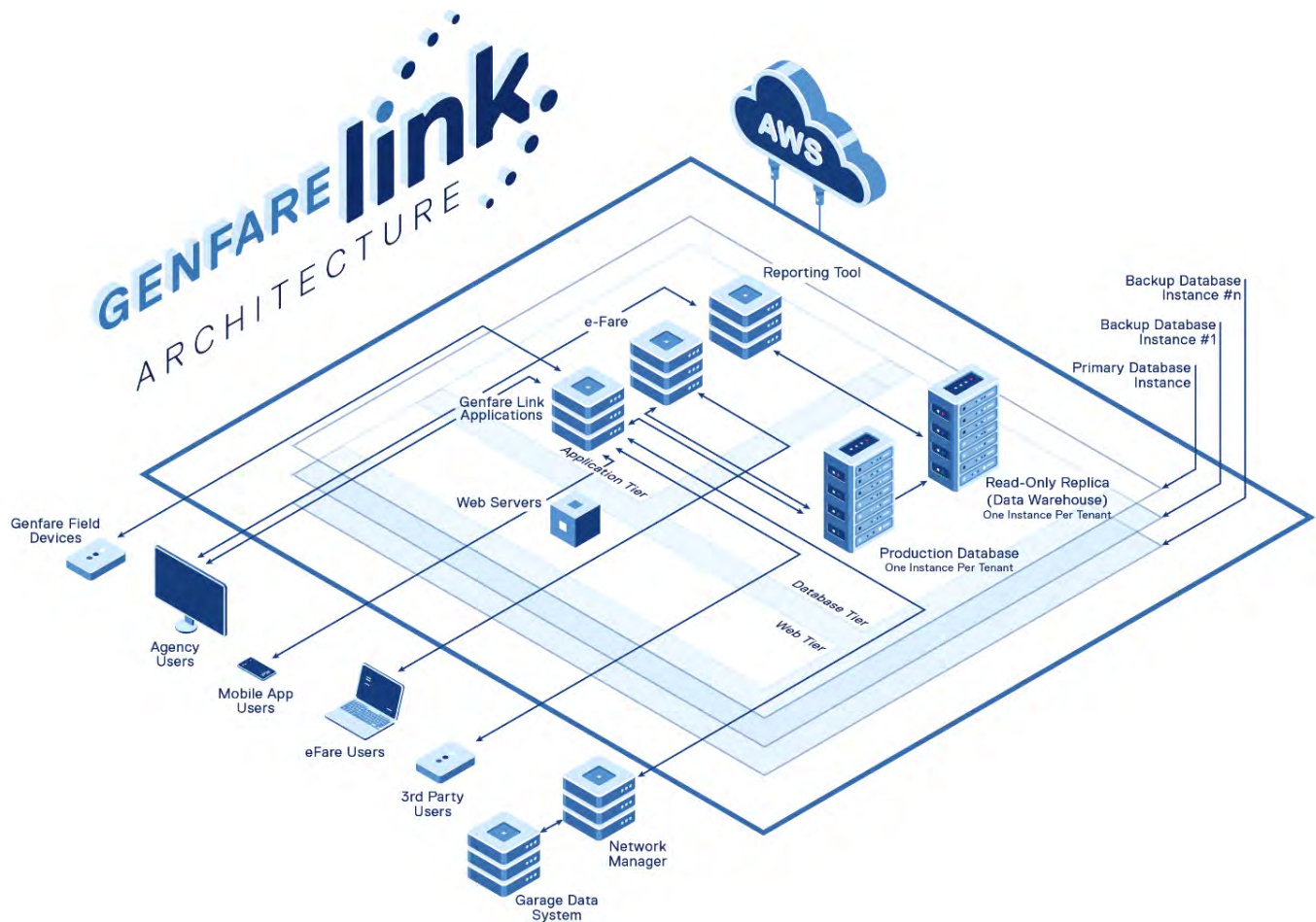


Figure 50. Genfare Link architecture

- **Dedicated database instances.** Each Genfare Link tenant is provided with an independent database instance – there is no commingling of data between tenants. This segregated private data store ensures data security and integrity.
- **Dual region disaster recovery.** To protect against the rare case of a regional outage, Genfare maintains a “warm site” in the AWS U.S. west region – see figures 53 and 54. This consists of a continuously synchronized replica of the production database plus provisioning for the necessary hardware and communications bandwidth. In the event of disaster on the East Coast, Genfare personnel would take immediate steps to spin up the West Coast Link implementation (including primary and backup sites) and transfer connectivity to it. The process, which has been tested multiple times, takes 2-4 hours. No DTPW participation is required.

Each piece of equipment has ample storage capacity to securely store transaction and event records until Genfare Link is available again to receive data. Vaulting operations can continue as all data stored on the local garage computer will be kept until it is successfully transmitted to Genfare Link.

Link's cloud architecture provides multiple levels of redundancy

- East - Production Site
 - Database instances distributed over 3 availability zones in US East region (Virginia)
- West - Disaster Recovery Site
 - 1 Zone - US West (Oregon)



Figure 51. Genfare Link data redundancy

"Warm Site" kept ready for disaster recovery

- Continuous RDS/DB replication between East and West
- No data loss if U.S. East goes down (e.g., regional blackout)
- West coast instances spun up, back online in 2-4 hours



Figure 52. Genfare Link disaster recovery

3.5.5 Data Center

Genfare Link is hosted within Amazon's data centers powering Amazon Web Services (AWS). Amazon publishes its own data center controls detailed below.



3.5.5.1 Secure Design

- **Site selection.** Prior to choosing a location, AWS performs initial environmental and geographic assessments. Data center locations are carefully selected to mitigate environmental risks, such as flooding, extreme weather, and seismic activity. Availability Zones are built to be independent and physically separated from one another.
- **Redundancy.** Data centers are designed to anticipate and tolerate failure while maintaining service levels. In case of failure, automated processes move traffic away from the affected area. Core applications are deployed to an N+1 standard, so that in the event of a data center failure, there is sufficient capacity to enable traffic to be load-balanced to the remaining sites.
- **Availability.** AWS has identified critical system components required to maintain the system's availability and recover service in the event of outage. Critical system components are backed up across multiple, isolated locations known as Availability Zones. Each Availability Zone is engineered to operate independently with high reliability. Availability Zones are connected to

enable users to easily architect applications that automatically fail-over between Availability Zones without interruption. Highly resilient systems, and therefore service availability, is a function of the system design. Through Availability Zones and data replication, AWS customers can achieve very short recovery time and recovery point objectives, as well as the highest levels of service availability.

- **Capacity planning.** AWS continuously monitors service usage to deploy infrastructure to support availability commitments and requirements. AWS maintains a capacity planning model that assesses infrastructure usage and demands at least monthly. This model supports planning of future demands and includes considerations such as information processing, telecommunications, and audit log storage.

3.5.5.2 Business Continuity and Disaster Recovery

- **Business continuity plan.** The AWS Business Continuity Plan outlines measures to avoid and lessen environmental disruptions. It includes operational details about steps to take before, during, and after an event. The Business Continuity Plan is supported by testing that includes simulations of different scenarios. During and after testing, AWS documents people and processes performance, corrective actions, and lessons learned to improve.
- **Pandemic response.** AWS incorporates pandemic response policies and procedures into its disaster recovery planning to prepare to respond rapidly to infectious disease outbreak threats. Mitigation strategies include alternative staffing models to transfer critical processes to out-of-region resources, and activation of a crisis management plan to support critical business operations. Pandemic plans reference international health agencies and regulations, including points of contact for international agencies.

3.5.5.3 Physical Access

- **Employee Data Center access.** AWS provides physical data center access only to approved employees. All employees who need data center access must first apply for access and provide a valid business justification. These requests are granted based on the principle of least privilege, where requests must specify to which layer of the data center the individual needs access and are time-bound. Requests are reviewed and approved by authorized personnel, and access is revoked after the requested time expires. Once granted admittance, individuals are restricted to areas specified in their permissions.
- **Third party data center access.** Third-party access is requested by approved AWS employees, who must apply for third-party access and provide a valid business justification. These requests are granted based on the principle of least privilege, where requests must specify to which layer of the data center the individual needs access and are time-bound. These requests are approved by authorized personnel, and access is revoked after the request time expires. Once granted admittance, individuals are restricted to areas specified in their permissions. Anyone granted visitor badge access must present identification when arriving on site and are signed in and escorted by authorized staff.

3.5.5.4 Monitoring and Logging

- **Data center access review.** Access to data centers is regularly reviewed. Access is automatically revoked when an employee's record is terminated in Amazon's HR system. In addition, when an employee or contractor's access expires in accordance with the approved request duration, their access is revoked, even if they continue to be an employee of Amazon.

- **Data center access logs.** Physical access to AWS data centers is logged, monitored, and retained. AWS correlates information gained from logical and physical monitoring systems to enhance security on an as-needed basis.
- **Data center access monitoring.** Amazon monitors its data centers using its global Security Operations Centers, which are responsible for monitoring, triaging, and executing security programs. They provide 24/7 global support by managing and monitoring data center access activities, equipping local teams and other support teams to respond to security incidents by triaging, consulting, analyzing, and dispatching responses.

3.5.5.5 Surveillance and Detection

- **CCTV.** Physical access points to server rooms are recorded by closed circuit television cameras (CCTV). Images are retained according to legal and compliance requirements.
- **Data center entry points.** Physical access is controlled at building ingress points by professional security staff utilizing surveillance, detection systems, and other electronic means. Authorized staff utilize multi-factor authentication mechanisms to access data centers. Entrances to server rooms are secured with devices that sound alarms to initiate an incident response if the door is forced or held open.
- **Intrusion detection.** Electronic intrusion detection systems are installed within the data layer to monitor, detect, and automatically alert appropriate personnel of security incidents. Ingress and egress points to server rooms are secured with devices that require everyone to provide multi-factor authentication before granting entry or exit. These devices will sound alarms if the door is forced open without authentication or held open. Door alarming devices are also configured to detect instances where an individual exits or enters a data layer without providing multi-factor authentication. Alarms are immediately dispatched to 24/7 AWS Security Operations Centers for immediate logging, analysis, and response.

3.5.5.6 Device Management

- **Asset management.** AWS assets are centrally managed through an inventory management system that stores and tracks owner, location, status, maintenance, and descriptive information for AWS-owned assets. Following procurement, assets are scanned and tracked, and assets undergoing maintenance are checked and monitored for ownership, status, and resolution.
- **Media destruction.** Media storage devices used to store customer data are classified by AWS as critical and treated accordingly, as high impact, throughout their life cycles. AWS has exacting standards on how to install, service, and eventually destroy the devices when they are no longer useful. When a storage device has reached the end of its useful life, AWS decommissions media using techniques detailed in NIST 800-88. Media that stored customer data is not removed from AWS control until it has been securely decommissioned.

3.5.5.7 Operational Support Systems

- **Power.** Our data center electrical power systems are designed to be fully redundant and maintainable without impact on operations, 24 hours a day. AWS ensures data centers are equipped with back-up power supply to ensure power is available to maintain operations in the event of an electrical failure for critical and essential loads in the facility.
- **Climate and temperature.** AWS data centers use mechanisms to control climate and maintain an appropriate operating temperature for servers and other hardware to prevent overheating

and reduce the possibility of service outages. Personnel and systems monitor and control temperature and humidity at appropriate levels.

- **Fire detection and suppression.** AWS data centers are equipped with automatic fire detection and suppression equipment. Fire detection systems utilize smoke detection sensors within networking, mechanical, and infrastructure spaces. These areas are also protected by suppression systems.
- **Leakage detection.** To detect water leaks, AWS equips data centers with functionality to detect water. If water is detected, mechanisms are in place to remove water to prevent additional water damage.

3.5.5.8 Infrastructure Maintenance

- **Equipment maintenance.** AWS monitors and performs preventive maintenance of electrical and mechanical equipment to maintain the continued operability of systems within AWS data centers. Equipment maintenance procedures are carried out by qualified persons and completed according to a documented maintenance schedule.
- **Environment management.** AWS monitors electrical and mechanical systems and equipment to enable immediate identification of issues. This is carried out by utilizing continuous audit tools and information provided through building management and electrical monitoring systems. Preventive maintenance is performed to maintain the continued operability of equipment.

3.5.5.9 Governance and Risk

Ongoing data center risk management. The AWS Security Operations Center performs regular threat and vulnerability reviews of data centers. Ongoing assessment and mitigation of potential vulnerabilities is performed through data center risk assessment activities. This assessment is performed along with the enterprise-level risk assessment process used to identify and manage risks presented to the business. This process also takes regional regulatory and environmental risks into consideration.

- **Third party system attestation.** Third-party testing of AWS data centers, as documented in Amazon third-party reports, ensures AWS has appropriately implemented security measures aligned to established rules needed to obtain security certifications. Depending on the compliance program and its requirements, external auditors may perform testing of media disposal, review security camera footage, observe entrances and hallways throughout a data center, test electronic access control devices, and examine data center equipment.

3.5.6 Load Balancing and Disaster Recovery

In addition to these AWS measures, Genfare employs its own processes for load balancing and disaster recovery. Genfare uses AWS's Elastic Loading Service to load balance the application traffic. AWS's Elastic Load Balancing service automatically distributes incoming application traffic across multiple servers spread across different availability zones (multiple data centers) to make the app highly available and offer good performance even during peak time/load. By leveraging the AWS Elastic Loading Service, Genfare protects application traffic with industry standard TLS-1.2 encryption.

Genfare uses a warm-site redundancy model within the AWS infrastructure, ensuring that if a system at one data center goes down, another system can quickly manage the load without a loss of data. The system is designed with Master and Slave configuration and has cross regions replication enabled. When one region goes down, all the data, including the most recent transactions, are replicated across the region. The main database has two replicas (backups) that in total add up to three copies of the

data (1 master + 2 replicas). Genfare uses AWS RDS service for its database, and each database server is configured to have automated backups. This system is tested several times throughout the year, and we can restore the most critical components in two hours or less and all components in less than eight hours.

3.5.7 Logical Security

To ensure the security of the Genfare Link platform, Genfare has implemented several security controls to ensure access is limited to just employees who need access. The production and non-production Genfare Link environments are managed within two separate AWS accounts, allowing Genfare to give employees different levels of access based on the environment.

Access to the AWS instance requires a VPN in the environment. This VPN is also secured using two factor authentication to ensure the specified employee is accessing the environment. All data transmitted in this VPN tunnel are encrypted with TLS 1.3 encryption.



3.5.8 Change Management for Software

Genfare Link and all equipment firmware is on a quarterly release schedule. Features defined in the respective roadmaps are estimated, prioritized, and then scheduled into one of these releases. During release planning, each feature will be broken down into sub tasks that will be scheduled into sprints, and test scripts that will be performed when development is complete. Once development and initial QA has been completed, Genfare has strict internal end-to-end testing protocols to ensure the final release is ready for production. Genfare sets up a User Acceptance Testing (UAT) lab at each agency so that customers can test releases prior to their going to production.



Genfare uses Agile Software Development principles including two-week sprints, weekly standups for cross functional teams, and multiple testing levels to ensure quality. Once sprint testing is completed by the development team, the software is provided to the QA team for regression testing. Both sprint and regression testing are managed in Jira for issue tracking and Zephyr for test plan tracking, and the results are reviewed across teams.

Genfare has a full internal lab setup where the customers' data and configuration are loaded, and testing can be done from any piece of equipment – from the farebox, ticket vending machine, or faregate to Genfare Link. Only after sprint, regression, and internal lab testing are complete can the software move to User Acceptance Testing. Once the software is approved for UAT, the implementation team will begin testing in their lab, which trains them for future deployments. After this signoff, the software is approved for customer UAT in the lab environment then moved to production.

Sprint deliverables are set the quarter prior and are based on customer or internal enhancement requests. Change requests or enhancements are logged on an engineering request form. Each week, teams come together to evaluate the importance and work required to implement each of the new requests. Requests are then prioritized based on these criteria and are added to future sprints based on workload. Dates are provided to the requesting customer on when to expect the change.

Once a release is ready for UAT, a quarterly release notification is generated, sent to all customers, and posted to the Genfare Customer Portal. The quarterly release notification is where customers can find more information about any software upgrades, updates, patches, bug fixes, and optional software features that are accessible throughout the platform. These are all included in the Genfare offering as defined in Genfare's Software Support Agreement, Warranty and Extended Warranty in [section 2.3.9](#).

3.5.8.1 Patch Management

While quarterly releases cover an array of updates, there are times when immediate updates are required and addressed. Should bug fixes or patches are needed for critical function, these fixes are prioritized as raised by project teams and customers. Genfare anticipates that while it has high performance in both equipment and software, patches will be needed occasionally to accommodate different use cases and edge cases.

Patch management is a vital part of every vulnerability management solution as the process of distributing and applying updates to software. These patches are often necessary to correct errors in the software. If an issue is found after a release is moved to production, the issue will be root caused and a full root cause analysis (RCA) will be completed.

Genfare employs leading industry standard common vulnerabilities and exposures (CVE) scanning tools to continuously assess its infrastructure for known vulnerabilities and generate notification channels of CVE to get notified directly about latest CVEs. This scanning is integrated into routine monitoring processes, allowing for rapid identification and response to potential risks.

The patch will go through a full suite of testing from sprint to regression to UAT and can be pushed to all customers once approved.

Once patches have successfully passed testing phases, they are promoted to the production environments. This promotion typically occurs during scheduled maintenance windows to minimize disruption to ongoing operations.

All the remote fare collection devices are patched as well. Each patch will be validated internally by Genfare and then will be staged and pushed to each individual customer using the Asset and Real Time Monitoring Modules in Genfare Link. Genfare will stage the firmware on its enterprise platform and provide reports to track the current firmware versions actively running on all the fare collection devices.

Genfare maintains detailed documentation of the patching process, including a log of patches applied, their dates, and the specific servers or systems affected. All the patch requests go through change management process and are documented and audited. Release notes for all patch updates will be made available to stake holders before the updates are made to the equipment or backend.

3.6 General Requirement for Fare Collection Equipment

All the proposed Fare Collection Equipment has been reviewed against all of the General Requirements listed in Section 4 of the Technical Specifications and meets all requirements. A table summarizing this review is provided as an [appendix](#) to this proposal.

3.7 Faregates

Magnetic proposes a stylish and efficient gate solution, custom made and developed to the requirements of Genfare and DTPW.

The proposed faregate is a single-barrier point solution (i.e., no 'Man Trap'). The single-barrier point within each lane consists of two 71-inch tall 'wing-action' swinging barriers. Each barrier will be assembled using a smooth metal surrounding frame and affixed central non-glass panels (left and right side of the lane), through which the passenger moves through upon successful validation of the fare media presented. The barriers will be durable and long-lasting, and can optionally be transparent or non-transparent, based on final design guidance by DTPW.

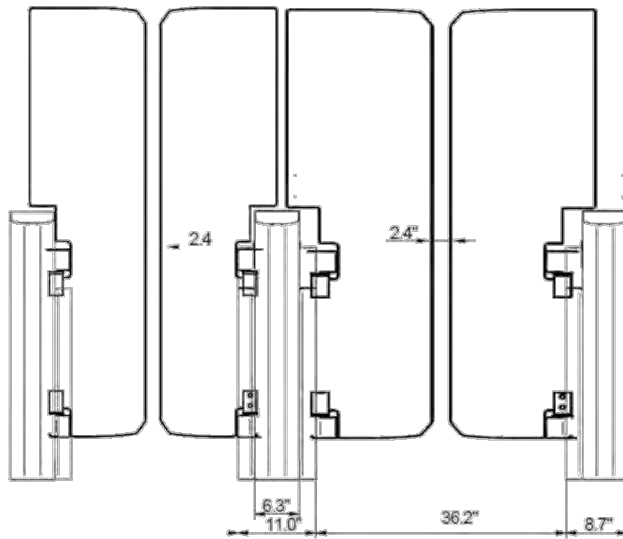
The barrier is designed to extend over the top horizontal surface of the faregate module, such that when the barrier is closed, it discourages a person from attempting to evade fare collection by climbing over the faregate module.

The faregate housing material will be made from type 304 stainless steel and can be (optionally) powder-coated in a range of colors to suit the end customer's desires. A rendering of the base (non-customized for DTPW) gate design is shown below, and overall approximate dimensions are shown on the following page.

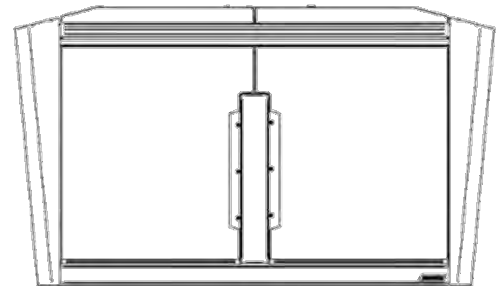


Figure 53. Faregate base rendering (Magnetic)

MRTW (2-line configuration) – front view



MRTW (2-line configuration) – side view



MRTW (2-line configuration) – top view

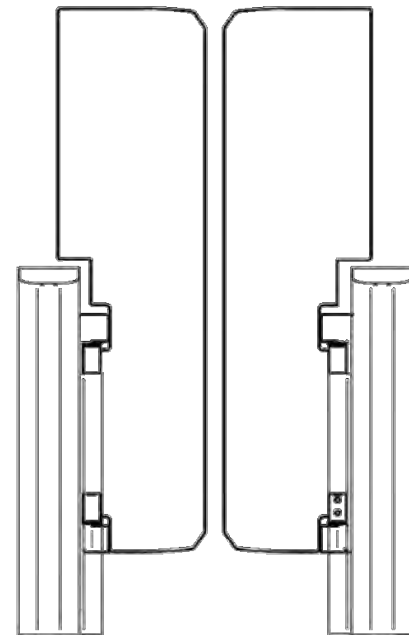
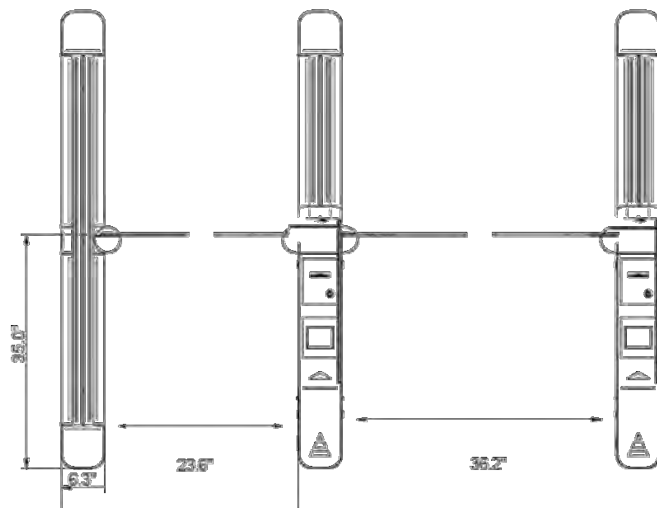


Figure 54. Faregate approximate dimensions (Magnetic)

The MHTM™ motor with sensor technique offers almost silent operation. The motor allows direct drive of the rotating center shaft without additional gearing.

The high-definition position resolvers allow for accurate and safe control of the doors' position and motion. It operates under constant power and, thus, prevents condensation and prolongs the life of the motor.

In concert with the universal MGCPlus controller, Magnetic can provide features that are especially useful and expedient for customers. Magnetic's MHTM™ motors have a rated life of well over ten million cycles of operation; they are utilized in vast border control and public transport projects around the world including, projects in Europe and EMEA regions.

3.7.1 Functional Modes

The faregate can operate in three functional modes:

- **Closed mode.** The faregate is normally in the closed position. When a valid type of fare payment is properly processed, a tone sounds, the barrier mechanism is released, and the barrier opens to permit the passenger to pass through the aisle. If the fare payment presented reads as invalid, then the barrier mechanism will not open, and a distinctive tone will sound.
- **Open mode.** The barriers are in the open position allowing the passenger to pass through the aisle quickly. When a valid fare payment is properly processed by the validator, a tone will sound, and the barrier mechanism will remain in the open position. If the fare payment reads as invalid, or if a fare payment is not presented, then the barrier mechanism will close, and a distinctive tone will sound.
- **Exit mode.** The barriers are normally in the closed position. When a passenger approaches the faregate to exit, the barrier will open. An entry/exit faregate can be configured as an exit only faregate via Genfare Link or by the removal of internal control modules. The console will display the faregate status to the passenger.

The mode in which the faregates operate can be activated automatically, based on a specific time (e.g., rush hour), or manually from Genfare Link. Genfare Link maintains a record of the number of passengers entering and exiting for each mode described above for passenger count purposes.

3.7.2 Faregate Array for the South Dade Transitway

Faregates will have paddle type barriers and entry and exit controlled modes selected by DTPW. There will be three types of consoles that make up an array of two accessible faregates as follows:

- **Right end console.** One long paddle on the left side and validator for entry
- **Accessible console.** Two long paddles on either side and a validator for entry)
- **Left end console.** One long paddle on the right side and no validator

All faregates will be configured to process both contactless payments and barcoded media.

3.7.3 Accessible Faregate Console

Each station will have set of two faregate consoles with a wide path in each fare collection area to permit passengers with disabilities and others who cannot use the standard gate to gain access to or exit from the station. This accessible faregate console will also serve as a service gate, a backup to the regular gate array, and as an emergency gate when required. Genfare and Magnetic will provided fully dimensioned scale drawings of the accessible faregate during design review.

The accessible faregate console will be clearly differentiated through signage and paddle size from the standard gate console in addition to the following additional requirements.

- The contactless media target will be the same as the standard gate console to allow easy identification by passengers.
- The international symbol of accessibility (wheelchair symbol) sign will be affixed to both ends of the console.



- A remote unlatch command will be available from the MAS. A key operated unlatch will be available on the console for use by emergency personnel.
- All contactless media processing will be identical to the standard gate console.
- Fare media acceptance or denial will utilize clearly discernable audio beep or alarm and visible indication. Care will be given not to use alarm frequencies and volume that are likely to trigger disorientation in older people or people who experience epileptic seizures.
- The accessible faregate will sense the direction of travel through the gate and will sound an audible alarm if entry is attempted when the gate has been activated in the exit mode, or if more than two entries are detected in an entry mode (two entries will be allowed to permit a paid entry with a baby stroller). The alarm will be adjustable in duration between five and thirty seconds.
- The accessible faregate will sense an open gate condition and transmit a message when the gate opening has exceeded the allowable time. The allowable time will be adjustable in duration by software control, between 10 and 60 seconds. Once an open gate message has been transmitted, the accessible faregate will transmit a gate closed message upon closure of the gate.
- The sound level of alarms will be 80 dB minimum measured 10 feet from the barrier with adjustment possible from within the console or through software control. An externally accessible key switch will be provided to deactivate the alarm.
- The accessible faregate will only function in closed mode for entrance and open mode for exit.

3.7.4 End Gate Console

An end console will be installed to provide a clearly defined end to the faregate array. The end console will have only the light graphics and barriers required to complete the last aisle in a faregate array. The end console will have the same faregate cabinet as the other faregate console.

3.7.5 Faregate Barrier

The faregates will have a paddle or panel type barrier system that is perpendicular to the aisle when closed. The barrier system is activated by the faregate console, which regulates passage in one direction and will have the following characteristics:

- **Gate barrier.** The gate barrier has a smooth surface on both sides. Paddles or panels are of sufficient height and width to provide the necessary access and egress control between the paid and free areas. The final design of the barrier system will be presented for approval during design review.
- **Clearance.** The gap between the paddles when closed at the centerline of the aisle does not exceed three inches. In the proposed faregates, the unobstructed entry aisle is 23.6 inches wide for the freestanding faregate and end console and 36.2 inches wide for the accessible faregate console.
- **Response time.** The total time for the processing of contactless or barcoded fare media, from presentation to the target to release of the barrier mechanism does not exceed 0.30 seconds.
- **Loss of power.** Upon loss of power, the gate switches to an emergency power backup, processes the last transaction, and initiates an orderly shutdown. Entry and exit through the faregate will be possible without restriction. Data stored at the faregate is stored in non-volatile memory and is not lost even with total loss of power to the faregate.

- **Restoration of power.** Upon restoration of power, the entry gate will return to its normal operating state within four (4) minutes.
- **Accessibility.** The faregates meet all federal ADA requirements and the overall height of the faregates does not exceed 50 inches, including all displays. Any additional State of Florida and Federal ADA requirements concerning accessible faregates in effect at the time of award of the contract will be met.
- **Emergency gate release.** All faregates incorporate an interface appropriate for connection to the station fire control system to provide for unattended emergency gate release.

3.7.6 Smart Card Target Accessibility

All consoles will contain a contactless smart card target on the top, front, or side of the console clearly identified with appropriate graphics, accessible by persons with disabilities, and fully compliant with the ADA.

3.7.7 Contactless Media Processing

When a passenger places a form of contactless fare media near the target, the logic in Genfare Link will determine if the fare media is valid (i.e., sufficient remaining value, valid period of validity, valid transfer privilege, etc.).

If the fare media is determined to be valid, the console will permit one entry and display "Enter" and the remaining value on the smart card. An audible beep will accompany the "Enter" display. Distinctive audible beeps will be used for other fare media classes, such as reduced and free fare or elderly.

3.7.8 Sensors

The faregate has sensors that detect the passage of a passenger in either direction between the paid and unpaid areas. This passage triggers a message to be sent to Genfare Link indicating one entrance or exit transaction, along with a faregate ID, date, and time stamp. Genfare Link will maintain a record file per gate per date of all passengers entering and exiting the station.

Sensors also detect attempted unauthorized passage between the unpaid and paid areas and cause the barrier to remain locked. Such unauthorized attempted passages trigger a message to be sent to the MAS indicating one unauthorized entrance or exit attempt and can be programmed to sound an alarm at the faregate. The volume of the alarm can be adjustable either at the gate or through Genfare Link.

The faregate also has sensors to detect when an object is stuck between the two paddles during the closing cycle. When an object is sensed, the paddles immediately return to the open position until the passenger is sensed as passing through the aisle in either direction. When this occurs, a message with details of the transaction, together with the direction of passenger travel will be stored. Diagrams identifying the location and operation of all passenger sensor will be provided during design review.

3.7.9 Graphics and Displays

All graphics on the proposed faregate conform to ADA requirements. The faregate's display is easily read in open sunlight. Genfare and Magnetic will demonstrate the display during design review. The faregate can be to be remotely updated and programmable via Genfare Link to display various greetings and messages. When a new display configuration is transmitted from MAS, a log at the MAS and at the local device will show the message was received and implemented. Displays are latent and become visible only upon electrical illumination for:

- **International symbol for entry prohibited.** A red “X” facing each end to alert the passenger not to use that aisle.
- **International symbol for entry.** A green display including an arrow pointing in the direction of the aisle to use to enter or exit the system.
- **Redcue fare indicator.** Lights to provide a visual signal that a reduced fare instrument is being used.

A label of the international symbol for “Accessible” will be placed on the appropriate faregates.

The display on the top of the faregate can display a minimum of two rows of 20 alphanumeric characters, 0.37-inch high (minimum), total. This display will be the same as the display on the proposed Fast Fare 25 farebox; it can be programmable locally or via Genfare Link to display various greetings and messages. Preprogrammed messages, limited to 20 characters per line will include but not be limited to:

- **Welcome:** A message greeting the passenger when contactless fare payment reader and barcode reader are ready for use.
- **Please Add Value:** A flashing message that is lit when the value of the smart card is insufficient for fare payment. The message will also present the amount that needs to be added so the value is sufficient for a full fare. It remains on for a configurable period, initially set to five seconds.
- **Call for Assistance:** A flashing message presented whenever the acceptable media cannot be processed in the normal manner, contactless or barcode.
- **Out of Service:** A message presented whenever the contactless fare payment reader and/or barcode reader is inoperative, preventing use of the faregate.
- **Acceptable media validated. Thank you for riding _____.** A message presented after an acceptable media has been verified as valid. This display will also show "Amount Remaining \$XXX.XX" for stored value cards, where \$XXX.XX is the value remaining on the account in Genfare Link linked to the passenger's card at the conclusion of the transaction. When rolling period passes are used, the faregate display indicates the expiration of the pass by displaying "Valid Through MM/DD/YY."
- **Smart Card Already Validated.** A message to indicate that a time-based pass has already been used at the current station within the passback period. This message will remain on for a time configured by DTPW.
- **Acceptable Media No longer Valid:** A flashing message that is illuminated when the contactless media or barcode presented has expired, has insufficient value for the fare selected, or is otherwise no longer valid. It remains on for a configurable period, initially set to five seconds.
- **Current Value** or **Current Validity Period.** Appropriate messages, selectable and programmable by DTPW, to display the status of account status linked to the smart card.
- **Exit Only.** A message that is displayed when the faregate is locked in the exit direction and does not permit entry. All faregates can be set to this condition.

The faregate includes space for a display card on each of its ends, facing passengers as they enter and exit the station paid area. Other messages shall be provided as needed to furnish the passengers with

proper instructions for the operation of the faregate. The wording of messages to be displayed to the passenger will be defined at the conceptual design review and finalized at the final design review.

3.7.10 Microprocessor Assembly

The microprocessor assembly in the gate console controls and monitors all functions of the faregate. All gate consoles have an identical and interchangeable microprocessor assembly. Each faregate is a stand-alone system and all faregates communicate in real time with Genfare Link.

The failure of any microprocessor assembly in an array will only affect one aisle. All microprocessors used are of the latest service proven commercial grade production releases of Intel® or Intel-compatible chips or equivalent.

Communication between the faregate and Genfare Link is an integral, but not necessary part of the microprocessor operation. Bidirectional data transfer allows for the uploading of entry data, exit data, and faregate status messages, and downloading of control information. However, the faregate maintains normal operation even in the event of loss of communication with Genfare Link.

3.7.11 System Clock

Each faregate has an internally maintained time and date clock that is synchronized via Genfare Link with a NIST type source and provides the following time and date information:

- **Time tagging of all messages and alerts.** To be included with all data transmitted to Genfare Link.
- **Time and date stamping of transactions.** The date and time of use of contactless or barcoded fare media will be stored on the account linked to the media in Genfare Link.
- **Peak/off peak fare.** The clock automatically controls the time periods selected for these categories of fares, if implemented as well for the validity transfer period selected.
- **Validity checking for time-based passes.** Including day, month, year, and day of the week.

3.7.12 Downloading

Data transfer from the fare Collection application and Genfare Link to each faregate will be used for the following purposes:

- Synchronize/set the clocks
- Provide new fare tables
- Execute commands and update software.
- Apply changes to system variables
- Purge all transmitted transactions after data is transferred to Genfare Link
- Identify equipment addresses for physical and logical location

In the event of loss of communication between Genfare Link and the fare collection application, data transfer of all transaction data can be done locally for an individual faregate console with the use of a portable programming device or a PC-compatible handheld or notebook type computer.

3.7.13 Fare Collection Application Data Transmission

Each transaction record transferred from the faregate to Genfare Link will include the following:

Upon valid payment method. Upon valid entries, the following information is stored:

1. Transaction number
2. Faregate ID (with station identifier)

3. Entry time and date
4. Smart card serial number or barcode number and credit card transaction identifier needed to track the transaction in the fare collection application in full compliance with PCI DSS (if open payment acceptance is implemented)
5. Smart card issuing equipment ID
6. Agency code
7. Complete cEMV data from valid contactless payment via credit/debit card and all applicable forms of mobile wallet applications in strict compliance of PCI DSS (if open payment acceptance is implemented)

Upon attempted invalid payment method. For unauthorized or invalid entries, the following is stored:

1. Transaction number
2. Faregate ID (with station identifier)
3. Attempted entry time and date
4. Attempted type of payment media used

Upon change in system status. When the status of the faregate changes, the transaction number, date, time, faregate number, and failure/event code is stored locally and transmitted to Genfare Link. Faregate status events include the following:

1. Intrusion alarm conditions
2. Maintainer identification
3. Maintenance mode
4. Out of service
5. In service
6. Power restored
7. Gate open
8. Gate closed
9. Data verification error
10. Contactless media misread
11. Contactless media cannot be read
12. Invalid fare type

As requested by Genfare Link: Faregates will identify:

1. Faregate ID
2. All transactions since last data transfer to Genfare Link
3. Status of each subsystem
4. Passenger counts (by direction, exit and entrance)
5. Out of service
6. In service
7. Maintenance mode
8. A list of all faregate variables, software version number and required checksums

3.7.14 Data Storage

The gate will transmit all maintenance-related data to Genfare Link and store it until instructed to purge it by Genfare Link. In the event communications cannot be established with Genfare Link or a purge command is not received, data shall be stored locally, with storage for a minimum of two days' worth of transactions provided in the faregate. In the event data storage requirements are exceeded, the faregate will take itself out of service.

The faregate will store data in two physically separate locations within each faregate to protect against data loss and corruption. One complete set of data is transferred to Genfare Link together with the checksum of the second set of data. Checksum errors will be identified, and an alarm message will be reported to Genfare Link together with both sets of data,

All data related to passenger transactions will be identified with the device and station at which the data was generated.

3.7.15 Invalid Smart Card List – Passenger Flow

The faregates can achieve the required passenger flow rate defined below regardless of any invalid smart cards or credit cards used randomly during a high passenger flow operation, provided the gate is in open mode.

3.7.16 Passback Control

Each faregate will monitor all transactions to prevent reuse of acceptable media within a predetermined time limit, subject to approval. The time limit for the passback control is configurable for each array, between the limits of zero and 60 minutes. The control of passback is based on all entries and requires continuous updating of information from all faregates at a given location. Maintenance of the passback list is done locally for each array.

3.7.17 Passenger Flow Rate

The faregate processes contactless and barcode fare media at a minimum rate of 40 passengers per minute provided the gate is in open mode.

3.7.18 Test Mode

Each faregate console is equipped with a test mode switch that allows maintenance personnel to test all electrical and mechanical functions of the faregate. While the faregate is in test mode, it will only accept test mode fare media. When test fare media is processed, all functions are performed for the test media except that the transaction is not included in revenue summaries and entry is not provided to the paid area. Test transaction can be reported on separately in Genfare Link.

Test fare media are invalid when the faregate is in normal operating mode and will not permit entry to the paid area. If any gate is left in test mode longer than the maximum time, defined by a configurable parameter in Genfare Link, an alarm condition is generated.

3.7.19 Maintenance Display / Keypad

The faregate is equipped with a display and touch screen keypad to enable troubleshooting of the console by maintenance personnel. The display and keypad have the capability to access software statements to perform such tasks as exercising the logic networks and mechanical modules. Safeguards ensure that changes to the software cannot be made unless a secure and pre-approved procedure is followed.

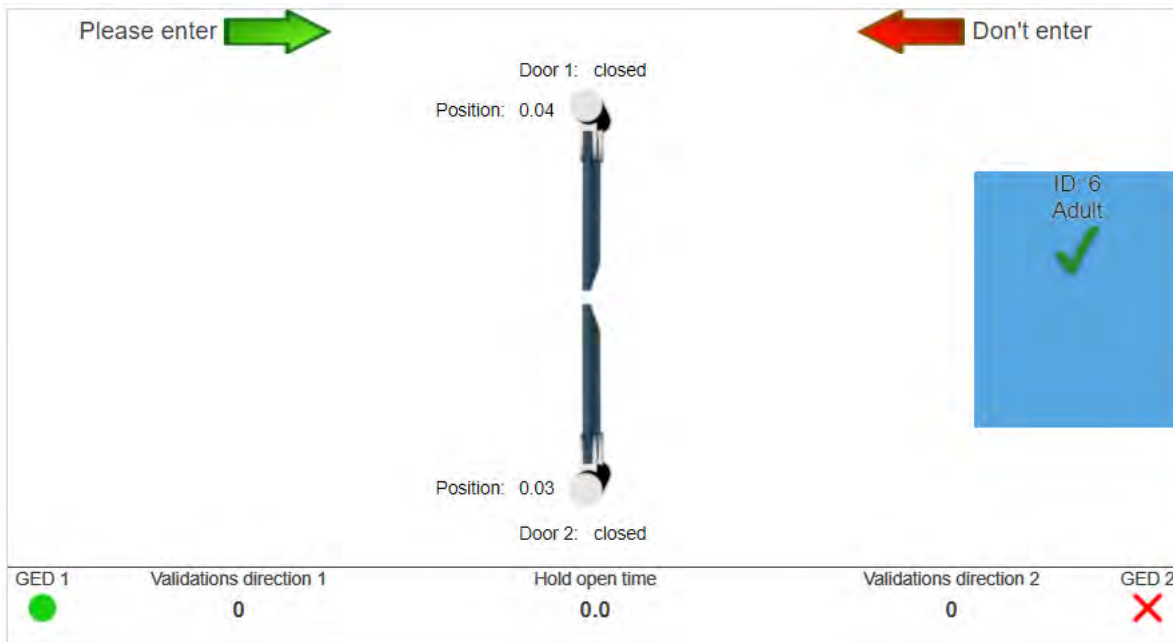


Figure 55. Screenshot of gate maintenance display

Failure codes, which diagnose problems to a subassembly level, are displayed on the touch screen. Diagnostics of the microprocessor logic and memory storage are continuous and automatic. Diagnostics are also possible through the keypad. Should additional testing be required, a PC-compatible computer can be connected to the faregate via an ethernet connection to generate local printouts of statistical data or other stored data, and for downloading locally when necessary. The PC connection can also be done wirelessly; if DTPW desires to use this feature, Genfare will work with DTPW IT staff to ensure the wireless connection is secured to prevent unauthorized access.

3.7.20 Maintenance Test Smart Cards

Faregates will recognize and process maintenance test smart cards as well as the fare types. Maintenance test smart cards can be used to test all faregate smart card functions and transactions are recorded as "non- revenue" when the faregate is place in maintenance test mode.

3.7.21 Power Switch

Each console has a single-pole, single-throw power switch incorporated within its housing that is used to power down and power up the faregate.

3.7.22 Ventilation

The faregate consoles are designed to provide adequate air circulation and ventilation.

3.7.23 Cabinet Design and Construction



Figure 56. Magnetic faregates in Malaysia

The faregate cabinets are made from type 304 stainless steel and can be (optionally) powder-coated in a range of colors to suit the end customer's desires. All exterior panels and interior components are installed inside or attached to the cabinet. Frames, panels, and doors are constructed with appropriate tooling that allows for complete interchangeability of all like panels, covers and doors with consistent fits. All faregate cabinets have identical exterior dimensions and identical appearance except for the provision of cutouts, displays and other features required on some configurations and not on others.

Paddle or panel barriers are made from vandal-resistant, revenue service-proven materials and can withstand forces equivalent to a 200 lb. passenger moving at 3 mph and striking the barrier at the junction of the two paddles. A 200 lb. downward force will cause no damage to the barrier or its mechanisms.

Faregates can be installed adjacent to a wall and still provide for maintenance access. Servicing or maintenance access and activity does not require the closing of any adjacent faregate aisle. Genfare and Magnetic will provide dimensioned drawings of the faregates showing each side and with the doors and covers both opened and closed during design review.

Equipment cabinets, including the base, can withstand a concentrated load of 200 pounds applied to any one area of one square inch or a uniformly distributed load over an entire surface of 50 pounds per square foot without causing damage or permanent deformation.

3.7.24 Location of Assemblies

To simplify maintenance, assemblies performing identical or similar functions are mounted in the same location within each faregate cabinet. Electrical, electronic, and mechanical components are packaged together in replaceable assemblies according to the function performed. Assemblies performing identical functions in each type of cabinet are interchangeable.

3.7.25 Access Doors and Covers

The faregate cabinet has hinged doors and covers providing direct access to the assemblies. Doors and covers are equipped with devices to hold them in the fully open position. Top covers will not interfere with an adjacent faregate aisle when fully opened. Hinges are concealed and do not protrude beyond the outer surface. The closing joint prevents unauthorized entry, as well as dirt, dust, and moisture from entering the cabinet.

3.7.26 Mounting and Cable between Consoles

The faregate base will be provided with four mounting holes for securing the cabinet to the floor. Magnetic will supply any specialized mounting devices.

3.7.27 Barcode Device

Every faregate at South Dade Transitway will be equipped with a barcode reader to validate and process barcoded fare media. Upon implementation of the fare collection application, Genfare will ensure that the faregate and other fare collection equipment interface properly and function as a cohesive system. The barcode reader will be capable of reading barcoded tickets purchased at the TVM as a stopgap for Phase 1.

If DTPW exercises the option outlined in [section 7.2](#), namely, to integrate the barcode reader with its existing fare collection system, Genfare will provide the required effort to support this integration for compensation as an optional item pursuant to the costs established in the contract.

3.8 Ticket Vending Machines

Genfare's latest generation ticket vending machine, Vendstar 5 is a full-service unit that will support transit agencies with the objective of servicing the riding public with account lookup, stored value, pass product, and fare media purchases.

The Vendstar 5 is suitable for installation in a self-service unattended vending environment, including indoor and outdoor locations, on or off agency property. The TVM utilizes an optional pedestal, which enables the use of existing bolt patterns, expediting the installation time and making future replacement simpler.

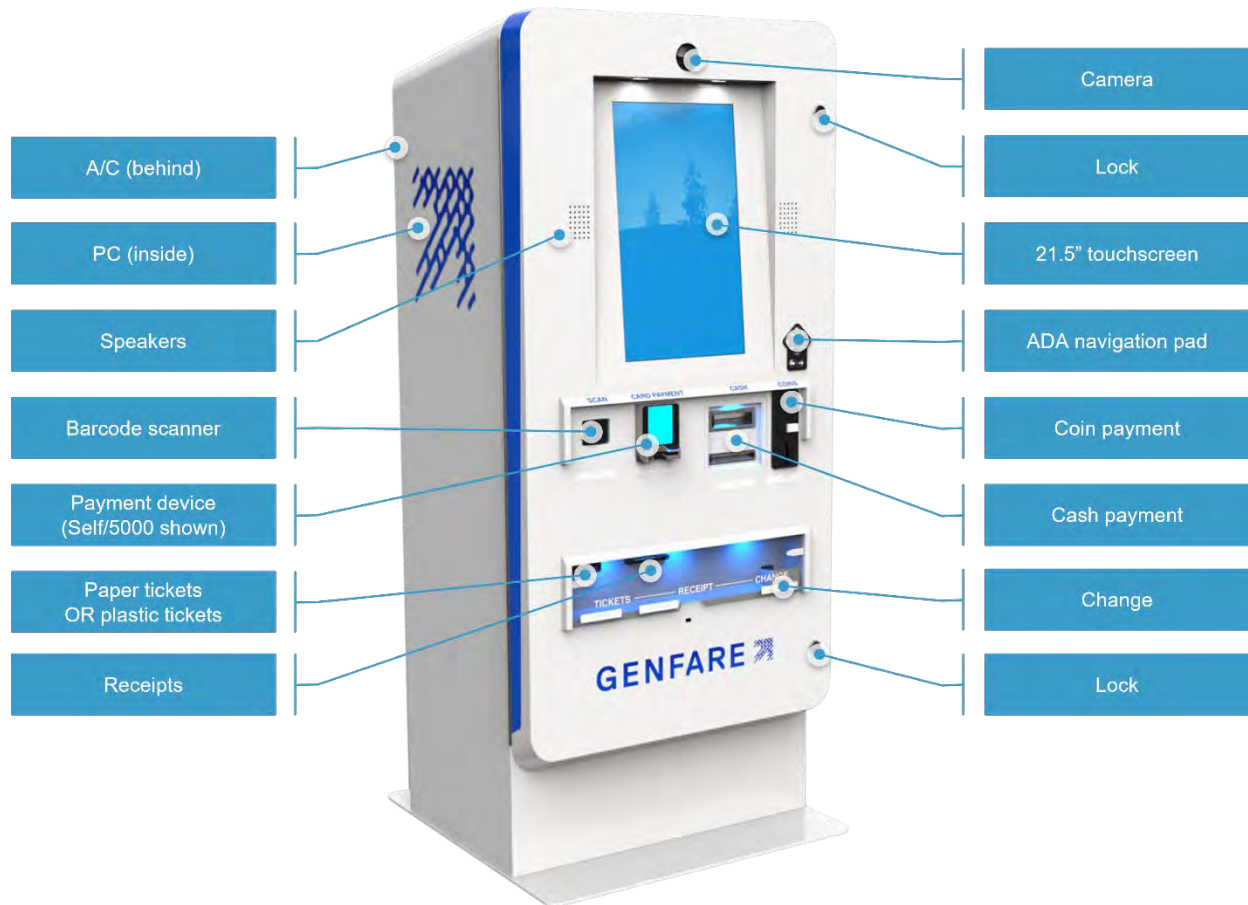


Figure 57. Genfare Vendstar 5 rendering

3.8.1 General Requirements for the TVMs

The Vendstar 5 is a full-service ticket vending machine that accepts valid United States currency in general circulation, valid cEMV credit and bank debit or ATM cards issued by certified financial institutions, and stored value smart cards using a menu-driven passenger interface to perform the following functions that reside in the passenger account established in Genfare Link:

- Sell and dispense a card to be linked to account in Genfare Link where stored value or time-based products purchased at the TVM will be recorded and available to be processed at faregates and on the farebox
- Provide change with the cash purchase of a smart card and fare products
- Display remaining value and/or rides and pass expiration information recorded in Genfare Link linked to previously issued smart cards
- Allow the purchase of multiple cards in one transaction with each card linked to a corresponding Genfare Link account with the subsequent purchase of a fare product per card

The Vendstar 5 is equipped with a printer that can issue passengers a printed receipt for a credit/debit card purchase, generate printed reports for maintenance technicians, and print barcoded tickets.

Reduced fares of all types are available for purchase at the TVM when a passenger uses a reduced fare permit card linked to a proper registered and certified “Reduced Account” in Genfare Link.

3.8.2 Payment Card Industry (PCI) Compliance

The Vendstar 5 complies with the Payment Card Industry (PCI) Security Standards in effect and throughout the term of the contract. If at any time any of the components of the Fare Collection Equipment, including but not limited to the hardware, software, or policies, become non-PCI compliant, Genfare will upgrade as necessary to maintain PCI compliance. In addition:

- Any communications into or out of DTPW’s network will be encrypted. All subsystems can log information into a central logging system for event audit and anomaly detection.
- During any installation or a major upgrade, Genfare will provide implementation manuals and detailed diagram(s) that show all cardholder data flows across DTPW’s systems and networks.
- Genfare will resubmit any passing, updated, completed, and signed PCI compliance documents annually to DTPW.
- Genfare will update any fare collection equipment as required to remain compliant with any changes to the PCI standards and requirements by the implementation dates mandated by the PCI Security Council and will correct any critical security vulnerabilities within 30 calendar days of identification.

3.8.3 Front Panel Assembly

The IP53-rated stainless steel cabinet enclosure is ruggedized to support a wide range of storage and operating temperatures and is FCC and UL 62368-1 certified. The enclosure includes a built in HVAC system to enable it to withstand the warm and humid climate in Miami.

The enclosure is designed for installation in an uncovered, non-climate-controlled environment and many of the components are flush with the Vendstar 5 enclosure to prevent vandalism. The steel in the Vendstar 5 is American steel with a transparent protective coating further improving its durability. DTPW could optionally have that coating be in a color that better reflects the vibrancy of Miami. The door of the enclosure includes a locking mechanism to ensure that the door remains fixed in place

when opened for revenue or maintenance servicing to prevent accidents related to wind or unintentional closing of the main door.

The enclosure is designed to withstand harsh environments to minimize maintenance costs and downtime. It can handle direct sunlight, variation in humidity and temperature, elevation, vibration, and ingress protection against water and particulate matter.

The enclosure is equipped with a highly visible beacon and an alarm system for security to serve as a deterrent to vandalism and theft.

The Vendstar 5 offers an easy-to-understand and operate passenger interface. Key elements include:

- A 21.5" touchscreen display for ease-of-use and guided purchases
- Six (6) function AudioNav keypad buttons under the main passenger display to help users with impaired vision, reading difficulties, or impaired fine motor skills easily navigate through the various functions, along with customizable 21.5" touchscreen keys created in the user interface display.
- Coin entry slot
- Separate bill insertion and bill return slots
- All in one contact and contactless bank card reader and PIN on glass keypad with ability to also complete smart card transactions.
- Extended use smart card dispenser
- Barcode and QR code scanner
- Receipt and barcoded ticket printer
- Dispensing tray for tickets, receipts, and change in an enclosed environment for security



Figure 58. Vendstar 5 TVM front and side view with color customization

3.8.4 Message Display Unit

The message display unit (MDU) on the Vendstar 5 is an enhanced 21.5" diagonal screen with 1,600 nit brightness, wide temperature, and a projected capacitive (PCAP) touchscreen display. The 1920x1080 pixel display is highly visible in ambient light, including direct sunlight. The display also has an auto-brightness sensor to adjust to varying lighting conditions throughout the day or night.

The MDU is designed with durability in mind and has been used in marine, military, medical transportation, and industrial applications. The display is fully ADA (Americans with Disabilities Act) compliant in terms of its ability to display appropriately sized fonts and touch screen sensitivity to support gloves and prosthetics.

The Vendstar 5 passenger interface guides the customer through each step of the fare purchase process and, upon its conclusion, confirms that the transaction has been successful. If the transaction is not successful or a problem arises, such as a card misread, the passenger interface provides the customer with appropriate instructions or other messages.

The Vendstar 5 passenger interface is logically laid-out and easy-to-understand with screen graphics, audio instructions, and easy-to-upgrade external graphics and artwork. To meet ADA compliance, all controls are wheelchair-accessible via side reach; and all labels are provided with raised letters and Braille equivalents.

3.8.5 Out of Service Message

The Vendstar 5 will display an "out of service" message on the MDU either by command from the MAS or under abnormal conditions such as:

- All three of the operating modes (cash, smart card, and credit/debit card) fail
- Security has been breached

3.8.6 Cancellation and Reversal of Transaction

The Vendstar 5 offers two methods of cancellation as required, along with reversal of transaction capabilities.

Manual cancellation

A "CANCEL" button is provided on the touchscreen, which allows the passenger to cancel a transaction at any time prior to:

- Inserting the full amount due
- The commencement of the ticket being printed and issued, for a cash or smart card transaction
- Bank authorization request and/or processing in the case of a credit/debit card transaction

Upon cancellation, "Transaction Canceled" will be displayed and inserted coins and bills will be returned within five seconds (including up to 20 coins and all inserted bills), after which time the display reverts to idle screen.

Automatic cancellation

Automatic cancellation occurs under the following conditions:

- Passenger exceeded the preset time limitation between actions
- Maximum coin and/or bill escrow capacity has been exceeded
- Passenger has exceeded the pre-set number of attempts to enter the correct PIN number

- Smart card cannot be dispensed after insertion of monies
- Smart card cannot be read during a smart card transaction

The message display unit displays "Transaction Canceled" along with a message that indicates the reason for the cancellation. All coins and bills inserted by the passenger are returned within five seconds (including up to 20 coins and all inserted bills).

Reversal of transaction

If the Vendstar 5 cannot dispense a smart card for an approved credit or debit transaction, the transaction is automatically reversed. When a transaction reversal occurs, details of the transaction are stored and recorded in Genfare Link. A printed receipt is issued to the passenger to show the account and reversed activity. An abbreviated account number conforming to federal regulation requirements is printed on the receipt.

3.8.7 Access Lock

The Vendstar 5 employs an electronic lock, which is sealed against the elements to prevent possible moisture related failures. The lock includes a lockout penalty after repeated incorrect passwords to deter unauthorized access. The locking mechanism includes logic to automatically relock itself to prevent the Vendstar 5 from unintentionally being left in an unlocked position.

The Vendstar 5 also leverages a multipoint latching method further protecting the internal contents from external attempts to break into the machine. In addition, the Vendstar 5 employs multiple security features, such as a networked customer-facing camera with local storage capabilities to support the monitoring of the device including revenue service operations as well as an intrusion alarm to alert the agency when unauthorized access is achieved. (See also [section 3.10.](#))

3.8.8 Placard Frame

In lieu of a physical placard frame, Genfare proposes using the large message display unit to display instructions, messages, or other information to passengers. The messages can be configured in Genfare Link and can be displayed based on the mode of the Vendstar 5.

3.8.9 Operating Modes

The Vendstar 5 will have three basic modes of operation:

- Nomal mode
- Limited operation mode
- Test mode

3.8.9.1 Normal Mode

There are three primary normal operating modes. The Vendstar 5 automatically operates in the appropriate mode based on the passenger's actions and prohibits the other modes.

- **Cash transaction.** This mode is activated when a passenger elects to pay for a fare purchase with cash. The passenger selects the desired fare type (e.g., single ride, stored value, 1-day pass, 3-day pass, 10-ride pass, etc.) and passenger category, then selects cash as method of payment. The Vendstar 5 prompts the passenger to insert the required cash, displays the full amount due, and decreases the amount as cash is inserted and verified. Once the passenger has inserted cash, the Vendstar 5 will inhibit the use of credit/debit cards for that transaction. Appropriate text is displayed on the MDU throughout the transaction. When the fare media is vended, a transaction record is stored in Genfare with details of the purchase, including the

serial number of the smart card issued if appropriate. The Vendstar 5 will print a receipt if requested by the passenger.

- **Card transaction.** This mode is activated when a passenger selects to pay for a fare purchase with a credit or debit card. The passenger selects a fare type (e.g., single ride, stored value, 1-day pass, 3-day pass, 10-ride pass, etc.) and passenger category, then selects credit or debit card as method of payment. The Vendstar 5 prompts the passenger to insert or tap the credit or debit card. Once the passenger has inserted or tapped a credit or debit card, the Vendstar 5 will inhibit the use of cash for that transaction.. A menu-driven display appears to guide the passenger to complete the smart card purchase transaction.
- **Replenishment transaction.** To add value to a smart card using either cash or a credit/debit card, the passenger selects the replenishment function and places the smart card near the target on the Vendstar 5. An audible tone sounds, and a message is displayed on the MDU to indicate that the smart card has been properly accessed. The passenger then selects the method of payment (cash or credit/debit card). All other payment methods are inhibited. After selecting the value to be added and completing cash payment or receiving credit/debit card authorization, the passenger's account in Genfare Link will be replenished. An audible tone sounds, and a message is displayed on the MDU to indicate the value has been updated and the passenger's account in Genfare Link has been credited with the product purchase via an interface/integration. A receipt is be issued for smart card replenishments when requested.

3.8.9.2 Limited Operation Mode

Whenever possible, the Vendstar 5 will remain in service even if multiple failures occur; for example, it is possible for the TVM to simultaneously be in both "No Coins Accepted" mode and "Exact Fare Only" mode. The Vendstar 5 automatically goes out of service only when:

- A component necessary to support all operations fails, such as the electronic control unit, power supply, passenger keyboard, etc.
- All payment accepting modules fail (coin acceptor, bill acceptor, bank card reader, smart card module)
- The smart card read (SCR) module fails
- Other operational conditions as defined in the technical specifications occur

3.8.9.3 Test Mode

The Vendstar 5 enters test mode upon the activation of an internal test mode switch when a selection is made on the MDU by a service technician. All fare types sold from the TVM are available for purchase in this mode.

The Vendstar 5 will function as it normally would except that all money inserted is returned. A credit/debit card purchase during this mode bypasses the bank certification check and authorization. For each smart card issued in the test mode, a transaction record is generated, stored, and transmitted to Genfare Link, clearly identified as "TEST." Change is not made.

When the TVM is in the test mode, the message display unit displays an out of service message also indicating that the TVM is in the test mode. After an DTPW configurable period of inactivity while the TVM is in the test mode, an alarm message is transmitted to Genfare Link.

3.8.10 Electronic Control Unit

The electronic control unit (ECU) of the Vendstar 5 controls all operating functions of the TVM, including the performance and timing of all the assemblies, sub-assemblies, modules, displays, and all communications with the MAS. The ECU is based on an embedded microprocessor or a similar processor approved by DTPW/ITD. The ECU will run an up-to-date version of its operating system and have sufficient RAM to avoid using virtual memory to temporarily supplement RAM during normal TVM activities. The ECU supports plug-in upgradeability to double the amount of memory initially supplied.

The ECU's hard drive (i.e., non-volatile memory) stores the primary copy of dynamic data registers, status flags, fare tables, event records, etc. Its capacity exceeds current storage needs by at least 200% and is field replaceable.

Detailed information on the ECU and its associated modules, including operation, dimensioned drawings, and exploded drawings, will be provided during design review.

3.8.11 TVM Data

The Vendstar 5 will compile the required alarm/event data, revenue service data, smart card sales information, and maintenance information detailed in section 5.2.11 of the Technical Specifications.

Transaction data will be transmitted to Genfare Link and then on to the fare collection application via an interface/integration on a complete transaction basis. Information required for credit/debit card verification will be transmitted on a real-time basis. All transactions will include a transaction number that will be sequential for each individual TVM. By leveraging Genfare Link reporting, DTPW will be able to produce customized reports without assistance from Genfare.

The status of the components within the Vendstar 5 will be transmitted to Genfare Link (serving as the MAS as described in [section 3.3](#)). This information will also be available through the TVM local maintenance service terminal and as a report printed at the TVM.

All out of service and degraded operating conditions at the TVM will be reported immediately to Genfare Link.

Failure information for specific devices is communicated to Genfare Link. For failures, Genfare Link tracks maintenance activities and can schedule and track preventive maintenance activities. Genfare Link has the capability of sending an email or text to a designated number or IP address indicating the out of service information.

Full and detailed information on the transactional information stored by the Vendstar 5 will be provided as an entity relationship diagram/data dictionary during design reviews.

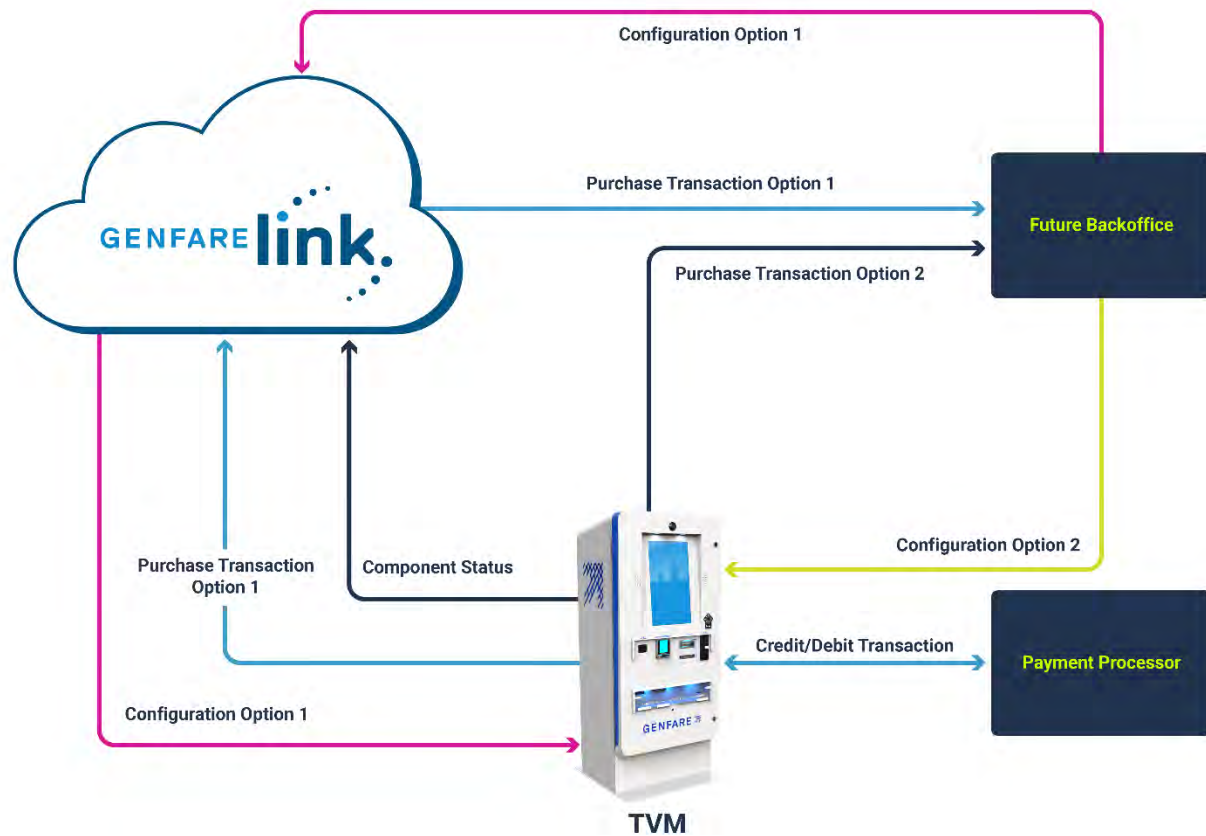


Figure 59. Ticket vending machine data flow

3.8.12 Data Storage & Transmission

The Vendstar 5 is equipped with sufficient data storage to store all required transaction and event data in non-volatile memory or storage devices for at least 30 calendar days. Genfare Link will ensure that the data redundancy requirements are always met for all data. This redundant data will be available for downloading at the TVM by DTPW staff and can be transmitted to Genfare Link.

When the data storage level reaches an agency-defined level, the Vendstar 5 will send an alarm to Genfare Link. The Vendstar 5 will take itself out of service in the unlikely event that insufficient data storage is available to store additional transaction information. An alarm message will be generated and forwarded to Genfare Link when this automatic shutdown occurs.

All data related to passenger transactions will be identified with the date, time, device, and station where the data was generated.

The Vendstar 5 has a variety of ways in which it can communicate with Genfare Link and then onto the SI system through APIs. The Vendstar 5 is equipped with a cellular modem internal to the device, can utilize a CAT 5/6 cable run directly to DTPW's network, or can leverage fiber optic cabling for communications.

All transactions and events are sent back to Genfare Link for processing and reporting. The bank card processing unit uses an independent communication path so all PCI and PII information can be sent using a dedicated path isolated from the rest of the TVM's processes.

If data transmission is not successfully completed, the Vendstar 5 will periodically attempt to re-transmit data, continuing until the transmission is acknowledged by Genfare Link. No data shall be removed from memory until receipt of transmission and redundant storage of information has been confirmed. TVM maintenance data will be sent to Genfare Link and will remain resident on the TVM until the maintenance issues have been resolved.

3.8.13 Service Keyboard

The Vendstar 5 is equipped with a standard size internally located alphanumeric keyboard to allow technicians to input data, initiate commands, follow menu driven instructions or equivalent aids, request data, and initiate repair routines.

3.8.14 TVM Timers

The Vendstar 5 has an agency-settable timers to control the permitted intervals between steps in a transaction, communication responses, or activities. Time limits are adjustable in Genfare Link for each TVM. Passenger actions with configurable time limits include the amount of time to complete the insertion of bills and/or coins. Timers reset to zero when a subsequent action is taken by the passenger within the allotted time interval. If the timer elapses, the transaction is automatically canceled.

3.8.15 Coin Handling Assembly

The coin handling assembly in the Vendstar 5 consists of a coin slot, coin acceptor, a combination coin vault and recycler, and a coin return cup.

Whenever the coin acceptor or coin vault/recycler is removed, a revenue service audit report is generated in both electronic and printed form. Sensors detect and report the occurrence of jams. The electronic version of the audit report is immediately transferred to Genfare Link. It is not possible to fish coins from the coin vault or from the interior of the TVM.

The coin handling assembly:

- Limits the value of the change dispensed to the value of the money received and up to the maximum levels imposed for change giving
- Accurately dispenses the required number of coins for change, with 99.9% accuracy
- Dispenses coins at an industry-leading 12 coins per second
- Denies access to any of the coin storage locations without the use of the revenue key
- Provides accumulated readings of the coins dispensed and readings since the last coin vault removal by quantity and dollar value of each denomination
- Provides the current number and value of coins in the vault/recycler unit

Full and detailed information on the coin acceptance system and associated modules, including operation, dimensioned drawings, and exploded drawings, will be provided during design review.

3.8.15.1 Coin Slot

The shape of the coin slot and bezel on the Vendstar 5 minimizes accidental deflections of the coins and is accessible to and usable by persons with disabilities. Graphic representations of the coins accepted is shown adjacent to the coin slot and meets ADA requirements.

The coin slot permits 5-cent, 10-cent, 25-cent, \$1 (SBA and Sacagawea) coin denominations to pass without restriction directly into the coin acceptor assembly by the force of gravity. The bezel is precisely aligned to the coin acceptor to prevent diversion of the coin. There are no transports, conveyors, or other mechanisms employed to move the coin from the coin slot to the input of the coin acceptor assembly.

A mechanical shutter closes the slot between transactions and opens it automatically upon selection of a fare type and method of payment. The slot is sized to physically block the insertion of a 50-cent coin at its minimum diameter and the simultaneous insertion of two dimes, each at their minimum thickness.

3.8.15.2 Coin Acceptor

The Vendstar 5 comes with an industry-leading coin acceptor capable of reading 1¢, 5¢, 10¢, 25¢, and \$1 coins. Coins detected as invalid, such as tokens, slugs, washers, counterfeit coins, and foreign coins, are returned directly to the coin return cup located below the coin slot.

The coin acceptor is electronic and is service proven in a transit environment. Each coin is checked for metal content to be within the coin standards set by the U.S. Mint for coins in general circulation. Reprogramming for future coin types will be provided by Genfare.

3.8.15.3 Coin Escrow

The Vendstar 5 tracks the coins inserted by the passenger and returns the appropriate coins if the transaction is cancelled. The passenger will receive the same mix and quantity of coins deposited, up to 20 coins, but not the exact coins inserted.

3.8.15.4 Change Making / Coin Recycling / Coin Vault

The Vendstar 5 is equipped with a single coin recycler / coin vault component that provides for the reuse of four types of deposited coins: nickels, dimes, quarters, and dollars.

Accepted coins are deposited into a smart hopper, which consists of hoppers for dispensing coins and a coin re-circulator integrated into the same device. The smart hopper utilizes a multi-coin hopper, allowing one device to dispense a variety of coins as change for riders. This allows a larger denomination to be issued as change, reducing the required frequency of revenue servicing.

The combination coin vault and recycler can process an industry-leading 12 coins per second, enabling faster dispensing of change to riders and reducing the time required to accept coins as a payment method. By having the integrated coin vault and recycler built into a single unit, DTPW staff have fewer components to maintain. The unit takes up less space inside the TVM, allowing the machine to have an overall smaller footprint and providing greater flexibility in installation locations.

3.8.15.5 Coin Return Cup

Coins detected as invalid, such as tokens, slugs, washers, counterfeit coins, and foreign coins, are returned to the passenger in the coin return cup right below the coin slot.

The coin return cup is constructed of stainless steel and shaped to enable quick and easy removal of returned coins without creating a pinching hazard. An inward swinging transparent polycarbonate plastic cover, 1/8-inch-thick minimum, is used to prevent coins from jumping out of the cup and to enable the passenger to see into the cup. The cover also prevents access to internal components via the return cup. Whenever any coin is returned, the cup is illuminated for approximately five seconds.

3.8.16 Bill Handling Unit

The Vendstar 5 bill handling unit is modular in design, keeping related components independently locked. The bill handling unit can be configured with one or two bill recycling cassettes. With one cassette, the cashbox capacity is six hundred bills, with two, the capacity is increased to 1,400 bills. It is equipped with a highly reliable anti-jam mechanism to reduce service calls and lower the total cost of ownership.

The bill acceptance slot will be in an ADA compliant zone on the ticket vending machine and includes anti-card insertion devices to deter non-currency materials from jamming the bill validator. The unit accepts and validates \$1, \$2, \$5, \$10, \$20, and/or \$50 bills. Bill escrow unit accepts up to fifteen bills for return if transaction is cancelled.

The recycling drums can hold up to sixty bills to distribute as change prior to being deposited into the cashbox. Four denominations can be selected and configured at one time. The bill recyclers enable multiple denominations on various drums, enabling the bill handling unit to give change to riders in multiple denominations as well further reducing revenue trips needed to replenish the ticket vending machine.

3.8.17 Credit/Debit Card Assembly

The Vendstar 5 is equipped with a single reader to process both credit/debit cards and contactless smart cards. It allows riders to use the following type of payment cards to purchase tickets or fare cards, or to reload a smart card:

- Magnetic stripe credit or debit cards
- Contact EMV cards (with a chip) for insertion into the device
- Contactless EMV cards
- Mobile payment platforms including Apple Pay, Google Pay, and Samsung Pay

The bank card module is provided with a PIN pad enabling its use with bank cards that require either debit PIN or zip code verification. The number 5 on the pin pad is raised and includes braille, allowing riders to easily locate the correct layout to enter their bank card credentials.

The bank card module is PCI-PTS 5.1 certified and sends transactions through the network independent of the main ticket vending machine computer, ensuring that all PCI and PII relevant information is isolated from the rest of the machine. This enables the Vendstar 5 to receive future software and feature improvements without affecting the PCI certification of the device.

The Genfare solution has been certified as compliant with a leading provider of qualified security assessment (QSA) services for electronic payments. QSA/Coalfire conducts an annual audit of Genfare's payment processes to ensure continued rigorous adherence to PCI standards.

3.8.17.1 Card Reader

The card reader has the following characteristics as required:

- The card reader does not remove the card from the sight of the passenger
- The card reader reads and verifies information in tracks 1, 2, and 3 of cards encoded in accordance with current ABA and latest ISO/IEC standards. In the event a card cannot be read by the card reader, an “invalid” read message is immediately displayed to the passenger on the MDU and an event is recorded in the machine’s memory.
- The card reader contains a contact smart card reader chip with the ability to interface with a contact smart card based on ISO/IEC 7816 and latest cEMV standards, which will be maintained for the term of the contract.
- The card reader can process all types of contactless payment in full compliance with cEMV and PCI DSS standards for the term of the contract.

3.8.17.2 Card Transaction Keypad / Touchscreen

The keypad operates interactively with the Vendstar 5 and supplies transaction data to the TVM as an interface for the passenger. The passenger uses the touchscreen keypad to enter the required personal identification number (PIN) when completing a debit card transaction. The touchscreen keypad also provides input for any other data entry required to complete transactions.

The PIN pad operates in both clear and encrypted modes and supports derived unique key per transaction (DUKPT) key encryption, employing a dynamic master session key. The PIN pad is given a new master session key each day.

The touchscreen PIN pad is secured such a way that physical entry into the housing that contains the memory chip in which the encryption software resides causes automatic erasure of the device memory.

The location of the PIN pad is ADA compliant and precludes the ability for others to observe a passenger’s PIN entry. It is vandal resistant and prevents moisture from getting inside the unit. The keypad is built into the card reader module, which is only removable from the inside of the Vendstar 5. The keypad provides audio feedback to indicate to passengers that their action has been recognized and supports key injection.

3.8.17.3 Card Control Electronics

The credit/debit card reader meets the requirements detailed in the specifications. The credit/debit card reader:

- Is ADA compliant.
- Accepts all valid major credit cards in circulation.
- Prohibits the use of cash upon the insertion and recognition of one of the accepted cards.
- Displays the necessary steps in an operational sequence to permit purchase of a barcoded ticket or smart card in the minimum amount of time.
- Requires acknowledgment of the purchase price before requesting authorization from the banking network..
- Permits canceling of the transaction or changes to the smart card value up to the point of acknowledgment of the smart card value, which occurs immediately prior to the request for authorization.
- Upon loss of power, completes the transaction and performs an orderly shutdown.
- Limits smart card values to preset minimums and maximums in \$1 increments. Both limits are easily changed in Genfare Link.

- Cancels the transaction and displays the reason when any of the following occur:

- Authorization from the bank is negative
- Valid smart cards cannot be dispensed
- Time constraints are exceeded
- Procedural constraints are violated
- Smart cards presented for credit are invalid
- PIN is invalid after three attempts*
- The credit card is expired
- The card is invalid (i.e., department store or gas company credit card)

* Passengers are limited to three attempts to enter the PIN required for all debit cards within a prescribed time period. The time period is adjustable by DTPW from three to 30 seconds in one-second increments.

- Displays error messages on the MDU including, but not limited to, the following:

- Card invalid
- PIN invalid, repeat PIN
- Transaction not approved
- Selected value under minimum - please select higher value or cancel
- Selected value exceeds maximum - please select lower value or cancel
- Preset transaction limit per day per card exceeded
- Maximum dollar limit per week per card exceeded
- Credit card operation only
- Debit card operation only
- No cards accepted

- Requests approval of credit/debit transactions in real time.
- Provides software configurable limits (from one to 10) on the number of transactions permitted by fare type, and the dollar value (from \$1 to \$500) that can be purchased by a single card and within a software configurable period (from one to 744 hours).
- Displays a message on the MDU if receipts are not available.

3.8.17.4 Card Transactions Receipt Printer

If receipts are not available, a message will display on the MDU at the beginning of a credit/debit transaction to give the passenger the option to continue the transaction or to cancel.

A printed receipt will be provided upon request during the fare purchase process. Once the barcoded ticket or smart card is issued, if a receipt has not been requested, a receipt is not issued. The receipt contains all the information required to comply with the Electronic Fund Transfer Act. As a minimum, the information shall include:

- Date and time of purchase
- TVM ID number
- TVM station location
- Dollar amount of the transaction.
- Transaction authorization number (where required) and reference number
- Smart card serial number, if applicable
- Last four digits of credit/debit card number
- Credit/debit card expiration date

- If debit, an indication that it is from primary account
- Method of payment (credit or debit)
- Type of smart card vended, if applicable
- Transaction number
- Phone numbers to contact Customer Service.

The receipt is issued from a field-replaceable, modular thermal printer unit within one second after issuing the fare media. The stock for the receipts has the capacity to issue at least 1,000 receipts that are a minimum of two inches in width. The receipt can be issued through a slot and dropped into a pocket.

3.8.18 Contactless Smart Card Reader

The Vendstar 5 is equipped with a single reader to process both credit/debit cards and contactless smart cards. The reader will read an authorized smart card when the card is passed in the vicinity of the target. The Vendstar 5 will read the necessary information on the card to link it to the passenger account in Genfare Link and determine if the card is valid (has enough stored value or a pass) or invalid. Cards are read on the first proper pass with an accuracy of not less than 99.99%, assuming each card is valid.

If a cash or credit/debit card transaction is initiated, this action will cause the reader to be inoperative during the time while such transaction is in process.

The credit/debit/contactless smart card reader is readily accessible from the interior of the TVM. Electrical connections are plug-in and screw-type connectors. Genfare will train DTPW staff to replace the reader within five minutes.

3.8.19 AC Power Cord and Plug

The Vendstar 5 includes an industrial AC cord and plug that will be inserted into a floor outlet to supply power for the machine. The outlet should be raised from the floor minimum 3 inches and mounted sideways. There is also a 120V/20A receptacle inside the TVM as required.

3.8.20 Front Panel Mockup

Genfare will provide a full-sized mockup of the Vendstar 5 front panel, constructed of material that will retain its shape for the duration of the mockup evaluation period, at the conceptual design review. The mockup will be exact in dimensional details for all the features and approximately in color and texture and will include all graphics printing and actual displays.

The mockup will be self-standing with the front panel vertical and at the exact height above the floor as the production equipment. This mockup can be used to obtain public input on the design of the TVM. The design of the mockup will be submitted to the DTPW Project Manager for approval prior to fabrication and the mockup will become the property of DTPW upon delivery.

3.8.21 Commands from Genfare Link

The messaging and alerting functionality in Genfare Link will be capable of sending a variety of commands to the Vendstar 5, including but not limited to:

- Reset time/date information
- Initiate self-diagnostic operations, unless performed automatically at machine level
- In service/out of service control
- Transaction menu contents and formats
- Change of all TVM variables such as minimum fare, remaining value, card maximum value, maximum stored value, time between events
- PIN assignments for equipment access for maintenance and revenue crews defining the level of access
- Software/communication to the fare collection application to handle smart card acceptance verification
- Fare table change.
- Forced polling of data

3.8.22 Data Dictionary

Full and detailed information on the transactional information downloaded to the TVM will be provided as a data dictionary at the conceptual design review and updated prior to final design review.

3.8.23 Human Factors

The Vendstar 5 is designed to make fare media purchases quick and easy for passengers by incorporating the following characteristics:

- Passengers are guided by interactive menus through all transactions.
- Graphics and displays are easily read under all conditions of illumination, including direct sunlight, and will conform to DTPW's standards for printed medium.
- Controls are organized and located to minimize confusion, transaction time, and passenger motion.
- The Vendstar 5 can be conveniently used by people with disabilities, including people that have limited manual dexterity and people who are visually impaired, if feasible, without the need for assistance or special training.

The front panel of the Vendstar 5 is designed to incorporate the operating features required, giving practical aspects a higher priority than optimum locations. Genfare will identify what features must stay in a particular location and what features can be relocated and to what locations. All the messages, instructions, and front panel graphics to be displayed on the MDU will be supplied along with alternatives for each. Genfare and DTPW will collaborate on the final definition of the graphics during the conceptual design review.

Graphics, efficient machine timing, appropriate bezel design, software efficiency, and the quick display of subsequent instructions are key. Timing within equipment, between modules and subassemblies, and between various steps in the transaction is crucial and will be efficiently handled.

The Vendstar 5 will accept a subsequent transaction without delay. Bills and coins are accepted one after the other without the passenger waiting between insertions. The cancellation of a transaction is immediate and displays are timed such that the messages or instructions are coordinated with the passenger's actions.

Passenger interfaces such as visual displays, display format, display language, printed information and instructions, design and location of slots and operating functions, and keypads will be evaluated during conceptual design review.

3.8.24 Display Language Selection

The Vendstar 5 allows passengers to select a language in which to interact, enabling non-English speaking passengers to use a machine without assistance. Language selection is available from the initial screen prior to beginning a transaction.

The display returns to English after each transaction is complete, regardless of whether it terminates normally or is aborted. Instructions on how to return the display to English are always available in English. Genfare will provide DTPW the ability to add or modify alternate language screens as needed.

English, and at minimum three other languages, will be provided to include Spanish and Haitian Creole, with the capability to add or modify additional selected languages without reprogramming.

3.8.25 Transaction Speed

3.8.25.1 Cash Transactions

Because the speed of TVM transactions is critical in determining the number of TVMs required at each station, Genfare's Vendstar 5 will meet the transaction speeds requested in the Technical Specifications.

Assuming all inserted coins and bills are accepted on the first insertion and all transactions are for the purchase of a single contactless smart card, the time required to complete the following transactions will not exceed the times defined in the following table.

Transaction Content	Maximum Time to Complete
One bill inserted; two coins returned	12 seconds
Four coins inserted; two coins returned	15 seconds
Three coins inserted, one bill inserted, four coins returned	17 seconds
Two bills inserted; four coins returned	15 seconds
One bill inserted, four coins inserted, two coins returned	17 seconds
Five bills inserted; four coins returned	25 seconds
Credit/Debit/Smart Card transaction	30 seconds
Insert two bills to replenish a Smart Card	15 seconds

Table 34. Vendstar 5 cash transaction speeds

In addition, for all varieties of transactions listed above, the time between the completion of the transaction (when the smart card is issued, all coins and bills are deposited, and change provided) and the Vendstar 5 becoming available to begin another transaction will not exceed three seconds.

If a transaction is canceled by the passenger before money has been deposited, the Vendstar 5 immediately returns to the idle screen. If a transaction is canceled after money has been deposited and before the smart card is issued, all the money deposited is returned and the Vendstar 5 resumes its idle state within five seconds of the cancellation.

3.8.25.2 Credit/Debit Card Transactions

Transaction times for bank card transactions, measured from the time a card is inserted into the Vendstar 5 to the time a smart card is dispensed, excluding PIN entry time and clearinghouse processing time, will not exceed four seconds when the Vendstar5 is online with the clearing house. If the Vendstar 5 is not online with the clearinghouse, it will attempt to establish communication for a period of 10 seconds before entering “Cash Only Mode”.

3.8.25.3 Contactless Card and Barcoded Media Transactions

Transaction times for contactless media transactions, measured from when a contactless media is presented until the time the purchased media is dispensed, will not exceed four seconds when the Vendstar 5 is online with the clearinghouse and will not exceed 10 second when not online with clearinghouse.

An audible tone sounds and a message is displayed to indicate that the value has been updated on the contactless smart card. A receipt is automatically issued for all CSC replenishments or new fare product recorded at the corresponding account in Genfare Link.

To perform an automatic update (autoload) function, the passenger selects the appropriate function and places the smart card near the target on the Vendstar 5. An audible tone sounds, and a message displayed and spoken in the selected language indicates that the smart card has been properly credited. The Vendstar 5 will then display and speak ‘complete’ in the selected language.

3.8.26 Audio

The Vendstar 5 is equipped with an audio jack, located near the navigation pad, that enables passengers to plug in their earphones to access the audio system. The button to start the audio and the adjustable volume control are located in the ADA-compliant navigation pad that is on the lower right of MDU.

The audio system announces machine instructions, prompts, and other information including degraded operation conditions, supporting both SAPI4 and SAPI5 interfaces. All audible messages are stored in digital form and easily modified by DTPW.

Full and detailed information on the audio system, including operation, timing, settings and capacities, placement of external speaker, etc., will be provided during design review.

3.9 Farebox Replacement & Revenue Transfer & Collection Equipment

As DTPW's supplier of fareboxes and vaults since 2009 as a subcontractor to Cubic, Genfare is looking forward to working with DTPW directly and is pleased to offer our latest validating farebox, the Fast Fare 25 to replace the existing Odyssey fareboxes, as well as all new revenue transfer and collection equipment that will provide the same security and reliability that the current equipment has provided for decades.

Genfare has chosen the enhanced farebox system, the Fast Fare 25, instead of the current Fast Fare farebox, to enable the latest technology for the next 20 years, including real time connectivity, enhanced security, and extensive data collection.

3.9.1 General Requirements for All Fare Collection Equipment

3.9.1.1 General Conditions

The Fast Fare 25 is designed to be installed in the front of the bus adjacent to the operator and enables passengers—including persons with disabilities—to easily and rapidly insert or present the required fare. This farebox can function in a wide range of environmental conditions, including the changing temperature and humidity levels typical in southern Florida.

A fully ergonomically redesigned passenger interface includes a large 7-inch (800 x 480 pixel) touchscreen that simplifies fare selection and reduces dwell time, improving the boarding experience.

The farebox automatically validates and counts inserted cash and displays the total without a need for operator intervention. Invalid coins, bills, and electronic fare media are rejected and, where appropriate, returned to the passenger. The farebox is provided with a separately-mounted Operator Control Unit (OCU) with a colored screen that allows the operator to easily register reduced and other special fares using a keypad. The farebox will be installed in an agency-approved location that allows unrestricted operator operations and unrestricted access to the cashbox door for removal and maintenance needs. The small footprint of the Fast Fare 25 simplifies installation as well as helping passengers with ADA access requirements while speeding access by revenue service personnel.

The farebox is securely mounted and does not rattle. The farebox's top casting can be opened and the upper farebox shroud removed without providing access to revenue. The farebox is ADA compliant. The farebox provides ridership, revenue, and other data as described in this proposal.

3.9.1.2 Environmental Conditions

The Fast Fare 25 can handle a wide range of weather conditions. It is designed for storage temperature of -25° F to +140° F and tested for an operating temperature inside a vehicle of +32°F to +122°F. It is also built to withstand a humidity level ranging from 5 to 99% (non-condensing). The farebox remains operational in the presence of airborne particles, grease, oil, and other contaminants accumulated on coins, tokens, and bills within reasonable limits.

The farebox electronics are protected against electromagnetic interference (EMI), vibrations, ultraviolet light, or other environmental conditions that may otherwise cause the farebox to become inoperative and/or lose data. It can withstand a thermal shock of 1° per minute drop in temperature over 15°F within a range between 110-60°F.

During operation, the Fast Fare 25 can handle 1.5g/rms, 5-200 Hz of vibration without a secondary anchorage. It can withstand up to 5Gs of instantaneous shock which is well within range of normal bus operations.

The farebox mounting base plate is affixed to the floor by means of carriage bolts from the interior of the bus, with the washers and nuts on the underside of the floor. The base plate is made of cast aluminum, suitably ribbed for added strength.

The lower part of the farebox is suitably designed and reinforced to prevent deformation in service, deterioration, or loosening that would subject the farebox to increased vibration, wear, metal fatigue or other stress.

The upper and lower portions of the farebox are securely fastened together by high yield bolts, accessible only from the farebox's interior. The completed assembly measures not more than 41 inches high, or optionally 36 inches or 31 inches high, as measured from the bus floor.

3.9.1.3 Electrical Environment

The Fast Fare 25 is designed to be immune to electrical noise on incoming power caused by switching loads in the bus environment. The farebox power supply unit has onboard filtering which provides immunity to bulk current transient (BCT) noise or conducted noise on the bus power supply due to other AC/DC loads.

The farebox is designed to operate at 12-24VDC nominal (bus battery) and operating range of 10-60VDC. It is protected against battery events such as reverse polarity and load dump caused due to high switching loads generally from air conditioning equipment. It consumes 210W peak and 30W typically during operation.

During standby (power save) mode, the power consumption reduces to 15W and after a configured time (typically 4 hours) of inactivity, the farebox can go into sleep mode to save bus battery/power. A high-conductivity grounding terminal is provided to ground the unit to vehicle ground with low resistance (<500 milliohms) to provide proper grounding connection.

The farebox provides a 'ride-through' power mechanism during a transient power loss to prevent farebox software corruption and data loss. If the power failure is permanent, the ride through mechanism allows the farebox to save all temporary data, close open files, and perform a gracefully shut down of the OS.

The farebox also monitors and records events on primary power source dropping voltage and generates alarms which can be reported into Genfare Link dashboard to determine a fault or maintenance issue. These events are uploaded wirelessly to Genfare Link.

3.9.1.4 Accessibility Compliance

The farebox is fully ADA compliant based on height, visibility, sound, braille/buttons, and features a large screen to assist physically impaired riders. The small footprint of the Fast Fare 25 enables installation creating enough room for passengers with ADA access needs.

3.9.1.5 Stand-Alone Operation

The farebox is designed to run in standalone mode in the event of loss of network connection and can hold virtually limitless transactions, bad-list data, events, route/run records, maintenance data, and login activity. As soon as the farebox connection is restored, the farebox will connect to Genfare Link to

upload the buffered data. The farebox is also built and designed to be used with another third party back-office system, if DTPW chooses in future phases.

3.9.1.6 Modularity & Interchangeability

The farebox has a modular construction to simplify maintenance, minimize the cost of repair, and reduce parts inventory. Each module is self-contained and designed in such a way that it can only be inserted in the correct orientation.

The coin and bill modules and farebox logic board are readily accessible when the top cover is opened and can be removed and/or replaced without the use of tools.

The Fast Fare 25 communicates events, alarms, and maintenance metrics in real-time with Genfare Link so operational failure can be avoided and proactive repair/maintenance can be performed, reducing operation and service cost. This gives DTPW the ability to plan for maintenance and cashbox vaulting as well as parts inventory levels and service team staff time. We have provided access to multiple error code sensors to pinpoint troubleshooting areas quickly.

3.9.1.7 Maintainability

The farebox is designed with maintainability in mind to minimize operations support time. This is achieved via a modular design as well as quality of component to minimize maintenance needs.

The farebox will provide the following minimum levels of reliability and maintainability:

- **Mean time between failures (MTBF).** 60 days for essential functions and safe operation
- **Mean time to repair (MTTR).** 10 minutes for diagnosis and replacement of malfunctioning components

Modular construction is used throughout the Fast Fare 25. This modular design of components enables ease in maintenance and repair as well as reduces downtime. Fare acceptance modules and the logic board can be replaced without the use of tools. The farebox is also designed to meet 12,500 mean cycles between repair/failure to reduce maintenance required on the equipment.

Adherence to the provided preventive maintenance schedule is required for it to meet the published MTBF and MTTR metrics.

3.9.1.8 Weight Limitation

The weight of the cashbox (when empty) is less than 18 pounds to facilitate removal and transport. The farebox is designed so no breakdown unit exceeds 50 pounds, and no component exceeds 20 pounds.

3.9.1.9 Electronic Components

The Fast Fare 25 includes redesigned electronics utilizing System on Module (SoM) architecture, which reduces complexity and components while adding more memory and processing power. As a result, the Fast Fare 25 has 35% fewer printed circuit boards (PCBs) than its predecessor. The reduction in PCBs and components not only improves reliability and speed of troubleshooting but is also better for the environment.

3.9.1.10 Exterior

The highest degree of security has been employed in the design and manufacture of the Fast Fare 25 and its cashbox. All exterior surfaces are smooth with rounded corners and will resist corrosion, abrasion, or scratching. There are no exposed or removable fasteners, cracks, or pry points. Both the upper and lower parts of the farebox cabinet are made of 14-gauge stainless American steel with a satin finish for security, durability, and easy cleaning. DTPW could optionally have that coating be in a

color that reflects the vibrancy of Miami. Each farebox is identified with metallic adhesive labels with unique unit serial number.

3.9.1.11 Security

The fareboxes report access of the lid and the pedestal door/cashbox to Genfare Link. Each step in the cashbox removal until securely vaulted is tracked by the system for audit purposes.

Alarms are generated in events when vaulting thresholds are exceeded and can be accessed historically in Genfare Link.

Each cashbox provided has an individual, electronic, cashbox ID, which is recognized and tracked by both the farebox and the vaulting equipment. The cashbox ID is securely mounted to the inside of the cashbox and is only accessible by authorized personnel with access to a high security key.

Access to the cashbox can be achieved with an employee-issued smart card or a physical probe. In either case, the appropriate electronic code must be transmitted to the farebox to trigger the unlock.

The entire cash collection and vaulting system with all equipment involved is designed to keep revenue secure at all times. The farebox pedestal door is built with internal hinges to prevent prying, and the vaults are secured with multiple locking points to avoid prying them open.

3.9.1.12 Network Interface

The farebox incorporates a multi-port unmanaged network switch containing RJ46/CAT6 ethernet ports to allow DTPW to connect to its on-bus network. The switch is built into the carrier board for the main processor and includes two externally available ports.

3.9.1.13 Reliability

The farebox is designed to exceed 12,500 mean cycles between failure (MCBF). The bill validator has a MCBF of 1.5 million cycles and the coin validator has a MCBF of 870,000 cycles. It also provides various diagnostics and self-test processes to report on issues and failures.

Reduced complexity in internal PCB boards, ability to continually report of maintenance cycles, and SoM architecture all translate into a reliable operation and minimize unplanned downtime.

A self-diagnostic routine can be initiated by operation from OCU at the farebox to ensure all components are operational. All components of the farebox are continuously monitored for issues.

3.9.1.14 Currency and Recognition Standards

At the conceptual design review meeting, Genfare will provide DTPW information on the steps used to verify the authenticity of each denomination of bill accepted in the Fast Fare 25 and Vendstar 5. Genfare will share the manufacturer and model number for the bill acceptor equipment, the manufacturer's specifications for the unit, and historical information on the manufacture, reliability, and use of the bill acceptors. Genfare will also share statistics regarding the performance of the bill acceptor in revenue service.

3.9.1.15 Equipment and Component Serial Tracking

Each farebox and all major sub-components have unique serial numbers so they can be tracked across the fleet as well as during the maintenance and repair process. The associated bar code will be included so they can easily be scanned as needed to read the serial number.

3.9.2 Fast Fare 25 Farebox

Genfare will provide DTPW with its latest validating farebox, the Fast Fare 25, configured to accept bills and coins for fare payment on its fixed route and paratransit vehicles. Genfare has selected the Fast Fare 25 farebox to ensure that DTPW has the most innovative fare collection technology available in the market, with operational improvements and a vast useful life.

The Fast Fare 25's development has more than 40 years of farebox engineering and design behind it leveraging improvements from prior generations of Genfare fareboxes. The Fast Fare 25 shares some components with the prior generation Fast Fare farebox which has been installed on more than 10,000 vehicles across more than one hundred transit authorities giving DTPW the peace of mind that its farebox replacement has been tried and tested in transit environments like Miami.

To enhance the rider experience and facilitate use, the Fast Fare 25 features a seven-inch passenger display, eye-catching visual indicators, and attractive contemporary styling. The Fast Fare 25 also provides a powerful processor, ample memory, and multiple communication ports to support today's data-intensive fare handling needs and prepare for those of the future.

3.9.2.1 Position of the Fast Fare 25 on the Vehicle

The farebox is installed in the front of the bus adjacent to the operator and enables passengers—including persons with disabilities—to insert the required fare easily and rapidly. The farebox will be installed in a DTPW-approved location that allows easy and unrestricted access to the cashbox door and maintenance openings by maintenance and revenue service personnel and does not hinder the operator. The Fast Fare 25 has the same footprint at DTPW's existing Odyssey fareboxes, so it can readily replace the Odyssey without the need to modify any handrails or mounting points. The farebox is securely mounted and does not rattle. The farebox's top casing can be opened and the upper farebox shroud removed without providing access to revenue.

The bottom of the farebox has a base plate to permit mounting to the bus floor. The substantial construction of this base plate provides lateral stability for the farebox without the need for secondary anchorages. The base plate is affixed to the floor by carriage bolts from the bus's interior, with the washers and nuts on the floor's underside. The farebox is attached to the base plate by heavy bolts accessible only when the cashbox door is open. This design makes it possible for an experienced maintenance technician, equipped with the proper tools, to remove the Farebox from the bus in less than 15 minutes.



Figure 60. Fast Fare farebox

Correct placement of the farebox on each different make and model of bus will be provided to ensure that the placement meets the required maneuvering and reach ranges of ADA accessibility guidelines. Relocation, removal, or installation of new railings or other elements that may represent barriers in the vicinity of the farebox will be performed as necessary to meet these requirements.

3.9.2.2 Farebox Power

The power supply for the Fast Fare 25 includes adequate filters to regulate the vehicle-supplied voltage and suppress power spikes and noise that could contribute to erroneous signals or corruption of data. The power supply is rendered immune to electrical interference caused by such items as fluorescent lights, bus alternators, air conditioning units, or radios. Adequate protection against transient surges in the bus power supply shall be incorporated to the extent necessary to prevent damage to electronic components, and to prevent loss or corruption of data stored in farebox memory.

Loss and restoration of power shall not result in any corruption of the data in farebox memory. The farebox shall be protected against damage, loss, or modification of data caused by power fluctuations identified via a power ride-through mechanism to ensure graceful shutdown.

The farebox will monitor and record each instance of the primary power source dropping below ten volts DC. In addition, events, alarms, and other non-revenue data can be transmitted to the FBS through a wireless LAN when the bus arrives at the revenue island for on-line inquiry and reporting. Power supply monitoring information may be used to determine possible problems with power systems. The reporting is an event record stored in the farebox and uploaded in real-time for routing to Genfare Link.

3.9.2.3 Bill Acceptance

The farebox is provided with a bill validator and transport mechanism to accept, validate, and count paper currency and convey it to the cashbox. A green light above the bill slot means the validator is ready to accept bills; a red light means it is not ready. The bill slot is provided with a guide plate to facilitate insertion of bills while deterring accidental insertion of coins. The validator grips an inserted bill positively and does not require precise insertion by the passenger.



Figure 61. Fast Fare bill validator

The validator can accept an inserted bill in any one of four orientations: face up or face down, either end first. The bills can be inserted by one hand on the farebox to help riders board faster. The inserted bill is positively identified based on internal characteristics; bills that cannot be identified are rejected as invalid. The validator can process the required U.S. banknotes in street condition, including wrinkled, torn, taped, or damp currency:

- One-dollar bills (\$1)
- Five-dollar bills (\$5), old and new style
- Ten-dollar bills (\$10), old and new style
- Twenty-dollar bills (\$20), old and new style

The farebox can be programmed to reject any of the above bills for policy reasons. The farebox also automatically rejects:

- All counterfeit bills, foreign currency, photocopies of valid currency, and badly damaged bills
- Any inserted paper other than currency, including magnetic or other

tickets

If a bill is rejected, the transport mechanism reverses, and the item is returned to the passenger via the bill slot. Processing time is less than two seconds per bill.

The farebox has an “accept next bill” (override) function that allows the operator to manually accept a bill rejected by the validator but which on visual inspection is found to be valid. The “accept next bill” feature can be limited to certain denominations or disabled. All uses of the feature are recorded by the farebox and uploaded to the data system during data transfer.

3.9.2.4 Coin Acceptance



Figure 62. Fast Fare coin acceptor

The farebox is provided with a coin acceptor to validate and count inserted coins, direct valid items to the cashbox, and return rejected items to a coin cup, all without operator intervention. The acceptor can process up to ten coins per second. As each coin is accepted, its value is immediately added to the total shown on the operator and passenger displays and recorded in farebox memory.

The farebox will provide cash counting accuracy of $\pm 1\%$ for amounts greater than \$300, assuming valid cash, proper operation, and environmental conditions within the specified range.

The acceptor validates inserted items based on their metallic content. More than 32 different coins or tokens can be distinguished, including U.S. pennies, nickels, dimes, quarters, and Susan B. Anthony and Sacagawea dollar coins. The coin slot admits no coin larger than a dollar coin (1.043”).

The acceptor can be reprogrammed to accept new types of coins without hardware modification. Multiple coins can be associated with a single denomination if a new series of coins is introduced.

Rejected coins are returned to an ADA-compliant coin cup for easy retrieval by the passenger. The cup illuminates when an item is returned to facilitate this process. All detected instances of invalid coins are recorded for subsequent uploading to the data system.

The coin acceptor can process bent or damaged coins within reasonable limits. It returns coins so bent or damaged that it is unable to read their electronic signature.

The total value of coins inserted is shown on the display for a programmable period, typically 15 seconds. The farebox records total coins and tokens processed as well as total items detected and rejected and sends this information to the data system during data transfer.

3.9.2.5 Jam Clearing Features

The coin acceptor is solid state and has no motor and few moving parts, making jams rare. However, should a jam occur – for example, due to a passenger inserting foreign material – the operator may activate the coin bypass mechanism, which permits the passage of coins directly to the cashbox.

Activating the coin bypass requires deliberate action on the part of the operator. The security of the farebox and the collected revenue is not diminished. Bills continue to be accepted, registered, and processed normally.

The farebox creates an event record reporting the exact times when the bypass was activated and deactivated for transmission to the central data system.

If the farebox senses a coin or bill jam, it automatically takes the affected device out of service, displays an appropriate message on the OCU and passenger display, and generates a maintenance alarm for

transmission to the central office. The farebox will continue to accept fares using the fare modules that remain operational.

3.9.2.6 Passenger Display

The fully redesigned passenger display is built to improve the rider experience and reduce the dwell time for faster onboarding. Large touch screens allow riders to quickly act and get rapid confirmation of fare due and payment confirmation.



Figure 63. Fast Fare 25 passenger interface

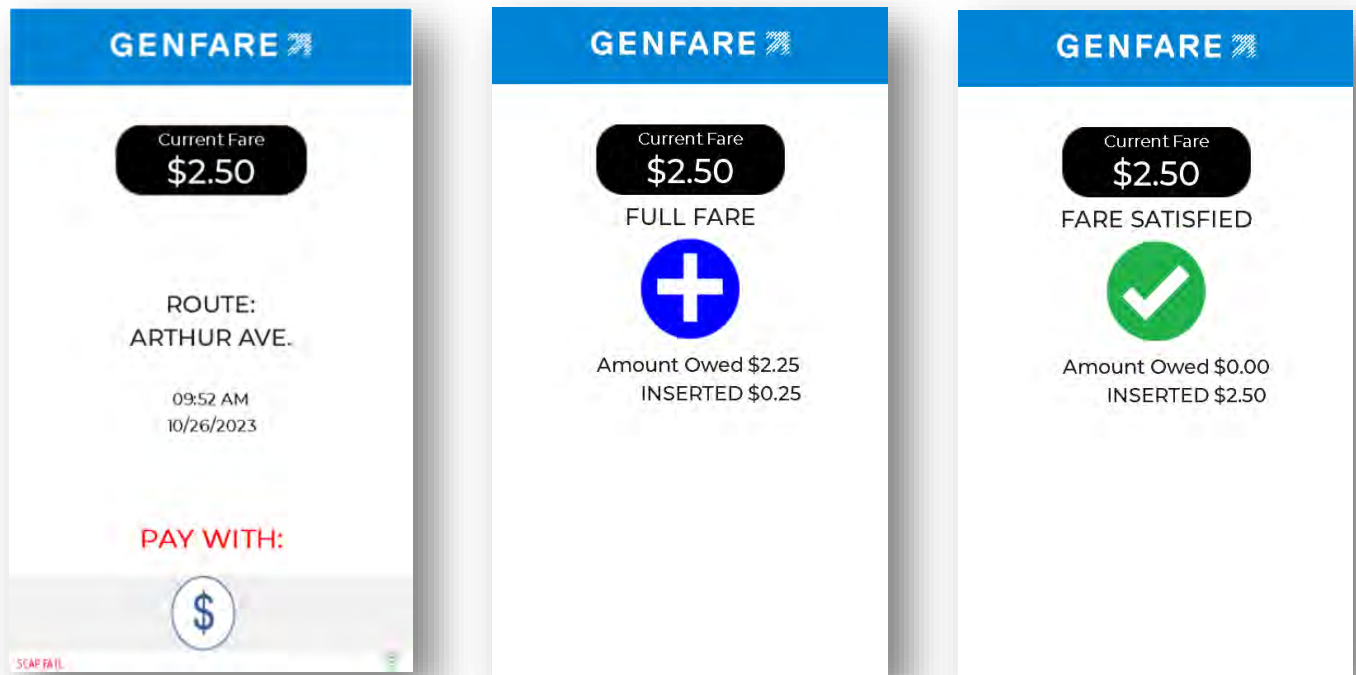


Figure 64. Fast Fare 25 passenger payment flow

3.9.2.7 Operator Control Unit and Operator Display

The Operator Control Unit (OCU) on the Fast Fare 25 farebox is mounted in the vehicle separately from the farebox, allowing greater flexibility in placement of both the farebox and OCU, especially when compared to units in which the OCU is a touch screen display on the back of the farebox. The OCU eliminates the need for the operator to touch the farebox; in fact, the operator can be physically separated from the farebox with a protective barrier if desired.

The color screen Fast Fare 25 OCU, pictured in figure 65, enables the operator to monitor and control farebox operation. The OCU is equipped with a keypad and display and is housed in a separate compact console constructed of high-impact plastic. The OCU can be mounted on the bus dashboard or a stanchion as desired. The OCU can be quickly adjusted by each operator to the optimal viewing angle. The OCU is connected to the farebox by a cable, which permits mounting in a convenient location separate from the farebox.

The OCU is provided with a high-contrast backlit color liquid crystal display (LCD) measuring approximately 4.5" by 3.4" (5.6" diagonal), capable of displaying graphics and text. The display brightness is adjustable via the operator keypad. The display shows all information needed to operate the farebox.

The OCU has 30 pushbuttons, consisting of the digits 0 through 9, #, *, the letters A through D, four cursor arrows, a green dot button, a blue dot button, and eight function keys with dynamically assignable electronic labels on either side of the display. Different "labels" for the function keys are shown on the OCU display depending on the task to be performed, similar to an ATM. The function keys typically are used to accept reduced fares and are labeled accordingly.

Once the vehicle is underway, most fare transactions involving the farebox are processed automatically and require no operator involvement. In such cases the OCU will display the fare card type and the fare amount if relevant. If desired, the OCU can be configured to signal a reduced-fare transaction by means of visual and/or audio indicators. In such cases the operator would inspect the rider's reduced-fare ID and press the appropriate button on the OCU keypad to accept a valid fare.

The display shows all information needed to operate the farebox, including:

- The amount of money inserted in the form of coins and bills. For operator convenience, cash amounts are displayed in a large, easy-to-read type.
- The current assignment of each screen side function key and associated fare value
- Classification of fare accepted
- Operator logon and logoff prompts
- Rejected coin notification
- Rejected bill notification
- System alarms and error conditions
- Bill reclassification options (selectable)
- System time (selectable)
- Current route (selectable)



Figure 65. Fast Fare Operator Control Unit

The most commonly used fare types are programmed to be shown on the default OCU screen next to the screen side arrow keys.

3.9.2.8 Audible Signals

The Fast Fare 25 provides feedback to the passenger that the required fare has been collected through audible signals, as well as indications at the OCU screen for the operator.

Audible signals are provided when coins and bills are being inserted or invalid payment has been rejected so passengers or operators can take action. Automatic fare registration and manual operator fare registration will trigger an audible signal. Other audible signals sound when bill jams are detected or cleared and as the operator inserts commands into the OCU.

The cashbox is constantly monitoring its capacity. The farebox can display notifications on the OCU as the cashbox reaches DTPW-configured thresholds, and automatically disable the appropriate payment methods if cash or coins reach a separate DTPW configured full threshold. Proper codes on cashbox level are reported to Genfare Link so vaulting times can be optimized like fill percentage level and classified revenue in the cashbox.

Appropriate alarms are generated to the operator and pushed to Genfare Link so operations staff can take appropriate actions.

Audible alarms can be suppressed or quieted by the operator.

3.9.2.9 Cashbox & Electronic Door Locking System

Construction

The farebox is provided with a cashbox to provide secure storage of coins, tokens, and bills accepted for fare payment. When in service the cashbox is locked in the lower portion of the farebox and is protected by a door of substantial construction. The farebox cannot be operated until a cashbox has been properly locked into place. The cashbox is provided with a high-security lock and cannot be removed from the farebox except in a closed and locked condition, making it impossible to gain access to revenue during revenue transfer. It is also not possible to gain access to the cashbox from the top of the farebox when all cash processing modules are properly installed.

The cashbox has separate compartments for coins and bills. Separation is maintained during emptying to facilitate counting in the money room. The cashbox is made of 19-gauge stainless steel. The handle is used as part of the mechanism to open and close the cashbox during emptying and folds away when not in use. An auxiliary handle is provided at the bottom of the cashbox to permit a two-handed grip when carrying the cashbox to the vault.



Figure 66. Cashbox lock

Opening of the cashbox door to remove the cashbox can be accomplished by transmission of the appropriate secure credentials via the smartcard reader or via the infrared probe. This is normally done during nightly servicing to access and empty the cashbox. The cashbox must be closed and locked before it can be removed from the farebox and remains locked until it is inserted in a vault for emptying. At no point during revenue transfer is the interior of the cashbox or its contents exposed. A high-security key is required to open the cashbox.

The cashbox is of sturdy welded construction with no exposed fasteners and will withstand years of rough usage. A fully loaded cashbox dropped in the upright position to a hard floor and landing on its bottom or bottom corner from a height of 48 inches will continue to operate normally with no breach of security.

A serial number is permanently stamped on the cashbox handle and remains visible through a small aperture in the door when the cashbox is locked into place. All cashboxes are freely interchangeable.

Capacity

The tall cashbox (associated with 42-inch farebox height) can hold and safely transfer to a vault a minimum of \$800 in mixed coins and 700 bills in unfolded street money or the equivalent in tickets.

The farebox monitors the quantity of coins and bills inserted in the cashbox. The OCU display notifies the bus operator when either the coin or bill compartments reach 80% full (programmable). The "cashbox full" indicator remains visible until the farebox is probed and the cashbox is extracted, at which time the revenue registers are automatically reset to zero.

Should coin or bill capacity be reached before the cashbox can be emptied, the farebox notifies the operator via the display and disables the coin or bill acceptor as appropriate.

Electronic Cashbox Identification

The cashbox and farebox are fitted with infrared devices to enable them to monitor the cashbox continuously and ensure it has been properly inserted and is ready to receive revenue. These devices consist of a cashbox ID transponder in the cashbox and a transceiver in the farebox.

The cashbox ID is self-powered – no battery is required. The farebox beams sufficient power to energize the CBID microprocessor in the cashbox each time the ID is to be sent. This is an enhanced technology that does not require periodic replacement of batteries, a maintenance item.

When energized by the farebox, the cashbox transmitter automatically sends a four-digit serial identification number to the farebox, which reads it and stores it in memory for subsequent data transmission. For security, the farebox will not operate if the cashbox ID number is not transmitted at least once every five seconds. Infrared technology eliminates the need for electrical contacts, plugs or other physical connections between the farebox and the cashbox. Reading the cashbox ID number is automatic and requires no action on the part of the operator or vault puller.

The ID is also read when the cashbox is inserted in the vault to be emptied. The exact time is also noted and matched with the time the farebox was removed from the farebox. This provides positive tracking of revenue from farebox to vault and makes it possible to flag suspicious events, such as an unusually long time to empty a cashbox.

Cashbox Door and Electronic Lock

The cashbox door is fitted with an electronic lock that permits the door to open when the correct code has been transmitted to the farebox. The code is transmitted via a secure electronic smartcard reader on the farebox. The backup mechanism is via an infrared probe. The new smartcard system is highly secure and cannot be counterfeited/duplicated to ensure only authorized personnel can access the cashbox and all access is recorded in back-office system.

Using the data system, it is possible to configure the cashbox door to either open or remain shut following probing. Closing the door and holding it in the closed position for 2-3 seconds causes the electronic lock mechanism to engage the locking pins and secure the door. If the door is slammed, with rebound, the mechanism will not engage.

3.9.2.10 Fare Set and Fare Categories

The farebox can have two fare structures programmed into its electronic logic, one active and one pending called a fare table.

Each fare table consists of 20 fare sets (that is, sets of pre-determined fare values) assigning the value of a full fare plus any special fare (e.g., student, senior, etc.), passes and other fare instruments. Each fare may range in amount from \$0.01 to \$99.99. The fare set allows a value and/or function to be assigned to each keypad button. For example, in addition to reduced fares, it is possible to assign a button for non-payment or short payment of fare. The farebox can also record up to 240 non-cash fare transactions, known as TTPs (ticket/token/pass), a substantial increase from previous generation technology. TTPs are used to record noncash fare transactions such as fare cards, tokens, and transfers accepted.

A different fare set may be assigned for each category of service (e.g., local, express, shuttle, etc.). Switching fare sets is a simple procedure that can be done using the OCU. The fare table is maintained through Genfare Link and updated during probing.

The pending fare table can be programmed to automatically become active and replace the current fare table at a predetermined time and date. This simplifies implementation of fare changes – the new fare table can be loaded to all fareboxes in advance and activated simultaneously fleetwide.

3.9.2.11 Fare Records and Passenger Registration

As each fare is registered, the farebox records individual transaction detail and increments cumulative registers. For example, it records total cash received since last probing and amount received since installation or clearing of farebox memory. A transaction is recorded for each cash fare, electronic fare, or tally (key press).

Failed transactions (bad listed cards, pass back, etc.) are also recorded. The Fast Fare 25 has an extended memory to allow a virtually limitless number of these transactions. Each type of failed transaction is given a unique identifying code to permit later generation of reports. Events such as jams are also recorded. A separate data register records all cash shown on the operator's display but not accounted for through pressing of a keypad button or registration of a full fare. All such revenue is counted in an "unclassified revenue" register.

All accumulated data, including transactions, events, and aggregate counts, are uploaded to Genfare Link during probing. Transaction and event detail is used to generate a transactional database, as discussed below. If desired, both cash and fare card transactions may be included in this database, which may be used to generate a wide variety of management reports.

The data management system keeps a separate tally of uses for each employer-subsidized card account number. It provides a means of collating employee card usage data, generating reports, and exporting data to a billing system or other third-party application not provided as part of this procurement. Genfare Link also provides a means to activate and inactivate individual employee card accounts.

3.9.2.12 Route/Run Segmenter

The farebox is equipped with a route/run segmenter. The route/run segmenter permits the driver, by pressing buttons on the OCU keypad, to make a route/run selection in the farebox memory reflecting accumulations in the data registers since the last route/run record was created. The farebox is connected to the cloud backend system and continuously uploads the information for accurate and timely reporting of the route/run data. The farebox also has sufficient memory to buffer 2,000 transactions/records in case connectivity is not established to retain the data.

The information stored in the segmenter is secure and cannot be altered by the operator, and only authorized users of Genfare Link can configure and update the route/run setup.

3.9.2.13 Logon/Logoff

To initiate service, the operator must first log on. This may be accomplished using the farebox OCU or via a third-party control head, typically for the CAD/AVL system, which is connected to the farebox via a J1708/1587 interface. The operator presses a button to call up the log-on screen and enters their operator ID, route, run, trip, and so on. The login is time-stamped and stored in memory as an event record, as described above. Login data is used to tag all subsequent farebox transactions and events.

New route, run, trip, and operator ID numbers may be entered into farebox memory at any time via the OCU. Drivers may log off by pressing a prescribed sequence of buttons. Logoff occurs automatically when:

- The operator logs off the CAD/AVL system
- Another operator logs on
- The farebox cashbox is removed
- The farebox is inactive for one, two, or four hours (user-configurable)

Logoff triggers the creation of a route/run record. After logging-off, the operator must re-enter route and operator ID numbers to reactivate the farebox.

3.9.2.14 Clock

The farebox clock is synchronized as it communicates to Genfare Link. In the event the farebox is not connected to the network or powered off, it maintains the time via a persistent hardware real-time clock.

3.9.2.15 Maintenance Actions

The farebox logic tracks the operation of farebox modules requiring preventive maintenance. When the number of operating cycles for a given module reaches an agency-programmable threshold, the farebox generates a maintenance alarm. The alarm is transmitted to Genfare Link on probing for use in generating maintenance reports.

The farebox logic provides ongoing counts for each type of coin, token, bill, and fare card processed. These counts may be used for audit purposes and as an indicator of periodic maintenance.

Maintenance alerts, along with maintenance cycles, are reported into Genfare Link to allow for planned maintenance and optimize the operations.

3.9.2.16 Transaction Operation Data Storage

Transaction and event detail reported by the farebox is used to populate a transactional database at the back-office system. The system extracts data from events to further enrich the data. Each transaction and event record includes time/date, operator, farebox number, route, run, trip, latitude/longitude as provided by the third-party CAD/AVL system, and other relevant data. Events are recorded for selected farebox occurrences such as logon/logoff, cashbox door opened/closed, cashbox removed/reinserted, farebox placed in bypass/removed from bypass, etc. Events are also recorded for farebox malfunctions such as cold/warm starts, jams, misreads and so on to facilitate later maintenance.

The farebox captures the serial number of each farecard used and reports it to Genfare Link. It is possible to track all uses of a given card, category of card, or school/employer account for any time period, route, etc. This information may be used for audit and security purposes, especially where high-value cards are implemented. For all transactions in the database, it is possible to determine day, time, route, and run for each fare paid.

To ensure the integrity of transactional data, all data uploaded from the farebox is buffered and subjected to a series of validity checks before being used to populate the database. Transactional and aggregate data are stored in the farebox until deletion is ordered by Genfare Link. This guarantees that data is successfully transmitted before the original is erased.

3.9.2.17 Locks and Keys

All locks and keys used on the farebox are of the high security type. The cashbox uses a MIWA rare earth magnetic lock. The key does not resemble a common house key in appearance – it does not use mechanical tumblers but rather relies on the precise alignment of opposing magnetic forces to permit the cashbox to be unlocked.

The keys are captive to the farebox and receiver and cannot be removed without damage. Genfare manufactures the keys using magnets provided by MIWA, and only Genfare can duplicate them. Replacement keys are shipped only to duly authorized agency personnel.

A high security Medeco key is used for the farebox top lid.

3.9.2.18 Farebox Dimensions

Dimensions of the farebox are 10 inches wide, 9.7 inches deep and 41 inches high to meet with ADA compliance. (Two shorter sizes are also available.) The base plate for the farebox does not exceed 12-1/2" by 12-1/2". Genfare will provide fully dimensioned scale drawings of the farebox and base plate showing full views for each side and with the doors and covers both opened and closed at the customer design review.

3.9.2.19 Power On/Off Switch

The power on-off switch is safely placed inside the farebox key accessible lid.

The farebox connects to the bus power supply using a polarized self-aligning snap-connect plug in the pedestal. A well-marked master disconnect switch (on-off type) is located inside the farebox. A standard automotive-type fuse is used to protect farebox electrical components.

3.9.2.20 Test Points and Indicators

- **Indicators.** Any failure of a major module detected by the farebox, e.g., a jam of the bill or coin validator, will be shown on the OCU operator display and stored as an event record. The farebox is provided with internal indicator LED to show that the equipment is operational and that voltage is being supplied to key modules.
- **Automatic sequence testing.** The farebox can sequentially exercise the bill validator, OCU display, passenger display, TRiM, and audio transducer to demonstrate proper operation.
- **Power supply monitoring.** The farebox reports the number of times input power has gone to zero volts and back to normal (cold start), indicating an intermittent power line, poor ground, or faulty switches. The farebox also reports the number of times the power supply drops to 75% of normal but not to zero (warm start), an indication of a heavy load.
- **Cashbox threshold indicator.** The operator display indicates when either the coin or the bill compartment of the cashbox reaches a predetermined percentage (or various percentages) of capacity.
- **Preventive maintenance report.** The farebox logic tracks the operation of farebox modules requiring preventive maintenance. When the number of operating cycles for a given module reaches an agency-programmable threshold, the farebox generates a maintenance alarm. The alarm is transmitted to Genfare Link on probing for use in generating maintenance reports.
- **Coin/bill totals.** The farebox logic provides ongoing counts for each type of coin, token, bill, and fare card processed. These counts may be used for audit purposes and as an indicator of periodic maintenance.

3.9.2.21 Cashbox Door Security Switch

The cashbox door can only be opened by authorized personnel using an IR-probe or an optional highly secure electronic method. This is normally done during nightly servicing. The cashbox must be closed and locked before it can be removed from the farebox and remains locked until it is inserted in a vault for emptying. The cashbox's interior or contents are not exposed during revenue transfer. A high-security key is required to open the cashbox.

Security door alarm. If the cashbox door is open longer than three minutes (programmable), a silent alarm is generated that is uploaded to Genfare Link during data transfer. The alarm indicates the time of occurrence, the length of time the door was open, and the amount of money then in the cashbox. The farebox also records when the top lid has been opened and closed.

Cashbox security alarm. If the cashbox is out of the farebox for longer than three minutes (programmable), an alarm is automatically uploaded to Genfare Link during data transfer. The alarm indicates the time of occurrence, the length of time between cashbox removal and data transfer, and the amount of money then in the cashbox.

Cashbox full alarm. When either the coin or bill compartments of the cashbox reaches a predetermined percentage of capacity, a message appears on the OCU display and the farebox disables the coin or bill acceptor, as appropriate. The remaining acceptor will continue to function, and transactions may continue to be processed. Once the cashbox is extracted, the coin and bill compartment registers are automatically set back to zero.

3.9.3 Revenue Transfer and Collection Equipment

3.9.3.1 Overview

Genfare revenue transfer equipment has been the industry standard for more than 40 years and has shown itself to be an efficient, economical, and secure means of transferring farebox cash. In normal operation, cash is never exposed from the time it is inserted in the cashbox by the passenger until it is removed from the mobile bin in the counting room.

Genfare vaults are exceptionally durable and secure, capable of operating reliably for 15 years before requiring mid-life rehabilitation. Some agencies have been able to keep their vaults in service for decades. Vault operation is smooth; jams and other malfunctions are rare. Genfare has never had a report of a successful vault break-in.



Figure 67. Dualport revenue collection vault

The Genfare revenue collection system consists of the following components:

- **Vault housing.** A permanently installed, secure, weather resistant housing for the mobile bin
- **Cashbox receiver.** Mounted atop the vault housing, which accepts a cashbox and permits its contents to be emptied into the mobile bin in a secure manner
- **Mobile bin.** Once locked inside the vault housing, the bin accepts the emptied cash and stores it in dual compartments, one for coins/tokens and one for bills/tickets. The bin can be removed from the vault structure only in a closed and locked condition. The bin is then transported to a counting room or bank where its contents can be removed and counted. The bin has a capacity of 10,000 bills and \$10,000 in mixed coins. It is equipped with an electronic ID module to enable tracking of which cashboxes were emptied into each bin to facilitate auditing. Bin removals and installations are also tracked as security events.

- **Cashbox transport cart.** Enables DTPW personnel to transport up to 12 fully loaded cashboxes between the garage and the counting facility
- **Portable data unit (PDU).** Allows DTPW personnel to collect data from a farebox in the field or other location that is unable to transfer data using an infrared probe or Wi-Fi data transfer at the garage. The PDU will transfer the data collected to Genfare Link in real time provided connectivity or via Wi-Fi when they are returned to the garage.

The revenue collection equipment to be provided incorporates two recent enhancements:

- **Battery-free cashbox ID.** The cashbox receiver is equipped with an electronic cashbox identification (CBID) system that does not require the use of batteries, reducing the need for maintenance. Instead, the receiver beams light energy to the cashbox, energizing a transponder that sends back the CBID number via infrared. Substantial maintenance savings are realized with this improvement.
- **Electronic timer.** In contrast to previous generation receivers, which used vacuum-based timers, the receivers to be supplied for this procurement use an electronic timer to control the minimum amount of time the cashbox receiver remains in the emptying position to ensure complete discharge of revenue. The electronic timer allows precise control and does not need to be adjusted based on weather conditions. DTPW will realize additional savings from the reduced maintenance requirement for this item.

3.9.3.2 Cashbox Receiver and Vault Housing

Physical Design

The cashbox receiver is mounted on top of the vault structure and is provided with a heavy-duty interlocked door. Once closed, the door is locked with a crank that starts revenue transfer and remains locked until the process is complete. If the door is not closed, the crank is inoperative. The locked cashbox is inserted into the receiver for revenue transfer in a unique correct position (upside down). Once the door is closed and locked, an internal mechanism opens the cashbox and securely transfers the contents into the mobile bin. At no time is the interior of the cashbox or the mobile bin visible or accessible by unauthorized means.

The receiver and vault housing are of sturdy construction and will withstand a force of 500 pounds for one minute on any point without permanent distortion, breakage, or other security breach. The receiver can operate at least 10,000 cycles between failures or malfunctions provided Genfare maintenance procedures are followed. All elements of the receiver are self-contained and integral to it. No loose keys are used. All engagements and alignments are positive and automatic. The design of the system is such that wear and tolerance buildup will not cause misalignment or other problems that will cause operation of the receiver to deteriorate.

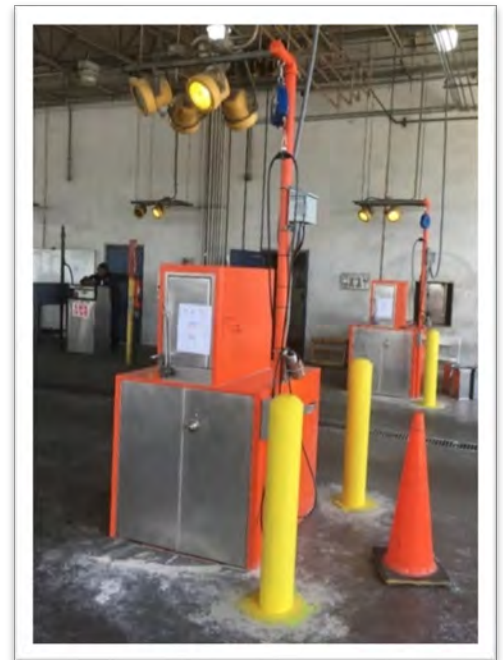


Figure 68. Typical installation of mobile vault

All components of the vault are solidly constructed. They are made of non-corroding or plated materials or, where cold rolled steel is used, are cleaned, prepared, and painted with weather resistant enamel. The front surface, door and interior of the receiver are made of stainless steel for protection against corrosion and wear.

The receiver is designed to maintain separation between coins and bills. During the revenue transfer process, coins from the cashbox empty into the coin compartment of the mobile bin, while bills empty into the bill compartment. The receiver door is provided with hardware to permit installation of a hasp lock. The receiver is equipped with a locking device to restrain the operating crank when the receiver is not in use.

A typical vault installation using mobile bins is shown in figure 68.

Operation

The receiver functions in the following manner. When the receiver door is open, the receiver mechanism and operating crank will not operate. Once the receiver door is closed, the operator begins turning the receiver crank, causing the receiver door to lock. The crank cannot be reversed once the operator has begun turning it. The cashbox opens and emptying takes place only after the crank has been fully turned.

At this point, an electronically controlled time delay is actuated to afford complete gravity discharge of the cashbox contents. The time delay is factory set for ten seconds and is field settable for five to 15 seconds. Meanwhile, a mechanical device shakes the cashbox to ensure that all the contents have been discharged. At the completion of the time delay, the interlock releases, permitting the crank to be turned in the reverse direction to close the cashbox. When the cashbox is completely closed, the remaining interlocks release and unlock the door, permitting the cashbox to be removed. The complete cashbox revenue transfer process takes no more than ten seconds in addition to the time delay described above.

Indicators are provided adjacent to the receiver door to signify a ready condition and a process condition. These indicators are patches of color that appear in a small window. The indicators do not require electricity and will operate even in the event of power failure. In the ready (green) condition, the door may be opened, and a cashbox may be inserted or withdrawn. In the process (red) condition, the door is locked, and revenue transfer is taking place. The door remains locked until the "ready" indication is visible again.

Inside the receiver, a mechanical five-digit counter viewable from the front when the receiver is open is provided to indicate the number of revenue transfer cycles the receiver has completed. This counter is not resettable from the outside.

The receiver is fitted with a cashbox ID transceiver to automatically read the electronic serial identification number of an inserted cashbox. When revenue transfer begins, the cashbox ID, time, and date are automatically reported to the NMS to facilitate revenue tracking.

Vault Housing

The vault housing is solidly constructed to resist unauthorized entry. It is made of one-eighth inch (1/8") steel plate, welded and ground to prevent unauthorized access, with no exposed bolt heads, nuts, or sharp edges. The door for the cashbox receiver is approximately 48 inches from the bottom of the vault for ease of cashbox insertion. The interior of the vault has guide rails/plates made of wear-resistant

steel to guide and position the mobile bin upon insertion or removal. The overall dimensional envelope of the vault, including receiver, is 66 inches high by 38 inches wide by 41 inches deep.

The vault housing can be attached permanently to a concrete pad or floor by anchor bolts. When the front door of the vault is closed, the bolt heads are not accessible. The vault is fitted with mechanical interlocks to sense the presence of a properly seated and open mobile bin. If the interlocks are not satisfied, the receiver cannot accept and process a cashbox. The interior of the vault has guides to properly position the mobile bin. The bottom of the vault is reinforced so that a forklift may hoist the structure without damaging it.

The receiver and vault housing open from the same side. Revenue transfer from the cashbox to the mobile bin begins only when all the following requirements are met:

- The mobile bin is in position and properly seated and locked within the vault housing;
- The mobile bin's cash inlet ports are fully open and ready to accept revenue (cash inlet doors will not open unless condition #1 is met); and
- The cashbox has been properly inserted into the cashbox receiver and the receiver door is closed and locked.

Once revenue transfer has started, a full transfer cycle must be completed before the cashbox can be removed. The receiver door will not lock, nor will the transfer crank operate without a properly inserted cashbox.

When a bin is being placed in the vault, the vault housing doors will not lock closed unless the bin is properly positioned. The bin's coin and bill inlet ports cannot be opened until the doors are locked. The bin is removable from the vault housing only after its cash inlet doors are securely closed and locked. The vault doors may be closed without the presence of a bin; however, in this case revenue transfer from the receiver is prevented.

When a receiver malfunction occurs, the receiver remains secure except for access by authorized personnel. The receiver cabinet can be opened to permit access to the receiver mechanism; if necessary, the mechanism can be removed in its entirety. The receiver cabinet is secured with high security locks. All locks are keyed alike and use keys different from those employed elsewhere in the fare collection system. Genfare will make replacement keys available for the life of the system.

When the mobile bin is in place and ready to accept revenue and the cashbox receiver door is open, it is not possible to gain access to the bin contents by fishing or other means.

The mobile bin ID number is read continuously the entire time the bin is inserted in the vault. This number is transmitted to Genfare Link to permit positive tracking of transferred revenue. If a bin is inserted in a vault and the vault cannot read the ID number, an alarm is generated and reported to Genfare Link.

3.9.3.3 Mobile Vaults / Bins

The mobile bin is configured with two separate interior compartments, one for coins and tokens and the other for U.S. bills and tickets. During the revenue transfer process, the coins and tokens from the cashbox go into the coin compartment while the bills remain separated from coins and go into the bills compartment.



Figure 69. Mobile bin in vault housing

The mobile bin has two large revenue discharge doors, one for coins and one for bills. Each door is secured by a high-quality security lock. Coins are discharged from the bin by gravity using sloped stainless steel bottom surfaces to aid in the process. Revenue discharge doors and openings are securely designed to prevent exposure of revenue except when opened in an authorized manner.

The mobile bin has maximum capacity of \$10,000 in street money bills and a total of \$10,000 in coins. The agency can configure a full capacity threshold that triggers when a bin pickup should be arranged. By default, this is set to \$20,000 and some agencies use this setting. The full capacity threshold is configurable in Genfare Link allowing the agency's finance team to determine the best setting for their operation. The higher the full capacity is set, the less often agency personnel need to remove and replace the bin.

All mobile bins provided under this contract will be identical in manufacture and dimensions and are interchangeable between any cashbox receivers and vault housing.

Mobile bins are equipped with wheels to allow them to be rolled easily to the money room and dead man brakes prevent the units from moving when not actively being used. A demonstration of the heavy-duty braking system developed by a Genfare supplier for transit agencies in Los Angeles and San Francisco can be [viewed here](#).



Figure 70. Bin braking system test w/brake handle inset

3.9.3.4 Cashbox Transport Cart

Genfare will provide DTPW with 12 cashbox transport carts (CTCs) to transport fully loaded cashboxes between the garage and the counting facility. Each CTC has capacity to carry 12 cashboxes. The CTC is designed for rollout or forklift operation and has the same overall dimensions as the mobile vault. Authorized DTPW personnel can securely lock the cashboxes into the CTC to prevent unauthorized removal. Genfare will provide fully dimensioned scale drawings of the CTC showing views for each side and with the doors and covers both opened and closed.

3.9.3.5 Data Collection Operations

Genfare Link, which serves as both the farebox backend system (FBS) and monitoring and alerting system (MAS), governs the collection of data from the fareboxes and cashbox receivers.

The Fast Fare 25 is designed to connect over the air to Genfare Link by a Wi-Fi, cellular, or wireless LAN connection. Bidirectional data transfer can occur on an ongoing basis with revenue and transactional information moving from the farebox to Genfare Link and operational updates moving from Genfare Link to the farebox. This bi-directional data transfer can be accomplished with an IR probe as a backup process.

The standard information to be transmitted by the farebox and received and stored by Genfare Link includes all data accumulated since its last data transfer or physical probing, such as:

- All transaction level data
- The date and time of probing
- The bus number and farebox number
- The stored operator badge numbers
- The stored block numbers and route numbers
- The cumulative number of times the farebox has exchanged data with Genfare Link
- The date and time of the last six data exchanges, including exchange method
- The data and time of the cashbox removal from the farebox
- The revenue totals, resettable and non-resettable
- Bill, coin, fares manually entered by the operator (tallies record).
- Selective registration of fares (e.g., key categories 1-9)
- Cashbox number
- All alarms activated, with the date and time alarms were activated.
- Any other information may be required to produce the specified reports

When the data is transmitted from the farebox to Genfare Link, it is buffered in memory, checked for validity, and stored. It can then be forwarded to the fare collection application, when available, via an interface/integration.

Genfare Link will download into the farebox memory new fares for the presets and associated push-button values and the serial numbers each time a data transfer occurs or the farebox is probed.

Upon successful uploading and downloading of all data to and from Genfare Link, the cash box access door can be opened to permit removal and vaulting of the cashbox. While DTPW requirements indicate that a probe be utilized for the purposes of unlocking and opening cashbox access door, Genfare recommends using a smart card tap instead, with the IR probe process available as a backup. Smart card access to the cashbox door is faster, reducing the time needed to vault the cashbox while remaining equally secure.

As requested, Genfare will present this alternative method of opening the cashbox access door, which provides the same or better security and access control as the physical probe, for review and approval during design reviews.

3.9.3.6 Portable Data Unit

Genfare will provide DTPW with the requested number of Portable Data Units (PDUs) to allow agency personnel to extract data from any farebox that is unable to transfer data using the data probe installed at the garage. Once the data is collected from the farebox, the PDU can transfer the data to Genfare Link when connected to the agency network via Wi-Fi. The secure data storage and transfer technology the PDU leverages will be presented at the conceptual design review and approved at final design review by DTPW/ITD.

The PDU uses the same security approach for uploading and downloading data to/from the farebox that is used in the garage. The PDU extracts all stored transaction and event data from a single farebox in not more than 25 seconds and stores the information in unique file(s) on the PDU hard drive. As a default, each time the PDU is used to probe a farebox, the farebox data is reset once the data exchange with the PDU has been successfully completed. Probing a farebox with a PDU will also transfer any new or updated farebox operating programs or rules in a similar fashion to the garage probing equipment.

Following successful probing, a security key is validated between the PDU and the farebox, and if valid allows the unlocking of the revenue door on the farebox so cashbox vaulting can be completed. Unlocking of the revenue door may occur only after successful communication between the farebox and the probe.

The PDU causes the farebox to increment the non-resettable PDU counter each time the PDU is used to download the farebox data. A similar register is provided to indicate the number of times that the PDU has been used to read data from a farebox. An event record, which includes data and time, is also stored in the farebox each time the PDU is used to download farebox data. A similar event record is generated at the PDU each time it is used to read data from a farebox.

Genfare will provide fully dimensioned scale drawings of the PDU showing all displays, slots, controls, and interfaces to DTPW for approval during design reviews.



Figure 71. Portable data unit

3.9.3.7 Operator Training Farebox Systems

To facilitate operator training courses for DTPW, Genfare will provide complete farebox installations that can be easily moved between classrooms and can be powered using standard 120VAC. Each farebox training unit will contain:

- ***A complete farebox and OCU system in a stand-alone configuration.*** The OCU will be mounted directly to the farebox to permit easy adjustments and use by instructors and trainees.
- ***A power supply to convert 120VAC to 12VDC,*** with sufficient power capacity to supply the farebox and OCU. The power supply will be equipped with an easy-to-reach on/off switch, and all cables connecting to the farebox will be neat and securely fastened.
- ***A stable platform onto which the farebox, OCU, and power supply are mounted.*** The platform will be equipped with four steerable casters and have a sufficient wheelbase to resist tipping while the training unit is being moved.

3.9.4 Tools and Gauges

The Fast Fare 25 does not require any special tools or gauges to maintain it. Should that ever change in the future, Genfare will provide DTPW with six sets of the special tools and gauges needed for maintenance of the farebox's coin and bill acceptor units within 14 days of completion of the farebox installation. Genfare will provide a list of suggested suppliers for all special tools and gauges for approval by DTPW.

3.9.5 Farebox Software

All software for the farebox and supporting systems are in conformance with DTPW's Technology Model (Exhibit B) and/or Cloud Computing Policies (Exhibit C).

3.9.6 Secure Automatic Revenue Audit Trail

The Genfare fare collection system provides a secure revenue audit trail to enable positive tracking of cash from the time it is inserted in the farebox until it is received in the central counting facility. The revenue audit trail works in the following manner:

- *Each cashbox is equipped with an electronic cashbox ID number*, which is automatically read and recorded by the farebox upon insertion.
- *The farebox automatically records all revenue deposited in the cashbox*, and periodically uploads this and other transaction information to Genfare Link during routine probing.
- *The cashbox cannot be removed from the farebox until it is closed and locked*. Once removed from the farebox, it cannot be opened until it is placed in the vault receiver for revenue transfer.
- *The receiver reads the cashbox's electronic ID number* when the cashbox is placed in the vault receiver and transmits it to Genfare Link.
- *The receiver opens the inserted cashbox* and allows the contents to empty into a mobile bin.
- *The vault receiver reads the serial number of the mobile bin* and transmits it to Genfare Link.
- *Revenue service personnel remove the bin* from from the vault when it is full and transport it to the money room for emptying and counting of the inserted cash.

By recording: (1) the amount of money deposited in each cashbox and (2) which cashboxes are deposited into which mobile bins, Genfare Link will compute the amount of money that should be in each bin delivered to the counting room. This can be compared to the amount in the bin as determined by actual count. In this manner the system provides positive tracking of revenue from farebox to vault to counting room.

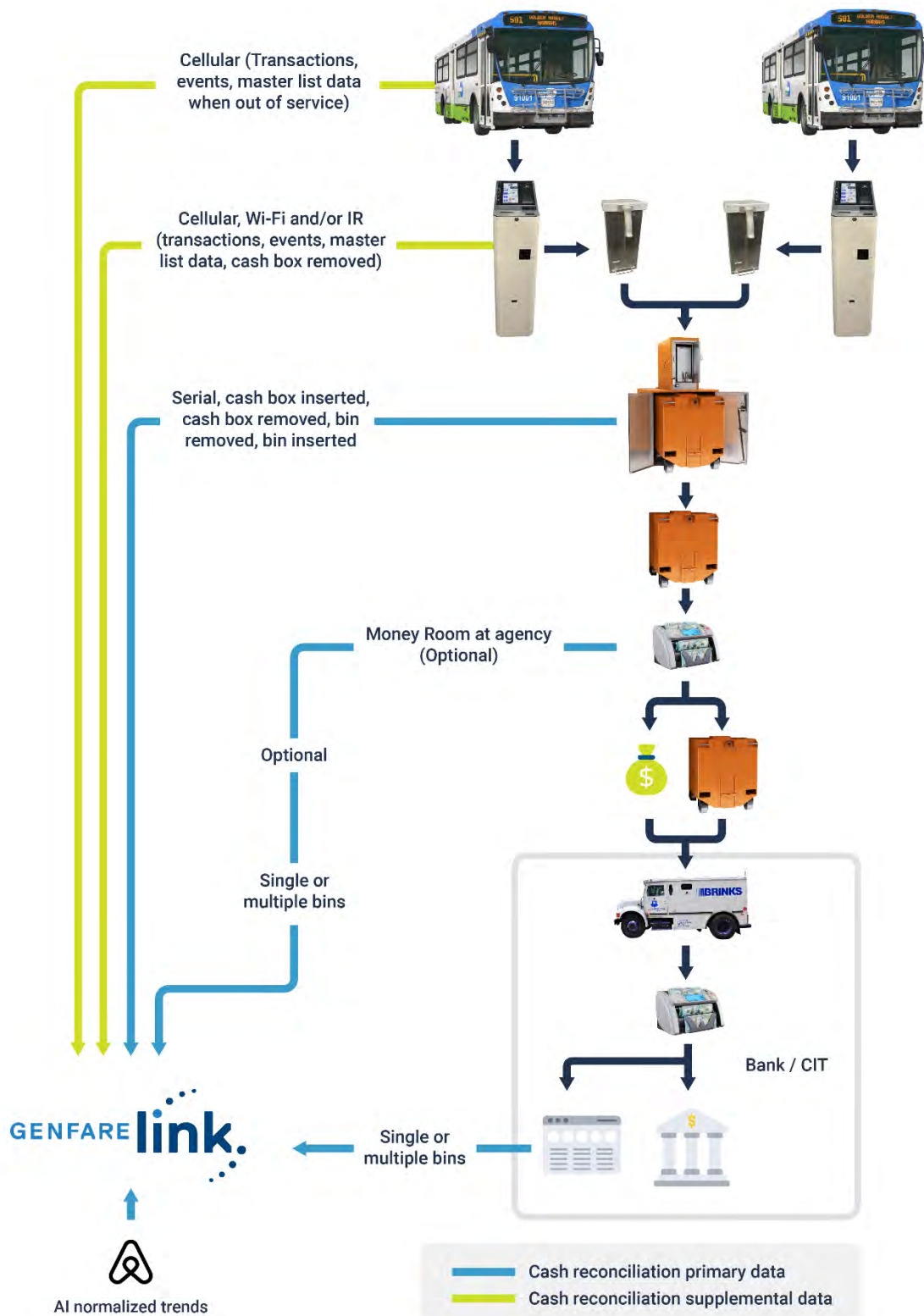


Figure 72. Automatic revenue trail

3.9.7 Farebox Self-Test and Diagnostics

The Fast Fare 25 automatically tests all components and functions on every power up. Errors detected during this self-test function are recorded in the farebox's transactional data and displayed to the operator on the OCU display. The performance of the farebox is continuously monitored during operation, and all errors, exceptions, anomalies, and other items required by DTPW are recorded in the farebox transactional data reported to the operator on the OCU.

3.9.8 Local Area Networks

All fare collection equipment within a rail station or garage, or onboard a bus, will be connected through a Local Area Network (LAN). The Fast Fare 25 is also capable of connecting via Wi-Fi to a DTPW provided network. Required data exchange with Genfare Link will be over these networks. Genfare requires a connection to the Internet and TCP/IP traffic over port 443. Genfare will assist DTPW in ensuring all fare collection equipment is able to communicate with Genfare Link in accordance with DTPW's security protocols.

3.10 Integrations

Genfare believes in providing its agency partners with open systems to enable them to interface with other specialized hardware or software solutions to enhance their fare collection system.

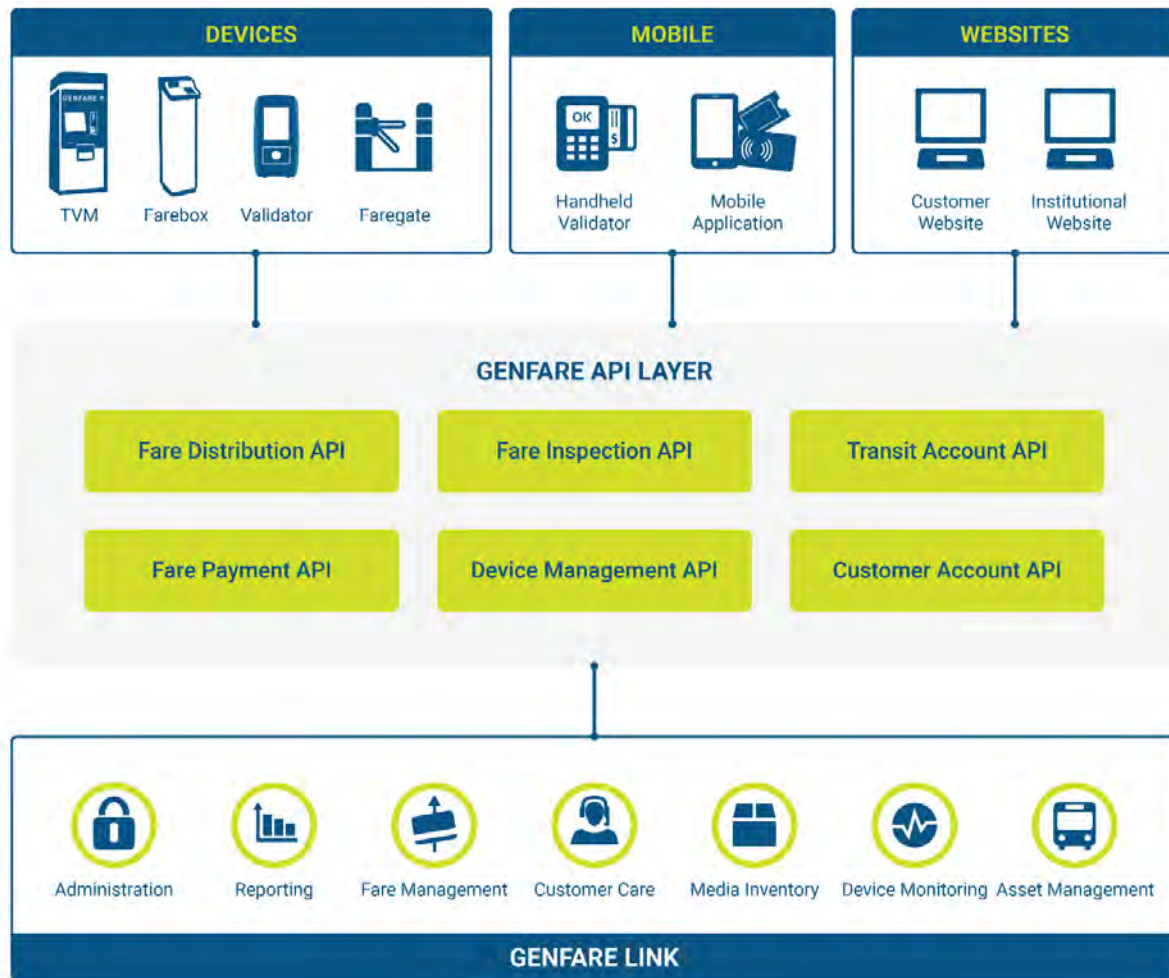


Figure 73. Open architecture

Genfare Link is built with a robust set of APIs. A unique attribute of Genfare's APIs is that they are used by Genfare's hardware and software, so they are constantly updated and maintained. The APIs are built using a RESTful model with JSON message and response types.

As depicted in the figure above, the Genfare API layer combines like functions together. For the scope of this procurement, the Fare Distribution, Fare Payment, Fare Inspection, and Device Management APIs would be leveraged. Should DTPW choose to enable the account-based processing features of Genfare Link later, the Transit Account and Customer Account APIs can be utilized.

The Fare Distribution, Fare Payment, and Fare Inspection APIs enable the fare structure, products, and validation rules to be shared from Genfare Link down to the devices. The devices also use these APIs to share results of inspection events back to Genfare Link. The Device Management APIs provide the configuration to fare collection devices and enable the equipment to report status back to Genfare Link.

These APIs can also be leveraged by a third party to modify parameters and configurations within Genfare Link, which will subsequently be sent down to the devices. In a similar manner, a third party could leverage these APIs to fetch the fare collection events and equipment status from Genfare Link and duplicate them in its own system.

Genfare recommends DTPW follow this pattern of integration, where Genfare Link is managed by the third-party system and the field equipment continues to communicate with Genfare Link. This method provides DTPW with flexibility to change fare collection applications in the future without having to interact with all pieces of fare collection equipment. Additionally, this method has a built-in backup, so if the fare collection application or the integration to that application fails for any reason, the data is still available in Genfare Link. This means DTPW can view event records, modify equipment configuration, and react to equipment issues from Genfare Link until the integration is restored.

Genfare uses APIs in a variety of ways today. Genfare has worked with several agencies and outside vendors to support different mobile ticketing applications, on demand service, and data aggregators with its APIs. In most cases, existing API documentation is sufficient to enable the vendor to connect to Genfare Link, but if there are any issues, Genfare provides the vendor a point of contact for any technical questions. Genfare also provides vendors with access to the agency's testing environment and supports the agency and vendor through the development and testing process to ensure the solution works as desired before moving to production.

While Genfare is happy to work with DTPW and the vendors of their choice, to ensure the security of the system for DTPW and our agency partners, Genfare does require vendors to enter into an API agreement and sign an NDA.

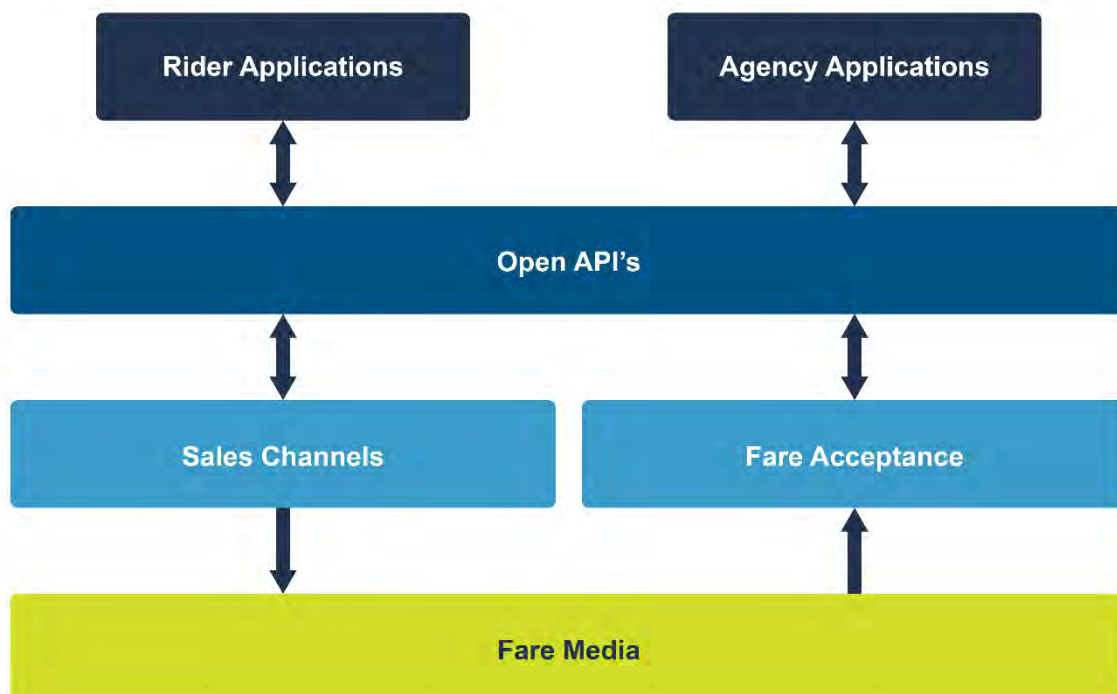


Figure 74. High-level API data flow

3.11 Fare Equipment Locking Methodology

All the proposed fare collection equipment has secure locking mechanisms.

Fast Fare 25 farebox

The farebox lid is secured with a high security key, different than common house keys. Inside the farebox, the bill transport is secured with a different key to protect revenue in the cashbox, which is potentially exposed after removing the bill transport. The cashbox door is fitted with an electronic lock that permits the door to open only when a smart card is tapped on the reader by authorized personnel or when an unlock code is sent to the farebox following data transfer with an infrared (IR) probe.

The Fast Fare 25 has a unique lock code that is programmed into the farebox during the data transfer process. Once a farebox has received the unique lock code, a matching smart card with the unlock passcode can be scanned on the smart card target of the farebox to activate the electronic lock's function. The Fast Fare 25 has a multi-point locking bar, improving the security of the cashbox while in revenue service.

Closing the door and holding it in the closed position for 2-3 seconds causes the electronic lock mechanism to engage the locking pins and secure the door. If the door is slammed, with rebound, the mechanism will not engage.

Cashbox

The cashbox is provided with a high-security lock and cannot be removed from the farebox except in a closed and locked condition, making it impossible to gain access to revenue during revenue transfer. A high-security magnetic key is required to open the cashbox.

Vault housing

The vault housing is locked with a separate high security key, different than the other keys in the system. The mobile bin has yet another high security key for locking. This system of different keys allows DTPW to keep revenue secure from the insertion of the currency into the farebox until it is removed and counted.

Vendstar 5 ticket vending machine

The TVM employs an electronic lock, which is sealed against the elements preventing possible moisture related failures. The lock includes a lockout penalty after repeated incorrect passwords to deter unauthorized access. The locking mechanism includes logic to automatically relock itself to prevent the Vendstar 5 from unintentionally being left in an unlocked position. It also uses a multipoint latching method, further protecting the internal contents from external attempts to break into the machine.

In addition, the Vendstar 5 employs multiple security features, such as a networked customer-facing camera with local storage capabilities to support the monitoring of the device including revenue service operations as well as an intrusion alarm to alert the agency when unauthorized access is achieved. (See also [section 3.8.7.](#))

Faregates

Faregate cabinets will be secured with a uniquely keyed locking access door, complete with the required quantity of keys defined in the specification. The faregate's internal mechanisms and electronics/wiring cannot be accessed without the key.

A 'door open' sensor will track every time that the faregate is opened and closed, and this will be reported to the transit system operations team electronically. The sensor will also detect and issue a signal/report if a faregate access door is accidentally left unlocked or open.

3.12 Information Technology Matrix

Genfare has completed Attachment G, Information Technology Security Matrix, and included it as an [appendix](#).

3.13 PCI Compliance

Genfare's expertise in PCI solutions is well-established. We are currently certified with PCI-P2PE for our open payment solution, a certification obtained in collaboration with NMI. In addition to this, our upcoming Vendstar 5 platform is set to secure PCI-P2PE certification through NMI, a distinguished provider of P2PE (point to point encryption) solutions that also possesses PCI-KIF certification.

We are committed to delivering an end-to-end certification process, scheduled for completion by Q2 2024, encompassing both PCI-P2PE and PCI-KIF certifications. This commitment underscores our dedication to upholding the highest data security and compliance standards.

The scope of this RFP does not include any internet-based purchases, so all purchase transactions will be routed directly to DTPW's payment processor, Elavon. Should DTPW add portions of Genfare Link that allow for internet-based purchases, we would recommend leveraging the same payment connection to Elavon. However, given the options DTPW has outlined in Attachment F, we would need to leverage a DTPW-provided interface if a direct connection to Elavon is not permissible. We would still expect a RESTful API experience. If DTPW does choose to enable internet-based purchases from Genfare Link, Genfare would work with DTPW to design the best solution for DTPW and its riders.

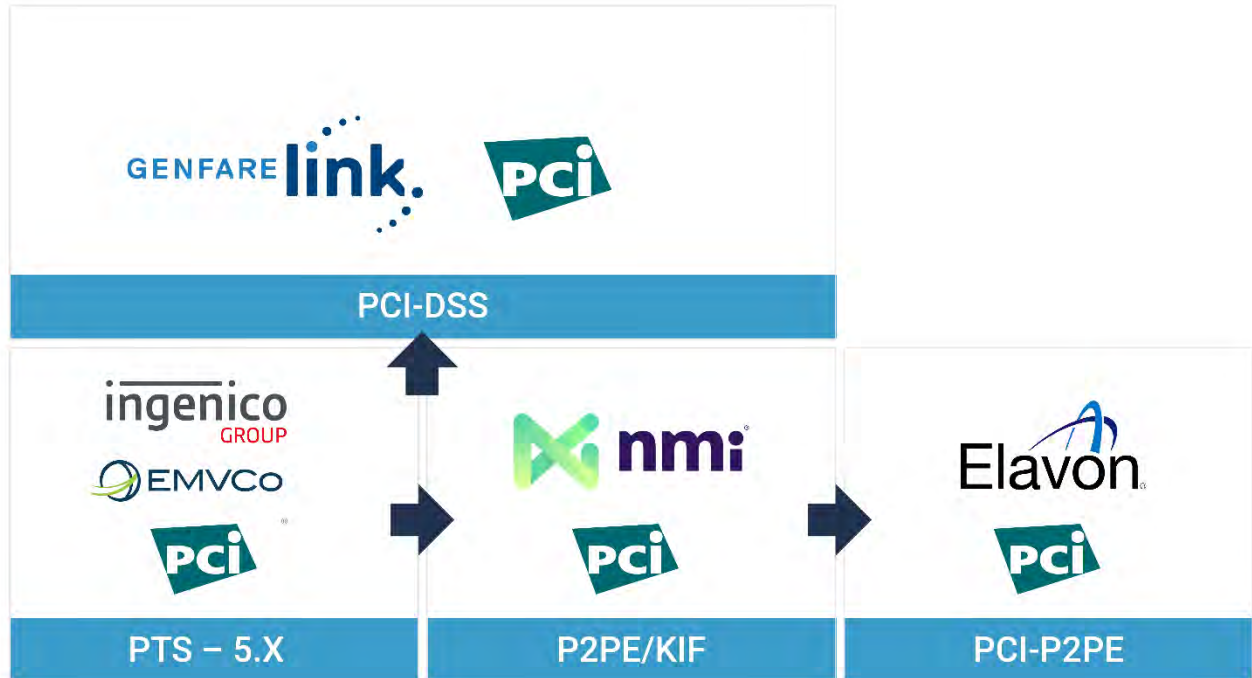


Figure 75. PCI compliance

3.14 Interoperability

Genfare Link, Genfare’s cloud-based back-office solution, is built with a robust set of APIs. Unlike other software solutions, the Genfare APIs are used by Genfare’s hardware and software, so they are constantly updated and maintained. The APIs leverage a RESTful model with JSON message and response types.

Genfare uses APIs in a variety of ways today. Genfare has worked with several agencies and outside vendors to support different mobile ticketing applications, on-demand service, and data aggregators with its APIs. In most cases, the API documentation is sufficient to enable the vendor to connect to Genfare Link. However, Genfare also provides the vendor with a point of contact for any technical questions regarding integration. Genfare provides vendors with access to the agency’s testing environment and supports the agency and vendor through the development and testing process to ensure the solution works as desired before moving to production.

While Genfare is happy to work with Miami and the vendors of their choice, to ensure the security of the system, for Miami and all our agency partners, Genfare does require the vendors to enter into an API agreement and sign an NDA.

Genfare has integrated its hardware to several other fare collection vendors. We have integrated with a Conduent fare collection system with our gates in Cleveland and with our fareboxes for SEPTA in Philadelphia. Our fareboxes have been integrated with a Cubic back office in several locations, including Miami, but most recently with WMATA in Washington, D.C.

Genfare has integrated our software into other vendors for a variety of purposes. Genfare Link has been integrated with software from Unwire, Token, Moovit, Moovel, Cubic, and Avail in several agencies across North America.

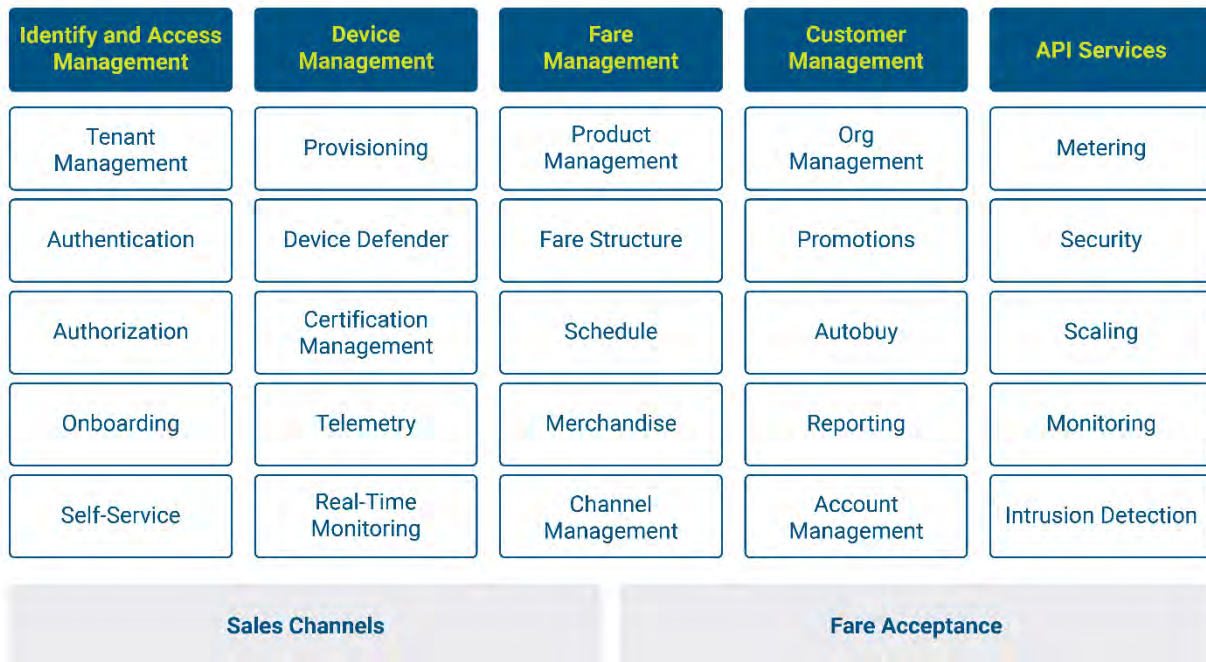


Figure 76. API layer details

3.15 Proprietary Components

The proposed fare collection equipment is designed to be able to interface to any back-office system Miami chooses. This integration can be achieved either through a Genfare Link API integration or a direct integration between the hardware and the back office. The Genfare Link API is fully featured and can be used to completely configure the system's hardware and get data of transactions performed. Each hardware type proposed uses a similar computing environment to simplify the process of installing custom firmware on the hardware if desired.

Individual components designed to recognize coins or bills or accept credit cards have proprietary firmware that cannot be easily re-written by a third party. This ensures the security of the revenue portions of the system. While non-revenue components could be sourced from providers outside of Genfare, sourcing from Genfare ensures the components will work with the system.

3.16 Value-Added Features

Each piece of the fare collection equipment Genfare offers in this proposal has value-added features that exceed the requirements requested and result in enhanced operations, easier maintenance, and reduced cost for DTPW while providing riders the utmost in convenience, equitability, and ease of use.

All the hardware and software proposed includes open architecture to facilitate integration with other systems and is fully proven as a fare collection system in revenue service today.

While not required for this procurement, Genfare is proud to offer equipment that is fully Buy America compliant with 100% US sourced steel. This offers DTPW the flexibility to leverage federal funds to purchase more of the same equipment if needed in the future.

3.16.1 Fast Fare 25 Farebox

The Fast Fare 25 has several key features to help DTPW optimize their operations and reduce the cost of cash collection. Operationally, the Fast Fare 25 is very similar to the Odyssey fareboxes DTPW currently uses. DTPW maintenance staff will find that the components inside are familiar to them, even if there are slight differences. The Fast Fare 25 has the same footprint as the Odyssey farebox, so DTPW can be sure it will fit on any bus that the Odyssey is currently installed on. DTPW's operators will also appreciate the familiar operation of the farebox, so they can focus on the road and not need to worry about the farebox operation.

3.16.1.1 Connectivity Improvements

The connectivity of the Fast Fare 25 is far superior to its predecessors, resulting in several key benefits. The Fast Fare 25:

- **Is registered via Amazon Web Services (AWS)** at the time of manufacture, allowing DTPW staff to configure their new farebox before it arrives. Upon installation, each farebox connects to Genfare Link, downloads the relevant configuration, and is immediately ready for revenue operation.
- **Leverages a plug-in modular design** that simplifies migration to future technology innovations.
- **Integrates with any onboard equipment** over two externally available Ethernet ports and via the ITxPT communication protocol, simplifying onboard communication between devices of all types.

3.16.1.2 Real-time Data Transfer and Communication

Because of the improved connectivity of the Fast Fare 25, data transfer between the farebox and Genfare Link can occur in near real-time while the bus is out on the street. The Fast Fare 25 has sufficient memory to withstand a loss of real-time communication and automatically continues data transfer when connectivity is re-established. This “always on” data transfer between Genfare Link and Fast Fare 25 reduces the need for data transfer in the garage.

3.16.1.3 Over-the-air (OTA) Firmware Updates

Over-the-air firmware updates protect the security of the fare collection system by ensuring the latest security patches and other updates are applied as soon as possible. Genfare will notify DTPW when a firmware update is available and DTPW can schedule the updates to occur at a convenient time based on its operations.

3.16.1.4 Health and Performance Monitoring

The Fast Fare 25 provides accurate, real-time information to maintenance dashboards in Genfare Link, allowing DTPW to plan maintenance activities, optimally manage parts inventory, and assign repair staff when needed.

3.16.1.5 Improved User Experience

The passenger display on the Fast Fare 25 is a large, full-color, touchscreen (7 inches, 800x480) that improves the fare payment flow for riders through iconography and ADA compliance. The result is a more intuitive experience to speed fare payments and reduce dwell time. DTPW can define the programmable buttons to further improve the rider experience.

The new touch screen has a heavy 4mm thick 6H rated glass cover which prevents scratches from most common objects, such as keys, coins, and knives. It is also resistant to scratches from sand and dust from regular cleaning tasks.

3.16.1.6 Operations Improvements

The Fast Fare 25 is equipped with a smart card reader to allow authorized personnel to open the cashbox door without the use of an IR probe. This enhancement reduces the time to access and vault the cashbox while maintaining the security of the vaulting process. The IR probe is available as a backup.

The process of vaulting cashboxes is further optimized by leveraging the information provided via wireless data transfer to determine if the amount of cash in the cashbox has reached an agency-determined amount that warrants vaulting. If the data transfer has been completed and indicates that a cashbox contains a small amount of revenue, the operator can skip the probing/vaulting lane and park the vehicle.

Bus	Cashbox ID	Last Probed Time	Last Vaulted Time	Revenue	Cashbox capacity	Coin Count	Coin Amount	Bills Amount
200	1353	08-11-2023 3:34 pm	05-22-2023 7:05 pm	\$406.15	135.24%	859	\$153.15	\$253.00
336	1238	08-14-2023 6:45 am	05-19-2023 9:09 am	\$385.25	128.23%	15	\$3.25	\$382.00
2202	1332	08-13-2023 11:05 pm	08-07-2023 10:25 pm	\$334.57	111.5%	274	\$61.57	\$273.00
4236	1264	08-13-2023 11:04 pm	08-08-2023 5:50 pm	\$295.44	98.46%	536	\$113.44	\$182.00
5522	1309	08-14-2023 4:54 am	08-12-2023 12:55 am	\$290.37	96.78%	181	\$33.37	\$257.00
4222	1034	03-06-2023 6:32 pm	02-27-2023 7:47 pm	\$279.21	93.04%	463	\$103.21	\$176.00
5520	1295	08-12-2023 2:16 pm	08-10-2023 7:13 pm	\$267.55	89.18%	111	\$24.55	\$243.00
6020	1157	08-13-2023 2:31 pm	08-11-2023 9:30 pm	\$260.04	86.67%	344	\$75.04	\$185.00
5503	1186	08-13-2023 7:08 am	08-11-2023 7:09 pm	\$258.30	86.09%	174	\$33.30	\$225.00
5506	1073	08-13-2023 3:11 pm	08-11-2023 4:06 pm	\$240.55	80.18%	135	\$34.55	\$206.00
5502	1331	08-13-2023 7:41 am	08-11-2023 6:20 pm	\$230.93	76.97%	150	\$32.93	\$198.00
4217	1061	08-14-2023 7:55 am	07-19-2023 11:32 am	\$208.82	69.54%	432	\$86.82	\$122.00
4230	1034	06-13-2023 5:22 am	02-27-2023 7:47 pm	\$203.27	67.75%	360	\$75.27	\$128.00
4147	1085	08-14-2023 5:32 am	08-11-2023 9:50 pm	\$200.11	66.68%	299	\$60.11	\$140.00

Figure 77. Cashbox revenue tracking dashboard to optimize vaulting operations

3.16.1.7 Expandability and Growth

The Fast Fare 25 meets DTPW's requirement for a cash and coin farebox, and can support a complete range of fare payment options as future needs change:

- **Smart card/open payment.** If DTPW chooses to implement a smart card system or open payment acceptance in the future, the Fast Fare 25 and the already-installed smart card/open payment reader can be configured to support either or both with no hardware upgrade required. Genfare has already achieved full EMV L3 certification with the hardware, allowing DTPW to accept contactless credit cards on the farebox immediately. For the new buses on the South Dade Transitway, this could be a welcome stop gap until the new fare collection application is operational.

- **Barcode reader and printer.** A barcode reader and printer can be added to the Fast Fare 25 in the future allowing riders to, for example, validate a transfer or barcoded day pass purchased at a TVM or on the farebox, or validate a barcoded mobile ticket. Thus, DTPW can expand validation options for riders without adding an external third-party validator. The printer can issue barcoded transfers to riders upon request or automatically as desired by DTPW.
- **Ruggedized tablet-based OCU.** Genfare offers an optional, ruggedized, tablet-based OCU that has the ability to extend integrations to other onboard systems, minimizing the number of screens for the operator or hosting third-party applications to reduce hardware. The ruggedized tablet-based OCU could be integrated with third party dispatch tools, CAD/AVL systems, and other applications as DTPW's needs evolve. By leveraging one device it would reduce the clutter in the operator's cab and enable them to better focus on driving the bus.
- **Upgraded RAM and CPU.** Genfare's Fast Fare 25 is equipped with more RAM, a more powerful CPU, and an improved operating system over its predecessor. The increased horsepower of the Fast Fare 25 provides DTPW with the peace of mind knowing that as its needs evolve, the hardware in place will be capable of integrating with external systems and continue to grow in functionality as DTPW's needs change. Additionally, the increased memory enables DTPW to store more transactions and records without the need to offload that information as frequently.
- **Communication capabilities.** Genfare's Fast Fare 25 equipped with both a larger screen and a stronger CPU, which enables DTPW greater flexibility in what is displayed on the customer screen while the farebox is sitting idle. In addition to displaying fare information, when not in use, the Fast Fare 25 can display information about planned service and fare changes, route detours or delays, public safety messages, and Amber Alerts.



Figure 78. Tablet-based OCU



Figure 79. Fast Fare 25 fully featured with open payment and barcode reader

3.16.2 Vendstar 5 Ticket Vending Machine

3.16.2.1 Fare Media Flexibility

As proposed, the Vendstar 5 will be configured with an extended use smart card dispenser as per DTPW's request. However, the Vendstar 5 can be configured with a dispenser that supports both extended use smart cards and limited use smart cards should DTPW require more media options in the future. This is a single encoder and dispenser fed by two cassettes of media with a picker motor. DTPW could offer single ride, round trip, and day passes via a printed barcode on receipt paper, three-day and week passes on a limited use card, and account cards with any product or value on extended use smart cards.

3.16.2.2 Maintenance Efficiency

The Vendstar 5 includes a fully integrated smart hopper. The smart hopper replaces conventional coin vaults, coin recirculators, and coin hoppers by combining these functions into one device. This integration results in a more compact TVM and reduces the risk of coin starvation, i.e., not having sufficient coins to provide riders with change or optimal change.

Additionally, by integrating all this functionality into one device, the device can intelligently monitor and adjust its fill levels to require fewer hopper replenishment runs to provide change to riders.

Lastly, having only one device reduces the space required for the smart hopper, and simplifies maintenance by enabling Genfare or DTPW staff to quickly swap out the smart hopper with a replacement should issues with the device arise rather than needing to maintain three separate units.

3.16.2.3 Mobile Account Integration

The Vendstar 5 can include a barcode scanner built into the front panel of the Vendstar 5. The barcode scanner enables DTPW riders to use the Vendstar 5 as a reload channel for their mobile wallet. The riders would present a mobile QR code to the ticket vending machine and the Vendstar 5 will quickly pull up the customers' relevant account information in a similar manner to how it would function using a smart card.

The QR code will enable cash preferred customers to add value or products to their mobile device to enable them the benefits of using an account versus paying with cash directly onboard the bus. This will facilitate benefits such as fare capping and bonus rides. The QR code top-up also enables DTPW to reduce its dwell time by offering additional means to pay with cash offboard.

3.16.2.4 Status indicator information

The status indicator located on the top of the ticket vending machine informs riders and DTPW staff at of the status of the machine before they approach it. Green, yellow, and red lights can be used to inform individuals from a distance whether the machine is fully operational.

DTPW staff may also retrieve this information within Genfare Link leveraging real-time system monitoring. However, the addition of the status indicator light will be more convenient, saving riders time from selecting which machine to use, especially if the next bus or train is quickly approaching.

3.16.2.5 Advertisements

When the Vendstar 5 is not in use, DTPW or approved third parties could display informational messages or advertisements on the 17" customer facing display. This additional revenue would enable DTPW to help fund its operations budget or could provide additional funding to provide equitable fare payment options to the community.

The customer facing display would simply need to be interacted with by touching touch screen, navigation pad, or smart card interaction to wake up the device to bring it back to normal ticket vending machine operations.

3.16.2.6 Safety and Security

The Vendstar 5 includes a rider facing camera. The Vendstar 5 can optionally be equipped with an emergency call button to alert the transit authority of an emergency so the agency can call the police or dispatch safety personnel to address the issue.

3.16.3 Faregates

The barcode reader, smart card reader, display, and computer provided in the faregates are the same as the ones in the Fast Fare 25. This reduces the number of different components that need to be stocked as spares and the amount of training required for DTPW staff to maintain the equipment. It also makes it easy to upgrade components in the future if needed.

The smart card reader proposed for the faregates can read closed loop smart cards issued by the transit agency as well as open loop contactless credit cards, either a physical bank card or virtualized card on a mobile device or wearable. Genfare has achieved full EMV L3 certification to accept contactless credit cards with this device, providing DTPW the ability to enable credit card acceptance on day one of the BRT system launch. Since DTPW is already able to accept contactless credit cards on the existing fleet, this will provide a seamless experience for the riders already utilizing that method of payment.

In the faregate, all drive units and gearbox are sealed from the outside environment from the incursion of dust particles thereby minimizing exposure to contaminants. This guarantees that installation in a rail transit environment where a train's ferrous disc brake dust is present won't penetrate the gearbox, and cause damage to the internal lubricants or bearings. (Ferrous materials are attracted to a faregate's earthgrounded metal housing).

The faregates proposed can detect the passenger type as the passenger moves through the gate in both directions. These can be tracked in Genfare Link to provide additional insights to DTPW about the passengers using their BRT and train services. Since the rider classification from barcoded or smart card media will also be tracked on each entry, DTPW could use this data to find instances that may be fraudulent, such as use of a reduced fare program, and take steps to verify and intervene. This data can also be useful to ensure platforms and stations are meeting the needs of the disabled; if certain stations seem to have lower wheelchair counts, DTPW could review those stations to ensure there aren't barriers to access for those in wheelchairs.

While the faregates being offered, in conjunction with Genfare Link, can be completely configured and managed remotely, they also have the ability to be controlled via an analog interface. This can be particularly useful in emergency situations where DTPW desires to move people through the gates as quickly as possible. A button can be installed in every station that when pressed, will immediately set the gates into an emergency open mode. Additionally, each gate or gate array can be managed locally via a hardwired cable if needed in the event of internet service disruptions.

3.16.4 South Florida Regional Transportation Authority App Integration

Genfare was recently selected as the preferred bidder for the SFRTA Tri-Rail regional mobile application project. The Tri-Rail project has a go live date of November 2024. The faregates and fareboxes proposed to DTPW can be configured with barcode readers that are capable of reading barcodes generated by new Tri-Rail mobile app on day one. This gives DTPW a working mobile application, simplifying the experience for riders whose trips include travel on both Tri-Rail and the South Dade Transitway BRT. Given the tight timelines for both projects, Genfare believes we are the only proposer who could offer this integration on launch day.

3.16.5 EQ Card

The EQ Card is a prepaid contactless Discover® debit card that can be used at any farebox or validator that accepts open payments. Riders may also use the EQ Card to make purchases anywhere that Discover cards are accepted.

The EQ Card is ideal for unbanked or underbanked riders and those who prefer not to use a credit card for transit. Because it allows parents or guardians to fund a shared account that all family members, it's a great option for households. This new card offering extends the convenience and benefits of open payment, such as fare capping, to the without stranding funds on a card that can only be used for transit.

Features of the EQ card include:



Figure 80. The EQ card

- Contactless, cash-reloadable Discover®-backed debit card that empowers equitable mobility
- Requires minimal know your customer (KYC) data
- Cards may be used to pay fares on board buses and for retail purchases
- Does not strand funds
- Reload at DTPW point-of-sale terminals for free, including the Vendstar 5
- Accepted on all fareboxes and validators to pay fares on any mode of transportation: BRT, MetroMover, bus, MetroRail (anywhere cEMV is accepted in network)
- Given there is no EASY card access on the BRT, the EQ Card provides an option that is accepted across the network

Genfare Experience



GENFARE 

MDC438

4. GENFARE EXPERIENCE

4.1 Genfare History

Genfare was founded as General Farebox, Inc. in 1980 and acquired by SPX in 1998. Genfare earned its reputation by developing innovative solutions using the latest technology to reduce fare processing costs, increase convenience for riders, and advance the transit mission.

Except for several satellite maintenance facilities, all Genfare activities are conducted at the company's headquarters at 800 Arthur Ave., Elk Grove Village, Illinois, 60007 near Chicago's O'Hare airport. Having a single office facilitates interaction between personnel from the production floor, business development, program management, quality assurance, and customer care. Because all 150 employees and dedicated contractors are based in a single facility, Genfare's team naturally takes a collaborative approach to deploying projects and troubleshooting issues, enabling an undivided focus on its customers.



Figure 81. Genfare's Chicago-area headquarters

Genfare is the leading provider of fare collection equipment in the U.S. and Canada, with more than 50,000 items of equipment in service at about 400 agencies of all sizes throughout North America. Genfare built more than 80% of the validating fareboxes currently in use in the U.S. and Canada. Every year, more than 3 billion transactions worth over \$5 billion are processed using Genfare equipment and systems.

Genfare systems are Buy America compliant, as all systems are built in our Illinois facility. Genfare is ISO 9001 certified, complying with international quality control in all aspects of its business.

More than 40 percent of Genfare employees are engineers and other technical personnel. Genfare also employs technicians to support remote maintenance sites. Several of Genfare's suppliers – including DBEs – are located near Genfare's facility, allowing close collaboration with its technical staff to ensure quality equipment and materials.

Genfare's facility includes CAD/CAM drafting, software and system test labs, and a modern production line. Software programming is performed by a staff of full-time programmers supplemented by specialized software consultants.

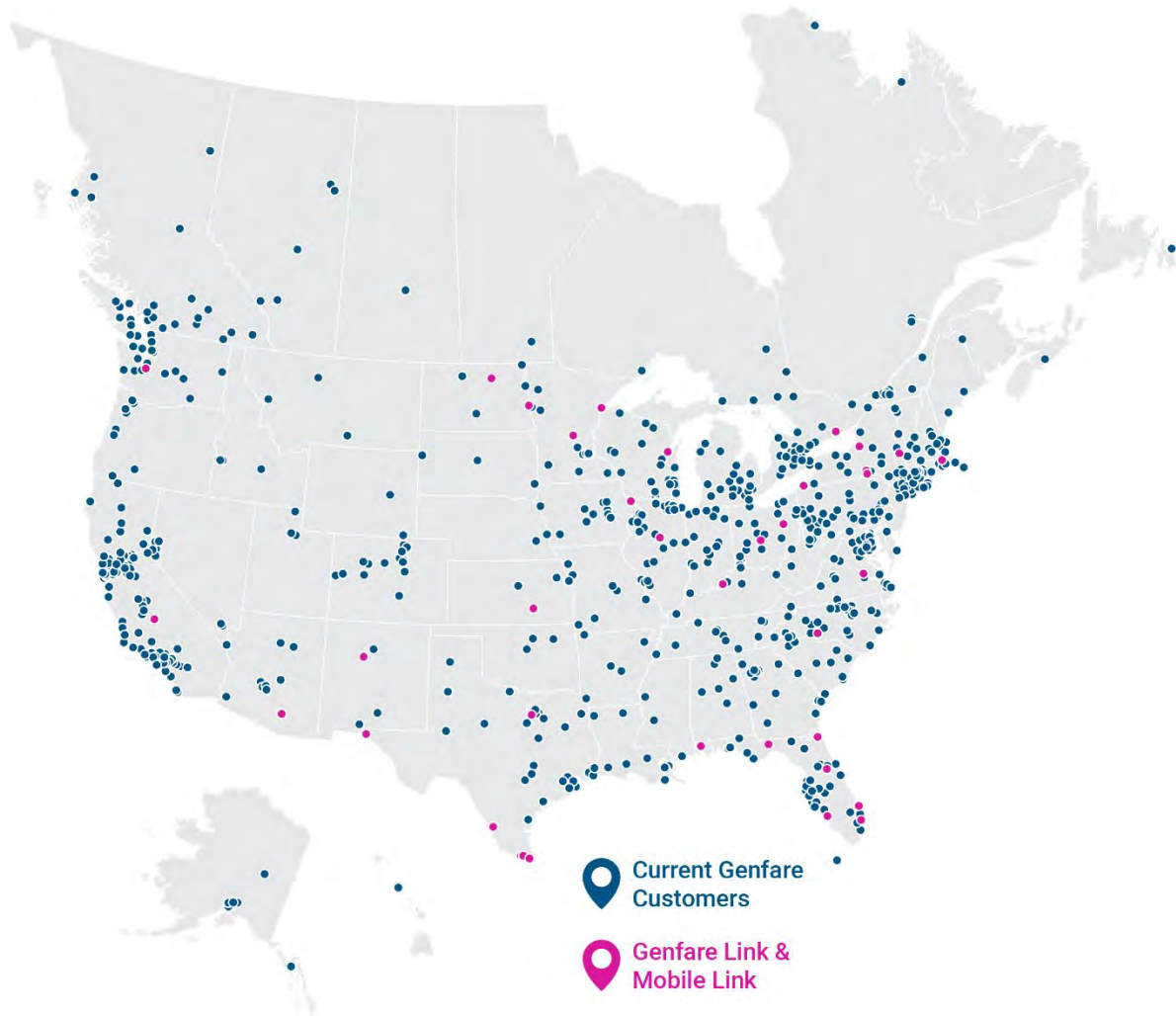


Figure 82. Genfare customers in the U.S. and Canada

Genfare has become a leading provider of fare collection services through Genfare Link, Genfare's software-as-a-service (SaaS) platform that provides fully integrated back-office support for Genfare field equipment and customer-facing services. It is the leading cloud-hosted fare processing platform in the U.S. with 50 instances in service or in various stages of implementation. Genfare Link provides agencies with several benefits compared to legacy on-premises systems such as housing all transaction, ridership, and device monitoring data in one place; ongoing hardware and software updates at no additional cost; and greater reliability with 99.9% availability.

4.2 Genfare's Transformation

To better support its customers in the evolving mobility landscape, Genfare has evolved beyond its long history as an industry-leading manufacturer of transit equipment to become a forward-looking and flexible provider of full-scale equitable mobility solutions. *We recently revised our mission to reflect our transformation: Genfare elevates public transit by building mobility solutions that simplify the rider experience, empower equity, and connect communities.* Learn more about our transformation by [watching this video](#).



Figure 83. Genfare transformation video

Leadership. Since March of 2019, when Eric Kaled came onboard as Genfare's president, Genfare's transformational journey from hardware manufacturer to solution provider has rapidly accelerated.

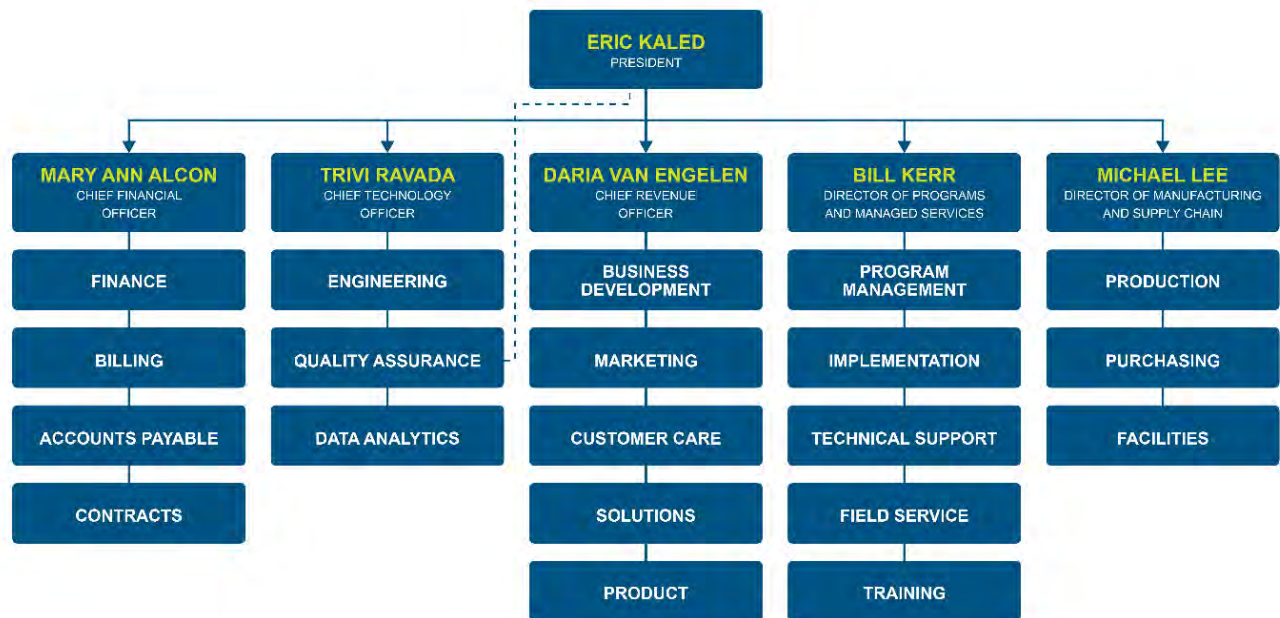


Figure 84. Genfare's leadership team

Genfare has made a number of changes internally that have yielded benefits for the agencies it serves. For DTPW, that means Genfare's process improvement efforts will ensure a more complete understanding of DTPW's needs by all customer facing personnel, an efficient implementation, and a smooth handoff to support teams following system acceptance.

Genfare has worked intentionally to build significantly more capacity into its post-installation support for clients. Genfare has expanded the breadth of services that are offered, including online training, online help libraries, transparency in service reporting, and much more. Genfare has also invested significantly in standardizing and streamlining implementations, hiring a new staff of program managers and veteran project administrators. System deployments are now managed through disciplined process

that begins before the RFP is issued, and continues through the definition of the solution, configuration, training, implementation, and final acceptance, into a structured transition to ongoing support.

Kaizen: Under Eric's leadership, Genfare has adopted a continuous improvement culture utilizing the business practice of Kaizen, which originates from the Japanese root words KAI and ZEN (改善). The Kaizen methodology focuses on continuously improving upon existing business practices across departments to enhance the quality of delivery, which leads to an overall improved customer experience for Genfare's transit agency partners and their riders.



Figure 85. Cross functional Genfare team participating in a Kaizen session

Genfare's recurring Kaizen events focus on several coordinated and targeted phases to outline current state maps for all internal processes with the goal of providing a future state map that provides a tangible improvement in the overall customer delivery process. This technique allows all internal stakeholders at Genfare to identify areas that can be improved to allow features, products, and services to be delivered to agency partners more efficiently than previously executed. This internal business practice methodology is a constant recognition that the quality of delivery and support can always be improved upon for the sole benefit and satisfaction of all Genfare's agency partners.

Customer Care: As Genfare's solutions have evolved to include software and managed services in addition to fare collection hardware, Genfare has improved the way it supports clients who now have a broader range of needs. After listening to customers' support preferences, Genfare has expanded its customer portal. The customer portal, easily accessible from genfare.com, provides an efficient way to open and track a support case, read Genfare and industry-related articles, and find the latest Genfare Link software release notes.

Genfare's self-paced training site, GenEd Training, was launched in late 2021. GenEd provides clients like DTPW access to an always-available training curriculum focused upon Genfare hardware and software. These training modules can be customized for specific roles within the agency such as finance, maintenance, or customer support. See [section 3.10.3](#) for more details and link to view a training video.



Figure 86. Genfare Customer Care rep speaking to a customer

A full library of "how-to" self-training videos has been created by Genfare's technical support team and subject matter experts (SMEs) give all Genfare's customers the ability to learn and relearn about the

products and services they have in operation. These videos supplement the documentation, user manuals, and training materials that have been delivered during the program's successful implementation. Genfare recognizes that agency staff can excel by simply providing the tools for them to learn on their own, at their own pace.

Business Development (BD) Organization: The BD team, under [Daria van Engelen's](#) leadership, has implemented several processes that enable the Business Development Directors (BDDs) to foster relationships with their customers, allowing Genfare to thoroughly understand the challenges transit agencies face today as well as their visions for their mobility future. The BDDs develop a detailed account plan for each agency that captures the agency's goals and unique characteristics of its ridership. In conjunction with the Solutions Architect, the BDDs work to identify the customer needs, design a solution, and create a detailed statement of work to provide a thorough understanding of each project. Through participation in industry conferences and interactions with hundreds of agency leaders across the nation, the BDDs stay on top of market trends so they can share innovative ideas with their customers.

Program Management and Managed Services: Under [Bill Kerr's](#) leadership, Genfare has embarked on a continuous improvement effort that examines all Genfare's internal processes to identify ways to streamline efforts and improve communications internally. The benefit of this effort to DTPW and Genfare's other customers is a significant reduction in project implementation time. Following final acceptance on a project, customers will experience a seamless transition to technical support, field service, and training support.



Figure 87. Genfare customer lifecycle

Engineering team: Under [Trivi Ravada's](#) leadership, Genfare's engineering group has transitioned from a waterfall approach to an agile approach to product development. With a number of new team members and a product roadmap developed to align with customer demands, this team is poised to deliver the next generation of fare collection hardware and software for Genfare's customers.

Supply chain challenges: Genfare is proud that its products are Buy America compliant and sources the majority of its parts within the U.S. Genfare has historically been lean in terms of procurement. Recent challenges in the supply chain have required Genfare to modify its approach, placing orders for key parts further in advance to ensure sufficient parts are on hand to manufacture equipment to meet customer needs throughout the year. Mike Lee has recently joined Genfare as Director of Manufacturing and Supply Chain and will be responsible for driving transformation in manufacturing, sourcing, logistics, distribution, procurement, and continuous improvement.

Transformation is a constant here at Genfare; it is guided by a vision to simplify and improve the transit rider's experience and deliver equitable mobility. Genfare tracks its progress using key performance indicators that measure how each group is achieving its continuous improvement goals. The continuous improvement events held to date have simplified internal communications, communicating and prioritizing product enhancements with our Engineering team and streamlined implementation schedules.



4.3 References

Genfare has long-standing relationships with transit agencies throughout Florida, including nearby Broward County and Palm Beach County, and has demonstrated experience meeting the challenges presented by the weather and other factors in this region. The familiarity of Genfare's equipment in nearby agencies is also a plus for riders, operators, and other users of the fare collection hardware and software.

In November 2023, Genfare was selected to negotiate for a fare collection back-office suite and mobile application to the South Florida Regional Transportation Authority for use on Tri-Rail. This software and mobile application are expected to support fare collection and reporting and to simplify connections between Tri-Rail and other agencies, allowing riders to plan trips and purchase fares across SFRTA, Palm Tran, Miami-Dade (DTPW), and Broward County Transit (BCT) systems.

The references given on the following pages are summarized in the table below.



Figure 88. Genfare customers in Florida

Agency	Location	Year(s)	Solution Includes
Palm Tran	Palm Beach County, Florida	2020	Genfare Link, Fast Fare fareboxes, Mobile Link®, Ticket vending machines, point of service terminals, GenPay
Lynx (Central Florida RTA)	Orlando, Florida	2020, 2022	Genfare Link, Fast Fare fareboxes, Mobile Link, Administrative point of sale terminals, GenPay, e-Fare®
WMATA Metro (Washington Metropolitan Area Transit Authority)	Washington, D.C.	2022	Fast Fare fareboxes, vaults as a subcontractor to Cubic
CDTA (Capital District Transportation Authority)	Albany, New York	2013, 2022	Genfare Link, Fast Fare fareboxes, vaults, e-Fare, Mobile Link, point of sale terminals, GenPay
CATS (Charlotte Area Transit System)	Charlotte, North Carolina	2016	Ticket vending machines, Fast Fare fareboxes, Genfare Link, Electronic fare media validators
The Wave	Mobile, Alabama	2021	Genfare Link, Fast Fare fareboxes, Mobile Link, point of service terminals, GenPay

Table 35. References at a glance



Palm Tran Public Transportation

Address	100 N. Congress Avenue, Delray Beach, FL 33445
Contact	Don Livernois, dlivernois@pbcgov.org , (561) 841-4205
Award	April 2020
Delivery Date	Hardware: December 2020 Genfare Link: March 2021
Value	6.4M
Status	Complete
Description of Initial System Delivered	▪ Genfare Link (account-based), Network Manager, Garage Data System ▪ Vault Upgrades ▪ Mobile Link ▪ Fast Fare fareboxes (159) ▪ Vendstar-4 TVMs (25) ▪ Smart Cards, GenPay payment processing, Open Payment ▪ RPOS (23), APOS, InComm partnership

Palm Tran covers a wide area in Palm Beach County, Florida, including the urban/suburban communities of Boca Raton, West Palm Beach, and Delray Beach, and more rural areas, with a fleet of 165 buses. Many riders are dependent on transit as senior citizens or workers in tourism or healthcare, with a smaller number of choice riders, including tourists.

Palm Tran wanted to bring back riders by making it easier to pay fares while reducing cash on board and lowering operating costs. The agency's solution accepts cash, smart cards, and the Paradise Pass transit app, as well as open payments using smartphone mobile wallets and bank cards. For technology-averse seniors and unbanked workers, they set up multiple channels for funding smart cards, including point of sale terminals in libraries and other public service buildings, ticket vending machines, and InComm terminals in Walgreens and Speedway. They also bring temporary administrative desks into senior homes to get residents signed up for their reduced fare program. Fast Fare fareboxes accept all forms of payment and Genfare Link connects the agency's numerous fare sales and acceptance/validation platforms on the cloud for real-time monitoring and reporting as well as instant access to revenue collected.



Central Florida Regional Transportation Authority (Lynx)

Address 455 N. Garland Ave., Orlando, FL 32801

Contact Doug Jamison DJamison@golynx.com 407-463-6346

Award May 2020 | March 2022

Delivery Date June 2020 | September 2022

Value \$4.7 million | \$1.25 million

Status Complete

Description of Solution

- 318 Fast Fare fareboxes with OCU, TRiM, swipe card reader, Wi-Fi, 2D barcode reader and smart card/cEMV reader
- Vault receiver upgrades
- Administrative Point of Service terminals
- Mobile data routers
- Genfare Link, Mobile Link, e-Fare, and GenPay

Genfare is a longtime supplier to Lynx and previously provided the agency's Odyssey fareboxes. Due to COVID-19, Lynx had stopped collecting fares, resuming on July 1, 2020, with all its new fare collection operational. All equipment had been delivered but was in storage. Genfare arranged for accelerated installation of fare collection equipment within an extremely short timeframe, which included taking rigorous precautions to safeguard its employees as well as Lynx riders and staff and beat the deadline.

A second phase was added in 2022 to introduce open payment, payment processing, fare capping, and mobile ticketing. The Fast Fare fareboxes were upgraded with open payment readers to validate cEMV cards and the bar code reader was activated to accept mobile tickets and mobile wallets. Genfare Link, Mobile Link, e-Fare, and GenPay were implemented in a brief period of time so riders would have more options, regardless of how often they ride or how they pay for transit.

The complete, modular solution also brought benefits to the transit agency, including a revenue share program through the GenPay payment processing solution, providing Lynx a new funding source to subsidize the creation of programs to reward specific demographics of loyal riders, fund promotions or free rides in support of special events, and reduce the agency's software subscription cost. The adoption of Genfare Link streamlined the back office, making the management of the fare collection system and the creation of reports to drive data-driven planning easier for agency staff.



Washington Metropolitan Area Transit Authority (WMATA)

Address 600 Fifth Street NW, 3E-12, Washington, DC 20001

Contact Samuel Scheib, slscheib@wmata.com, 202-962-9819

Award February 2021

Delivery Date March, 2022

Value Fareboxes \$21M

Status TVM contract complete

Description of Initial System Delivered

- 1,726 Fast Fare Fareboxes
- 21 Mobile Vaults
- 21 Spare Mobile Bins with ID
- 21 Probe Lanes
- 10 Portable Electronic Keys
- 11 Cashbox ID Controllers
- 3 Year Warranty

WMATA has been a valued Genfare client for many years. Genfare installed WMATA's CENTSaBILL® fareboxes in 1996 and has since supported them through multiple rounds of upgrades and refurbishments, making it one of the longest-lived systems Genfare has ever built.

In 2007, Genfare installed the Odyssey Validating Farebox in WMATA's fleet. This farebox is equipped with the Cubic Transportation Systems, Inc. Operator Control Unit and Tri-Reader to implement the new SmarTrip contactless stored-value smart card payment system.

Genfare served WMATA and its regional partners through the agreement with Cubic Transportation Systems, Inc. In February 2021, Genfare and Cubic entered into a new contract agreement to provide WMATA and its Regional Partners Fast Fare fareboxes and auxiliary equipment to replace current Odyssey fareboxes and auxiliary equipment. Installation was completed in 2022 at WMATA garages.



Capital District Transportation Authority (CDTA)

Address 110 Watervliet Ave., Albany, NY 12206

Contact Thomas Guggisberg, thomas@cdta.org, 518-437-8326

Awards December 2013 – April 2022

Delivery Date March 2014; expanded services in 2022

Value \$6.3M

Status Complete

- Description of Initial System Delivered
- Genfare Link
 - 275 Fast Fare fareboxes
 - 5 garage data systems
 - 7 mobile vaults
 - Network manager
 - PEM printer/encoder machine
 - 2 portable data units
 - e-Fare customer web portal
 - Mobile ticketing
 - APOS/RPOS system
 - GenPay Payment Processing

The CDTA fare collection solution included Fast Fare fareboxes plus all infrastructure needed for CDTA's Navigator electronic fare system, including smart cards and mobile ticketing. Notable features include:

- Genfare Link cloud-based central data system. This state-of-the-art system resides in a virtual computing environment hosted by Amazon Web Services and managed by Genfare and offering 99.99% availability, web-based reporting, and centralized management.
- Real-time data transmission. Fast Fare fareboxes exchange data with the central office at short intervals while enroute via cellular modem using a third-party onboard router.
- e-Fare online ticketing portal. Riders use the CDTA-branded online portal to purchase and recharge smart fare media.
- Mobile ticketing. Riders purchase mobile tickets using a CDTA-branded application downloaded to their smart phones and then present the barcoded mobile ticket to the scanner on the Fast Fare farebox for validation.
- Administrative and retail point of sale (APOS and RPOS) systems. CDTA staff uses the APOS terminal and Link functionality to inventory newly delivered smart fare media, sell and recharge smart cards, answer customer inquiries, and produce photo ID cards for reduced-fare riders.



Retail sales agents issue and recharge riders' smart cards using the RPOS, a compact countertop unit.

- In 2022, CDTA upgraded their mobile application to integrate with microtransit providers and piloted open payments leveraging GenPay payment processing

The Intelligent Transportation Society of New York bestowed its "Outstanding ITS Project of the Year" award on CDTA and Genfare for the Navigator electronic ticketing program in 2017. [Read a full case study here.](#)

"We worked closely with Genfare to ensure we had developed and implemented a fare payment system that was so easy to use, our passengers would not even have to think about it when they board our vehicles. With our Navigator program, we have achieved exactly that, and our passengers have truly embraced it."– Thomas Guggisberg, Director of Information Technology, CDTA



Charlotte Area Transit System (CATS)

Address	3145 S. Tryon Street, Charlotte, NC 28237
Contact	Fred Wilson, fwilson@charlottenc.gov , 704-432-2543
Award	December 2015
Delivery Date	September, December 2016
Value	TVMs \$8.5M, fareboxes \$7.7M
Status	TVM contract complete
Description of Initial System Delivered	▪ 77 Ticket Vending Machines (TVMs) and TVM maintenance agreement ▪ 186 Fast Fare-e validators (176 light rail, ten parking gate) ▪ 315 Fast Fare fareboxes ▪ VIP data system ▪ Genfare Link central data system

Genfare has provided a wide variety of equipment to CATS, including Fast Fare fareboxes, Fast Fare-e validators, Vendstar ticket vending machines, and Genfare Link central data system. The Vendstar-4, Genfare's standard full-service TVM, was initially designed for CATS – innovative features include a recycling bill mechanism, multiple security cameras providing a video feed to a central security desk, hardening of the Linux operating system to prevent intrusions, and an EMV-compliant payment card acceptance module.

Genfare also worked with CATS to integrate the Fast Fare-e validator with parking exit gates in CATS-owned garages near transit stations. Riders can tap their CATS fare cards to the Fast Fare-e at the exit gate when driving out of the garage. If an eligible fare product such as a weekly pass is loaded on the card, the gate automatically opens. If not, the rider is directed to pay a parking fee.

Genfare Link was implemented in Charlotte, including an integration via open APIs with Kuba (formerly Unwire), a Danish provider of account-based ticketing and trip planning solutions.



The Wave Transit System

Address	1224 West I-65 Service Road South, Mobile, AL 36609
Contact	Damon Dash, ddash@thewavetransit.com, (251) 338-0092
Award	October 2020
Delivery Date	Mobile Link and Genfare Link – February 2021 Fareboxes – April 2021
Value	\$1.1M
Status	Complete
Description of Initial System Delivered	▪ 30 Fast Fare fareboxes ▪ Garage Data System ▪ Network Manager ▪ Administrative Point of Sale terminal (APOS) ▪ Genfare Link ▪ Mobile Link ▪ Gen Pay Payment Processing

For the City of Mobile, the Genfare solution includes Fast Fare fareboxes, along with software and services that give The Wave a complete fare collection system upgrade. Genfare Link, a cloud-hosted fare collection-as-a-service platform, is the backbone of the solution supporting all the other elements. Mobile Link, the mobile ticketing application, allows riders to plan trips, purchase fare products and present mobile tickets for validation. The Organizations component of Genfare Link allows agency partners to manage transit benefits for their constituents. An Administrative Point of Sale (APOS) terminal, installed at The Wave transit center, gives riders another way to manage their account and purchase fare products. The services Genfare provides include a User Acceptance Testing environment (UAT) for testing and training agency personnel on the new solution, a service level agreement for dedicated software support, and warranty and maintenance support for hardware.

The Genfare solution was implemented over the course of a three-year contract and gives The Wave the ability to accept any kind of payment riders have in their pocket, along with effortless payment processing. Its all-in-one accepts cash, coin, smartcard, a mobile app, and open payments. The Wave can also make data-driven decisions guided by powerful analytics, all while implementing measures like fare capping that help make transit affordable and equitable.

A key element in Mobile's success was informing riders about upcoming changes. Not only were riders prepared for the upgrade; they were looking forward to useful new features and capabilities.

4.4 Previous Projects with DTPW

In 2009, Genfare, as a subcontractor, partnered with Cubic to deliver a comprehensive fare collection solution to Metro Dade Miami at a cost of \$9,168,959. As part of this contract, Genfare delivered:

- 1,000 41" tall Odyssey fareboxes
- 11 mobile vaults with cashbox carts
- 10 data probes and associated components
- 3 garage data systems

Testing, training, documentation, software maintenance, service, and a three-year warranty were also part of this contract. The statement of work was finalized October 8, 2008, and installation was planned over four phases ending July 31, October 15, November 15, and December 15 in 2009.

In the following years, maintenance training was provided on-site in May 2018 and March 2016 at a cost of \$9,800 each time. In addition, 10 components were delivered in 2021 for a total cost of \$7,916.

The Genfare team worked closely with Jose Rodriguez of the Miami-Dade County Department of Transportation and Public Works Infrastructure and Field Engineering to implement the fare collection solution. His contact information is 305-637-377 or JoseR@Miamiidade.gov.

4.5 Bankruptcy Petitions

Neither Genfare nor its parent company, SPX Technologies, has filed for bankruptcy. There are also no bankruptcy petitions from predecessor organizations or wholly owned subsidiaries.

4.6 Genfare Employees

Genfare has more than 150 employees working directly on the Fare Collection Equipment being proposed.

Staff Type	% of Total Staff
Sales	17%
Research and Development	53%
Support Services	30%

Table 36. Genfare staff by area

4.7 Fare Collection Equipment Roadmap

Bus manufacturers are transitioning from buses with computers to computers that happen to be buses. Genfare plans to do the same with fare collection equipment. Genfare simplifies fare collection utilizing the latest technological advances to allow a large amount of data to be collected across the system, analyzed, and provided to all levels of an agency with pertinent information in one location. As artificial intelligence progresses, Genfare will embed these capabilities using AWS modules so agencies can know their communities and how to best service riders to make the best, data driven decisions for their operations and maintenance.

4.7.1 Genfare Link Roadmap

In the past four years, Genfare Link has evolved to support all devices and all users across our fare collection system. Genfare has re-architected the system to support only direct connections to hardware devices to manage all devices in one location. Enhancements in usability, payment processing options, additional sales channel support, and reporting are ongoing.

2020		2021	
H1	H2	H1	H2
Open Payment processing for EMV credit cards Three tiers for fare capping for account-based fare cards Autobuy for CSR	Order History for Rider Self Service portal Shifts to Point of Sale Open Payment support Introduce Open Payment processing for EMV credit cards Introduce ability to define three tiers for fare capping for account-based fare cards, such as daily cap, 7-day cap, and monthly cap. Add ability to edit autobuy processing for transit riders, where a cash balance is added to a fare card automatically when the balance on the card falls below a specific dollar amount A variety of system improvements related to processing and managing refunds, system performance, printing receipts and shipping labels, working with shifts for clerks using the Administrator Point of Sale hardware, processing payments from mobile devices, and information provided on user screens. Corrected a variety of problems related to how information is displayed for order history, fare structure, use of the eFare account screens, and other displays of data. Customer Portal - Support Case Management module	Debt recovery for Open payment Smart card replacement Pay with existing smart cards New capacity to recover debt from a rider after an open payment with a credit card fails. Support for setting up promotional codes for organizations. Support for replacing smart cards, account-based, where fare information is stored in the computer system for each transit rider account. Option for customers to pay for fare card products using an existing account balance. Improve information provided on reports, such as a new bus field and refund records, and improved reporting search tools. Correct problems related to eFare online accounts, bulk processing, autobuy transactions, Customer Portal - Knowledge base and training modules	Search for reporting Bulk processing to CSR Sales processing with POS Add support for sales processing with the Administrative Point of Sale (APOS) platform. Provide for mobile device users to sign up as riders and improved processing for mobile devices. Update Open Payments processing to allow system to publish deny list to fare boxes. Improve processing of transfers. Notifications when digital wallets expire, improve processing for fare card transactions from mobile wallets.

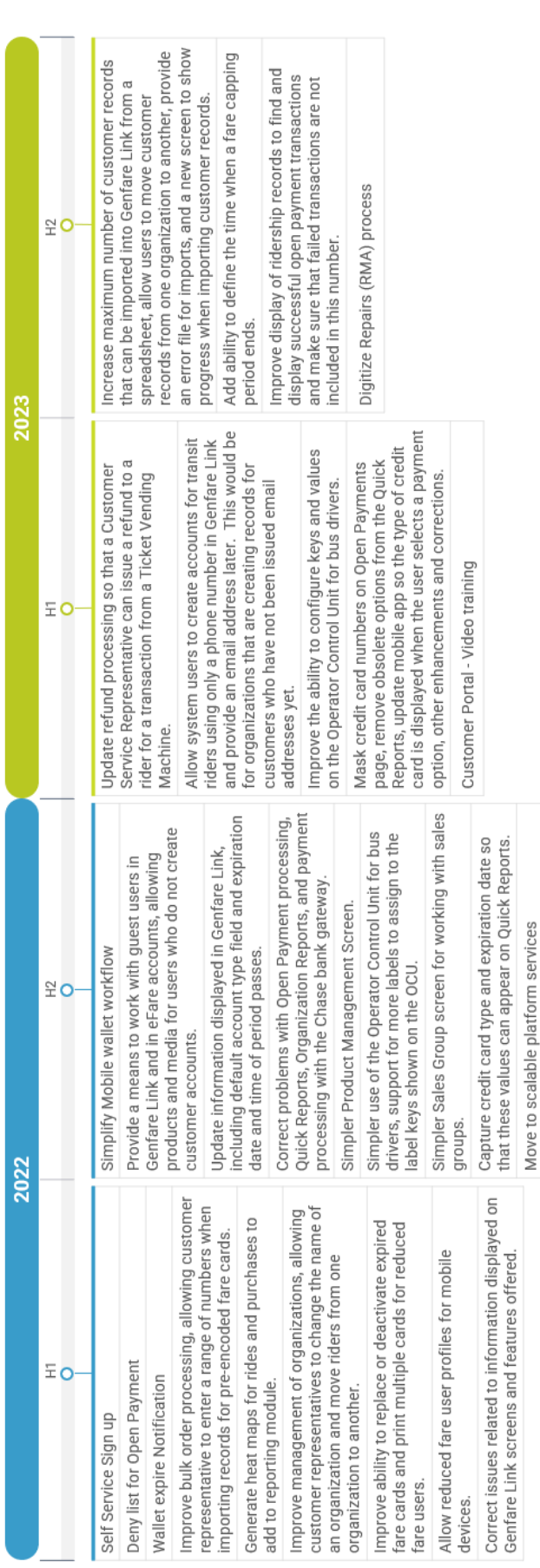


Figure 89. Genfare Link roadmap 2020-2023

For the next five years, Genfare Link will continue to process more data and offer predictive analytics and insights into our fare collection systems. Genfare will support integration with any requested third parties, increase monitoring capabilities across the system, and increase the payment choices for riders.



Figure 90. Genfare Link roadmap 2024-2028

4.7.2 Fast Fare 25 Roadmap

Genfare's farebox is an industry standard that has evolved from accepting cash, coin, and magnetics to including smart cards, mobile payment, and open payment. The Fast Fare continues to evolve with a direct connection to the cloud where data is aggregated and used to make data driven decisions.

Incremental upgrades have been made to the Fast Fare farebox regularly since its introduction, such as adding the ability to accept open payment at the same farebox that accepts cash and coin. The newest iteration -- the Fast Fare 25 -- is well under way, and will present a modular, future-proofed approach to an all-in-one farebox available for install in early 2025.

The next evolution of the Fast Fare will support riders with a bigger screen and support agencies with data transfer directly to the cloud. Enhanced location capabilities will provide agencies with metrics on type of riders, how they are paying, and how to enhance routes and provide better customer support.



Figure 91. Fast Fare 25 farebox roadmap

4.7.3 Vendstar TVM Roadmap

Genfare's Vendstar TVM is a durable and versatile hardware that has evolved from dispensing tickets to allowing fund recharging for mobile and smart cards and direct connection to Genfare Link for reporting, refunds, and configuration. The TVM has advances in security both for credit cards as well as with security cameras and enhanced locking systems.

Genfare is launching the next evolution of TVM – the Vendstar 5 -- in 2024, where AI enhancements to trip planning, customer support, and support of multiple languages will be introduced. Genfare plans to incorporate bill paying of county utilities with cash to support unbanked riders.



Figure 92. Ticket vending machine roadmap

4.7.4 Magnetic Faregate Roadmap

Magnetic AutoControl's gate technology was revamped during the past five-year period, starting first with the FlowMotion commercial (entry-/access-point) gate line, and transitioning over a five-year period into all of the other gate families.

2009-2018 - Legacy generation: Prior to 2018, all Magnetic pedestrian e-gates utilized a legacy model logic controller (MBC120), which did not have the ability to communicate bi-directionally via TCP/IP or Ethernet. The only mode of communication that the previous generation of logic controller had was via 24 VDC relay circuitry (i.e., normally open circuit, momentary pulse activation signal, similar on both inputs and outputs). This limited the gates' ability to act only on receipt of a hardwired low-voltage signal to the logic controller, and subsequently, send signals back only as hardwired binary (off/on) relay output low-voltage signals.

2018-2023 - Current generation: Improvement began in late 2018 when the MGCPPlus and MGCPPro logic controllers were transitioned into the pedestrian family of e-gates. (The MGC logic controller had already been in use with Magnetic's vehicle barrier gates for a few years prior to the implementation into the FlowMotion pedestrian e-gates). The addition of TCP/IP Ethernet communications facilitated a new era of advanced interaction between back office or higher-level systems with the Magnetic pedestrian e-gates.

During this era, back-end system software programmers could directly communicate with the e-gates/faregates via standard programming language, sending commands and receiving detailed messaging back from the gates/faregates on functional performance. Additionally, detailed data on the equipment's health, service status, and reporting of any processes or anomalies were nearly instantaneously available.

2024-2030 – Forward looking: Gradually, more detailed feedback from Magnetic's faregates/e-gates will be available to systems software programmers, enhancing the level of granularity of command and control that the systems will have.

Additionally, Magnetic imagines offering a level of control and visibility to the gate operation, motor action, highly variable speeds, start-stop micro-positioning, and feedback device (lighting) control and micro-control. At some point the logic controllers will become smaller and more efficient and the motor elements will reduce in size as well, allowing for more compact gate housings.

4.8 User Groups

Genfare's commitment to connecting communities goes beyond the riders served and extends to the greater community of transit professionals. Genfare held user groups in 2019, 2020, and, after a pandemic delay, in 2022 to allow customers to share their experiences. A cross section of customers from communities ranging from large metropolitan service areas to widespread rural coverage has discussed current topics, challenges, and best practices. Genfare continues to benefit by connecting with its customers at a strategic level and uses this information to inform its product roadmap.

At Genfare's most recent user group, in April 2022, the Genfare product roadmap, customer care practices, and current industry topics were discussed in a virtual session. Time was provided for customers to connect with one another to share experiences surrounding their various program implementations and expansions of revenue service operations. Networking is a key feature of the user groups as it allows new and existing Genfare customers to work with one another to collaborate on strategies for future projects. These user groups are very influential during Genfare's development path for all solutions.

Genfare chose to skip a user group in 2023 due to the APTA Expo trade show and is currently planning the live 2024 user group in conjunction with the APTA Mobility conference in April in Portland, Oregon.

4.8.1 Customer Survey

Each year Genfare administers a survey to nominate specific subjects that customers are interested in learning more about. Over the years, several ideas have been given prioritization in the research and development roadmaps based on this feedback. Projects like shoring up the Handheld Validator functions and reduced fare functions on equipment have had major improvements due to customers expressing their needs.

For many years, Genfare held quarterly online Customer Corners, but this event was halted over the pandemic period. These quarterly customer reviews are in the works to kick off again at the top of 2024 as a time to reconnect with each agenda focused on specific areas like Customer Care support or implementation.

A survey will be sent to customers ranking topics of interest to dive deeper into each area where feedback is directly given to learn and listen about customer needs and experiences. This is a part of the continuous improvement culture embedded at Genfare. By capturing more of the voice of the customer, Genfare can grow and improve product quality and enhance the customer experience.



4.9 Personnel Retention

Genfare's personnel retention policy is based on competence management. The approach to competency is to identify the requisite skills, recruit the right people, train and develop the right skills, and assess the right things. Genfare's focus is to coach, mentor, and retrain in a continuous cycle. This is described in the Genfare's Competence Management Model, illustrated in figure 92.

This model is developed around a cycle of critical success factors that make up the key components that influence competence. It also enables identified improvements to be fed back into the process.

Recruiting. Competence begins with the ability to recruit key personnel for projects of comparable scope, duration, and complexity to this project for DTPW. Genfare identifies the best possible candidates who have the right skills and attributes for the job, then these candidates go through a series of appropriate evaluations. Hiring the right individuals ensures training begins at the right level.

Training. Once onboard, all personnel undergo a rigorous training regimen that includes product guidance, online, and on-the-job training. With Genfare's book of business there are many opportunities to train with similar roles of comparable scope and complexity to this project – whether that is in program management, safety, or QA. Best practices and processes are shared within each functional area as well as cross-pollinated with other functions to encourage collaboration, better problem solving, and understanding of the whole program.

All key staff and maintenance technicians train for many reasons: to maintain and upgrade their skills, to improve their productivity to excel and create upper mobility, and to improve the service they provide to the traveling public.

Assessment. Genfare conducts assessments not only to measure the effectiveness of the allocated training, but when established effectively, to continuously measure and highlight individual improvement areas. This is the continuous improvement approach embedded in the Genfare culture. These assessments are not finite; rather, they are progressive and can be conducted both under live and simulated conditions.

For example, a TVM maintenance technician performing well or poorly during onsite work at a customer provides evidence of an individual's competence and is recorded and addressed, even though it may not have been observed during a formally arranged assessment. Our assessments summarize accomplishments and gaps while, at the same time, providing motivation. This feedback provides a forum for technicians and managers to create a plan for further training. This process institutionalizes the concept of continuous improvement and gives ownership to each member of the team.

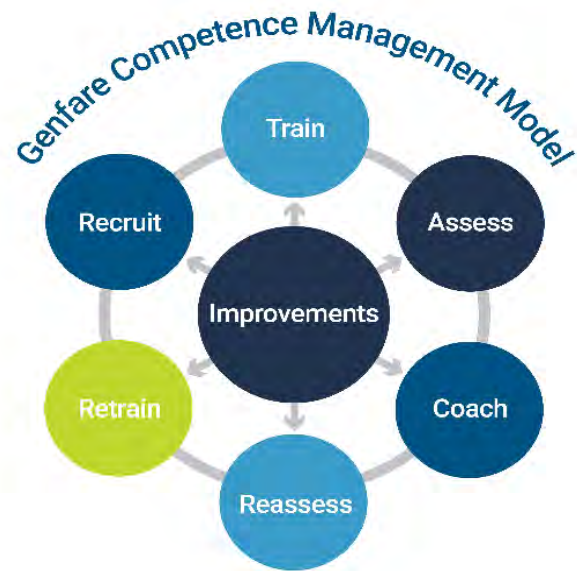


Figure 93. Competence management

Coaching. Once technicians are trained and assessed, we create a coaching plan to ensure that they are not “left to get on with it.” Instead, they are continually supported so that their development continues, and they have access to a process for addressing any gaps. Coaching delivers the human capital element necessary to stay connected with teammates, retain morale, and provide trust and leadership.

Training is key to learning skill sets, domain knowledge, and familiarity with processes, but it does not necessarily address confidence, capability, and overall competence. To combat these concerns, communication is the best form of training and coaching provides a forum for communication.

Our managers are responsible for supporting the development and training of their teams. They will own training and coaching schedules for on-the-job assignments, updating training documentation and playing an active role in the on-shift coaching and feedback process to support our dedicated trainer.

Reassessment and retraining. Reassessment and retraining measures embrace our technicians’ shortcomings and give them time, opportunity, and access to continuously improve. Retraining warrants our services. Retraining reengages the technician and piques new interests for procedure changes, improved approaches, or new skills. It also is critical for “refreshing” technicians in those procedures not used often to make sure that they are always ready for any scenario. It encourages cross-functional training so learning and engagement remain paramount.

As a result of this approach by many Genfare contracts around the US, we have seen:

- A structured approach that drives continuous improvement
- The right employees recruited for each role
- Dramatic improvements in the frequency, quality, and content of training
- Effective managers identified within teams
- Effective assessments and coaching that continually evolves

4.10 Integration Experience

Genfare Link is a fare collection back office that supports all payment methods, and all Genfare equipment is integrated with Genfare Link. There are more than 50 instances of Genfare Link in revenue service, supporting cash and coin, smart cards, mobile payment, and contactless credit and debit cards.

Genfare hardware has also been integrated with several other fare collection vendors. We have integrated with a Conduent fare collection system with our gates in Cleveland and with our fareboxes for SEPTA in Philadelphia. Our fareboxes have been integrated with a Cubic back office in several locations, including Miami, but most recently with WMATA in Washington, D.C.

Genfare has integrated our software into other vendors for a variety of purposes. Genfare Link has been integrated with software from Unwire, Token, Moovit, Moovel, Cubic, and Avail in several agencies across North America.

Client	Fare Collection Provider	Scope	Genfare's Role
Miami Dade County	Cubic	Fareboxes with integrated 3 rd party smart card reader	Provided fareboxes and revenue collection equipment. Added Cubic reader to Odyssey farebox. Facilitated cash and coin data integration from Garage Data System.
WMATA	Cubic	Fareboxes, Farebox back-office software	Provided fareboxes, revenue collection equipment, and farebox back-office software. Facilitated integration of cash and coin data from Genfare Link.
LA Metro	Cubic	Fareboxes with integrated 3 rd party smart card reader	Provided fareboxes and revenue collection equipment. Added Cubic reader to Odyssey farebox. Facilitated cash and coin data integration from Garage Data System.
CTA	Cubic	Fareboxes	Provided fareboxes and revenue collection equipment. Facilitated integration of cash and coin data from Garage Data System.
Pace	Cubic	Fareboxes, Farebox back-office software, Farebox maintenance software	Provided fareboxes, revenue collection equipment, farebox back-office software, and farebox maintenance software. Facilitated integration of cash and coin data from Genfare Link.
SEPTA	Conduent	Fareboxes, Farebox back-office software, Farebox maintenance software	Provided fareboxes, revenue collection equipment, farebox back-office software, and farebox maintenance software. Facilitated integration of cash and coin data from Genfare Link.
Cleveland	Conduent	Fareboxes and Gates with ability to read Conduent smart cards	Provided fareboxes, gates, and revenue collection equipment. Added support for Conduent formatted smart cards in faregates and fareboxes. Facilitated cash and coin data integration from Garage Data System.
Trinity Metro	Unwire	Mobile Application	Upgraded fareboxes to accept barcoded tickets. Provided farebox back-office software. Facilitated integration for Unwire mobile application to Genfare Link to purchase mobile tickets, generate barcodes, and accept on the farebox.

Table 37. Integration experience

Experience & Key Personnel



5. EXPERIENCE & KEY PERSONNEL

5.1 Genfare Team

Genfare is excited to present the DTPW with a built-for-purpose team balancing equipment excellence, local knowledge, and an experienced program management office to deliver a best-in-class fare collection system to Miami.



5.2 Project Organization Chart

Genfare's proposed DTPW project team, as indicated in our project organization chart, is comprised of:

- Genfare's key project personnel with extensive expertise in automated fare collection systems
- Genfare's engineering and development team that developed Genfare's account-based fare collection system
- Subcontractors who have extensive expertise in their respective areas
- An executive team including executive and industry leadership
- A company with 150+ employees focused only on transit systems

Michael is dedicated and results-driven with a proven track record of efficiently overseeing maintenance operations, ensuring optimal equipment performance, safety, and minimizing downtime. Offering over 12 years of experience in various industries, he brings a diverse skill set, strong leadership capabilities, and a commitment to ensuring a safe and productive work environment.

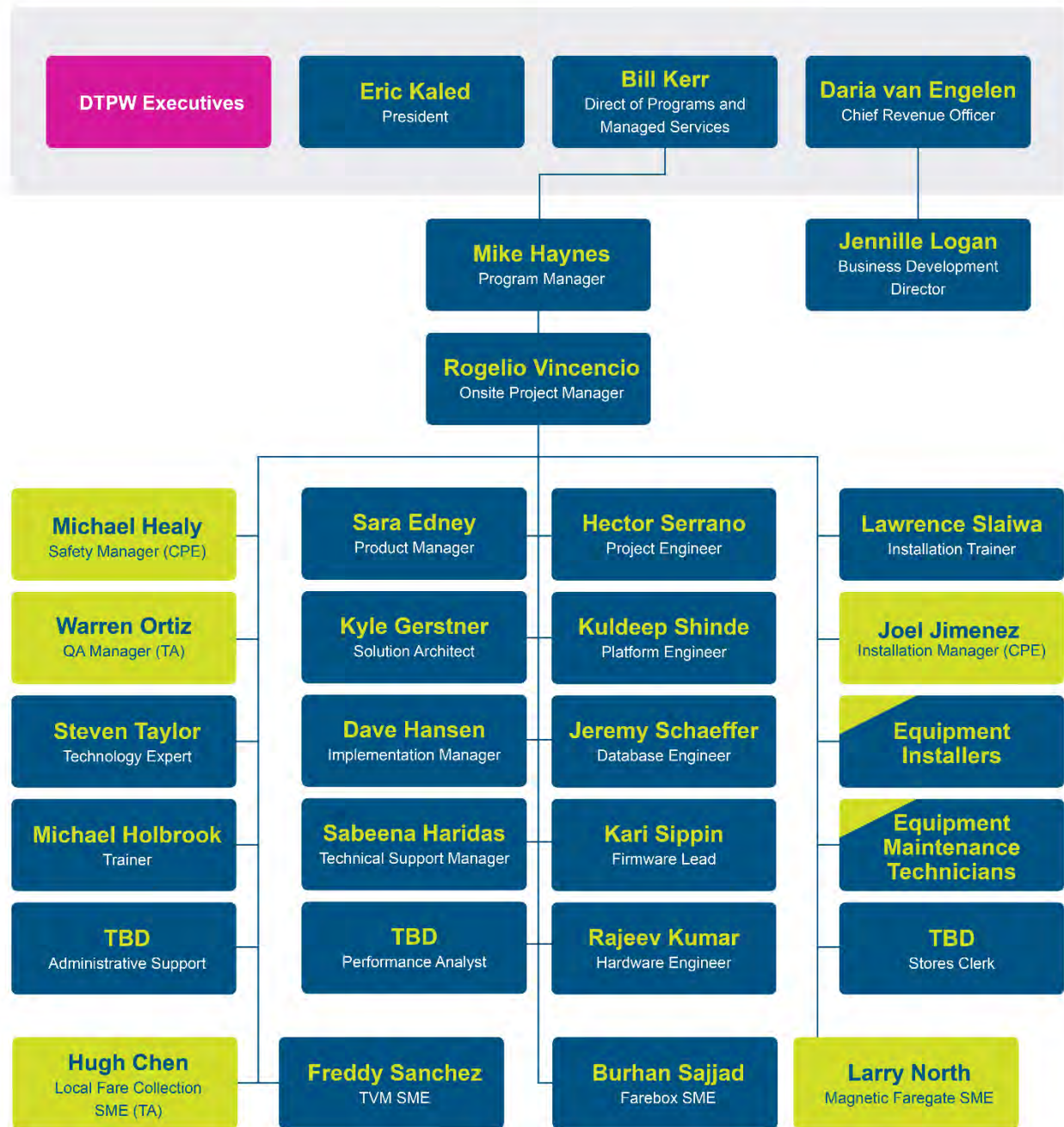


Figure 94. Project organization chart

5.3 Key Project Personnel

The project team reflects the experience and expertise of the Genfare and our partner organizations. Expert engineers, technicians, project managers, DTPW veterans, and other team members will ensure DTPW's implementation and training goes smoothly. Key team members for this project include:

Name	Title	Role/functions to be Performed	Certifications/accreditations and experience	Estimated Percentage Dedicated to Project
Mike Haynes	Program Manager	Program management	Skilled transit data system professional with more than 20 years of transportation analysis, business development, and data systems integration experience	50%
Rogelio Vicencio	Onsite Project Manager	Project management	Certified in lean manufacturing, Six Sigma Green Belt, and Scrum Fundamentals. Bilingual English/Spanish. 10 years of industrial engineering and leadership experience	90%
Joel Jiminez	Installation Manager	Installation Management	Miami-based Marine Corps veteran and electrician with safety, planning, and supervisory experience performing installations	90%
Michael Healy	Maintenance and Safety Manager	Safety Manager	Offers 12 years of experience overseeing maintenance operations, ensuring optimal equipment performance and safety	75%
Hugh Chen	VP, Operations	Fare collection SME	Engineer with 20+ years of operations and engineering at Miami-Dade Transit, now providing operations and maintenance consulting for Broward	35%
Warren Ortiz	Quality Assurance Manager	Quality Assurance Manager	Fare collection and transit security systems expert with decades of employment at Miami-Dade Transit including field acceptance testing and installation inspections	35%
Larry North	Faregates Project Manager	Faregates SME	Florida-based hands-on leader with 30 years success with project management of technical products	30%
Mike Holbrook	Trainer	Trainer	Certified A+ Core Service Technician with 30 years of experience in field engineering, implementation, and technical support engineering. Skilled in networking technology and SAP	35%
Steven Taylor	Technology Expert	Technical support and development	More than 10 years of technical support, customer success, and implementation engineering with excellent communication skills	50+%

Table 38. Key personnel for DTPW implementation

All other personnel identified will support the key personnel above.

Genfare will do everything to make this project successful. Key project personnel will be available to perform the proposed services for the duration of the contract. None of the above key personnel will be removed or replaced without the prior written concurrence of DTPW.

5.4 Subcontractors

Genfare proposes partnering with three subcontractor vendors to provide elements of the solution for fare collection hardware, software, and services:

- Consolidated Parking Equipment will provide installation, safety, and field services
- Transportation America will provide safety and quality assurance services
- Magnetic AutoControl will provide faregates

Qualifications for personnel at these subcontractors follow.

5.4.1 Magnetic AutoControl USA – Faregates



Figure 95. Magnetic faregates in Honolulu

The Magnetic AutoControl Group, with a U.S. location in Rockledge, Florida, will organize itself into two distinct locations as part of the project team. The project team will involve team members from Germany and the United States. Each location will provide a specific contribution to the successful delivery of the project.

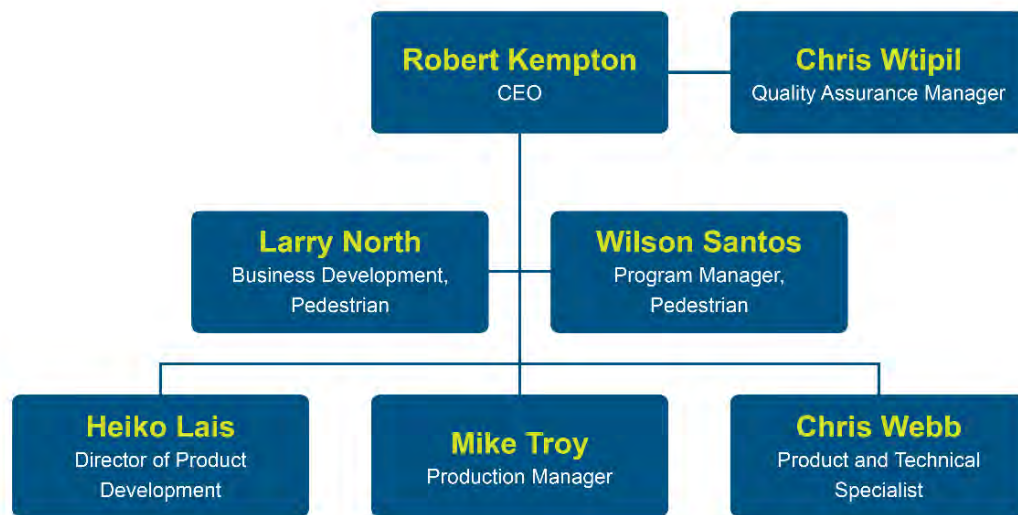


Figure 96. Magnetic project team organization

5.4.2 Consolidated Parking Equipment– Installation and Field Services

Consolidated Parking Equipment is a Miami Dade County small business specializing in the distribution, installation, and support of advanced access and revenue control systems. The company's trained technicians will assist Genfare with installation and field services including repair and maintenance.

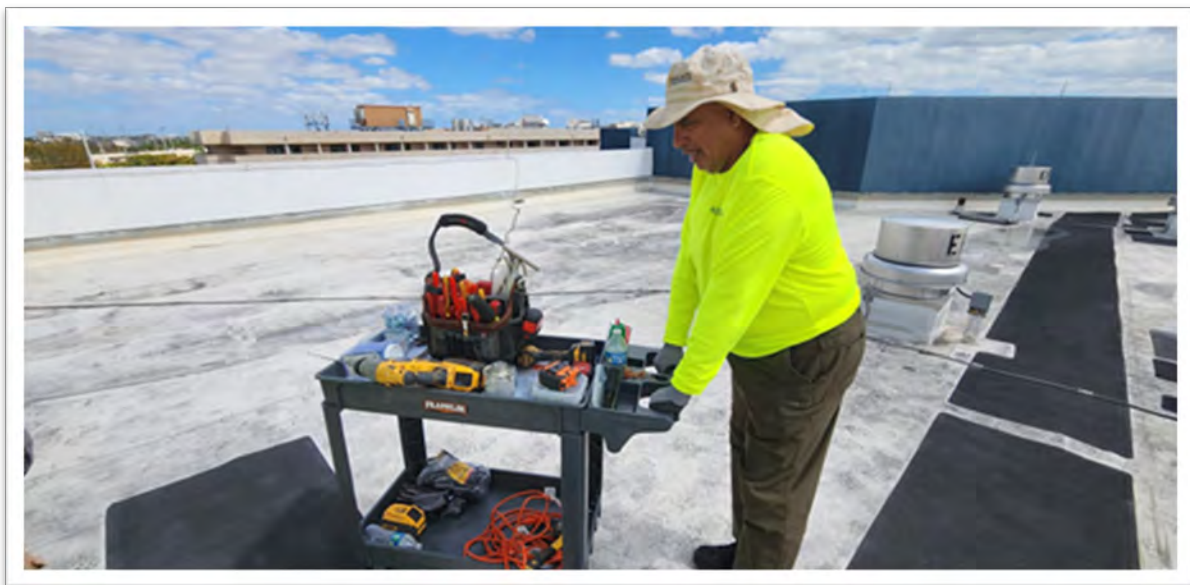


Figure 97. Consolidated Parking technician

Consolidated Parking Equipment maintains a complete state-of-the-art on-premises repair facility in Miami to help ensure rapid turnaround on equipment in need of repair. The company currently serves other local agencies including the Miami Parking Authority, Port Everglades, and the City of Miami Beach.

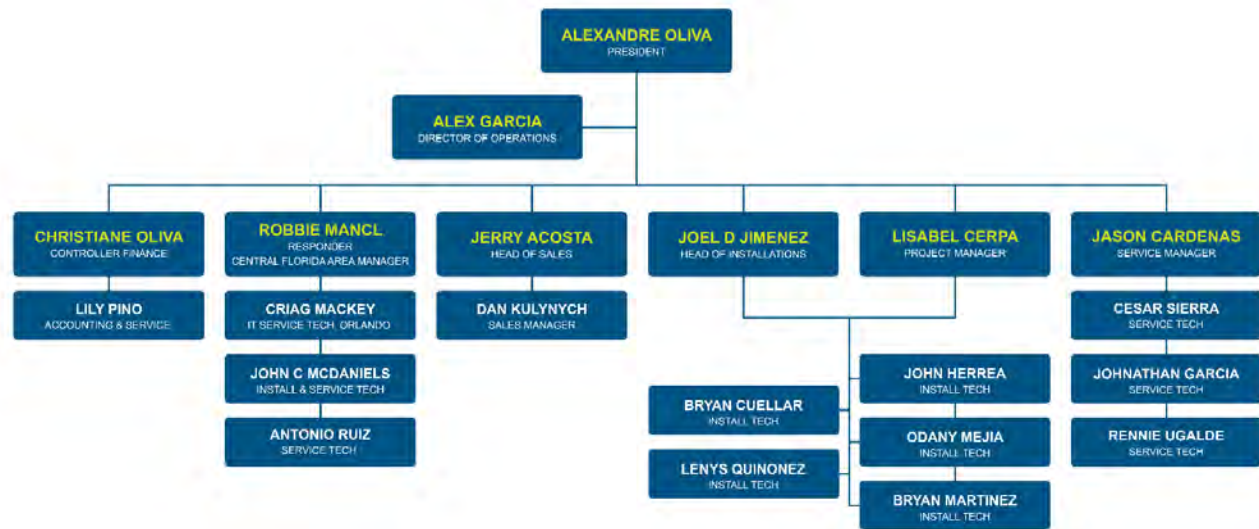


Figure 98. Consolidated Parking organization chart

5.4.3 Transportation America – Safety & Quality Assurance Management

Transportation America is South Florida's largest transportation company and will be providing quality assurance and safety services to the DTPW implementation. The 3,500 employees of the Miami-based company help its customers design, operate, and manage integrated transportation solutions to improve economic, safety, and operational performance. Transportation America provides more than 10 million safe, on-time trips annually as the exclusive paratransit provider to DTPW, as well as operating fixed route solutions, airport shuttles, ambulance services, executive transportation, and private circulator trolleys. The company maintains a fleet of over 1,500 vehicles and also offers the services of four 24-hour maintenance facilities, auto collision body shops, tow trucks, and 14-hour-a-day call centers.

Transportation America was awarded "Operator of the Year" by the Florida Commission for the Transportation Disadvantaged. Its proven track records in Southeast Florida demonstrates the company's commitment to high-quality, safe, and cost-effective services while as a local family-operated company, it is uniquely attentive to its customers' needs.

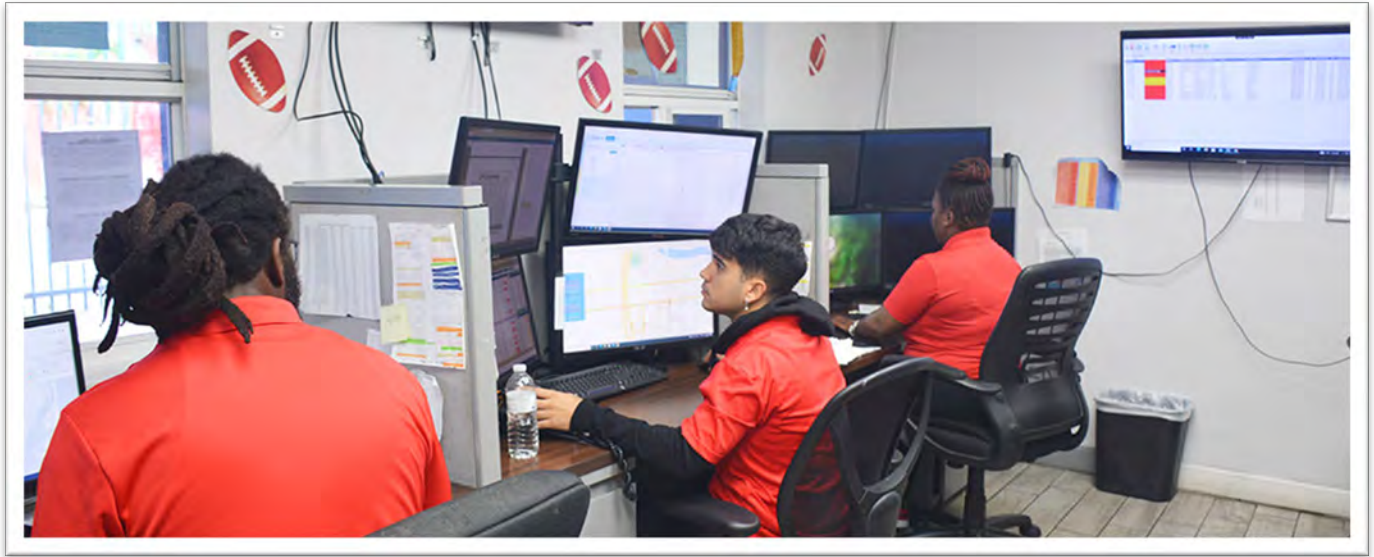


Figure 99. Transportation America command center

5.5 Key Personnel Resumes

Resumes for key personnel from Genfare and subcontractors follow.

5.5.1 Genfare Dedicated Project Team

- Mike Haynes: Program Manager
- Rogelio Vicencio: Project Manager
- Stephen Taylor: Technology Expert
- Michael Holbrook: Trainer



5.5.2 Genfare Experts and Leadership

- Freddy Sanchez: Ticket Vending Machine Expert
- Burhan Sajjad: Farebox Expert
- Daria van Engelen: Chief Revenue Officer
- Trivi Ravada: Chief Technology Officer
- Sara Edney: Product Manager
- Kyle Gerstner: Solutions Architect
- Hector Serrano: Project Engineer
- Dave Hansen: Implementation Manager



Mike Haynes

Program Manager

Mike is a dedicated and skilled transit data system professional with more than 20 years of transportation analysis, business development, and data systems integration experience. He was honored in Mass Transit Magazine's Top 40 Under 40 list in 2016.

Skills & Expertise

- CAD/AVL
- API integration
- Project management
- Transit planning
- Programming languages
- Systems engineering
- Data, schedule, and safety analysis
- Transit financial reporting

Experience

Program Manager, Genfare, 2023-present

Develops and implements small to large-scale projects including product development, process improvement, and continuous improvement across teams to meet internal and external customer requirements. Responsible for overall program management and direction, preparation of the project schedule and budget, coordinating Genfare and agency activities, overseeing preparation of required submittals and deliverables, conducting design reviews, and assisting in the resolution of any issues.

Performance Practice Lead, Transpro Consulting, 2022-2023

Principal lead of TransDASH division, leading the deployment of an industry transit performance dashboard. Developed 10 transit outcomes and over 75 transit KPIs while managing the contracting of eight transit agencies.

Business Improvement Director, Transdev North America, 2019-2022

Senior ITS technologist engaged across the enterprise in data solutions, integration, and analysis. Developed monthly reporting metrics, on-time performance reporting, safety metrics, and operations delivery improvements.

Transit Systems Support Manager, Chicago Transit Authority, 2002-2018

Managed bus ITS and CAD systems. Developed data analysis across real-time systems providing end-to-end integration solutions. Supervised agile software developers, project managers, systems analysts, and field techs. Provided support of APC/AVAS/RTBM data structures and administration. Data architect for bus performance management program. Integrated AVM with a maintenance management information system.

Education

B.S., Civil Engineering, Lafayette College, Easton, Penn.

M.S.C.E., Transportation Engineering, University of Texas, Austin, Texas



Rogelio Vicencio

Project Manager

Rogelio is a team leader and industrial engineer with a decade of experience in manufacturing and continuous improvement. He is skilled at leadership of multidisciplinary teams, communication, and conflict resolution.

Skills & Expertise

- Lean manufacturing
- Six Sigma Green Belt certified
- Management skills development certified
- Scrum Fundamentals certified.
- Bilingual English/Spanish
- Project management
- Value stream mapping

Experience

Managed Services Supervisor, Genfare, 2023-present

Supervise managed services team, including electronics technicians, engineers, and shipping and receiving coordinators. Ensure quality and efficiency of mobility solution installation and setup provided to customers. Anticipate challenges and lead troubleshooting. Direct site surveys, installation planning, and firmware updates to work with the unique qualities of each transit agency's assets and equipment.

Project Business Analyst, Ball Corporation, 2022-2023

Managed projects, standards implementation, mapping, transitions of activities, and workload. Created training programs.

Manufacturing & Continuous Improvement Coordinator, Siemens, 2016-2022

Managed the manufacturing and continuous improvement department, including budgeting, productivity, and implementation of new production standards. Led Kaizen events focused on standard work and waste. Used plant simulation software to manage factory bottlenecks. Also served as a manufacturing engineer at Siemens before this position.

Operation Engineer, Crane Payment Innovation, 2014-2016

Implemented improvements and performed root cause analysis with the repair team for bank note recycler hardware. Managed inventory, instructed workers, and participated in process improvement and workflow streamlining.

Manufacturing Engineer, Ametek Lamb Motors, 2012-2014

Responsible for process and efficiency improvement and measurement in manufacturing.

Education

M.B.A., Business Administration, Universidad del Valle de Mexico

B.S., Industrial Engineering, Instituto Tecnológico de Ciudad Madero



Steven Taylor

Implementation Engineer

A second to none, customer success driven professional with excellent communication skills. A trusted partner who excels in providing solutions, strategies, and customer satisfaction. Combines fundamental understanding of customer business and experience in customer relationship building to create and implement efficient technical solutions.

Skills & Expertise

- Portfolio, program, and project management
- Process improvement
- Customer onboarding
- Customer relationship management

Experience

Implementation Engineer, Genfare, 2022 to present

As part of Genfare's digital transformation in Transit and Mobility, part of a team of implementation and configuration specialists delivering AWS based solutions, identifying, and employing portfolio and implementation process improvements, and partnering with clients to complete ongoing implementations.

Implementation Manager, PressPage, 2020-2023

Delivering solutions in Professional Services, Implementation, Pre-Sales, Customer Success, Product Management, and Project Management to small and midsize companies. Driving high adoption and user engagement. Communicating with customers to drive strategic value, expand solution adoption, and recommend best practices to optimize the customer experience.

Customer Success/Technical Support Supervisor, Genesis Digital, LLC, 2017-2020

Acting as subject matter expert and training lead for as part of Genesis Digital's expanding product base. Assisted in customer success projects including knowledgebase creation, client onboarding, and strategy development.

Air Traffic Control Specialist, Federal Aviation Administration, 2016

Basic air traffic control training completed. Controlling and separating live air traffic within designated airspace at and around FAA Academy traffic control tower and air route traffic control center.

Technical Support Lead, Pampered Chef, 2011-2016

Manage, troubleshoot, and analyze technical issues pertaining to order processing using Oracle, Hybris, Prowess, MDM, P800 and other order processing systems. Proactively identified potential gaps in processes. Maintained a knowledgebase for tech support utilizing Confluence.

Education

Computer Science, DeVry University - Chicago, Illinois



Michael Horbrook

Technical Support Engineer

Michael has 30 years of experience in implementing and engineering payment and information technology systems, including hardware and software. He is detail-oriented and customer-focused and takes initiative to troubleshoot and solve problems. His positive attitude and tenaciousness lead to excellent results and customer satisfaction.

Skills & Expertise

- Networking technology including VOIP, LAN/WAN
- Project and account management
- Troubleshooting and problem solving
- Cloud applications
- A+ Core Service Technician certified
- SAP applications
- Conflict management

Experience

Technical Support Engineer, Genfare, 2015-present

Provide technical support engineering for commercialization of new product release for next generation Genfare Link. Troubleshoot and solve technical issues for internal product development staff, technical support team, and customers. Technical lead for fare collection system development, integration, and deployment, including fareboxes, ticket vending machines, handheld validator, and web and mobile applications. Develop software for devices operating on Mircrium OS, Ubuntu, Android, and iOS. Led successful deployment of solution for 600-bus transit agency. Managed team of system engineers in production support.

Implementation Specialist, Florist Transworld Delivery, 2006-2015

Designed, developed, and implemented information technology systems for provider of distributed floral delivery systems.

Field Engineer, Qmatic, 2004-2006

Installed, wired, and configured queuing management system in network and standalone environments.

Senior Field Engineer, Fujitsu Transaction Solutions, 1994-2004

Engineered and maintained new and existing servers, automated teller machines, point of sale systems, and PC-based terminals for leading provider of retail payment systems.

Education

Associate of Science, Electrical Engineering, Devry Institute of Technology



Freddy Sanchez

Ticket Vending Machine SME

Freddy has nine years of experience installing, troubleshooting, and servicing Genfare hardware and software solutions. His deep understanding of several components of the Genfare's fare collection solutions is an asset in his new role as a customer-focused technical support and training partner.

Skills & Expertise

- Genfare fareboxes
- Ticket vending machines
- Mechanical troubleshooting
- Genfare equipment installs
- Software troubleshooting
- Procedure writing
- Equipment trainer
- Electronics programming

Experience

Tech Support/Trainer, Genfare, 2023-Present

Uses all the knowledge acquired from previous years of experience within Genfare to further help customers troubleshoot hardware or software issues. He also travels to customer sites to training transit agencies on how to properly operate and maintain Genfare systems.

Field Service Technician, Genfare, 2012-2021

Traveled to customer sites for equipment installations, troubleshooting, and programming of equipment. Performed various tasks including data/electrical wiring, maintenance and repair, soldering/micro soldering, and preventive maintenance of fare collection solutions.

Education

Palatine High School



Burhan Sajjad

Farebox SME

Experienced solution architect who excels working with sales, product, and engineering teams to design hardware and software solutions tailored to the customer's needs.

Skills & Expertise

- Data center infrastructure design
- Enterprise risk management
- Program management
- Solution selling

Experience

Solutions Architect, Genfare, 2022 - Present

Supports Sales and Engineering in defining the hardware, software, and services needed to meet agency requirements. Acts as a bridge of communication between customers, Sales, Engineering and Service Delivery teams to ensure all requirements are properly documented, implemented, and verified.

Senior Manager, Software Solutions and Services, Panduit, 2020 – 2022

Business Development Manager, Panduit, 2016-2020

Managed a global team of Solutions Architects, RCDD engineers, and Software Engineers to develop just-right offerings, combining software, services, and training solutions. Consulted with business and pre-sales teams to define use cases and solutions that provided the best customer value and pull through for Panduit. Cultivated novel opportunities to grow Panduit Data Center Infrastructure Manager (DCIM) business globally. Provided sales enablement and support for DCIM opportunities worldwide. Acted as trusted advisor between sales, customers, and business units to promote sales of overall solution stack.

Solutions Architect, Data Center and Colocation, Panduit, 2014-2016

Data Center Infrastructure Manager Solutions Architect, Panduit, 2011-2014

Oversaw large global strategic multi-million-dollar opportunities like SAP, Itau, and Apple. Identified key accounts to penetrate and mobilize working with global accounts teams. Aligned with theater's strategic accounts to ensure synergy globally and maximum pull-through of products and software. Consulted with Panduit system integrators on design and deployment of Datacenter Infrastructure Management Solution and integrations.

Pre-Sales Technical Manager, Panduit, 2008-2011

Software Systems Engineer, Panduit, 2006-2008

Provided solution support to sales, product, and marketing teams. Built strong relationships with end-users and consultants to provide complete, end-to-end IT connectivity and integrated solutions. Managed system level requirements for the Panduit Physical-Layer Infrastructure Manager (PIM) software. Specified a new user interface design to meet the functional and marketing requirements.

Software Release Manager/Technical Lead, Motorola, Inc., 1994 – 2006

Managed software releases and provided technical direction in software development.

Education

B.S., Computer Science, Wichita State University

M.S., Computer Science, Wichita State University





Daria van Engelen

Chief Revenue Officer

Daria's strength lies in her ability to open the line of communication between customers, experts, and businesses to support solutions that result in better outcomes. With 20 years in both public and private sectors, Daria has spent her career in various surface transportation roles in rail and transit – from operations to service delivery and business development. Her role at Genfare is to lead the sales and marketing teams and grow the Genfare business through a clearly defined mission, a plan to measure impact, and engaging stakeholders.

Skills & Expertise

- Strategy development and implementation
- Coaching, and SME development
- Cross-functional team leadership
- Sales and account management

Experience

Chief Revenue Officer, Genfare, 2020 to present

Leads the sales, customer care, marketing, solutions, and product teams and grows the Genfare business through partnering with business leadership, creating, and executing strategy, developing plans and budgets, and building and monitoring the pipeline. She serves as a strategic and commercial leader to advocate and implement sales and marketing methodologies, strategies, and “best practices” throughout North America.

Business Development Senior Director, Cubic, 2018-2020

Managed a \$5 billion pipeline in the U.S. Central and Canada Central and East regions for all business development activities related to mobility and fare collection services. Oversaw scope and award of upgrade programs for Chicago Transit Authority, Metro Transit (MSP), Toronto, and Montreal accounts.

Principal, Public Sector, North Highland Company, 2017-2018

Led high profile projects including the NY Metro Asset Management PMO, the Comprehensive Strategic, Financial and Operational Assessment of NJ Transit and Cultural Coaching at the Minneapolis Police Department within public sector practice.

Business Development Director, Surface Transportation, Serco Inc., 2010-2017

Led business development activities in North America for projects directly with state and local governments and/or private consortiums through various contract vehicles including P3, DBOM, Joint Ventures, and Direct in the transportation and infrastructure markets.

Senior Consultant, Rail Operations, Halcrow/ CH2MHILL/ Jacobs, 2005-2010

Led the development of automated revenue and yield management systems with dynamic pricing capabilities for rail operating company franchises.

Performance Manager, Docklands Light Railway, TfL, 2003-2005

Implemented a program to target improvements within the business and contribute to an improved reliability service to ensure control and trend analysis, resulting in a full 2% improvement in reliability.

Education

M.A., International Relations, University of Amsterdam

B.S., Political Science and Government, Skidmore College



Jennille Logan

Business Development Director - Southeast

Jennille is a 17-year veteran of the transit industry with strong communication, interpersonal, and organizational skills. An avid networker, Jennille excels at bringing the right people together to dissect the issue and work towards a solution. She combines strong relationship and technical skills to drive customer satisfaction, organizational success, and profitability.

Skills & Experience

- Budget Analysis
- Contracts Support
- Customer Relations
- Key Account Management
- Product Development
- Thought Leadership

Experience

Business Development Director, Genfare, 2021 to present

Responsible for building solid relationships with transit agencies and vendors in the southeast while developing sales growth opportunities.

Business Development Director, Cubic Corporation, 2016-2021

Developed and implemented marketing and operations plans to maintain and increase existing business and capture new opportunities. Developed proposals in response to requests for proposals (RFPs). Delivered sales presentations and conducted seminars for clients, external vendors, and advisors.

Chief Consultant, Logan & Associates, 2013-2016

Performed a variety of contracted services for public, nonprofit, or private clients. Provided guidance in the preparation of technical assessment documents and reports for planning submissions. Supported the completion of technical assessments using a range of industry standards.

Business Development Director, American Logistics Company, 2011-2013

Maintained and increased existing business and captured new business by implementing growth initiatives for regional markets and targeted customer segments.

Account Manager, ACS A Xerox Company, 2008-2011

Provided product and service solutions, problem resolution and developed new business within ACS' current customer base. Ensured client satisfaction and maintained positive ongoing relationships. Oversaw and managed projects to ensure contract deliverables and goals were met. Managed all aspects of the client engagement.

Director of Marketing and Communications, MV Transportation, 2007-2008

Managed and organized marketing and communications processes including public affairs, government relations and community outreach. Assisted in the development and implementation of company-wide marketing and public information programs designed to skillfully communicate MV's services.

North American Marketing Manager, INIT Innovations in Transportation, 2005-2007

Managed and developed all functions of the Marketing Department. Developed creative strategies to meet organizational objectives. Evaluated customer research, market conditions and competitor data to implement marketing strategic plan. Specified market requirements for current and future products by conducting market research supported by on-going visits to customers and non-customers.

Education

B.S., Marketing, Hampton University



Sara Edney

Product Manager

Sara has 15 years of experience in technical product development focused on leading software, mechanical, electrical, and systems engineering teams to meet internal and external customer requirements. She is an innovative engineer with a demonstrated understanding of how to prioritize project deliverables and motivate engineering teams to deliver exceptional products. Sara excels in challenging and fast paced environments where collaboration and communication are key.

Skills & Expertise

- Leadership
- Communication
- Organization
- Product development
- Presentations
- Sales support
- Technical demonstrations
- Scheduling
- Budgeting
- Problem solving

Experience

Product Manager, Genfare, 2023 to Present

Sara leads Genfare's product management team. Given her understanding of Genfare's customers and their needs, she helps shape the product roadmap and bring new products and product enhancements to the market.

Program Manager, Genfare, 2020 to 2023

Led project teams in implementing new and upgraded fare collections systems for Genfare clients. Responsible for overall program management and direction, preparation of the project schedule and budget, coordinating Genfare and agency activities, overseeing preparation of required submittals and deliverables, conducting design reviews, and assisting in the resolution of any issues.

Program Manager, Metrom Rail, 2019-2020

Managed the development of a safety certified rail product and a complex ranging radio. Developed processes and tools to fulfill SIL4 CENELEC standards. Managed the day-to-day activities and deliverables for the engineering team.

Senior Engineering Project Manager, Metrom Rail, 2015-2019

Led the development and demonstration of five rail safety products utilizing Ultra-Wideband (UWB) technology and one utilizing alternative ranging technology. Successfully developed and executed three Proof of Concept demonstrations for the NYC MTA.

Systems Engineer, Motorola, 1999-2008

During her nine-year tenure, Sara led multiple projects in software engineering, product development and deployment, and customer service. Developed, deployed, and supported picture and text messaging platforms for major U.S. telecom provider.

Education

B.S., Electrical Engineering, Christian Brothers University



Kyle Gerstner

Solution Architect

Entrepreneurial and collaborative technology professional with 13 years of experience as a Software Architect and 8 years of experience building and leading teams. Proven expertise in defining and refining long-term strategy and product roadmaps. Passionate about leveraging technology to solve difficult problems.

Skills & Expertise

- Solution Architecture
- Systems Integration
- Mobile Applications
- User Experience
- Product Validation
- Product Roadmap
- Process Improvement
- Long-Term Strategy

Experience

Solution Architect, Genfare, 2022 – Present

Supports Sales and Engineering in defining the hardware, software, and services needed to meet agency requirements. Acts as a bridge of communication between customers, Sales, Engineering and Service Delivery teams to ensure all requirements are properly documented, implemented, and verified.

Product Director, Genfare, 2020-2022

Responsible for Genfare's mobile applications, providing a robust solution for Genfare's transit partners and their riders. Leveraged experience in both the consumer and enterprise application spaces to provide an engaging user experience with enterprise grade reliability.

Digital Transformation Architect and Owner, Acclivity Solutions, 2018-2020

Started Acclivity Solutions and focused on helping companies leverage cloud and mobile technology solutions with a cohesive user experience to achieve their goals. Lead the development of Genfare's mobility solution. Lead riders' development teams.

Chief Technology Officer, Healthcare Technology Startup, 2018-2020

Designed and architected a suite of SaaS products that focus on patient satisfaction, cost, and provider communication to give consumers more control over their healthcare experience. Developed long-term roadmap to seek venture funding.

Mobile Practice Director and Principal Architect, Sonoma Partners, 2012-2018

Started Mobility Practice at Sonoma Partners and worked with clients to develop highly customized innovative mobile solutions for their workforce. Built a team and grew to working on \$1M+ projects. Created applications for clients that increased the efficiency of their employees in the field.

Education

B.S. Computer Science, University of Illinois School of Engineering, Champaign-Urbana, Illinois

Bill Kerr

Director of Programs and Implementation



Bill is a program and project management leader with more than 14 years of experience delivering fare collection hardware, cashless payment, and enterprise software solutions. Before joining Genfare, he led programs and implementations with globally distributed development and operations teams at Crane Payment Innovations (CPI). He is an experienced PMO leader who has developed innovative visual management solutions for prioritization, milestone, and project status management. Bill is focused on continuous improvement that ensures high quality and secures repeatable and scalable processes. He is a technologist with experience and professional certifications in cloud computing and software development.

Skills & Expertise

- Leadership and team management
- Project and program management
- Continuous improvement
- Product management
- Hardware and SaaS product development

Experience

Director of Programs and Implementation, Genfare, 2020 to present

Bill leads a team of program and implementation managers that are responsible for the end-to-end delivery of Genfare systems, which consist of front-end hardware devices, backend software systems, and integrations with AVL and other third-party suppliers.

Program Manager, CPI – Connectivity Solutions, 2016-2020

Program management lead for CPI – Connectivity Solutions (CS). Responsible for driving projects through the full life cycle using agile and waterfall frameworks. Responsible for project performance, process, and tools. Responsible for managing project managers/scrum masters.

Solution Delivery Manager, CPI, 2011-2016

Responsible for end-to-end delivery of services related to the CPI SaaS and IoT solutions that manage routing, inventory, accountability, and remote monitoring for vending industry. Responsible for managing the solution delivery management team.

Education

M.S.E., Materials Science & Engineering, University of Delaware
 B.S., Physics, Rowan University
 A.A.S, Camden County College

Certifications

P.M.P., Project Management Professional
 AWS Certified Solutions Architect – Associate



Trivi Ravada

Chief Technology Officer

Trivi is an engineering leader with 20 years of experience in product development focused in building and leading global teams developing software and hardware products for the security and payments industries. He is responsible for Genfare's hardware products and software solutions. A promoter of process automation to reduce costs and improve quality and efficiency, he has also managed operations for large customer deployments of security systems.

Skills & Experience

- Leadership
- Innovation
- Communication
- Product development
- Operations
- Technical demonstrations
- Process automation
- Budgeting

Experience

Chief Technology Officer, Genfare, 2021 to present

Trivi is responsible for establishing Genfare's vision and product roadmaps and delivering the company's hardware and software products. He is responsible for building and retaining engineering talent focused on solving customer challenges with innovative technology and managing relationship with key technology partners.

Senior Director, Engineering, Crane Payment Innovation, 2018-2020

Managed Crane's cashless products and connectivity solutions used by consumers to pay for services and by operators to remotely manage and monitor payment terminals. Improved security across all products by introducing secure development practices. Implemented automated Continuous Integration, Deployment and Delivery with business mandated checks and balances.

Senior Engineering & Operations Manager, Johnson Controls Inc, 2004-2018

Responsible for engineering and operations for two Azure-hosted IoT solutions, used to collect and analyze building data for potential faults and to identify energy saving opportunities for Johnson Controls customers. Responsible for a 15-person cross-functional team in multiple geographies on projects valued at \$150M annually.

Education

MBA, General Management, University of Wisconsin, Madison
BE, Computer Science and Engineering, Osmania University, India



Hector Serrano

Project Engineer

Hector has twenty years of experience in public transit and has worked with Genfare products for decades. His expertise in electrical engineering in a transit environment extends beyond fare collection to connect all the ways transit technology works together.

Skills & Expertise

- Technical writing & documentation
- Implementation planning
- Automatic Fare Collection deployment
- Fare media encoding
- Automatic vehicle locations (AVL)
- Camera systems
- Destination sign programming
- Ticket Vending Machines
- Screens and Mobile App designs
- Test acceptance documentation

Experience

Project Engineer, Genfare, 2022 - Present

Hector harnesses his experience in implementing, maintaining, and repairing Genfare hardware and software -- including fareboxes, various types of fare media, ticket vending machines, software, mobile applications, and reporting platforms -- to provide technical expertise to the teams implementing Genfare solutions at transit agencies. His deep knowledge of the electrical engineering behind the systems that optimize transit allows Hector to view the technologies individually and collectively at a macro and micro level.

Transit Technology / ITS Manager, Greater Richmond Transit Company, 2003-2022

Hector was directly responsible for all electronic repairs and coordination of transit technology preventive maintenance for onboard electronic components, including associated software and hardware upgrades for revenue and non-revenue vehicles. During his tenure at GRTC, Hector implemented new technology including smart cards, an AVL system, software platforms, Fast Fare fareboxes, mobile applications, TVMs, and other ITS equipment.

Education

Electrical Engineering, Polytechnics Engineer College



Dave Hansen

Implementation Manager

An enthusiastic leader known for engaging, retaining, and helping customers realize value. Trusted partner who excels in providing customer success. Combines entrepreneurial spirit, strategic understanding of customer business, vast experience in process building, and customer relationship management to create and implement the best technical solutions for each customer.

Skills & Expertise

- Creating and leading professional services organizations
- Portfolio, program, and project management
- Customer onboarding
- Customer relationship management
- Process improvement

Experience

Implementation Leader, Genfare, 2020 to present

As part of Genfare's digital transformation in Transit and Mobility, directing a team of implementation and configuration specialists delivering AWS based solutions, identifying, and employing portfolio and implementation process improvements, and partnering with clients to complete ongoing implementations.

Product Delivery Manager, KDH Solutions, 2019-2020

Delivering solutions in Professional Services, Implementation, Pre-Sales, Customer Success, Product Management, and Project Management to small and midsize companies.

BusinessConnect Professional Services Director, Equifax, 2014-2018

Relationship and Implementation manager for large BusinessConnect Salesforce AppExchange application customers. Built customer success relationship as customer engagement manager.

Project Management Consultant, DHansen Consulting, 2012-2014

Partnered with J2A Systems, Trillium Consulting Group, and Blue Slate Solutions to provide Project and PMO Management consulting services to Blue Cross Blue Shield of Michigan, Sears, General Board of Pension and Health Benefits, Northwest Community Healthcare, and Community Healthcare System.

Director of Implementations and Training, Accretive Health, 2007-2012

Led process and program development for enterprise-wide project management and professional services initiatives. Drove strategies throughout cross-departmental teams to raise efficiency, productivity, and quality of deliverables for operations and implementation.

Education

Bachelor of Science in Computer Science and Mathematics, University of Illinois - Urbana, Illinois

Certifications

Project Management Institute (PMI) Certified Project Management Professional (PMP)
Scaled Agile Framework (SAFe) Agilist (SA), Product Owner/Product Manager (POPM)
Engagement Alliance Gamification Design Certification – Level 3: Master

5.5.3 Magnetic AutoControl

- Heiko Lais: Product Development Director
- Larry North: Faregate SME
- Chris Webb: Senior Product Specialist
- Wilson Santos: Pedestrian Project Manager

5.5.4 Consolidated Parking

- Joel Daniel Jimenez: Installation Manager
- Michael Healy: Safety Manager

5.5.5 Transportation America

- Warren Ortiz: Quality Assurance Manager
- Hugh Chen: Local (Miami) Fare Collection SME



Heilo Lais

Product Development Director

Heiko is based in Schopfheim, Germany, and is responsible for product management with a main focus on pedestrian gates. He supports product specialists at Magnetic subsidiaries worldwide.

Skills & Expertise

- Deep knowledge of vehicle and pedestrian products
- Product and project management
- Worldwide market business knowledge
- Technical support, with a sales engineering background

Experience

Product Development Director, Magnetic AutoControl GmbH, 2013-present

Leads project management with a main focus on pedestrian gates and secondary responsibility for vehicle barriers, supporting the worldwide market.

Sales Engineer and other positions, Magnetic Group, 2007-2013

- Sales Engineer managing support, sales, and technical support for the Magnetic subsidiaries
- Sales Engineer for regions as Spain, Italy, UK
- Key Account and Project Manager for OEM customers
- Managing AFC, Immigration and Boarding Gates projects within Magnetic and OEM customers

Mechanical Project Engineer, Touchcorp Ltd., 2000-2002

Project manager for Magnetic measurement systems, responsible for worldwide projects.

Education

Master of Science Degree, Computer Based Engineering, 2004
Dipl. Ing. (BA) Electromechanical Engineer



Larry North

Faregate SME

Based in Rockledge, Florida, Larry is a hands-on leader with 30+ years demonstrated success bringing technical products and services to market. He is tech-savvy and drives efficient, cost-effective product lifecycle planning.

Skills & Expertise

- Business Development/client retention
- Cost planning
- Project management
- Product training
- Staff education
- Marketing presentations

Experience

Business Development Director, Magnetic AutoControl USA, 2010-present

Leader for USA-based team with objective of broadening the company's position in the pedestrian/passenger gate market in North & Central America. Develop market plan, strategy, and direction for pedestrian gate access control business, serving commercial-industrial facilities, airlines and airports, public transit customers and border/immigration locations.

Program management skills employed for ongoing HART (Honolulu Authority for Rapid Transportation) 21-station rail project. Involves driving design, production and building a US-based supply chain for automated gate products. Manage production and test process for pedestrian faregates in Florida.

Marketing Director, Nortek Security & Control., 2010-2016

Lead team providing marketing strategy, direction, materials, and sales tools for 4 product brands, serving B2B and B2C customers. Promote and market smart residential and commercial "Internet of Things" (IoT) products – security, lighting, control/ convenience, home, and business automation solutions.

Education

Bachelor of Science, Manufacturing Engineering, University of Massachusetts at Amherst



Chris Webb

Senior Product Specialist

Based in Rockledge, Florida, Chris manages pedestrian and vehicle products for the North and South American markets, as well as heads the technical support department. Chris has been with Magnetic since 1997.

Skills & Expertise

- Business Development/client retention
- Cost planning
- Project management
- Product training
- Staff education
- Marketing presentations

Experience

Senior Product Specialist, Magnetic AutoControl USA, 2011-present

Manages Magnetic Pedestrian and Vehicle products for the North and South American markets. Creates products for specific customer needs. Creates manufacturing process for the US facility. Manages product side of ERP system in the U.S. facility. Head of the technical support department for Magnetic Product.

Production Manager, Magnetic AutoControl USA, 2004-2011

Managed Magnetic Pedestrian and Vehicle products for the North and South American markets. Created manufacturing process and managed ERP system for the US facility. Lead technical support and shipping and receiving departments. Created production schedules to meet corporate and customer demands and planned parts ordering schedules.

Production and Technical Support, Magnetic AutoControl USA, 1997-2003

Provided telephone and onsite technical support. Repaired Magnetic products. Supported production.

Education

Associate of Science, Electronic Engineering Technologies, Eastern Florida State College



Wilson Santos

Pedestrian Project Manager

Based in Rockledge, Florida, Wilson plans and executes new projects for Pedestrian Gate customers, delivering projects with a high degree of quality, managing the build and the installation team. Wilson takes pride in delivery of projects on time and within expected budget.

Skills & Expertise

- Vehicle and pedestrian products
- Technical support
- Project & product management
- Manufacturing
- Customer service
- Training

Experience

Pedestrian Product Manager, Magnetic AutoControl USA, 2020-present

Develop new and manage existing customers relationships in the area. Deliver projects on time and within expected budget. Prioritize, resolve, and escalate issues. Train new staff as needed. Spearhead the development, planning, and execution of new projects for Pedestrian Gate Customers. Successfully manage Production/Installation teams, ensuring timely milestones, adherence to budgets, and high-quality outcomes. Lead comprehensive evaluations of project designs alongside cross-functional teams comprising engineers, sales, procurement, quality, and installation experts. Integrate customer feedback and technical insights to enhance reliability and proactively address concerns.

Product Analyst, Magnetic AutoControl LDITA, 2004-2011

Development of products and solutions in Magnetic's Brazil location. Technical and commercial training for partners and customers. Second level technical support and supervision of technical area in the performance of maintenance and support. Direct contact channel with the matrix Magnetic Germany, for solution and implementation of new products and production processes.

Junior Maintenance Technician, Tash Sistemas de Computatacao S/A, 2013-2014

Field installation and maintenance of access control and time attendance equipment (turnstiles, vehicle and pedestrian barriers, electromagnetic locks, air-conditioned room for pharmaceutical industry). Server administration for security and time-attendance, technical and commercial visits to customer-oriented solutions.

Education

BD in Mechatronics Engineering, Paulista University, Sao Paulo, Brazil
Mechatronics AS Degree, Getulio Vargas, Sao Paulo, Brazil



Joel Daniel Jimenez

Installation Manager

Joel is a Miami native and an articulate communicator who works well with people at all levels. He is a bilingual Marine Corps veteran with collaborative cross-functional abilities.

Skills & Expertise

- Bilingual English/Spanish
- Organized and punctual
- Strong communicator
- Critical thinker
- Equipment management
- Leadership & planning

Experience

Head Installation Technician Safety Manager, Consolidated Parking Equipment, 2017-present

Provide infrastructure for equipment installations including integrations with third party hardware and software. Perform walk-throughs for site planning. Service and maintain equipment.

Electrician Apprentice, Delta Tech Electric, 2016

Assisted head electrician with projects, learning electrical techniques and operating procedures at customers throughout Miami Beach.

Platoon Chief and Team Leader, U.S. Marine Corps, 2014-2016

Managed and ensured readiness of up to 34 personnel, including training, facilitating practice exercises, and teaching Standard Operating Procedures. Mentored personnel. Supervised inventory of gear. Employed and monitored a large variety of sensor surveillance equipment including early warning detection and guarding entry and exit points.

Education

U.S. Marine Corps Training Courses
CBT College, Electrical Program



Michael G. Healey

Safety Manager

Michael is dedicated and results-driven with a proven track record of efficiently overseeing maintenance operations, ensuring optimal equipment performance, safety, and minimizing downtime. Offering over 12 years of experience in various industries, he brings a diverse skill set, strong leadership capabilities, and a commitment to ensuring a safe and productive work environment.

Skills & Expertise

- Preventive maintenance
- Inventory management
- Safety protocols & compliance
- Strategic planning
- Data analysis
- Customer service

Experience

Maintenance & Safety Manager, Consolidated Parking Equipment, 2017-present

Oversee and optimize the operation of diverse parking equipment, including Magnetic equipment. Skilled in managing preventive maintenance, equipment repairs, and safety protocols to ensure seamless functioning. Deliver regular training sessions and safety drills to maintain a culture of safety. Collaborate with IT to integrate new technologies into parking equipment.

Warehouse Manager, Caribbean Express, 2015-2017

Oversaw all warehouse operations, including receiving, storage, order picking, packing, and shipping, ensuring efficient and smooth processes. Managed a team of 10 warehouse staff, providing leadership, training, and performance evaluations. Prepared and presented regular reports to senior management.

Detailing Specialist, G2G Detailing, 2012-2015

Operated detailing tools and equipment. Interacted with customers to understand their specific detailing needs and preferences. Addressed customer inquiries, provided recommendations, and ensured customer satisfaction.

Education

Sarasota High School
Sarasota Technical Institute



Hugh Chen, PE

Local Miami Fare Collection SME

After a 20+ year career in operations and field engineering and systems maintenance at Miami-Dade Transit, Hugh shifted to consulting focusing on transportation operations. He currently serves as VP of Operations at Transportation America.

Skills & Expertise

- Public transit & paratransit
- Operations & maintenance
- Infrastructure & capital projects
- Labor negotiations
- Compliance & state and local regulations

Experience

Vice President of Operations, Transportation America, 2021-present

Lead Limousine of South Florida. Provide contracted operations and maintenance services for Broward County. Responsible for operations of Broward County paratransit service.

President, PiR2 Services Inc., 2016-present

Provide transportation operations, engineering, and management consulting services.

Deputy Director of Operations, Miami-Dade Transit, 2007-2015

Planned and directed the complex and diversified activities of the transit agency across modalities. Responsible for agency infrastructure. Ensure the safe, reliable, and cost-effective operations of the agency. Responsible for operating and capital budgets.

Chief of Field Engineering & Systems Maintenance, Miami-Dade Transit, 1996-2007

Responsible for two operating divisions of engineers, technicians, and administrative personnel. Lead specifications development, contract administration, and plant inspection of new bus purchases. Lead installation and maintenance services for several technologies including fare collection.

Assistant Chief of Transit Communications, Miami-Dade Transit, 1992-1996

Managed project implementing communications technology. Provide engineering support for modernization of Metrorail and existing radio, computer, and fare collection systems. Lead operations for electronics lab and radio and fare collection repair shops. Supervised crew.

Education

B.S., Electronic Engineering, Northrop University

M.S., Electronic Engineering, Northrop University

State of Florida Registered Engineer



Warren Ortiz

Quality Assurance Manager

After a decades-long career with Miami-Dade Transit, beginning as a bus operator in 1975 and ending as a technical expert in fare collection, Warren now provides technical services for the repair, maintenance, and installation of radio systems and electronic equipment associated with revenue collection systems.

Skills & Expertise

- Program management
- Maintenance & installation
- Fare collection technology
- Surveillance & security systems
- Technical specifications
- Field acceptance testing

Experience

Maintenance Manager, Transportation America, 2021-present

Monitor, maintain, repair, and replace bus security and surveillance systems.

Assistant Program Manager, Miami-Dade Transit, 2005-2010

Provided technical assistance for automatic fare collection project. Researched documents, reviewed technical specifications, perform installation inspections and field acceptance testing.

Supervisor of Field Engineering & Systems Maintenance, Miami-Dade Transit, 2003-2005

Manage staff of 11 technicians servicing fare collection equipment. Scheduled repair activities, reviewed work orders, and prepared report.

Electronic, Communications, and Rail Technician, Miami-Dade Transit, 1983-2003

Responsible for installation, maintenance, and repairs of revenue collection equipment including entry gates, parking meters, and ticket dispensers; fire alarm, CCTV, telephone, and fiber optics systems; mobile and handheld radio and antenna systems; and digital communications equipment.

Bus Supervisor & Operator, Miami-Dade Transit, 1975-1982

Responsible for safe operation of transit vehicles, maintaining prescribed schedule. Supervise and instruct bus operators. Perform surveys.

Education

Diploma, Industrial Electronics, Miami Lakes Technical School

Certificates, Electronics and Supervisory Training, Miami-Dade Transit

Price Schedule



6. PRICE SCHEDULE

Genfare has completed and attached Attachment B (Proposal Price Schedule) in both PDF, as the official proposal submission, and in Excel in support of internal data analysis.

Genfare warrants that it has reviewed DTPW's requirements and has asked such questions and conducted such other inquiries as deemed necessary to determine the price we will charge to provide the work to be performed under this contract.



Optional Items



7. OPTIONAL ITEMS

7.1 Preliminary Project Schedule for Phase 1 Options

Should DTPW exercise the option to have additional TVMs installed at the local bus stops along the South Date Transitway, Genfare will install the TVMs on the schedule below, following the design reviews for the Phase 1 TVMs and faregates. The TVMs for the local bus stops will also be operational by December 31, 2024. Pricing for the optional work is also included in our price schedule.

	Days	Start	Finish
Phase 1 - OPTIONAL - TVMs at Local Bus Stops	11d	11/04/2024	11/16/2024
Installation at Bus Stop 1, 2, and 3	1d	11/04/2024	11/04/2024
Installation at Bus Stop 4, 5, and 6	1d	11/05/2024	11/05/2024
Installation at Bus Stop 7, 8, and 9	1d	11/06/2024	11/06/2024
Installation at Bus Stop 10, 11, and 12	1d	11/07/2024	11/07/2024
Installation at Bus Stop 13, 14, and 15	1d	11/08/2024	11/08/2024
Installation at Bus Stop 16, 17, and 18	1d	11/09/2024	11/09/2024
Installation at Bus Stop 19, 20, and 21	1d	11/12/2024	11/12/2024
Installation at Bus Stop 22, 23, and 24	1d	11/13/2024	11/13/2024
Installation at Bus Stop 25, 26, and 27	1d	11/14/2024	11/14/2024
Installation at Bus Stop 28, 29, and 30	1d	11/15/2024	11/15/2024
Installation at Bus Stop 31, and 32	1d	11/16/2024	11/16/2024

Table 39. Preliminary schedule for TVMs at local bus stops

7.2 Preliminary Project Schedule for Temporary Integration with Existing Backoffice

Should DTPW exercise the option to integrate the equipment with the current back office provider, Cubic, Genfare will work with DTPW and Cubic to complete that integration. A preliminary schedule is below. Genfare and Cubic have a long history of working together on various integrations, including one currently in place on DTPW's fleet.

	Days	Start	Finish
Phase 1 - OPTIONAL – Integration to Cubic	181d	01/01/2025	07/01/2025
Notice to Proceed	1d	01/01/2025	01/01/2025
Kickoff Meeting	1d	01/06/2025	01/06/2025
Integration Development Plan	20d	01/06/2025	01/31/2025
Integration Development	60d	02/03/2025	04/25/2025
Integration Testing	20d	04/28/2025	05/23/2025
User Acceptance Testing	15d	05/26/2025	06/13/2025
Production Pilot	10d	06/16/2025	06/27/2025
Go Live	1d	07/01/2025	07/01/2025

Table 40. Preliminary schedule for integration with existing back office

7.3 Standalone Fare Validators

In Addendum 2, DTPW added an additional optional item, standalone fare validators. The Fast Fare 25 proposed in our solution can already support smart cards and contactless credit cards with the reader contained the lid. DTPW can optionally add a barcode reader to the lid of the Fast Fare to support printed or mobile barcoded tickets. Genfare believes this solution would be better for the DTPW as it minimizes the hardware required onboard.

Should DTPW require a separate validator which can be mounted near the farebox up front, at a rear door to support all door boarding, or on a smaller vehicle that does not have room for a farebox, such as a paratransit van, Genfare has a validator solution as well.

The Open Link Validator (OLV) supports smart cards, contactless credit cards, and barcoded media. Like all equipment proposed here, the OLV connects to Genfare Link for its configuration and transaction reporting.

Palm Tran is currently using the Fast Fare farebox onboard its fixed route buses for all cash and electronic payment and has recently rolled out the OLV to its smaller vehicle fleet to have a seamless electronic payment experience across its fleet. Genfare looks forward to discussing the best path forward with DTPW.

Appendices



8. APPENDICES

- Appendix A: Implementation Plan – Phase 1
- Appendix B: Compliance with General Requirements for All Fare Equipment
- Attachment G: Information Technology Security Matrix

In addition to the files above, Genfare has also provided the following files as required:

- Attachment E: Exceptions Table
- Attachment B: Proposal Price Schedule – Excel and PDF

GENFARE SUBSCRIPTION AND SERVICES AGREEMENT

THIS SUBSCRIPTION AND SERVICES AGREEMENT (the “Subscription Agreement”) is made a part of Contract No. RFP-EVN0001090 between Genfare, LLC (“Genfare” or “Contractor”) and Miami-Dade County (“Customer” or the “County”). Customer and Genfare agree as follows:

1. Definitions

- 1.1 “Affiliated Users” means organizations, entities, affiliates or partners of Customer and to which access to the Services is approved and desired by Customer.
- 1.2 “Subscription Attachment” means the document that sets forth the subscription details for the Services and the Software, and any product specific terms applicable to Customer’s subscription, more specifically the Genfare Link Services Attachment attached hereto.
- 1.3 “Documentation” means certain Genfare documentation that describes the use, functions, features, or purpose of the Services or any component thereof, in any medium, which is delivered to Customer by Genfare under this Agreement, including Genfare's user manuals, training materials, program listings, data models, flow charts, logic diagrams, functional specifications, instructions, and complete or partial copies of the foregoing.
- 1.4 “Equipment” means certain equipment purchased by Customer from Genfare which is to be used by Customer in connection with the Services.
- 1.5 “Initial Subscription Term” means the period of time specified on an applicable Attachment.
- 1.6 “Intellectual Property Rights” means patent, copyright, trade secret, know-how, trademark, trade dress rights, and any other intellectual property or proprietary rights in the Services, Software, Equipment and all software, equipment, processes and facilities utilized by or on behalf of Genfare to provide the services contemplated herein.
- 1.7 “Permitted Users” means (a) Customer’s employees (including temporary employees and contract employees) authorized by Customer to access and use the Services on Customer’s behalf, and (b) Customer’s service providers that need to access the Services, provided such third parties are subject to written restrictions comparable to the restrictions on use in this Subscription Agreement and may only use the Services for purposes of providing Services to Customer (provided that the acts and omissions of such third parties shall be deemed the acts and omissions of Customer) and (c) for Customers whose SaaS Services may include the optional “Organizational Module”, the applicable Affiliated Users authorized for such access in an Attachment.
- 1.8 “Renewal Subscription Term” means any extension to this Subscription Agreement, commencing upon the expiration of the Initial Term or any extensions thereto, as provided in this Subscription Agreement or otherwise in an Attachment.
- 1.9 “SaaS” means the software as a service subscribed to by the Customer. The SaaS Services being subscribed to by Customer are more specifically detailed in the Services Attachment.
- 1.10 “Services” means the SaaS listed on an Attachment and Support.

- 1.11 “Software” means Genfare’s proprietary software that is to be installed on Customer’s computer system, including Network Manager, and/or the Garage Data System, and/or software that may be embedded on the Equipment.
- 1.12 “Subscription” means the Customer’s payment to access, use and obtain the benefit of the Services.
- 1.13 “Subscription Fees” means the fees set forth in an Attachment for providing the Services.
- 1.14 “Subscription Term” means the Initial Subscription Term together with any Renewal Subscription Terms.
- 1.15 “Support” means those support services to be provided by Genfare pursuant to and in accordance with the terms and conditions set forth herein, as more particularly described in Exhibit A attached hereto.
- 1.16 “Term” means the term of the Subscription Agreement which begins on the Effective Date and continues until: (i) this Subscription Agreement is terminated by a Party as provided herein or (ii) this Subscription Agreement expires as provided herein, whichever is earlier.

2. Access Rights, License and Services

- 2.1 Subject to the terms of this Subscription Agreement and during the Subscription Term, Genfare grants Customer and its Permitted Users a limited, non-exclusive, non-transferable, revocable, non-sublicensable right to access and use the Services solely for Customers internal business purposes.
- 2.2 Subject to the terms of this Subscription Agreement, Genfare grants Customer a non-exclusive, non-transferable, revocable, non-sublicensable license to install and/or use the Software solely for Customers internal business purposes.

In the event that Customer desires to add services and/or increase its scope of use of the Services and/or add Permitted Users, Customer may do so by purchasing the applicable access rights from Genfare as Extra Work, in accordance with Article 40, *Extra Work*, of the Agreement.

- 2.3 Customer’s rights granted under this Subscription Agreement may not be leased, sublicensed or otherwise transferred or made available for use by unaffiliated third parties, in whole or in part, by Customer without Genfare’s prior written consent or as expressly permitted in this Subscription Agreement. Customer shall not use or attempt to use the Services in a manner that would exceed the scope of the rights granted under this Subscription Agreement or facilitate any such unauthorized access for any third party.

Customer shall not without the express written consent of Genfare: (a) reverse engineer, reverse assemble, decompile, or disassemble any technology underlying the Services and Software; (b) otherwise attempt to discover the source code to the Services or Software; (c) translate or migrate the Services or Software into another format, language, or hardware platform; (d) make the Services or Software available to anyone other than Permitted Users; (e) alter or remove any copyright, trademark or other proprietary notices on or within the Services, Software or Documentation; (f) create derivative works based upon the Services or Software in whole or in part; (g) develop or modify any software based on ideas, processes or materials incorporated into the Services or Software, or (h) permit any third party to do any of the foregoing.

GENFARE LINK SERVICES ATTACHMENT

SaaS Services	Genfare Link, applicable modules are checked: ☒ Admin Link ☒ Report Link ☒ Fare Link ☒ Customer Care Link ☐ Inventory Link ☒ Asset Link (requires latest generation Genfare hardware) ☐ Card Check ☐ Invoice ☒ Real Time Link (requires latest generation Genfare hardware) ☐ Account Based (additional fee) ☐ Open Payment (additional fee) ☐ e-Fare (additional fee) ☐ Organizations / Affiliated users (additional fee)
Subscription Start Date	The date Genfare makes the Services available for user acceptance testing.
Initial Subscription Term	6 years from the Effective Date of the County Agreement.
Contracted Number of Affiliated Users, not to exceed	Not Applicable.
Affiliated Users	Not Applicable.

EXHIBIT A
Service Level Agreement

1. Support

Support Levels	Platinum
Portal Licenses	8 users
Access	Knowledge Base, Case Management, Assets and Training
Support Hours	24/7
Email and Phone Support	Included
Online Portal Training	Up to 8 users
Software Updates	Included
Fare Structure*	Unlimited
3-Day System Review**	Included

*Fare structure changes require a minimum of six (6) weeks' notice with the fare structure checklist completed and provided to Genfare's team. Requests where Genfare receives less than six (6) weeks' notice are subject to availability and are subject to an expedite fee.

** The three-day system review will take place once every three years for Customer. Genfare will not offer an additional three-day system review if Customer terminates this agreement and later restarts services unless the date Customer restarts services is at least three years after the execution this Subscription Agreement.

3-Year Schedule

- Year 1 - Three-day system review with recommendations
- Year 2 - revenue reconciliation review and year 2 overview
- Year 3 - revenue reconciliation review and year 3 overview

In preparation for the review Genfare will review the Customer's current system along with an overview of any issues Customer are experiencing or want to discuss. There will be four main areas of focus for the review.

1. Maintenance
 - a. Inspect a sample of equipment
 - i. Overall condition
 - ii. Preventive maintenance procedures
 - b. Update records about Genfare equipment for warranty purposes
 - c. Spare parts inventory
2. Reports
 - a. Check onsite computer specifications and suggest capacity updates
 - b. Check exception and edit data reports
 - c. Check cashbox audit report for operations procedures
 - d. Check unclassified revenue, to get a feel of security operation procedures
 - e. Reconciliation review
3. Training
 - a. Preventive Maintenance
 - b. Reports
4. Overall system performance and areas for improvement

2. Definitions

“Error” means any situation where the Services or the Software (a) does not operate in accordance with the Documentation; and/or (b) does not produce incorrect results; and/or (c) encounters any other problems or issues set out in the chart in Section 6.4 of this Exhibit.

“Resolution” or “Resolve” refers to actions taken to correct or provide a reasonable work-around for a reported issue by delivering new code or otherwise restoring the Services to a functional state. In the case of a work-around as a solution, Genfare shall continue working to more permanently resolve the Error until such Error is fully resolved.

“Standard Service Hours” are defined as Monday through Friday beginning at 8:00am and ending at 5:30pm Central Time, excluding federal, Customer, and Genfare holidays.

The Holiday List is updated annually and can be found on the Customer Portal within the knowledge base searchable by: Genfare Holidays. Outside of Standard Services hours, Customer may contact the help desk at the after hour support number shown in section 6.1.

“Telephone Support” means an oral responses, “Email Support” means an electronic response, and “Customer Portal” means an electronic response by Genfare's Customer Care Representatives and Technicians to questions regarding (a) the functions of the Services, (b) the steps for Customer to follow in operating the Services, (c) the proper format for the input of Customer's data or information, (d) steps to improve the efficiency of operation of the Services, (e) the interface of the Services, and any related system in Customer's current technical environment, (f) the interface of the Services and other software, (g) the Documentation relating to the Services, and/or (h) changes to the operation of the Services due to the provision of a maintenance and/or support service to Customer.

3. SaaS or Software patches and upgrades

- 3.1 Genfare shall (i) develop, test, provide and/or implement all applicable “patches” or updates that become necessary to remedy the Errors in the Services or the Software and (ii) provide all version updates, software patches and error corrections necessary for the Services and the Software to maintain functionality.
- 3.2 All SaaS/Software updates and/or upgrades are based on the minimum hardware requirements needed for such update and/or upgrade.
- 3.3 Genfare strongly recommends the customer utilize a test environment for all software updates. Customer is agreeing to assume all risk and liability associated with accepting an update in their production environment.
- 3.4 Applicable Software updates will be made available to Customers as they are released. Customer's involvement may be required as Genfare may need access to certain Customer equipment or systems to effectuate updates.
- 3.5 For Errors in the Software, prior to implementing any patches or upgrades, Genfare shall first notify Customer's IT department in advance to schedule a time and date for the installation. Depending on the scope of the change, Customer may wish to back-up their data associated with the Software prior to the software upgrade.
- 3.6 Genfare Support includes new features in modules subscribed to by the Customer, but does not include modules not subscribed to or new modules developed by Genfare.

4. Exceptions

- 4.1 The provisions of this Exhibit A shall not apply to issues arising from:

- (a) the negligence of Customer, its customers, employees, or representatives,
 - (b) any loss or damage resulting from a force majeure event (as set forth in Section 10.8 of this Subscription Agreement),
 - (c) alteration, misuse, or abuse of the Services or Software,
 - (d) use of the Services or Software contrary to the terms of this Subscription Agreement, or the instructions in any Documentation provided to the Customer,
 - (e) the combination of the Services or Software with any third-party hardware or software not expressly recommended or approved by Genfare,
 - (f) any improper installation, operation or maintenance of the Services or Software by the Customer or a third party, including use of non-OEM parts in the Services and a Customer's failure to promptly install all patches, error corrections and updates provided by Genfare,
 - (g) Customer's failure to report a known Error in a timely manner (no more than seven (7) business days from identification of such Error), or
 - (h) a Genfare-supplied hardware failure (except to the extent that such hardware is under warranty).
- 4.2 Genfare will not provide Support or any associated services for the Customer's Oracle database environment. Oracle database adjustments, enhancements and/or recommendations will be communicated and passed to Customer for implementation. Genfare is not responsible for executing updates to maintenance for the Customer's network manager/Oracle database virtual environments, operating systems, database version, database allocation or similar Customer-provided resources.

5. Genfare and Customer Duties

Although Genfare shall be responsible for the Support, Customer shall be the Party that initially responds to all Errors. Genfare agrees to assist the Customer, as required and contracted by the Customer.

5.1 Genfare SHALL:

- (a) Provide remote support for the Services and Software, as required by this Subscription Agreement;
- (b) Respond to and Resolve any Errors in accordance with the chart in Section 6.4;
- (c) Perform the Support in a competent manner by qualified personnel;
- (d) Ensure that the Services or Software will operate and function with updates, upgrades, modifications or fixes, that are provided by Genfare, including without limitation, software patches or bug fixes;
- (e) Ensure that Genfare personnel or contractors are available to carry out the obligations of Genfare hereunder;
- (f) Provide contact information for Genfare personnel, available to receive notices of Errors under Section 7.2 of this Exhibit; and
- (g) Notify Customer of any identified indication of deliberate tampering or patterns of damage not consistent with normal usage.

5.2 Genfare SHALL NOT:

- (a) Be responsible for any malfunction of Equipment, servers, computer equipment, communications infrastructure, cabling, networking capability or any other element or Errors that are not attributable to the Services or Software; or
- (b) Pay any claim pertaining to work done by or on behalf of Customer for removing modules or Equipment to be shipped to Genfare for repair.

5.3 Customer SHALL:

- (a) Provide any information reasonably requested by Genfare to understand and describe an Error in order to allow Genfare to carry out its duties hereunder;
- (b) Provide any access to Equipment or systems as reasonably requested by Genfare to provide patches or updates to Software;
- (c) Perform all preventative maintenance of Software and Equipment according to the Documentation; if asked, Customer must provide a history of preventative maintenance and support of the system as part of the terms of keeping the full fare collection system in good working order.
- (d) Be entitled to use any third party to carry out all or part of the hardware maintenance of the Services, or to carry out such maintenance itself (Genfare shall have no obligation to correct Errors attributable to such third-party or self-performed maintenance under this Exhibit A);
- (e) Make all requests for support through a Customer's representative, or Customer's representative's substitute(s) or designee(s);
- (f) Provide appropriate personnel and support as is necessary for Genfare personnel to perform their duties, such as IT technical support, communications support, revenue service support and security personnel, flaggers and other proper personnel;
- (g) Inform Genfare of all Customer operating and security policies established for the safe, secure and proper interaction with the Services;
- (h) Promptly notify Genfare when any change is made to the Services; and
- (i) Promptly (within a mutually agreed upon timeframe) install all patches, error corrections and updates provided by Genfare.
- (j) Customer shall provide the first level of support to its employees, staff, agents, contractors, riders or its Client's riders using Mobile Link.
- (k) Customer shall reconcile all reports on a monthly basis and notify Genfare of any discrepancies within sixty (60) days. Genfare shall not be liable for any amounts reported as a discrepancy if Customer does not reconcile on a monthly basis.

6. Support Response Time and Availability

6.1 Response Time.

Genfare shall make available an adequate number of personnel to ensure that the requirements hereunder, including, without limitation, all response times as described under Section 6.4, are met.

6.2 Initial Response.

Genfare shall provide an initial response (the "Initial Response") in accordance with Section 6.4 below. As part of the Initial Response Genfare shall:

- (a) Request access to the Services or any part thereof, other than to the actual Equipment itself, in order to determine the nature of the reported Error. Genfare access must be coordinated through the primary Customer representative or his/her designate. Access will only be provided upon request and will be terminated upon Resolution of the Error. During said access, Genfare agrees to observation by Customer staff.
- (b) Determine the cause of the Error and the solution to the Error.
- (c) Provide Customer with an estimate of the time required to correct the reported Error in accordance with Section 6.4 below.

- 6.3 Support Availability. Telephone Support shall be available 24/7 via Genfare's support telephone numbers. Customer Portal Support is available 24/7 for P2 and P3 Severity Issues. All P1 calls need to be directed a live person based on the time of day listed below
- (a) Main Hour Support: 847.871.1231 – 8:00am to 5:30pm CST
 After Hour Support: 844.287.5234 – 5:31pm to 7:59am CST
- (b) Customer Portal: <https://genfare-community.force.com/customer/> or at www.genfare.com on the home page top right corner.
- 6.4 Support Response Time and Availability.

Issue Severity

24/7 Support Breakdown				
Severity/Impact	Description	Acknowledgement Goal	Response Time Goal	Resolution Goal
P1	System Down – Critical production issue affecting ability to collect fares, including system unavailability, with no workaround available	Less than 30 minutes, 24/7	Less than 3 hours, 24/7	24 hours
P2	Major – Production issue impacting data integrity, loss of functionality and/or significantly degraded performance, issue is persistent with no workaround available	Less than 30 minutes, 24/7	Less than 4 hours, during main business hours	24 hours, during main business hours
P3	Minor – Any system issue that affects functionality or impacts performance, workaround may be possible but not sustainable	Less than 30 minutes, 24/7	Less than 24 hours, during main business hours	20 days

ALL RESPONSE TIMES CONTAINED IN THIS AGREEMENT ARE CALCULATED FROM THE TIME CUSTOMER MAKES AN INITIAL CALL FOR ERROR RESOLUTION. RESOLUTION TIMES ARE DEPENDENT UPON ACCESSIBILITY TO THE APPLICABLE SYSTEMS AS GRANTED BY THE CUSTOMER AND THE TIME PERIOD FOR DETERMINING RESOLUTION SHALL NOT BEGIN UNTIL CUSTOMER HAS PROVIDED GENFARE ALL REQUIRED ACCESS TO ITS SYSTEMS, IF REQUIRED.

7. Customer Assets

PRODUCT	QTY	DATE

As a part of the support package, Genfare and Customer will review each of the products that make up Customer's current fare collection solution. This will include Customer's current software, hardware, and any integrations integral to Customer's fare collection solution so these can be referenced within the

Customer Portal.

8. Help Desk Services

Genfare will provide Help Desk Services to assist Customer with use of the Services and assistance in resolving problems encountered by Customer.

8.1 Help Desk Services

(a) Contacting the Help Desk

- (i) Customer Portal (all users must be registered to access the Customer Portal): <https://genfare-community.force.com/customer/>
- (ii) Email: genfare.customercare@spx.com
- (iii) Phone:
 - (A) Main Hour Support: 847.871.1231 – 8:00am to 5:30pm CST
 - (B) After Hour Support: 844.287.5234 – 5:31pm to 7:59am CST

(b) Ticketing Procedures

- (i) Each inquiry will be documented, assigned a ticket number and a confirmation email will be sent to the originator to confirm the request has been received.
- (ii) Each ticket will be assigned to a technical support engineer to follow up and resolve each issue.
- (iii) A technical support engineer will make contact according to the contact information within the ticket to work on the ticket, or to schedule a time to work on the ticket.

8.2 Communications protocol

- (a) In order to connect to the Customer's system and Resolve Errors in the Services or Software, Genfare must be able to reach the Customer Representative (or delegate), or Genfare will be unable to connect to the system to identify the root cause of, and subsequently Resolve, the reported Error.
- (b) Genfare may use the following tools to remotely access the Customer system:
 - (i) LogMeIn Rescue/Pro (default and preferred option)
 - (ii) TeamViewer
 - (iii) VPN (Cisco or Junos)

8.3 Customer Portal

- (a) Customer may purchase additional Customer Portal licenses for access to the customer portal and digital training, such licenses are available at a rate of \$900/per user per year. Additional licenses will be prorated at the time of addition and will be updated annually.
- (b) Customer Portal licenses are available for a single user and cannot be assigned to shared email addresses.
- (c) Customer may change Customer's users listed below once per year, upon applicable contract renewals, or upon an employee leaving the Customer's employ.
- (d) Genfare reserves the right to audit Customer's Customer Portal licenses and use of such licenses and may remove any registered Customer Portal user for inactivity. If Genfare removes a registered Customer Portal user for inactivity, Customer may not re-fill that Customer Portal License until the removed Customer Portal license would have been eligible to be changed as specified in 7.3(c) above.
- (e) Initial Customer Portal License Users

Up to eight (8) contacts are allowed for portal access. If you go over the set number of contacts, each additional contact is \$900 and is added to the base of the contract. Contacts can be added anytime as we will pro-rate the license.

#	Contact Name	Title	Email	Phone
1				
2				
3				
4				
5				
6				

APPENDIX E – INFORMATION TECHNOLOGY SECURITY MATRIX**H.R. 5515**

In accordance with US House of Representatives H.R. 5515 “National Defense Authorization Act for Fiscal Year 2019” House Bill, the Solution shall not utilize products or services from the manufacturers listed therein.

Acceptance Policy: The County is willing to make reasonable business process changes rather than expecting the System to conform to every aspect of current system/processes in order to provide functionality. Contractor acknowledges and agrees that the County shall not be considered unreasonable for withholding or failing to grant Acceptance of any functionality due to the following items:

- Functionality fails to conform to any legislative mandates, including implementing/administrative orders
- Manner in which functionality is delivered creates undue impact to operations (i.e. a significant increase in the number of steps required to complete a task)
- Manner in which functionality is delivered results in a loss of functionality currently available in the legacy system which supports a business operation

The System shall provide the functionalities outlined in the matrix below. The acceptable codes are as follows:

“Y” – Will be FULLY met (without configuration or modification).

“C” – Will be met via configuration (without changing base source code).

“M” – Will be met via modification of the base source code.

“N” – Will not be met. If an alternative compensating control is being proposed, please provide a detailed explanation. A blank or N/A in any box will be interpreted as an “N”.

Table 1: Monitoring and Alerting System		Meet (Y/C/M/N)	Module / Detailed Explanation
Functionality			
1	Type of Data Stored (PII, PCI, PHI, HR, CJIS, HIPAA, Financial, etc.): Remove any that do not apply:		- o PII (Personally Identifiable Information) - o PCI (Payment Card Industry) - o PHI (Personal Health Records) - o HR (Human Resources) - o CJIS (Criminal Justice Information Systems) - o HIPAA (Health Insurance Portability and Accountability Act) - o Financial Records - o Other:
2	Solution uniquely identifies each user.	Y	
3	Solution provides integration with Microsoft Active Directory or Azure Active Directory for user authentication of Internal users. (ADFS, FIM, MIM)	M	Genfare Link will support integration to Azure Active Directory
4	Solution can be installed and maintained in accordance to the Microsoft Enterprise Access	C	

	Model. https://docs.microsoft.com/en-us/windows-server/identity/securing-privileged-access/securing-privileged-access-reference-material		
5	Solution can be installed and maintained in accordance to the principle of least privilege for Operating systems.	Y	
6	Solution can be installed and maintained in accordance to the principle of least privilege for Database systems.	Y	
7	Solution uniquely identifies each process (system, service, Managed Service Accounts) account.	Y	
8	Solution supports scheduled password rotation of process (system, service, Managed Service Accounts) accounts.	Y	
9	Default System accounts are either disabled or capable of being renamed. (e.g. administrator/admin, guest)	Y	
10	Accounts are automatically disabled after a configurable period of inactivity (e.g. 90 days).	Y	
11	Solution utilizes account passwords for authentication.	Y	
12	Account Password complexity is configurable to allow for a minimum of 14 characters comprised of upper and lower alpha, numeric and special characters (e.g. !, @, #, \$, %, &, *)	Y	With Active Directory integration, the Active Directory rules would govern
13	Passwords are suppressed (not echoed back) when entered by users.	Y	
14	Solution supports Multi-Factor Authentication (MFA)	C	With Active Directory integration, the Active Directory rules would govern
15	User login credentials (user account/password) are encrypted in transmission with a minimum of AES 256 bit encryption	Y	
16	Solution supports password history functionality whereby password re-use is prohibited for a configurable number of prior passwords of at least 10.	C	With Active Directory integration, the Active Directory rules would govern
17	Solution supports administrative passwords aging of 30 days.	C	With Active Directory integration, the Active Directory rules would govern
18	Administrative accounts have the capability of resetting passwords	C	With Active Directory integration, the Active Directory rules would govern
19	Solution provides user self-service password reset functionality utilizing a challenge and response authentication	C	With Active Directory integration, the Active Directory rules would govern
20	Solution includes self-service challenge and response that are comprised of 8 challenge questions and stores user's responses during	C	With Active Directory integration, the Active Directory rules would govern

	registration. Responses must be stored with a minimum of AES 256 bit encryption.		
21	Solution includes self-service password reset that presents user with a configurable number of random challenge questions which when answered correctly will enable the password to be reset.	C	With Active Directory integration, the Active Directory rules would govern
22	Solution supports the ability to limit unsuccessful login attempts to 5. If the number of unsuccessful login attempts is exceeded, system locks out or disables user account.	C	With Active Directory integration, the Active Directory rules would govern
23	Solution supports limiting concurrent user sessions to 1 by default, and the number of concurrent user sessions is configurable by administrators.	M	Genfare Link will support concurrent user session limit configuration
24	Solution provides administrative capability to lock or disable accounts whenever necessary.	Y	With Active Directory integration, the Active Directory rules would govern
25	Solution supports the display of a configurable warning, pre-login banner during solution login indicating that unauthorized access is prohibited.	Y	With Active Directory integration, the Active Directory rules would govern
26	Solution supports the ability to manage users based on group membership. (role based privileges) in addition to assigning/revoking specific user based privileges	Y	
27	Solution provides tools and reporting to enumerate user rights/privileges, group membership, access to locations/functions or user profiles	Y	
28	Solution provides audit logging capability which captures successful logins, unsuccessful logins, records viewed, printed, added, deleted or modified and has the capability to retain logs for a period of 5 years plus current.	Y	The system does this without a need for a configuration change
29	Solution audit logs captures date and time, user account, source IP address, audit event and success or failure of event	Y	The system does this without a need for a configuration change
30	Solution prohibits administrators from disabling the audit mechanism.	Y	
31	Solution ensures the audit log is protected from unauthorized access. (i.e. logs are capable of simultaneously being sent to a logging server or SIEM in addition to being maintained locally)	Y	
32	Solution prevents users or administrators from editing the audit log. (modifying, deleting or adding log entries)	Y	
33	Solution provides for software version controls to prevent outdated versions of software access to DBMS.	Y	
34	Solution generates outbound alerts and notifications. Explain what data is contained in said messages (e.g. email alerts, automated reports, SNMP traps).	Y	

35	If Solution's database is relational, referential integrity is enforced by the RDBMS	Y	
36	Solution prohibits users, developers, DBA's or system administrators from making changes to posted, completed or closed transaction records.	Y	
37	Solution provides rollback processes incorporated into the database for all critical transactions	Y	
38	Solution ensures that sensitive data (data that falls under the scope of FSS 539.003, CJIS, PII, SOX, HIPAA, and PCI requirements) is encrypted during transmission over the client's network (minimum AES 256-bit encryption)	Y	
39	Solution ensures that sensitive information (data that falls under the scope of FSS 539.003, CJIS, PII, SOX, HIPAA, and PCI) which is vulnerable to unauthorized access, encrypted while in storage (minimum AES 256-bit encryption)	Y	
40	Solution ensures that Is sensitive information (data that falls under the scope of FSS 539.003, CJIS, PII, SOX, HIPAA and PCI) encrypted for transmission over external networks or connections. (minimum AES 256-bit encryption)	Y	
41	If Cloud Hosted, Solution is hosted in an audited data center complying with ISO 27001, SAS 70, SSAE 16 or SOC2 or3 audit standards. (please provide copy of most recent audit)	Y	
42	If Cloud Hosted, Solutions has controls in place which prohibit Hosting or Solution's employees or 3 rd party vendor technical support personnel access to or the ability to access, view or modify customer confidential data in compliance with FSS 536.003. Please describe controls used to ensure data confidentiality, including encryption and key storage mechanisms.	Y	
43	If Cloud Hosted, Solution is a high availability solution with either active-active or active-passive failover between geographically diverse data centers	Y	
44	If Cloud Hosted, System and data is physically located within the Continental United States.	Y	
45	If Cloud Hosted, System is accessible from the County network and Proxy infrastructure	Y	
46	If Cloud Hosted, System encrypts all sessions from initiation to termination using validated encryption ciphers (TLS 1.2 or higher)	Y	
47	If Cloud Hosted, Solution is scanned for vulnerabilities on a regular basis (monthly) using commercially available vulnerability scanners such as Nessus, Qualys etc. Monthly vulnerability reports must be shared with the County.	Y	

48	Solution must be regularly patched with appropriate OS/database/application security patches within 30 days of vendor release.	Y	
49	Solution must have "Critical" security patches applied within 7 (seven) calendar days of release from vendor.	Y	
50	Solution must be maintained on current supported release of OS/database/applications. End of Life (EOL) versions will be upgraded prior to end of vendor support date.	Y	
51	Solution must be scanned for Application vulnerabilities on a regular basis (monthly) using commercially available vulnerability scanners such as WebInspect, Veracode, or AppScan, or comparable.	Y	
52	If Cloud Hosted, Solution or solution will have change control processes implemented to provide application vulnerability scanning (PCI, OWASP top 20) prior to production migration of any changes. All "Medium, Critical, and Severe" vulnerabilities will be remediated prior to migration. Application vulnerability reports will be shared with the County.	Y	
53	Any API must use API key security (X-API-Key) or demonstrate alternate security controls.	Y	
54	If Cloud Hosted, Solution is protected using Intrusion Detection and Prevention technology (IDS/IPS)	Y	
55	If Cloud Hosted, Solution is protected against Distributed Denial of Service (DDOS) Attack	Y	

Table 2: Farebox Backend System			
Functionality		Meet (Y/C/M/N)	Module / Detailed Explanation
56	Type of Data Stored (PII, PCI, PHI, HR, CJIS, HIPAA, Financial, etc.): Remove any that do not apply:		- o PII (Personally Identifiable Information) - o PCI (Payment Card Industry) - o PHI (Personal Health Records) - o HR (Human Resources) - o CJIS (Criminal Justice Information Systems) - o HIPAA (Health Insurance Portability and Accountability Act) - o Financial Records - o Other:
57	Solution uniquely identifies each user.	Y	

58	Solution provides integration with Microsoft Active Directory or Azure Active Directory for user authentication of Internal users. (ADFS, FIM, MIM)	M	Genfare Link will support integration to Azure Active Directory
59	Solution can be installed and maintained in accordance to the Microsoft Enterprise Access Model. https://docs.microsoft.com/en-us/windows-server/identity/securing-privileged-access/securing-privileged-access-reference-material	C	
60	Solution can be installed and maintained in accordance to the principle of least privilege for Operating systems.	Y	
61	Solution can be installed and maintained in accordance to the principle of least privilege for Database systems.	Y	
62	Solution uniquely identifies each process (system, service, Managed Service Accounts) account.	Y	
63	Solution supports scheduled password rotation of process (system, service, Managed Service Accounts) accounts.	Y	
64	Default System accounts are either disabled or capable of being renamed. (e.g. administrator/admin, guest)	Y	
65	Accounts are automatically disabled after a configurable period of inactivity (e.g. 90 days).	Y	
66	Solution utilizes account passwords for authentication.	Y	
67	Account Password complexity is configurable to allow for a minimum of 14 characters comprised of upper and lower alpha, numeric and special characters (e.g. !, @, #, \$, %, &, *)	Y	With Active Directory integration, the Active Directory rules would govern
68	Passwords are suppressed (not echoed back) when entered by users.	Y	
69	Solution supports Multi-Factor Authentication (MFA)	C	With Active Directory integration, the Active Directory rules would govern
70	User login credentials (user account/password) are encrypted in transmission with a minimum of AES 256 bit encryption	Y	
71	Solution supports password history functionality whereby password re-use is prohibited for a configurable number of prior passwords of at least 10.	C	With Active Directory integration, the Active Directory rules would govern
72	Solution supports administrative passwords aging of 30 days.	C	With Active Directory integration, the Active Directory rules would govern
73	Administrative accounts have the capability of resetting passwords	C	With Active Directory integration, the Active Directory rules would govern

74	Solution provides user self-service password reset functionality utilizing a challenge and response authentication	C	With Active Directory integration, the Active Directory rules would govern
75	Solution includes self-service challenge and response that are comprised of 8 challenge questions and stores user's responses during registration. Responses must be stored with a minimum of AES 256 bit encryption.	C	With Active Directory integration, the Active Directory rules would govern
76	Solution includes self-service password reset that presents user with a configurable number of random challenge questions which when answered correctly will enable the password to be reset.	C	With Active Directory integration, the Active Directory rules would govern
77	Solution supports the ability to limit unsuccessful login attempts to 5. If the number of unsuccessful login attempts is exceeded, system locks out or disables user account.	C	With Active Directory integration, the Active Directory rules would govern
78	Solution supports limiting concurrent user sessions to 1 by default, and the number of concurrent user sessions is configurable by administrators.	M	Genfare Link will support concurrent user session limit configuration
79	Solution provides administrative capability to lock or disable accounts whenever necessary.	Y	With Active Directory integration, the Active Directory rules would govern
80	Solution supports the display of a configurable warning, pre-login banner during solution login indicating that unauthorized access is prohibited.	Y	With Active Directory integration, the Active Directory rules would govern
81	Solution supports the ability to manage users based on group membership. (role based privileges) in addition to assigning/revoking specific user based privileges	Y	
82	Solution provides tools and reporting to enumerate user rights/privileges, group membership, access to locations/functions or user profiles	Y	
83	Solution provides audit logging capability which captures successful logins, unsuccessful logins, records viewed, printed, added, deleted or modified and has the capability to retain logs for a period of 5 years plus current.	Y	The system does this without a need for a configuration change
84	Solution audit logs captures date and time, user account, source IP address, audit event and success or failure of event	Y	The system does this without a need for a configuration change
85	Solution prohibits administrators from disabling the audit mechanism.	Y	
86	Solution ensures the audit log is protected from unauthorized access. (i.e. logs are capable of simultaneously being sent to a logging server or SIEM in addition to being maintained locally)	Y	
87	Solution prevents users or administrators from editing the audit log. (modifying, deleting or adding log entries)	Y	

88	Solution provides for software version controls to prevent outdated versions of software access to DBMS.	Y	
89	Solution generates outbound alerts and notifications. Explain what data is contained in said messages (e.g. email alerts, automated reports, SNMP traps).	Y	
90	If Solution's database is relational, referential integrity is enforced by the RDBMS	Y	
91	Solution prohibits users, developers, DBA's or system administrators from making changes to posted, completed or closed transaction records.	Y	
92	Solution provides rollback processes incorporated into the database for all critical transactions	Y	
93	Solution ensures that sensitive data (data that falls under the scope of FSS 539.003, CJIS, PII, SOX, HIPAA, and PCI requirements) is encrypted during transmission over the client's network (minimum AES 256-bit encryption)	Y	
94	Solution ensures that sensitive information (data that falls under the scope of FSS 539.003, CJIS, PII, SOX, HIPAA, and PCI) which is vulnerable to unauthorized access, encrypted while in storage (minimum AES 256-bit encryption)	Y	
95	Solution ensures that Is sensitive information (data that falls under the scope of FSS 539.003, CJIS, PII, SOX, HIPAA and PCI) encrypted for transmission over external networks or connections. (minimum AES 256-bit encryption)	Y	
96	If Cloud Hosted, Solution is hosted in an audited data center complying with ISO 27001, SAS 70, SSAE 16 or SOC2 or3 audit standards. (please provide copy of most recent audit)	Y	
97	If Cloud Hosted, Solutions has controls in place which prohibit Hosting or Solution's employees or 3 rd party vendor technical support personnel access to or the ability to access, view or modify customer confidential data in compliance with FSS 536.003. Please describe controls used to ensure data confidentiality, including encryption and key storage mechanisms.	Y	
98	If Cloud Hosted, Solution is a high availability solution with either active-active or active-passive failover between geographically diverse data centers	Y	
99	If Cloud Hosted, System and data is physically located within the Continental United States.	Y	
100	If Cloud Hosted, System is accessible from the County network and Proxy infrastructure	Y	

101	If Cloud Hosted, System encrypts all sessions from initiation to termination using validated encryption ciphers (TLS 1.2 or higher)	Y	
102	If Cloud Hosted, Solution is scanned for vulnerabilities on a regular basis (monthly) using commercially available vulnerability scanners such as Nessus, Qualys etc. Monthly vulnerability reports must be shared with the County.	Y	
103	Solution must be regularly patched with appropriate OS/database/application security patches within 30 days of vendor release.	Y	
104	Solution must have "Critical" security patches applied within 7 (seven) calendar days of release from vendor.	Y	
105	Solution must be maintained on current supported release of OS/database/applications. End of Life (EOL) versions will be upgraded prior to end of vendor support date.	Y	
106	Solution must be scanned for Application vulnerabilities on a regular basis (monthly) using commercially available vulnerability scanners such as WebInspect, Veracode, or AppScan, or comparable.	Y	
107	If Cloud Hosted, Solution or solution will have change control processes implemented to provide application vulnerability scanning (PCI, OWASP top 20) prior to production migration of any changes. All "Medium, Critical, and Severe" vulnerabilities will be remediated prior to migration. Application vulnerability reports will be shared with the County.	Y	
108	Any API must use API key security (X-API-Key) or demonstrate alternate security controls.	Y	
109	If Cloud Hosted, Solution is protected using Intrusion Detection and Prevention technology (IDS/IPS)	Y	
110	If Cloud Hosted, Solution is protected against Distributed Denial of Service (DDOS) Attack	Y	

Item No.	Page Number	Section	Question/Comment	Genfare Response	County Response
1	8 & 9	2.1.2	Table shows "DTPW as Permits Requested Primary Responsibility". Contract Documents clearly specify the Contractor is responsible for all permits required by the County Authorities ; Obtaining and managing permits are the responsibility of the Genfare and must be closed prior to project completion. These are some permits required when the Fare Collection equipment is replaced at a rail station, there may be some other requirements: 1. Demolition Permit/Inspection: • To assures all signal cables and bolts are removed. 2. Structural Permit/Inspection: • To ensure the area where the equipment is removed is repaired to the original status. • To ensure the new equipment is installed securely to the floor to stand hurricane requirements and passenger's safety. 3. Electrical Permit/Inspection: Cat 1 for power and a Cat 32 for low voltage. • To ensure the electrical connections, power and signal, for the new equipment is following codes. 4. ADA Permit/Inspection: • To ensure the new equipment is following ADA regulation. 5. Fire/Life Safety Permit/Inspection: • To ensure the new equipment is following Fire/Life Safety requirements. • The Fire Department (MFRD) may ask for a new Station NFPA 130 Egress Calculations/Drawings even if the same number of consoles and same exits paths are provided with the new equipment.		
2	16	2.1.7	Proposal states: "There is an optional integration to the current system provided by Cubic" : Is Genfare confident they can interface with Cubic present system? does Genfare have a commitment from Cubic for this integration?	JHR Genfare will take responsibility for all permits required for hardware installation, data, and low voltage power, and work with relevant General Contractors were necessary for the new BRT stations. JHR Our system is built on Open APIs to enable an integration with another system. We do not have a commitment from Cubic for this integration as it was not a requirement for this response. Should DTPW choose to exercise this option, Genfare will work with DTPW and Cubic to confirm scope and feasibility.	Note, permits are not solely required or the BRT stations, it is a requirement for all existing rail station, removal of old equipment and all installation activities to have the new equipment in place and in revenue service.
3	18	2.1.8.1	Under Specific Risk column Genfare states: "Unforeseen site-specific challenges (e.g. inadequate space, electrical supply issues, structural limitations)" . These are in fact issues they will face: Genfare and their sub-contractors have to pull all different permits: demolition, structural, electrical, low voltage, fire and ADA inspections, etc... The present AC circuits most likely will be required to be replaced with AC wiring suitable for wet location to be able to use 40 year old walker-duct cavity (the walker-ducts are disintegrated). The Fire department may require an actualization of the Station NFPA 130 Egress Calculations for the new equipment.	JHR Genfare will take responsibility for all permits required for hardware installation, data, and low voltage power, and work with relevant General Contractors were necessary for the new BRT stations. Should we encounter issues that we could not foresee, we will follow the procedures in Article 35 to notify DTPW of our Discovery of Differing Site Conditions	See County response to Item No. 1
4	26	2.1.8.8	Under the Assumption table "Timely Approval and Permits" Genfare acknowledge that: "All required permits, approvals, and clearances from relevant authorities will be obtain promptly, ensuring that the project adheres to local regulations and guidelines." Again, we need to emphasize "permits are the Contractor's responsibility" Under the Assumption table "Site Preparation and Modifications" Genfare acknowledge that: "Any required site preparation and modifications, such as electrical connection, network infrastructure, and physical changes to station layouts, will be completed as necessary prior to equipment installation." Again, we need to emphasize "Site preparations and modifications, etc.. are the Contractor's responsibility"	JHR Genfare will take responsibility for all permits required for hardware installation, data, and low voltage power, and work with relevant General Contractors were necessary for the new BRT stations. Should we encounter issues that we could not foresee, we will follow the procedures in Article 35 to notify DTPW of our Discovery of Differing Site Conditions	See County response to Item No. 1
5	42 & 43	2.2.1	Table 27: Phase 1 milestones should include the closeout of all open permits opened to accomplish the work and be included in the Acceptance & Signoff documentation	JHR For clarification, there will be a Phase 1 payment milestone, post installation, to ensure all open permits to accomplish Phase 1 work have been closed. This will be included in the Acceptance and Signoff documentation.	

6	44	2.2.3	The schedule for equipment removal and installation for Rail Station is not realistic. For example 4 days to modify DLS (8 TVMs, 23 Gates) is not possible considering the site work needed and all permits and inspections.	JHR	The estimates were based on the physical on-site days not including permits and inspections. Genfare will work with DTPW to come to an agreed upon schedule.
7	45	2.3	Genfare states: <i>"Genfare provides ongoing preventive maintenance by experienced onsite Genfare technicians, along with offering comprehensive maintenance training to our transit agency partners, regular updates to software and firmware, partnerships with third-party vendors, and a well-maintained stock of replacement parts, not just upon implementation, but for the life of the fare collection solution."</i> - This statement assure the onsite Tech are from Genfare and not from CPE. Please confirm. - What Genfare is Genfare referring as "the life of the fare collection solution"? Is this the length of the contract? Please clarify.	JHR	Our onsite tech team will be a mixture of Genfare and CPE staff. They will be available for the life of the contract.
8	44 & 45	2.2.3	Table 29 Phase 3 milestones should include the closeout of all open permits opened to accomplish the work and be included in the Acceptance & Signoff documentation	JHR	For clarification, there will be a Phase 3 payment milestone, post installation, to ensure all open permits to accomplish Phase 3 work have been closed. This will be included in the Acceptance and Signoff documentation.
9	46	2.3.1	Genfare states: <i>"Preventive maintenance. Genfare will perform preventive maintenance in cooperation with DTPW staff on all equipment a minimum of four times per year for the life of the contract."</i> Please confirm Genfare will perform PMs with Genfare Techs or CPE? For the obsolescence components: Is Genfare providing the replacement device and any hardware or software maybe required to have the new device properly working and price will be negotiated ?	JHR	Our onsite tech team will be a mixture of Genfare and CPE staff. If, during the life of the contract, any parts become obsolete, Genfare will provide new devices and necessary software changes subject to a negotiated price.
10	51	2.3.3	Please confirm Software upgrades and updates are included in the contract price, within the Software Support Agreement, Warranty and Extended Warranty. Are also Optional Software features included?	JHR	See the Proposal section 2.3.3 Software Maintenance Page 50 and 51 has this paragraph: <i>Once a release is ready for UAT, a quarterly release notification will be generated, sent to all customers, and posted to the Genfare Customer Portal. The quarterly release notification is where customers can find more information about any software upgrades, updates, patches, bug fixes, and optional software features that are accessible throughout the platform. These are all included in the Genfare offering as defined in Genfare's Software Support Agreement, Warranty and Extended Warranty outlined in section 2.3.9.</i>
11	64	3	Is the Fast Fare 25 base the same as the one for Odyssey? Is Genfare assuring that validator, barcode reader and processor PCB for the Fast Fare farebox and the Gates the same? Are they interchangeable? Is the TVMs using the same Validators and processor?	JHR	Quarterly feature updates and as-needed bug fixes are included in the Software Support Agreement. What does DTPW mean by the optional software question? The footprint of the FF25 is the same as the Odyssey. The validator, barcode reader, and computing unit will be the same hardware in the farebox and gates, limiting the number of different parts DTPW will need to stock for spares. However, the computing unit needs to be configured when installed, so you will not be able to remove the computing unit from a farebox and install it in a gate and just have it work, some configuration will be required.
12	65	3.1	Quantities on this table needs some clarifications: - Total Garages, new South Dade Garage + 3 existing Garages = total of 4 - Each garages have 3 probing lane, 3 Receiver/Vault, one Garage Computer System (GCS) - 3 LAB/Shop, each has 1 Receiver/Vault, 1 GCS -Genfare use special CSC to probe the farebox and extract the cashbox, what is included in the "Probe Data Pipe" in this table?	JHR	Note to County: Are DTPW Tech able to configure the Computing Units to use on each equipment or we will need to stock same hardware unit with different configuration for Fareegates and Fareboxes? The TVM uses different hardware The probe data pipe in our table lines up with your GCS. This is the computer that will take the data and push it to Genfare Link. We believe that the rest of the quantities line up with what you have outlined here.

67	3.3	This section states that Genfare Link include " Account-based client management, website and portal support, etc. " Does GENFARE Link provide a fully operational Account-Based System Backoffice capable to process all sort of payments. cash and contactless media? Is GENFARE assuring they can provide a complete FCA and Link can interface with any future selected FCA?	JHR	Genfare Link is a fully operational Account Based backoffice capable of processing all payments. Genfare Link is also built on an Open Architecture so we can interface with another backoffice should DTPW choose. However, the success of that integration is also dependant on the other vendor also supporting an integration
86-87	3.5	Block diagram shows contactless payments as " Option/Future Integration " but they are part of the specifications. We need Genfare clarification.	JHR	The specifications call for hardware that is capable of contactless payments leveraging an unknown backoffice solution (future integration). Genfare Link is capable of being the backoffice for the contactless payments without another integration (the option).
96	3.5.8	Genfare states: " The quarterly release notification is where customers can find more information about any software upgrades, updates, patches, bug fixes, and optional software features that are accessible throughout the platform. " Can Genfare confirm all above is included in this contract proposal	JHR	These are included in the Software Support Agreement
101	3.7.7	Genfare states: " When a passenger places a form of contactless fare media near the target, the logic in Genfare Link will determine if the fare media is valid " Does GENFARE Link have an account associated with the UID of each card where fare products are stored and take place all transactions, transfer rules, fare capping, etc. ?	JHR	This is correct
102	3.7.9	Genfare states: " This display will be the same as the display on the proposed Fast Fare 25 farebox " Is Genfare assuring the display is interchangeable between Farebox and Faregate? Another statement: " Current Value or Current Validity Period. Appropriate messages, selectable and programmable by DTPW, to display the status of account status linked to the smart card. " This is reassuring there is an account associated to each smart card in GENFARE Link, can this be confirmed?	JHR	Yes, the display will be interchangeable. Yes, there is an account associated to each smart card
103	3.7.12	Genfare states: " In the event of loss of communication between Genfare Link and the fare collection application, data transfer..... " Is there a way to know when a Faregate loses communication with GENFARE Link? Is there kind of "heartbeat" to find if the Faregate is "off line" and produce an alarm or failure event?	JHR	Yes, this is possible. Is this functionality included with your proposed system?
104	3.7.13	Genfare states: " If open payment acceptance is implemented " Open Payment (Account-based) is essential part of this REP, there is no "if"	JHR	The specifications call for hardware that is capable of open payments leveraging an unknown backoffice solution. Genfare Link is capable of being the backoffice for the open payment transactions as, which can be turned on from day one without the need for a future integration. This is an option DTPW could leverage.
105	3.7.18	Genfare states : " all functions are performed for the test media except that the transaction is not included in revenue summaries and entry is not provided to the paid area. " During "test Mode" the test media shall provide entry to verify this function.	JHR	As we get further into the design phase, we will work with DTPW to fully define the test cases the county wants to see. We can support the full experience in test mode if desired.
106	3.7.19	Genfare states: " The PC connection can also be done wirelessly; if DTPW desires to use this feature, Genfare will work with DTPW IT staff to ensure the wireless connection is secured to prevent unauthorized access. " This feature to connect wireless to perform testing and troubleshooting is very convenient. We certainly want to implement. Is there a possibility of doing the connection from an intelligent cell phone?	JHR	It COULD be done from a cell phone, however, with the amount of data on the screen, we would suggest a tablet as the smallest form factor. A phone could still be leveraged for quick actions.

110	3.8.1	Genfare states: "Sell and dispense a card to be linked to account in Genfare Link where stored value or time-based products purchased at the TVM will be recorded and available to be processed at faregates and on the farebox." Another statement: "Allow the purchase of multiple cards in one transaction with each card linked to a corresponding Genfare Link account with the subsequent purchase of a fare product per card" All cards sold by the TVM will be linked to individual account in the GENFARE Link back-office application, right? These accounts can work as Account-based System or can transfer all data to a selected Account-based provider by the FCA RFP? Please confirm	In phase 1, we do not anticipate that the new backoffice will be chosen and implemented, so we have proposed a system that can be stand alone to support the South Dade BRT. Once the backoffice is chosen we will work with DTPW and the vendor to design the cutover plan.	JHR
113	3.8.8	Genfare states: "In lieu of a physical placard frame, Genfare proposes using the large message display unit to display instructions, messages, or other information to passengers." Can the Large Message Display have a section to display all fare products and values besides a section for the selection of fare products? Can we see some samples of TVM screens working for some agencies?	During design we will work with DTPW to fully define the screens.	JHR
114	3.8.9.1	Genfare states: "The passenger selects the desired fare type (e.g., single ride, stored value, 1-day pass, 3-day pass, 10-ride pass, etc.) and passenger category," The passenger category or rider class (Discounted products) is not selected by the passenger. They have specially encoded CSC where they can load their products at their prices.	Yes, this is the standard. However, some agencies do allow a discounted rider to also purchase full fare products. If this is the case for DTPW, the rider would select the class of products they want to purchase. If this is not the case for DTPW, the rider will only see the discounted products.	JHR
115	3.8.11	Genfare states: "Transaction data will be transmitted to Genfare Link and then on to the fare collection application via an interface/integration on a complete transaction basis. Information required for credit/debit card interface/integration on a complete transaction basis. Information required for credit/debit card verification will be transmitted on a real-time basis." Is there a way to know when a TVM loses communication with: - GENFARE Link - and/or Payment Processor - and/or Future Backoffice ? Is there kind of "heartbeat" to find if those TVM communication links are interrupted and produce an alarm or failure event?	The TVMs will only be connected to the Genfare Link system, and yes it would be possible to alarm on a loss of communication to Genfare Link. The TVM does not keep a constant connection to the payment processor, but we would be able to alert if a rider attempted a transaction and we could not connect. The future backoffice integration would be between Genfare Link and the new backoffice. We can determine our alerting completed transaction basis". Does this mean only capabilities and responsibility during integration design. successful/completed transactions?	JHR
116	3.8.11	Genfare Figure 59: With Option 1, it seems: Card Accounts will be created and maintain in the Genfare Link as well as in the Future Backoffice Application. Right? This provide a "redundant Account-based functions " Please confirm?	In the case that we integrate to another backoffice, we will only duplicate the data needed to operate our system. It would not be a true stand by, the system could operate if there was a disruption in the 3rd party backoffice, but could not fully take over if, for example, the 3rd party provider went out of business.	JHR
118	3.8.15.2	Genfare states: "Reprogramming for future coin types will be provided by Genfare." Is function included in this contract price or it has an additional cost?	This reprogramming is included in the price during the term of the contract.	JHR
132	3.9.2.4	Genfare states: "The acceptor can be reprogrammed to accept new types of coins without hardware modification." Is it included in this contract price or it has an additional cost?	This reprogramming is included in the price during the term of the contract.	JHR
136	3.9.2.9	Fast Fare 25 cashbox. Can we use the present Odyssey cash box changing the ID sensor?	We would recommend new cashboxes with the new system, but DTPW and Genfare could work together to identify the current cashboxes that are in the best shape to upgrade the CBID and keep as spares.	JHR

138	3.9.2.13	Genfare states: "Logon/Logoff" <i>To initiate service, the operator must first log on. This may be accomplished using the farebox OCU or via a third-party control head."</i> Can we use the operator Employee EASY Card to Logon and read the route, run, trip as we presently do?	JHR	That may be possible, we would need to dig into some details of the current card, and likely coordinate with Cubic to get the data needed.
143	3.9.3	Genfare states: "The cashbox receiver is equipped with an electronic cashbox identification (CBID)" Is this CBID the same as the one used at the Cashbox?	JHR	Please confirm that this CBID reader for cashbox receiver is the same interchangeable hardware/reader as proposed throughout the entire system. This is the CBID reader to read which cashbox has been vaulted.
154		Genfare states: "Genfare recommends DTPW follow this pattern of integration, where Genfare Link is managed by the third-party system and the field equipment continues to communicate with Genfare Link. This method provides DTPW with flexibility to change fare collection applications in the future without having to interact with all pieces of fare collection equipment. Additionally, this method has a built-in backup, so if the fare collection application or the integration to that application fails for any reason, the data is still available in Genfare Link. This means DTPW can view event records, modify equipment configuration, and react to equipment issues from Genfare Link until the integration is restored." To make sure we understand: 1-Genfare Link will have Account associated to each EASY Card in the system. 2-Genfare Link will process all transactions and keep the Account balance 3-Genfare Link will maintain the Transfer Rules, Incentive and Fare Capping 4-Basically Genfare Link can provide a full Account-base Backoffice. 5-Genfare Link will integrate to the FCA providing all data for a them to provide the Account-Based System but keeping all data processed internally If this is correct, we will have two Account-Based System, Genfare Link as "stand by" and the selected provider as an "active" system. Can you confirm?	JHR	Yes, Genfare Link can function as a full account based backoffice capable of supporting farecapping, transfers, incentives, and open payment. However, in the case that we integrate to another backoffice, we will only duplicate the data needed to operate our system. It would not be a true stand by, the system could operate if there was a disruption in the 3rd party backoffice, but could not fully take over if, for example, the 3rd party provider went out of business.
162	3.16.1.7	Genfare Figure 79 Where is the Infrared port to communicate with the Portable Probe?	JHR	The proposed farebox does not have an IR probe, though if DTPW wishes to have an IR probe as a backup, that can be added.
164	3.16.3	Genfare states: A button can be installed in every station that when pressed, will immediately set the gates into an emergency open mode. Additionally, each gate or gate array can be managed locally via a hardwired cable if needed in the event of internet service disruptions. These functionalities are part of the requirements. The emergency open mode button is required at each Faregate array. Fire Safety Committee will not approve the installation without this button and interface with the Fire Panel to provide emergency exit in case of a fire at the station.	JHR	We will provide the emergency open as part of the requirements. We are also pointing out to DTPW that there is more capabilities for DTPW staff to manage the gate arrays.
NOTE		IMPLEMENTATION PLAN: Genfare states that DTPW was responsible to store in a safe place all the equipment before the installation and the Specification place that responsibility on the Proposer/Contractor	JHR	When equipment is stored at Genfare's facility, Genfare bares the responsibility of the security of that equipment. If DTPW asks for equipment to be moved to a DTPW facility, we expect DTPW to ensure the security of that equipment at that time.
		IMPLEMENTATION PLAN: STORAGE	JHR	DTPW will take responsibility of the installed equipment only after the official acceptance.

COUNTY/CONTRACTOR QUESTIONS, COMMENTS, RESPONSES

39	1090_APP_A_Implement ation_Plan_ Phase1, pg 6	To ensure the installation project progresses smoothly, it is crucial to address the storage and security of the equipment. The selected warehouse location will serve as a designated storage facility for the equipment throughout the installation process until its completion. These facilities will be responsible for safeguarding the equipment and ensuring its accessibility as needed. These areas must offer sufficient space, organization, and protection against environmental factors that could potentially damage the equipment. It is essential to maintain clean, dry, and secure storage conditions. Throughout the installation project phases, it is crucial for the transit agency to ensure the availability of the equipment to enable timely installation. Close coordination between the transit agency and the installation team is necessary to ensure that the required equipment is accessible when needed. This involves providing appropriate access to the storage areas and informing the installation team in advance of any potential constraints or limitations regarding equipment availability. The transit agency bears the responsibility for ensuring the security of all equipment stored at the designated warehouse location. Appropriate security measures should be implemented to prevent theft, vandalism, or unauthorized access to the equipment. This may involve installing surveillance systems, restricting access to authorized personnel only, and maintaining a log of equipment movements. By adhering to these guidelines for equipment storage and security, the transit agency can contribute to the successful and efficient installation of the ticket vending machines, fare gates and related equipment. Prioritizing the protection and availability of the equipment is crucial to minimize potential disruptions during the deployment process. Note: Confirm Genfare shall assume all responsibility for the storage, availability, and security of equipment/material stored.	When equipment is stored at Genfare's facility, Genfare bears the responsibility of the security of that equipment. If DTPW asks for equipment to be moved to a DTPW facility, we expect DTPW to ensure the security of that equipment at that time. DTPW will take responsibility of the installed equipment only after the official acceptance. DTPW is not providing a warehouse location	JHR
40	QUESTION	Please explain the Genfare's approach to PCI certification for software integration 1) before the County's Fare collection application integration 2) after the Fare Collection Application implementation.	Genfare's hardware and software solutions are already EMV L3 and PCI certified. When integrating to a 3rd party backoffice, Genfare will work with the provider to assist said provider in their PCI certification, but the fare collection provider will ultimately be responsible for PCI certification. Please provide additional details on PCI L1 (device hardware) and L2 (device software) certification	ITD
41	QUESTION	Is the reader PCI or PTS certified, 5 or higher?	Our reader is EMV L1 certified. Genfare's software solutions combined with our hardware provides EMV L3 certification and PCI certification. What about PCI L2 certification?	ITD
42	QUESTION	Can your reader integrate with existing Cubic backend? Can readers read existing EASY cards? If not, are you amenable to having a legacy reader attached to your gates and interfacing with your gate for communication with Cubic back Office and gate opening mechanism? If yes, Do you support open loop payments on the Tri-reader	If DTPW wanted to leverage the current EASY cards and Cubic backoffice, we would recommend an integration between Genfare Link and Cubic's backoffice, still leveraging our hardware. This would require coordination with Cubic. If we were to integrate the Tri-Reader into our equipment, we would expect the current open payment flow through Cubic's backoffice to remain. Please confirm that Genfare's proposed farebox and faregates will be able to integrate DTPW tri-reader, in addition to Genfare's reader.	ITD
43	7.2	Does Genfare have established commitment/engagement with Cubic for the proposed integration for the Cubic integration option?	Our system is built on Open APIs to enable an integration with another system. We do not have a commitment from Cubic for this integration as it was not a requirement for this response. Should DTPW choose to exercise this option, Genfare will work with DTPW and Cubic to confirm scope and feasibility.	ITD
44	2.3.9.1	The warranty provisions outlined in this section are not consistent with the County's terms outlined originally in the draft form agreement, nor consistent with the Exception to the warranty provisions provided by Genfare in the proposal. After the parties have reached agreement on warranty, reference to this section need to be included to explicitly state that it has been replaced by the mutually agreed provision.	We agree that after the parties have reached agreement on warranty, reference to this section need to be included to explicitly state that it has been replaced by the mutually agreed provision.	ITD

COUNTY/CONTRACTOR QUESTIONS, COMMENTS, RESPONSES

45	55	2.3.6.6	Regarding the archiving option, please confirm that the pricing provided assumes that no archiving is completed and that all data resides in the live environment. What are the pricing implications of the archiving option?	That is correct, the provided pricing does not include archiving and all data will reside in the live environment. Genfare can provide a quote for archiving based on the requirements from DTPW.	
46	51	2.3.4	Patch Management: Please clarify if patch management is throughout implementation phases and maintenance periods	DTPW will receive software updates throughout the life of the contract	ITD
47	86	3.5	System Architecture: Please confirm that garage computers for various location can be consolidated into 1 County hosted nad managed VM. If yes, how does this augment the licenses and any contractual agreements	Generally speaking, yes, the garage functions can be performed on a VM managed by our customer. We would need to dig into the proposed architecture you are suggesting, as generally we have each garage on individual VMs, otherwise all of the data appears to be coming from only one garage. Those VMs can all be on one physical system. Once we settle on the architecture we can answer the licensing question.	ITD
48	138	3.9.2.13	Logon/Off: Can the farebox handle sign in using a employee ID/smartcard?	It is possible, but we would have further questions that need to be answered. Most importantly, are you wanting to reuse cards that already exist from a DTPW system (building access for example) or are you wanting the Genfare system to create these cards?	ITD
49		3.9.2.16	Transaction Operation Data Storage <i>Each transaction and event record includes time/date, operator, farebox number, route, run, trip, latitude/longitude as provided by the third-party CAD/AVL system, and other relevant data</i> Will the above data be received from the DTPW CAD/AVL vendor?	Our intention is to connect to the CAD/AVL vendor leveraging J1708 or ITxPT interfaces.	ITD
50	153	3.1	Integrations: Will the open API documentation be provided to the County as part of the will be established contract? will the document be updated through the life of the contract?	Yes, documentation of the APIs will be provided and updated throughout the life of the contract	ITD
				Discussion topic.	



CONTRACT NO. EVN0001090

FARE COLLECTION EQUIPMENT

APPENDIX G

CONTRACT DATA REQUIREMENTS LIST

EXHIBIT 3: CONTRACT DATA REQUIREMENTS LIST

Contractor shall provide its standard documentation package as CDRL items delivered to the agency instead of individual items listed below. The contractor shall map CDRL items listed below to standard documentation delivered.

Section 1: Design

CDRL Number	Reference Section	Description	Due Date
0101	1.4.1	Documents, Data, Assembly and Installation Drawings	CDR, FDR
0102	1.4.1	Submittal Status	Monthly
0103	1.4.2	Drawing Format	CDR
0104	1.5	Installations and Interface Plan	CDR, FDR

Section 2: Contractor Installation Services

CDRL Number	Reference Section	Description	Due Date
0201	2.7	Typical installation drawings	CDR, FDR
0202	2.14	System hardware design for premise MAS if required	CDR
0203	2.14	Station-by-station plan	CDR, FCR
0204	2.15	System Phase-In Plan Criteria	CDR, FDR

Section 4: General System Requirement

CDRL Number	Reference Section	Description	Due Date
0401	4.9	Electrical Environment	CDR, FDR
0402	4.10	Accessibility Compliance	CDR, FDR
0403	4.17	Exterior	CDR, FDR
0404	4.21	Alarm	CDR
0405	4.23	Alternative Lock and Key System	CDR, FDR
0406	4.23.1	General Lock and Key Requirements	CDR, FDR
0407	4.24	Access Methods	CDR
0408	4.27.1	Automatic Diagnostics	CDR, FDR
0409	4.27.2	Self-Testing Capabilities	CDR
0410	4.30	Currency Recognition Standards	CDR
0411	4.31	Equipment Serialization	CDR
0412	4.31	Bar Code and Numbering	CDR

Section 5: Rail System Equipment

CDRL Number	Reference Section	Description	Due Date
0501	5.1.1	Fare Gate Functional Modes	CDR
0502	5.1.3	Accessible Fare Gate dimensioned scale drawings	CDR
0503	5.1.3	Locations for displays and graphics on the Fare Gate	CDR
0504	5.1.3	System Status Changes Sensed	CDR, FDR
0505	5.1.3	Location and operation of Fare Gate Patron Sensors	CDR
0506	5.1.3	Detailed information on Accessible Fare Gates	CDR
0507	5.1.3	Accessible Fare Gate Sign Requirements	CDR
0508	5.1.5	Fare Gate Loss of Power	CDR
0509	5.1.6	Displays and Graphics Preferred Locations	CDR, FDR
0510	5.1.7	Smart Card Processing	CDR
0511	5.1.8	Location and Operation of Patron Sensors	CDR
0512	5.1.9	Fare Gate Passenger Display Messages	CDR, FDR

CDRL Number	Reference Section	Description	Due Date
0513	5.1.13	Data Uploading to FCA	CDR
0514	5.4	System Status Changes	CDR
0515	5.5.1	Data Transmission to MAS and Storage	CDR
0516	5.5.2	Patron flow operation	CDR
0517	5.5.3	Passback Control	CDR
0518	5.5.10	Fare Gate Cabinet Design and Construction	CDR
0519	5.6.1	Description of CSC automatic Validity Period update process	CDR
0520	5.6.3	TVM front panel showing all components, slots and displays	CDR
0521	5.6.4	Message Display Unit	CDR
0522	5.6.7	Access Lock	CDR
0523	5.6.8	Placard Frame Dimensions	CDR, FDR
0524	5.6.9.1	Operations of TVM	CDR
0525	5.6.10	Electronic Control Unit	CDR
0526	5.6.11	Transactional Information Stored by the TVM	CDR, FDR
0527	5.6.15	Detailed Information on Coin Acceptance System	CDR
0528	5.6.15.4	Re-circulating Coin Hoppers Emptying Procedures Coin Box	CDR
0529	5.6.16	Information on Bill Acceptance System	CDR
0530	5.6.17	Information on CSC Processor and associated software	CDR, FDR
0531	5.6.17.4	Detailed information on Cash Transactions Receipt Printer	CDR
0532	5.6.17.7	TVM Front Panel mock up	CDR
0533	5.6.17.9	Transactional Information downloaded to TVM	CDR, FDR
0534	5.6.17.10	Human Factors Evaluation	CDR
0535	5.6.17.10	TVM graphics	CDR
0536	5.6.17.10	Patron Interfaces	CDR, FDR
0537	5.6.17.12	Transaction Speed	CDR, FDR
0538	5.6.18	TVM audio messaging	CDR, FDR

Section 6: Phase 2 Bus Farebox Replacement

CDRL Number	Reference Section	Description	Due Date
0601	6.1.1	Display Position	CDR
0602	6.1.2	Position of Farebox on the Vehicle	CDR, FDR
0603	6.1.4	Bill System Access Security	CDR, FDR
0604	6.1.5	Coin System Access Security	CDR
0605	6.1.6	Bill Jam Clearing Features	CDR
0606	6.1.7	Patron Display Wording	CDR, FDR
0607	6.1.8	Operator Control Unit (OCU) Configuration	CDR
0608	6.1.10	Cashbox Presence Indication	CDR, FDR
0609	6.1.11	Alternative Farebox Unlocking Process	CDR, FDR
0610	6.1.12	Fare Table Configuration and Capacity	CDR
0611	6.1.17	Maintenance Actions and Event Information	CDR
0612	6.1.19	Bus System Locks and Keys	CDR
0613	6.1.20	Farebox Dimensions	CDR
0614	6.2.1	Cashbox Receiver, Vault Housing – Structure & Installation Plan	CDR
0615	6.2.1	Cashbox Receiver and Vault Housing – Dimensioned Drawing	CDR
0616	6.2.2	Mobile Vault Braking System	CDR
0617	6.2.4	Trip Record Contents and Structure	CDR
0618	6.2.4	Secured Wireless or alternative Communications	CDR, FDR
0619	6.2.4	Wireless Communications Security approval for FBS & farebox	CDR, FDR
0620	6.2.5	Portable Data Unit	CDR
0621	6.3	Tools and Gauges List	CDR
0622	6.7	Firewall, security apparatus, LAN architecture and protocol	CDR

Section 7: Monitoring & Alerting System (MAS) and Farebox Backend System (FBS)

CDRL Number	Reference Section	Description	Due Date
0701	7.1	MAS and FBS Architecture	CDR, FDR
0702	7.1	Operating system & components updated after proposal submission	CDR
0703	7.1	Configuration Management, third-party software	CDR
0704	7.1.1	Identify, design and programming of necessary interfaces	CDR, FDR
0705	7.2.1	Disaster Recovery Plan	CDR
0706	7.2.2	Backup System	CDR
0707	7.2.3	Archive data system	CDR
0708	7.2.5	Version Control plan	CDR
0709	7.4.1	Communication System design	CDR
0710	7.5.2	Procedures to track and modify, download operational parameters	CDR
0711	7.5.3	Receipt printing information	CDR
0712	7.5.3	Fare Table - Element and Definition	CDR, FDR
0713	7.5.4.1	Workstation detail design and functions	CDR, FDR
0714	7.6.3	Alarm/Event Priorities	CDR, FDR
0715	7.6.4	Remote Control Functions	CDR

Section 8: System Testing and Acceptance

CDRL Number	Reference Section	Description	Due Date
0801	8.1	Test Plan Program	CDR
0802	8.1.1	Test Schedule	CDR
0803	8.1.2	Test Procedures	14 Calendar Days after submittal
0804	8.1.3	Test Results Reports	10 Business days after test
0805	8.1.4	Test Waiver Requests	CDR
0806	8.2	First Article Configuration Inspection Notification	14 Calendar days
0807	8.3	First Article Test Notification	Within 21 days of completion of FACI
0808	8.3.3.2.1	Vibration Test Plan Approval	CDR
0809	8.3.3.2.2	Shock Test Plan Approval	CDR
0810	8.3.4	Maintainability Test Plan	30 days prior to FAT
0811	8.4	Demonstration Test for Equipment not meeting specified requirements.	Within two week of FAIT Completion.
0812	8.7	Installation Acceptance Test Procedures	14 days prior to delivery.

Section 9: System Support

CDRL Number	Reference Section	Description	Due Date
0901	9.2	Training Program Plan and Schedule	CDR, FDR
0902	9.2	Training Course Class Information and Manuals	CDR
0903	9.5	Spare Modules and Inventory Parts List	CDR



Memorandum



To: Honorable Chairman Oliver G. Gilbert, III
and Members, Board of County Commissioners

From: Javier A. Betancourt, Executive Director

Date: October 31, 2024

Re: CITT AGENDA ITEM 7B:

RESOLUTION BY THE CITIZENS' INDEPENDENT TRANSPORTATION TRUST (CITT) RECOMMENDING THE BOARD OF COUNTY COMMISSIONERS (BCC) AUTHORIZE REJECTION OF ALL PROPOSALS RECEIVED IN RESPONSE TO A COMPETITIVE REQUEST FOR PROPOSALS AND AWARD OF A COMPETITIVE DESIGNATED PURCHASE PURSUANT TO SECTION 2-8.1(B)(3) OF THE COUNTY CODE BY A TWO-THIRDS VOTE OF THE BOARD MEMBERS PRESENT; AUTHORIZE AWARD OF CONTRACT NO. EVN0001090 IN AN AMOUNT NOT TO EXCEED \$64,771,337 FOR THE PURCHASE OF FARE COLLECTION EQUIPMENT FOR AN INITIAL SIX-YEAR TERM; AUTHORIZE THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE TO EXECUTE SAME FOR AND ON BEHALF OF MIAMI-DADE COUNTY AND TO EXERCISE ALL PROVISIONS OF THE CONTRACT, INCLUDING ANY CANCELLATION OR EXTENSIONS, PURSUANT TO SECTION 2-8.1 OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA AND IMPLEMENTING ORDER 3-38; AND AUTHORIZE THE USE OF **\$44,720,435** OF CHARTER COUNTY TRANSPORTATION SURTAX FUNDS FOR THIS PROJECT WHICH WAS ADDED TO THE PEOPLE'S TRANSPORTATION PLAN 2024-2028 FIVE-YEAR IMPLEMENTATION PLAN. **(DTPW – BCC LEGISLATIVE FILE NO. 241972)**

On October 30, 2024, the CITT voted (8-0) to forward a favorable recommendation to the Board of County Commissioners (BCC) for the approval of the above referenced item, CITT Resolution No. 24-024. The approval of the above contract is subject to the approval of the PTP FY 2024-28 Five Year Implementation Plan amendment adding the fare collection project to the plan. The vote was as follows:

Robert Wolfarth, Chairperson – Aye
Mary Street, Esq., 1st Vice-Chairperson – Absent
Hon. Peggy Bell, 2nd Vice-Chairperson – Absent

Omar K. Bradford, Esq. – Absent
Qjuezari Harvey – Aye
Kenneth Kilpatrick – Aye
Miguel Murphy – Aye
Paul J. Schwiep, Esq. – Aye

Meg Daly – Aye
Harry Hoffman – Aye
David Marin – Aye
Robert Ruano – Absent

c: Jimmy Morales, Chief Operations Officer
Bruce Libhaber, Assistant County Attorney