# Memorandum

**Date:** April 16, 2026

Agenda Item No. 2(B)(6)
July 21, 2026

**To:** Honorable Chairman Anthony Rodriguez
and Members, Board of County Commissioners

**From:** Daniella Levine Cava
Mayor

**Subject:** Report on the Performance of the County's Electric Vehicle Fleet - Directive No. 252468

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This report is in response to Resolution No. R-62-26 (Resolution), which was co-prime sponsored by Commissioners Roberto J. Gonzalez and Natalie Milian Orbis and adopted by the Board of County Commissioners (Board) on January 21, 2026. The Resolution directed the County Mayor or County Mayor's designee to provide a report on the performance of the County's electric vehicle (EV) fleet, to date (Report) to include: (1) to the extent known, a comparison between (a) the actual and anticipated life of said vehicles and charging stations, (b) the actual and anticipated cost and efficiency savings, if any, from placing such vehicles into operation, (c) the actual and anticipated number of miles between charges and the impacts to the County's operations, if any, from such variance, if any; (2) an analysis of the projected long term maintenance costs and overall fiscal impact; (3) the number of battery-electric buses that have been purchased, delivered to, and accepted by the County to date; (4) the total amount, also broken down per bus and by manufacturer, paid for the acquisition of battery-electric buses and their charging stations delivered to, and accepted by, the County to date; (5) the average number of battery-electric buses in operation on a daily, weekly, and monthly basis since their delivery to present; (6) the number of buses that are presently out of service and the reason(s) they are out of service; and (7) the status of the acquisition of spare parts needed for repairs; (8) the plans for the disposition of said electric vehicles and associated charging stations once they have reached their useful life.

Per the Board's direction, the People and Internal Operations Department (PIOD), Department of Solid Waste Management (DSWM), and Department of Transportation and Public Works (DTPW) conducted a review of available County data, along with published industry information, to develop this Report and to address all components of the Resolution. This Report underscores the many factors that shape both the current performance and long-term outlook of the County's EV fleet.

## Executive Summary

Electric Vehicles help ensure Miami-Dade County remains competitive by improving operational efficiency, enhancing resilience through fuel diversification, and generating financial savings that support more reliable and cost-effective service to our community, combined with improved local air quality. The County, like communities across the nation, faces challenges with our electric vehicle fleet as a result of ongoing manufacturer issues with Proterra, Inc. (Proterra). The County continues to do everything possible to hold vendors accountable for poor performance, including exploring all available legal remedies, while continuing to deliver reliable transit service with newer, better-performing vehicles. The County's Light-Duty Electric Vehicles have already demonstrated measurable operational efficiencies, including approximately $334,368 in realized savings to date, driven by reduced fuel consumption, lower maintenance costs, and avoided pollutant externality impacts.

It is important to note that the issues with Proterra – a contract that predates the current administration – are independent of the electric vehicle technology itself and stem from manufacturer specific challenges. Early data from the New Flyer of America, Inc. (New Flyer) fleet shows promising performance and potential future savings in fuel and maintenance costs, and this fleet is supporting

reliable, high-capacity service, including the South Dade Transitway – the largest electric bus rapid transit system in the country.

The ability to assess the long-term cost impacts of the battery-electric bus program remains limited due to the short period that the New Flyer 60-foot fleet has been in operation so far, and the continued unavailability of the Proterra 40-foot buses fleet as further detailed in this report. Long-term fiscal outcomes will depend on factors such as incentives, fuel price, vehicle utilization, and battery lifecycle performance. As additional mileage and operational data become available for Light-Duty and Heavy-Duty Electric Vehicles, the County will be positioned to continue lifecycle evaluations and guide future fleet planning decisions.

**Background**

Since 2003, the Board has advanced a series of actions to transition the County fleet toward more efficient technologies. In 2003, the Board adopted Resolution No. R-969-03, which established a goal of reducing the County's total gasoline consumption by 20 percent by 2008. In 2018, fleet electrification accelerated with Resolution No. R-1034-18, establishing 2028 fuel-reduction goals and directing increased procurement of electric buses, including a target for a 50-percent battery-electric transit bus fleet by 2035. In 2022, the Board accepted the EV Charging Stations Report (Directive No. 212661), documenting existing infrastructure and recommending strategies to expand charging access countywide.

In alignment with Resolution No. R-1034-18, under the previous administration in October 2019, the Board approved Resolution No. R-1041-19, awarding Contract No. RFP-00456 to Proterra for the purchase of up to 75 battery-electric buses and supporting charging infrastructure. Following the delivery of the buses and charging units in August 2023, Proterra filed a petition for bankruptcy protection under Chapter 11 in the U.S. Bankruptcy Court for the District of Delaware. A subsequent sale of assets to Phoenix Motors, Inc (Phoenix) was finalized in January 2024. In May 2024, Resolution No. R-346-24 reassigned the Proterra contract to Phoenix, updating warranty terms and enabling acceptance of 69 buses. Performance issues with the fleet continued as outlined in my Administration's October 2025 report to the Board. Pursuant to the report, termination of Phoenix was completed in April 2026 and DTPW staff is working the County Attorney's Office on legal action.

Separately, in 2023, major fleet investment continued under Resolution No. R-30-23, approving the purchase of 100 New Flyer 60-foot battery-electric buses and associated chargers. As further described herein, this fleet has performed well and is providing highly successful Bus Rapid Transit (BRT) service in the South Dade Transitway.

Currently, in today's evolving vehicle and technology markets, EVs have continued to move from a niche technology to mainstream transportation, with every major automaker now offering electric models across passenger, municipal, and commercial fleets—including buses, utility vehicles, and heavy-duty equipment. This shift is now extending into aviation through emerging technologies such as electric vertical takeoff and landing (eVTOL) aircraft and the development of vertiports to support Advanced Air Mobility (AAM). These advancements are being driven by strong total cost-of-ownership advantages, including lower maintenance requirements, reduced fuel price volatility, and the public-health benefits of improved local air quality. Collectively, these factors are making electrification an increasingly cost-effective and operationally efficient transportation solution for both public agencies and private operators.

**Analysis on Countywide Electric Vehicles**

Pursuant to the Resolution, certain reporting requirements pertain exclusively to the battery-electric buses operated by DTPW. Accordingly, and to promote clarity and facilitate an efficient review of the

information, this Report is grouped by vehicle category. Each section addresses the component of the Resolution applicable to that specific fleet segment and is designated as Light-Duty Electric Vehicles (LDEV), Heavy-Duty Electric Vehicles (HDEV), or Battery-Electric Buses (BEB). This structure ensures that performance, financial, operational, and lifecycle analyses are presented within the appropriate operational context and supports a clear understanding of the analysis. Accordingly, the sections that follow present the required responses to each Board directive by vehicle category.

## LIGHT-DUTY ELECTRIC VEHICLES

**1(a). The actual and anticipated life of said vehicles and charging stations.**

LIGHT-DUTY ELECTRIC VEHICLES

Actual Life

As of January 28, 2026, the County's active light-duty EV fleet is comprised of 405 units. See *Table1* below for breakdown by department or agency.

*Table1*

| COUNT OF LIGHT-DUTY EVs BY DEPARTMENT OR AGENCY | |
|---|---|
| Administrative Office of the Courts | 1 |
| Animal Services | 1 |
| Aviation | 19 |
| Communications, Information, and Technology | 16 |
| Community Services | 5 |
| Corrections and Rehabilitation | 16 |
| Cultural Affairs | 3 |
| Emergency Management | 1 |
| Environmental Resources Management | 5 |
| Solid Waste Management | 9 |
| Department of Transportation and Public Works | 60 |
| Fire Rescue | 25 |
| Housing and Community Development | 32 |
| Libraries | 2 |
| Miami Dade Sheriff's Office | 79 |
| Parks, Recreation, and Open Spaces | 42 |
| People and Internal Operations | 45 |
| Seaport | 7 |
| Regulatory and Economic Resources | 9 |
| Water and Sewer | 28 |
| **Grand Total** | **405** |

Most of the County's LDEV fleet is relatively new and currently in active service. As a result, the majority of these vehicles have not yet reached 40,000 miles and certainly not the end of their expected service life, limiting the ability to conduct a full lifecycle cost and performance analysis at the time of this Report. Therefore, certain figures presented throughout this Report are derived from projections rather than

finalized historical data and intended to reflect estimated outcomes based on available information and established assumptions. The only exceptions are two early-generation LDEVs introduced into the fleet in 2011 and 2012. These units were intentionally deployed as pilot vehicles to assess early EV integration within the pool fleet. The utilization (13,432 and 11,308 miles, respectively) reflects their limited operating range at the time rather than typical fleet usage patterns within the pool fleet. Both vehicles remained in service for approximately seven years and were retired when high-voltage battery replacement became necessary. Given the age of the vehicles and the state of early generation EV technology, battery replacement was determined to be impractical. As early generation models, technology and range were limited. Newer models now offer improved technology with increased range.

Anticipated Life

As the County's LDEV fleet continues to mature, lifecycle cost and performance evaluations are expected to become more representative as vehicles approach established industry replacement thresholds. Unlike internal combustion vehicles, LDEV replacement decisions are anticipated to be driven primarily by battery health rather than engine wear, with typical benchmarks ranging from 8 to 12 years of service and approximately 100,000–150,000 miles, depending on usage, time, and operating conditions. This life cycle is comparable to conventional internal combustion engine (ICE) vehicles.

Industry data indicates gradual battery capacity degradation over time, with replacement generally considered when usable capacity (performance) declines below approximately 70–80 percent, affecting range, charging efficiency, and operational reliability.

Battery replacement costs represent a significant share of an LDEV's residual value as vehicles age, often making mid-life battery replacement economically impractical. Based on current industry standards and federal fleet guidance, future LDEV replacement strategies are expected to favor full vehicle turnover when operational range requirements can no longer be met or when battery replacement costs exceed a reasonable proportion of remaining vehicle value.

However, depending on the timing of battery degradation and replacement relative to vehicle age and mileage, the cost impact of a major LDEV component replacement can be comparable to the aggregate cost of major component failures incurred over the service life of an ICE vehicle.

## CHARGING STATIONS

PIOD, in coordination with multiple County departments, managed the engineering assessment, design, permitting, construction and construction administration required for the installation of electric vehicle supply equipment (EVSE), commonly referred to as charging stations, at various County facilities. These efforts were undertaken to support the planned deployment of EVs within the County's fleet.

Following visual assessments of electrical systems at each site, PIOD provided the necessary design and construction services to accommodate the proposed LDEVs. Installation of charging stations was contingent upon the available electrical capacity at each facility. Infrastructure improvements completed under this initiative enabled the installation of ChargePoint CT4000 series Level 2 charging stations by PIOD, DTPW, Cultural Affairs, Miami-Dade Corrections and Rehabilitation, Miami-Dade Fire Rescue, Parks, Recreation and Open Spaces and the Water and Sewer Department (WASD). PIOD monitors all deployed charging stations through the ChargePoint management platform and associated dashboard tools. To date, 75 charging stations, representing 97 total charging ports, have been installed countywide and are being monitored and maintained by PIOD under ChargePoint's warranty services. All charging station installations have occurred over the last four years, and no repairs or replacements have been required to date.

The general industry standards for commercial Level 2 EV charging stations indicate an expected operational lifespan of approximately 10 to 20 years. ChargePoint chargers are specifically engineered for high-volume, outdoor commercial use and are constructed with durability features such as IK10 impact-resistant ratings and NEMA 3R/IP54 weather enclosures. While the primary charging station units are designed to remain in service for more than a decade, certain components-most notably, the charging cables-are designed to withstand more than 10,000 complete charging cycles, equating to roughly 27 years of daily usage. The actual service life of each station is dependent upon usage frequency, environmental exposure, and adherence to recommended maintenance practices. Routine maintenance includes ensuring that ventilation areas remain clear of debris or obstruction and conducting monthly inspections to identify any damage, vandalism, or operational concerns. Site managers are responsible for reporting observed damage to ChargePoint and for monitoring cable integrity on a monthly basis to ensure safe operation. Repairs and component replacements for ChargePoint charging stations must be performed by an approved installer or certified service technician to maintain warranty protections and ensure proper system functionality.

**1(b). The actual and anticipated cost and efficiency savings, if any, from placing such vehicles into operation.**

Actual Cost and Efficiency Savings

Based on current fleet deployment and observed operating performance, LDEVs have produced measurable and verifiable cost and efficiency savings relative to comparable ICE vehicles. To date, a total of 405 LDEVs have accumulated 2,728,226 miles of service across the fleet.

Using observed per-mile differentials, actual fuel (energy) savings average approximately $0.06 per mile, resulting in $177,335 in realized fuel savings, attributable to the avoidance of approximately 69,400 gallons of gasoline. In addition, observed maintenance savings average approximately $0.05 per mile, producing $136,411 in actual maintenance savings. Further, pollutant externality costs avoided are estimated at approximately $20,622. Combined, these efficiencies have generated total realized savings of approximately $334,368 to date (*Table 2*). However, as previously noted, the County's LDEV fleet remains in its early stages of deployment, and these savings are expected to increase as vehicle utilization expands and the fleet continues to mature.

These efficiency advantages, particularly in lower energy consumption and reduced routine maintenance, must ultimately be evaluated within the context of total cost of ownership.

*Table 2*

| Number of EVs | Combined Miles Traveled | Actual Fuel Savings ($0.06 per mile) | Actual Maintenance Savings ($0.05 per mile) | Pollutant Externality Cost Avoided | Total Actual Savings |
|---|---|---|---|---|---|
| 405 | 2,728,226 | **$177,335** | **$136,411** | **$20,622** | **$334,368** |

Utilizing a combination of actual realized fleet expenses and projected figures, EVs demonstrate measurable operating cost and efficiency advantages relative to comparable ICE vehicles, primarily driven by lower fuel/energy costs, maintenance, and repairs. However, the realization of these savings is contingent upon vehicle pricing, incentive availability, vehicle utilization, and service life assumptions.

When EV incentives or tax credits averaging approximately $7,500 per vehicle are applied, the net effective purchase price of an LDEV remains approximately $7,950 higher than a comparable ICE vehicle. Despite this higher up-front cost, LDEVs generate operating savings of approximately $12,974 per vehicle through the first 100,000 miles, consisting of $6,474 in fuel/energy savings and approximately $6,500 in maintenance savings. In addition, LDEVs provide an estimated $1,163 in pollutant externality cost savings over the first 100,000 miles, reflecting avoided societal health impacts

associated with nitrogen oxides (NOx), fine particulate matter (PM2.5), coarse particulate matter (PM10), and volatile organic compounds (VOC), including reduced risks of respiratory and cardiovascular illness and related public health costs. These values were calculated according to the U.S. Department of Energy's Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool, developed by Argonne National Laboratory, which applies the Air Pollution Emission Experiments and Policy Analysis (AP3) model and EPA MOVES emission factors to monetize marginal health damages from vehicle emissions.

Under this scenario, LDEVs achieve net savings of approximately $6,187 per vehicle by 100,000 miles, indicating that efficiency gains and reduced maintenance can offset the majority of the initial price premium when incentives are available. These figures were derived from an analysis of 99 LDEVs and 153 comparable ICE sedans under 100,000 miles in the County's fleet, ensuring a fair comparison and a sound basis for projecting savings (*Table 3)*. The analysis also benchmarked County results against industry data to validate accuracy and alignment with broader industry financial trends.

*Table 3*

Note: EV Projection past 40K miles

| Cost / Metric Category | | ICE Sedans (Toyota Camry /Ford Fusion) | LDEVs (Ford Mach-E /Chevy Bolt EUV) | Variance / Contrast (ICE vs LDEV) |
|---|---|---|---|---|
| **Up-Front Purchase Price**<br>Price AVGs | | $21,420 – $26,180<br>$23,800 | $31,000 - $47,500<br>$39,250 | EV appx higher expense:<br>$15,450 |
| **Incentives/Tax Credit (typical public fleet)** | | None | $7,500 | EV incentives apply to CY 2023, 2024, and up to September 2025. |
| **Net Effective Purchase Cost** | | $23,800 | $31,750 | EVs are appx. $7,950 higher cost |
| **Fuel / Energy Cost (per mile)** | | $0.11 – $0.14 | $0.05 – $0.07 | EV is $0.06 less per mile |
| **Fuel Cost (12K miles)** | | $1,500 | $720 | EV saves appx $780 per 12K miles |
| **Fuel Cost (100K miles)** | | $12,450 | $5,976 | EV saves appx $6,474 up to 100,000 Miles |
| **Net Fuel Cost up to 100K Miles** | | | | EVs result in appx. $6,474 savings |
| **Maintenance Cost (per mile) Actual - Fleet Data (EVs < 40K Miles)** | | $0.16 | $0.11 | At <40K Miles: EV $0.05 cents (31%) lower per mile. |
| **Maintenance Cost (12K miles)** | | $1,920 | $1,320 | EV saves Appx $600 per 12K miles |
| **Maintenance Cost (100K miles)** | | $16,000 | Projection based on Actuals <40K Miles: $11,000<br>Projection based on industry: $6,000 – $10,000 industry | Based on actuals avg and industry research: EV saves appx $6,500 |
| **Net Maintenance Cost up to 100K Miles** | | | | EVs result in appx. $6,500 savings |
| **Pollutant Externality Cost (12K Miles)** | | $797 | $657 | EVs represent appx $140 cost avoidance. |

| | | | | |
|---|---|---|---|---|
| **Pollutant Externality Cost (100K Miles)** | | $6,616 | $5,453 | EVs result in appx $1,163 cost avoidance. |
| **Net Pollutant Externality Cost up to 100K Miles** | | | | EVs result in appx. $1,163 savings |
| **Total Net Savings Up to 100K Miles** | | | | **EVs result in appx. $6,187 net savings** |
| **Major Components >100k miles** | | Transmission, engine, emissions, cooling system, etc. | Battery degradation primary concern | ICE = many moderate-cost risks<br>EV = single high-cost risk |
| **Major Repair Risk (100k–150k)** | | $3k–$8k cumulative typical<br>$5,500 avg used in report | Battery replacement (out of warranty):<br>• Mach-E: $14k–$20k<br>• Bolt EUV: $10k–$16k | EV risk = low probability, high financial impact |
| **EV Battery Replacement Likelihood** | | N/A | Low before 80k miles and 7-8 years, but consequence severe afterward | N/A |
| **Expected Useful Fleet Life** | | 100k–140k miles | 100k–150k miles | Comparable; EV utility depends on remaining range |
| **Residual / End-of-Life Value** | | Stable, predictable | Highly battery-health dependent | ICE lower uncertainty |
| | **Risk Past 100K Miles** | $5,500 | $15,000 | Risk factor is appx 3:1 more expensive for EV |

Anticipated Cost and Efficiency Savings

Anticipated cost and efficiency outcomes beyond current fleet experience are highly dependent on continued incentive availability and sustained vehicle utilization. With applicable EV incentives applied to the 405 EVs purchased prior to September 2025, these vehicles are expected to continue generating operating savings as mileage accumulates, driven by ongoing fuel and maintenance efficiency advantages. Based on these assumptions, the County projects cumulative net savings of approximately $2.5 million by the time these vehicles reach 100,000 miles *(Table 4)*.

*Table 4*

**Scenario 1 - Projected Savings from Current fleet status *with* EV incentives/credits up to 100K miles**

| | Purchase Price | Incentive / Credit | Net Price | Fuel Expense Up to 100K Miles | Maintenance Expenses Up To 100K Miles | Pollutant Externality Cost Up to 100K Miles | Total Expense | Financial Impact – Fleet Total (405 EVs) |
|---|---|---|---|---|---|---|---|---|
| EV | $39,250 | ($7,500) | $31,750 | $5,976 | $9,500 | $5,453 | $52,679 | $21,334,920 |
| ICE | $23,800 | | $23,800 | $12,450 | $16,000 | $6,616 | $58,866 | $23,840,613 |
| Balance | | | $7,950 | ($6,474) | ($6,500) | ($1,163) | ($6,187) | ($2,505,692) |
| Accumulated Net Balance (Negative value = EV Savings) | | | $7,950 | $1,476 | ($5,024) | ($6,187) | | |

However, considering that incentives or credits are not currently available, the net purchase price differential increases to approximately $15,450 per vehicle. Under these conditions, while LDEVs are still anticipated to deliver the same operating efficiencies, the cumulative savings through 100,000 miles are insufficient to offset the higher acquisition cost, resulting in an anticipated net cost disadvantage of

approximately $1,313 per vehicle compared to ICE vehicles over that mileage horizon, utilizing historic fuel prices based on averages.

If an additional 405 LDEVs were procured under this scenario, the County estimates a cumulative net cost impact of approximately $531,808 by the time these vehicles reach 100,000 miles of service. This outcome would reduce the previously anticipated $2.5 million in cumulative savings associated with the initial 405 LDEVs purchased with tax credits to approximately $1.9 million *(Table 5)*.

*Table 5*

**Scenario 2 - Additional EVs projection *without* EV incentives/credits up to 100K miles**

| | Purchase Price | Incentive / Credit | Net Price | Fuel Expense Up to 100K Miles | Maintenance Expenses Up To 100K Miles | Pollutant Externality Cost Up to 100K Miles | Total Expense | Financial Impact – Fleet Total (Additional 405 EVs) |
|---|---|---|---|---|---|---|---|---|
| EV | $39,250 | $0 | $39,250 | $5,976 | $9,500 | $5,453 | $60,179 | $24,372,420 |
| ICE | $23,800 | | $23,800 | $12,450 | $16,000 | $6,616 | $58,866 | $23,840,613 |
| Balance | | | **$15,450** | **($6,474)** | **($6,500)** | **($1,163)** | **$1,313** | **$531,808** |
| Accumulated Net Balance (Negative value = EV Savings) | | | **$15,450** | **$8,976** | **$2,476** | **$1,313** | | |
| **Projected Net Balance From additional EVs without Credits: Total Fleet Count 810 EVs** | | | | | | | | **($1,973,885)** |

Overall, the analysis shows that LDEVs can provide actual and anticipated efficiency savings in terms of fuel and maintenance, but the translation of these efficiencies into net fiscal savings is highly dependent on policy incentives and accumulated mileage.

**1(c). The actual and anticipated number of miles between charges and the impacts to the County's operations, if any, from such variance, if any.**

Actual Miles Between Charges

Based on charging and utilization data collected to date, current fleet performance indicates that LDEVs are achieving consistent and operationally sufficient mileage between charging events, with charging occurring predominantly through Level 2 (L2) charging during non-operational periods.

Across the LDEV inventory, vehicles accumulated an average of approximately 55 miles traveled between charging session. The average charging duration was approximately 3 hours and 47 minutes per session, which is consistent with L2 charging profiles and reflects charging that primarily occurs while vehicles are not in active service ("sleep" charging), such as overnight or between shifts. Vehicles are routinely charged approximately every two to three days, prior to full battery depletion.

Anticipated Miles Between Charges

Anticipated miles between charges are expected to remain generally consistent with current observed performance, assuming continued use of L2 charging during non-operational periods and alignment of LDEV deployment with appropriate duty cycles. While individual LDEV models offer higher nominal range, operational practice is expected to continue favoring frequent, off-shift and off-operation charging rather than extended range depletion.

From an operational perspective, the continued predominance of L2 "sleep" charging is expected to minimize impacts to County operations, as vehicles are charged while idle and returned to service with sufficient range to meet daily operational needs.

**2. An analysis of the projected long-term maintenance costs and overall fiscal impact:**

Projected long-term maintenance costs and overall fiscal impacts vary significantly across the evaluated scenarios and are driven primarily by battery degradation timing and incentive availability. Scenario modeling indicates that ICE vehicles typically incur recurring moderate-cost component failures beyond 100,000 miles, resulting in relatively predictable maintenance expenses over time. EVs, by contrast, are projected to maintain lower routine maintenance costs but carry a high-cost battery replacement risk, estimated at approximately $15,000 if replacement occurs outside of warranty coverage.

When incentives are applied and battery replacement is deferred to later years beyond 100,000 miles, accumulated fuel and maintenance savings are projected to offset both the higher acquisition cost and the eventual battery replacement, resulting in a favorable long-term fiscal outcome for EVs. Conversely, if battery replacement occurs earlier in the post-100,000-mile period, the fiscal advantage may shift in favor of ICE vehicles, particularly in scenarios where incentives are unavailable.

At the fleet level, scenario modeling analysis indicates that the financial impact associated with 405 EVs may reasonably range from net savings to net cost exposure (Attachment 1). The analysis evaluates potential battery replacement occurring at Year 1 (approximately 12,000 miles beyond 100,000 miles), Year 2 (approximately 24,000 miles beyond 100,000 miles), and Year 3 (approximately 36,000 miles beyond 100,000 miles).

Under credit-supported scenarios in which battery replacement is deferred to later years (e.g., Year 3 or approximately 36,000 miles beyond 100,000 miles), projected fleet-wide results reflect aggregate savings of approximately $3.11 million (Scenario 7). If battery replacement occurs earlier, such as in Year 2, projected savings are reduced to approximately $885,692 (Scenario 5)

Conversely, in scenarios without incentives and with early battery replacement (Year 1), the analysis projects a fleet-level cost disadvantage of approximately $4.38 million (Scenario 4). When battery replacement occurs in Year 2 without incentives, projected cost exposure declines to approximately $2.15 million (Scenario 6). If replacement is deferred to Year 3 in the absence of incentives, the projected outcome shifts to a marginal savings of approximately $75,692 (Scenario 8).

These projections indicate that fleet-wide outcomes for 405 EVs range from approximately $3.1 million in net savings to approximately $4.38 million in potential cost exposure, depending on incentive status and battery replacement timing. This reinforces that long-term fiscal performance is highly sensitive to lifecycle management strategy and policy conditions rather than driven solely by vehicle technology.

Overall, these outcomes highlight a fundamental difference in lifecycle cost profiles. ICE vehicles incur incremental and distributed maintenance costs, whereas EVs concentrate long-term cost risk into a single, high-impact component event. As a result, EV fiscal performance is more sensitive to service life assumptions, warranty coverage, and deployment strategy. Maximizing fleet-level return therefore depends on aligning EV deployment with incentive availability, higher-utilization applications, and strategies that extend battery life beyond early post-100,000-mile thresholds.

**8. The plans for the disposition of said electric vehicles and associated charging stations once they have reached their useful life.**

VEHICLES

Disposition Plan

The County follows the established disposition process applied to ICE vehicles and will dispose of EVs in accordance with County Administrative Order 6-2, Assignment, Operation, Acquisition, Maintenance and Disposal of County Vehicles (AO 6-2), and Procedure No. 812 – Decommissioned Vehicles—Emergency & Non-Emergency (Procedure No. 812).

Pursuant to AO 6-2, vehicles are retired based on a replacement assessment, once they have met their life expectancy or necessary repairs exceed vehicle value. Operational need, parts availability, vehicle condition, age, and other factors are considered during the assessment. Once a vehicle is determined to have reached the end of its useful life, it is decommissioned and sold through the County's auction process. Prior to sale, all vehicles are processed in accordance with Procedure No. 812, which governs the decommissioning and auction process. This includes removal of decals, markings, emergency equipment, radios, GPS, specialty equipment, and any other accessories prior to disposal.

Historically, the retirement and auction process generates approximately $2 to $4 million annually in resale revenue. Departments can reinvest these proceeds to offset the cost of acquiring replacement vehicles, including future EV or ICE acquisitions, thereby reducing net capital impact to the County.

### CHARGING STATIONS

As with the electric vehicles, the County will follow all established disposition processes applied to electrical equipment and will dispose of charging stations in accordance with County Administrative Order 8-2, Use, Care, Control and Disposal of County Property. Once a charging station has met its life expectancy or necessary repairs exceed the value, the station will be assessed and considered for disposal. The main components of charging stations include the housing and enclosure, power input accessories, control electronics, as well as exterior cables and connectors. The County will evaluate the probable use of any of the main components for recycling and repurpose. Once a charging station and associated parts are determined to have reached the end of its useful life, it will be decommissioned accordingly from a capital asset. Due to the recent installations, the County has yet to process the decommission or disposal of charging stations.

## HEAVY-DUTY ELECTRIC VEHICLES

In 2022, the Department of Solid Waste Management (DSWM) procured one electric automated side-loading (EASL) refuse truck, a Mack LR 27. This acquisition was done as a pilot program to evaluate the emerging technology of HDEVs under real-world operating conditions within the County.

The EASL was acquired with a five-year, 250,000-mile Mack Ultra Service Agreement, along with the manufacturer-recommended Level 3 charging infrastructure.

- The Mack Ultra Service Agreement is a non-deductible, comprehensive maintenance and repair contract that includes normal service, repairs, and technology upgrades. As a result, County funds are not expended for covered maintenance or technological updates performed on the EV chassis during the agreement term.
- The manufacturer-specified charger is a Heliox 50 kW Level 3 (DC fast) charger. Due to system requirements, this test vehicle can only be charged using Level 3 infrastructure.

The EASL operates on a designated residential route, as do the conventional automated side loaders (ASLs) within the DSWM fleet. On average, the unit services approximately 545 households per route and collects approximately 9.1 tons of refuse per operating day between charging sessions.

At the conclusion of each operating day, the battery is typically depleted and requires recharging. The primary contributor to battery depletion is the continuous electrical demand of the electric power take-off (EPTO) system, which powers the hydraulic pump, combined with route travel and trips to the transfer station for material disposal.

As the EASL continues to operate on its dedicated route during this pilot period, performance metrics and operational data are being collected in coordination with the manufacturer.

DSWM traditionally operates conventional ASL units for a minimum of seven years, or until the vehicle is no longer cost-effective to maintain. This pilot EASL will be managed under the same useful life and

performance monitoring standards. Upon retirement, the vehicle will be disposed of in accordance with all applicable laws and current County policy.

## BATTERY-ELECTRIC BUSES

DTPW's fleet of BEBs is divided into two main types: 40-Foot BEBs acquired from Proterra and later assigned to Phoenix (referred to herein as the Proterra fleet) and 60-Foot Articulated BEBs acquired from New Flyer (referred to herein as the New Flyer fleet).

Chronic performance issues with the Proterra fleet both prior to and after the assignment of the Contract to Phoenix, have been disclosed to the Board since the acquisition of the fleet and remain ongoing. The issues with Proterra-manufactured buses are not reflective of all BEB technology and are not unique to the County. Rather, these are nationwide, impacting all customers of Proterra and Phoenix. As noted in the Background section, the termination of Phoenix has been completed and legal action is moving forward.

The first portion of the New Flyer fleet was put into service in October 2025 for the operation of MetroExpress Bus Rapid Transit (BRT) service in the South Dade Transitway. Additional New Flyer BEBs have been placed into service upon delivery and commissioning. Because of the short period of time that the fleet has been in service, actual data pertaining to maintenance cost and total cost of ownership is very limited as is performance data.

### 1(a). The actual and anticipated life of said vehicles and charging stations

BEBs

Actual Life

The Proterra fleet was delivered and placed into service during 2022 and 2023 and therefore has an actual life of three to four years. DTPW began receiving the New Flyer fleet in 2025, with the final buses to be received in 2026, accordingly, the average actual life is less than one year.

Anticipated Life

The Federal Transit Administration (FTA) has established useful life of a minimum of 12 years for bus purchases made using federal funds. Regarding the Proterra fleet, the FTA is aware of the nationwide performance failures. DTPW has petitioned the FTA for a waiver of the useful life requirements for the Proterra fleet to allow for the replacement of these buses prior to the 12-year threshold without being subject to repayment of federal funding. Regarding the New Flyer fleet, DTPW will follow the FTA's standards and therefore would anticipate a useful life of 12 years.

CHARGING STATIONS

Actual Life

Seventy-five (75) charging stations, Power Electric NBI120 480V Chargers, were purchased for the operation of the BEB fleet and placed into service in 2022 and 2023 and therefore have an actual life of three to four years. Additional chargers are being acquired as part of the construction of the South Dade Transit Operations Center. Construction at the facility is ongoing and has not yet been accepted by the County.

Anticipated Life

The FTA has not yet established a useful life requirement for chargers. The Power Electric chargers are Level 3, industrial-grade charging equipment, and expected operational life is not measured in charge cycles as is typical in consumer-grade equipment. With proper maintenance and standard operating conditions, the chargers are designed for a service life of 10 to 15 years. Some components

of the chargers with high-power throughput, such as power modules, may require replacement during the useful life.

**1(b). The actual and anticipated cost and efficiency savings, if any, from placing such vehicles into operation.**

Cost and Efficiency Savings

In a scenario of optimal performance of the BEB fleet, the County would be able to realize savings in operational costs based upon efficiency in operating costs, such as fuel savings associated with the New Flyer 60-foot fleet (*Table 6*). When normalization for year of purchase, the BEBs have a higher purchase price when compared to other vehicles in the DTPW fleet.

*Table 6*

| Cost / Metric Category | 40-foot CNG | 40-foot Battery Electric Buses (BEB) | Variance / Contrast (CNG vs EV) | 60-foot Diesel Hybrid Electric Vehicle (HEV) | 60-foot Battery Electric Buses (BEB) | Variance / Contrast (Hybrid vs BEB) | Notes |
|---|---|---|---|---|---|---|---|
| **Number of vehicles in the fleet** | **560** | **69** | | **64** | **92** | | |
| **Purchase Date** | **2018-2020** | **2022-2023** | | **2015-2018** | **2024** | | |
| **Average Up-Front Purchase Price** | $576,754 | $897,067 | $320,313 | $978,795 | $1,659,266 | $680,471 | All purchase prices are based on 2024 figures using the U.S. Department of Labor Producer Price Index (PPI), Category 1413: Trucks and Bus Bodies. |
| **Tax Credit (typical public fleet)** | | $1,400,000 | | | Pending | | The County received $40,000 tax credit per vehicle for 35, 40-foot BEBs, and intends to pursue the $40,000 tax credit for each vehicle that qualifies in the 60 foot fleet. If the full tax credits are approved, the department will receive approximately $3,440,000 for the 60-foot BEBs. The tax credits are currently sunsetted by the "Big Beautiful Bill' for vehicles purchased after September 2025. |
| **Net Effective Purchase Cost:** | EVs are appx. $320k higher cost | | | EVs are appx. $680K higher cost | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Fuel / Energy Cost (per mile)** | $0.29 | $0.40 | $0.11 | $0.88 | $0.40 | $(0.48) | For BEBs, costs were determined using actual data from Florida Power & Light billing for six accounts tied to existing chargers. The estimate reflects limited operational data but is consistent with industry standards at $0.48 per mile. |
| **Annual Average miles per bus** | 43,626 | 7,233 | | 9,604 | 4,437 | | Performance issues with 40-foot BEBs have led to CNG fleet having more in service hours and thus accumulating more mileage |
| **Fuel Cost (250k miles)** | $72,500 | $100,000 | $27,500 | $220,000 | $100,000 | $(120,000) | BEBs fleet average < 20K Miles in operation therefore estimates reflect limited operational data |
| **Fuel Cost (500k miles)** | $145,000 | $200,000 | $55,000 | $440,000 | $200,000 | $(240,000) | |
| **Net Fuel Cost up to 500K Miles** | EVs result in appx. $0.11/mile higher costs for fuel | | | EVs result in appx. $0.48 per mile savings | | | |

Pollution/Health Costs

Pollution/Health Costs represent the monetized public health impact (e.g., respiratory and cardiovascular illnesses) associated with vehicle emissions. These values are calculated using the U.S. Department of Energy's AFLEET tool, developed by Argonne National Laboratory, which provides a "Well-to-Wheels" lifecycle analysis—accounting for everything from fuel production to vehicle operation. Costs scale proportionally with annual mileage. BEB data is currently based on less than one year of operational actuals. Attachment 3 and Attachment 4 outline two scenarios for the analysis of Pollution/Health Costs respectively, one that excludes manufacturing impacts and one that includes them. Across both scenarios, BEBs represent Pollution/Health Costs savings when in operation; however, they carry a large manufacturing pollution burden when the production lifecycle is considered.

Scenario 1 does not include, manufacturing impacts in the analysis. BEBs result in a cost savings due to zero tailpipe pollution during operation, lower emissions associated with the Florida Power and Light (FPL) grid, extremely low petroleum use, and the absence of engine-related emissions. Compressed Natural Gas (CNG) results in a higher Pollution/Health Costs due to combustion-related effects and upstream impacts, although CNG performs better than Hybrid Electric Vehicles (HEVs), which produce the highest cost.

Scenario 2 incorporates manufacturing impacts into the analysis, which significantly changes the results. The Pollution/Health Costs of BEBs increases significantly as a result of battery manufacturing and material-intensive vehicle production.

Actual Cost and Efficiency Savings

DTPW has not been able to realize the anticipated reduction in operating costs to offset the higher purchase price, compounded by the performance issues that are specific to Proterra 40-foot fleet and its higher operating costs when the vehicles are in service. The New Flyer 60-foot fleet has been in

operation for a very limited period of time, accordingly, cost savings to offset purchase price are anticipated to continue to accumulate in the future.

**1(c). The actual and anticipated number of miles between charges and the impacts to the County's operations, if any, from such variance, if any.**

DTPW uses BEBs to provide fixed route service and therefore does not utilize the full charge of a BEB prior to recharging the vehicle. Rather, BEBs are charged on a scheduled basis. The New Flyer fleet design specifications required that each charge must provide a minimum of 150 miles. Each BEB is tested as part of the commissioning process prior to the County's acceptance of the vehicle to confirm it meets the design specification prior to entering service. All accepted BEBs have met this design standard. The Proterra fleet had a slightly higher design specification of 175 miles due to the lower weight of the 40-foot BEB in comparison to the 60-foot BEB. The BEBs in service have maintained these design standards and performed as anticipated and thus have not caused an operational impact.

**2. An analysis of the projected long term maintenance costs and overall fiscal impact.**

An analysis of projected maintenance costs indicates a lower cost per mile to maintain the BEB fleet (*Table 7)*. However, due to the young age of the fleet of the New Flyer 60-foot fleet most maintenance items are addressed via warranty or as part of the commissioning process , therefore figures reflect limited operational data to complete the analysis. Further, the performance issues that are specific to the Proterra 40-foot fleet have led to CNG fleet having more in-service hours, thus requiring maintenance at the accelerated rate.

There are fewer high-risk parts associated with BEBs generally, however, the cost of high-risk parts is higher than the cost of replacement parts for CNG or HEV vehicles. Additionally, the Proterra 40-fleet has experienced parts failures at a higher rate than prescribed by the anticipated useful life of such parts, prior to the expiration of associated warranties. However, failure of Phoenix to deliver warranty parts and services exposes DTPW to ongoing fleet performance failures, potential costs, and continued strain on the CNG fleet. Accordingly, DTPW is not able to quantify overall fiscal impact until such time as the BEB 60-foot fleet has been in operation for a longer period and the ultimate resolution of the Phoenix termination takes place to quantify cost exposure to allow for an appropriate data set for analysis.

*Table 7*

| Cost / Metric Category | 40-foot CNG | 40-foot Battery Electric Buses (BEB) | Variance / Contrast (CNG vs EV) | 60-foot Diesel Hybrid Electric Vehicle (HEV) | 60-foot Battery Electric Buses (BEB) | Variance / Contrast (Hybrid vs BEB) |
|---|---|---|---|---|---|---|
| **Maintenance Cost (per mile)** | $1.44 | $1.09 | $(0.35) | $0.65 | $0.32 | $(0.33) |
| **Maintenance Cost (≤250k miles)** | $360,000 | $272,500 | $(87,500) | $162,500 | $80,000 | $(82,500) |
| **Maintenance Cost (≥500k miles)** | $720,000 | $545,000 | $(175,000) | $325,000 | $160,000 | $(165,000) |

| **Net Maintenance Cost up to 500K Miles** | EVs results in appx. $0.35/mile savings | | | EVs results in appx. $0.33/mile savings | | |
|---|---|---|---|---|---|---|
| **Major Components >250k miles** | Engine $60,000 Transmission $20,000 Total: $80,000 | Gearbox $35,000 (X2 $70,000) HV Battery $75,000 (X4 $300,000) Total: $370,000 | CNG = many moderate-cost risks EV = high-cost risk | Inverter (DPIM) $65,000 HV Battery $98,000 Hybrid Drive $50,000 Total: $213,000 | Motor Drive X 3 No Pricing HV Battery X 7 $84,000 Inverter $30,000 | HEV = many moderate-cost risks EV = high-cost risk |
| **Major Repair Risk (>250k)** | Engine @ 330,000 miles Transmission @ 250,000 miles | Gearbox @ 20,000 miles HV Battery @ 20,000 Miles | EV risk = low probability, high financial impact | Inverter @ 7-10 years HV Battery @ 7-10 Years Hybrid Drive @250,000 Miles | Motor Dive No Data HV Battery Warranty for 12 Years Inverter No Data | EV risk = low probability, high financial impact |
| **Battery Replacement Likelihood** | N/A | 3 Years | 40' battery replacement covered through April 30, 2030; however, a notice of default has been issued for failure to comply with warranty terms | 7-10 Years | 12 Years | New Flyers battery replacement covered up to 12 years or 500K miles |
| **Expected Useful Fleet Life** | 12 Years or 500,000 miles | 12 Years or 500,000 miles | Comparable; EV utility depends on remaining range | 12 Years or 500,000 miles | 12 Years or 500,000 miles | Comparable; EV utility depends on remaining range |

**3. Number of BEBs that have been purchased, delivered, and accepted by the county to date**
To date, DTPW has purchased a total of 169 BEBs as follows:

- Sixty-nine (69) Proterra 40-Foot BEBs have been purchased. All 69 BEBs have been delivered, accepted, and placed into service.
- Forty (40) New Flyer 60-Foot Articulated 4 Door MetroExpress Branded BEBs have been purchased. All 40 have been delivered, accepted, and placed into service.
- Twenty (20) New Flyer 60-Foot Articulated 4 Door BEBs have been purchased. All 20 have been delivered, accepted, and placed into service.
- Forty (40) New Flyer 60-Foot Articulated 2 Door BEBs have been purchased. Of the 40 purchased, 38 have been delivered, 32 of which have been accepted and will be placed into service upon completion of final processing (i.e. issuance of a license plate, receipt of

vehicle registration, etc.) and six of which are undergoing testing and commissioning. The final two will be delivered in March 2026.

**4. Total amount paid for the acquisition of battery-electric buses and their charging stations delivered to, and accepted by, the county to date.**

The table below outlines the total amount and cost breakdown for BEBs and chargers delivered and accepted to date.

| Manufacturer / Model | Quantity | Purchase Cost Per Unit | Tax Credit Per Unit | Net Cost per Unit | Total Cost |
|---|---|---|---|---|---|
| Proterra 40-Foot | 32 | $915,313.35 | $40,000.00 | $875,313.35 | $28,010,027.20 |
| Proterra 40-Foot | 1 | $946,529.84 | $40,000.00 | $906,529.84 | $906,529.84 |
| Proterra 40-Foot | 2 | $881,153.21 | $40,000.00 | $841,153.21 | $1,682,306.42 |
| Proterra 40-Foot | 31 | $881,153.21 | None | $881,153.21 | $27,315,749.51 |
| Proterra 40-Foot | 2 | $833,848.76 | None | $833,848.76 | $1,667,697.52 |
| Power Electric NBI120 480V Charger | 33 | $102,723.82 | $22,312.05 | $80,411.77 | $2,653,588.41 |
| Power Electric NBI120 480V Charger | 38 | $97,741.95 | None | $97,741.95 | $3,714,194.10 |
| Power Electric NBI120 480V Charger | 4 | $93,288.07 | None | $93,288.07 | $373,152.28 |
| New Flyer 60-Foot Articulated 4 Door MetroExpress Branded | 2 | $1,672,650.33 | TBD* | $1,672,650.33 | $3,345,300.66 |
| New Flyer 60-Foot Articulated 4 Door MetroExpress Branded | 38 | $1,673,524.26 | TBD* | $1,673,524.26 | $63,593,921.88 |
| New Flyer 60-Foot Articulated 4 Door | 20 | $1,666,178.77 | TBD* | $1,666,178.77 | $33,323,575.40 |
| New Flyer 60-Foot Articulated 2 Door | 1 | $1,659,266.03 | TBD* | $1,659,266.03 | $1,659,266.03 |
| New Flyer 60-Foot Articulated 2 Door | 31 | $1,632,030.02 | TBD* | $1,632,030.02 | $50,592,930.62 |
| | | | | **Total Amount Delivered and Accepted** | **$218,838,239.87** |
| | | | | **Total Amount of Federal Grant Funds Received for Proterra** | ($19,421,617.65) |
| | | | | **Total Amount of Federal Grant Funds Received for New Flyer** | ($28,812,380.00) |
| | | | | **Total Local Funds** | **$170,604,242.20** |

*These items were purchased in 2025. Tax Credits have not yet been filed for 2025; however, the estimated value of the credits is $3,400,000 based on current information.

Additional chargers and related infrastructure are being acquired as part of the construction of the South Dade Transit Operations Center, approved by the Board under Resolution No. R-1111-23 in December 2023. The estimated cost including contingency is $15,938,575. Construction is ongoing and has not yet been accepted by the County. Accordingly, the actual cost is not yet known.

**5. Average number of battery-electric buses in operation on a daily, weekly, and monthly basis since their delivery to present**

The use of BEBs is managed by DTPW as part of its overall fleet operations. DTPW does not conduct static reporting on BEBs in service on a daily, weekly, and monthly basis and is therefore, not able to

provide this specific breakdown. Rather, real time dashboards are used to manage the fleet. This is done because buses may be placed in-service or taken out of service multiple times on any given day or may require typical maintenance work that does not take the vehicle out of service for an extended period. The standard established by the Federal Transit Administration (FTA) for transit agencies is 80 percent of vehicles in service with 20 percent of the fleet serving as the spare ratio, regardless of the type of bus (i.e. diesel, hybrid, compressed natural gas, electric, etc.). Accordingly, the target for in-service fleet is 80 percent.

To address this component of the Resolution, DTPW conducted an analysis of fleet operations using the benchmark of 30 days or more for a vehicle to be considered out of service. As previously stated, the known performance issues with the Proterra 40-foot fleet have resulted in the majority of the fleet being out of service for an extended period, having a direct impact on DTPW's ability to meet on-time performance goals and causing additional strain on the remainder of the fleet. In contrast, the New Flyer 60-foot fleet has had significantly better performance since being placed into service and exceeds the 80 percent in-service standard. As would be expected when commissioning a new fleet, there is fluidity in vehicles being removed from service while initial glitches are resolved. This does not result in BEBs being removed from service for extended periods.

**BEBs in Operation**

| BEB Type | Number of Vehicles In-Service | Number of Vehicles Out of Service | Average Percent of Fleet In-Service |
|---|---|---|---|
| Proterra 40-Foot | 3 | 66 | 4% |
| New Flyer 60-Foot | 86 | 92 | 93% |

**6. Number of buses that are presently out of service and the reason(s) they are out of service**

Attachment 2 attached hereto delineates BEBs out of service and the associated reasons as of March 1, 2026. The majority of the Proterra fleet remains out of service due to a lack of warranty parts, primarily gearboxes and batteries. The New Flyer fleet has not experienced long term unavailability of vehicles, with parts and service being received in accordance with contract provisions when required.

**7. Status of the acquisition of spare parts needed for repairs**

Regarding the Proterra fleet, per report to the Board dated October 15, 2025, processes are currently underway for the termination of Phoenix. As noted in the report, even after termination, parts availability for the fleet will remain an issue as many parts still fall under the intellectual property rights of Phoenix or their contractors while others have very protracted lead times due to the industry wide need for repairs on Proterra-produced buses. DTPW is seeking to mitigate this through the termination process. Upon resolution when cost recovery, if any, for warranty parts and services that failed to be delivered is known, a financial analysis will be conducted to determine future steps with regards to the fleet. Regarding the New Flyer fleet, the BEBs remain under warranty. Acquisition of parts for warranty repairs has been functioning in accordance with the warranty provisions of the Contract.

**8. Plans for the disposition of said electric vehicles and associated charging stations once they have reached their useful life**

The disposition of transit assets with a federal interest, as is the case with BEBs and charging stations currently in the DTPW fleet, are governed under Part 49 of the U.S. Code of Regulations, Chapter 53. The provisions are updated on a periodic basis and prescribe useful life, asset management requirements, and disposition requirements. DTPW is required to submit a biannual asset management plan to demonstrate compliance with these standards. Once the BEBs and charging stations are approaching the end of the prescribed useful life, upon confirmation of compliance with federal

requirements, to the extent that no conflict exists, the provisions of AO 6-2 will be applied. Regarding the Proterra fleet, DTPW, along with numerous other agencies, has petitioned the FTA to issue a waiver of federal useless life requirements to provide more flexibility to DTPW for potential future options related to this fleet. Thus far, the FTA has issued a waiver for spare ratio requirements (i.e. the Proterra fleet is no longer counted towards the 80 percent in-service standard), but further waivers remain pending.

**Conclusion**

Today's rapidly evolving vehicle and technology markets have moved Electric Vehicles into the mainstream. Diversifying the County's fleet with Electric Vehicles helps ensure Miami-Dade remains competitive by improving operational efficiency, strengthening energy resilience, generating financial savings that support more reliable and cost-effective service to our community, and improving local air quality and public health. Pollution and health costs represent the monetized public health impacts associated with vehicle emissions—particularly pollutants such as particulate matter ($PM_{2.5}$), nitrogen oxides ($NO_x$), and ozone—which disproportionately affect vulnerable populations, including children, older adults, and individuals with respiratory or cardiovascular conditions. By eliminating tailpipe emissions, Electric Vehicles help reduce these health burdens.

Based on the analysis presented in this Report, the County's LDEVs have demonstrated measurable operational efficiencies to date, $334,368 in realized savings, particularly through reduced fuel and routine maintenance costs. At the same time, the evaluation confirms that long-term fiscal outcomes depend on several variables, including incentive availability, fuel pricing, vehicle utilization, and battery lifecycle considerations. As the LDEV fleet continues to mature and accumulate mileage, additional operational data will further refine lifecycle performance evaluations and inform future fleet planning decisions.

As noted in the analysis presented in this Report, DTPW's ability to assess the long-term cost impacts of the BEB fleet are limited by the short period of time that the New Flyer 60-foot fleet has been in operation as well as the unavailability of the Proterra 40-foot fleet. The initial data for the New Flyer 60-foot fleet is promising regarding the performance capabilities of BEB technology and our ability to fully utilize the investment made by the County while achieving potential future operational cost savings in fuel and maintenance costs. We will continue to explore all options related to the Proterra 40-foot fleet, including all available legal remedies, that are available as a result of the termination of Phoenix to garner the most favorable resolution for the failed performance of the fleet.

The County has benefited from the economics of electrification, including lower maintenance costs, reduced exposure to fuel price volatility, and the public health gains associated with improved air quality. A notable challenge, however, has been external issues beyond the County's control—such as manufacturer instability and performance problems specific to the Proterra 40-foot fleet—that have limited the ability to fully realize anticipated operating-cost reductions. In contrast, the New Flyer 60-foot fleet, which has been in service for less than a year, may result in cost savings as more operational data becomes available.

It's important to note that due to the cyclical nature of tax credit availability and fuel prices, fleet-electrification cost savings will vary over time and require ongoing monitoring. Recent geopolitical instability has increased global crude oil prices, raising fuel costs nationwide; however, this represents a pricing risk rather than a supply constraint for South Florida, which relies primarily on domestic and Gulf production. Historical trends demonstrate that such volatility is typically cyclical, and current U.S. Energy Information Administration (EIA) forecasts indicate prices may stabilize later in 2026. PIOD's multi-year analysis of fuel price and consumption data, using peak pricing assumptions to forecast impacts, estimates a $1.9 million increase from the originally projected $28 million in fuel expenditures for FY 2025–2026. However, it is still very early to have accurate projections. While the County's fuel

budget framework is structured to accommodate such fluctuations, these conditions nonetheless represent a measurable fiscal risk that warrants continued monitoring and proactive financial planning.

As the national and state policy landscape evolves, particularly with potential changes to federal incentives and clean-transportation programs, the County will need to maintain a flexible electrification strategy that can adapt to shifts in funding, regulatory requirements, and market conditions.

At the same time, emerging technologies, such as Advanced Air Mobility (AAM) and electric vertical takeoff and landing (eVTOL) aircraft, represent potential future opportunities to reduce noise, ease ground congestion, and expand mobility options for underserved areas. While AAM technologies are still maturing and federal certification pathways remain in development, the Miami-Dade Aviation Department (MDAD) has proactively evaluated potential vertiport locations and implementation pathways since 2022. These early assessments position the County to respond quickly as the technology, regulatory structures, and industry viability evolve, ensuring MDAD is well-positioned as a leader in AAM innovation.

Electrification of the fleet provides additional benefits including improved public health and operational diversity that are also important considerations. To mitigate risks associated with technology implementation, the County will continue to diversify vendors, evaluate phased procurement approaches, and apply lessons learned to maximize the economic benefits of fleet and infrastructure electrification. We will continue to closely monitor market developments, company stability, regulatory progress, federal and state policy changes, and long-term cost effectiveness to ensure the County remains well positioned to adopt electrification and AAM solutions that strengthen our local economy and deliver lasting public benefit.

Pursuant to rule 5.06(j) of the Board’s Rules of Procedure, this report will be placed on an agenda of the full Board without committee review.

Should you require further information or have any questions, please contact Yoamel Zequeira, Division Director, Fleet Management Division, PIOD, at 305-375-3110 or yaomel.zequeira@miamidade.gov.

Attachments

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Jess M. McCarty, First Assistant County Attorney
Office of the Mayor Senior Staff
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Basia Pruna, Director, Clerk of the Board Division
Eugene Love, Agenda Coordinator

## Attachment 1

### Scenario 3 - Life Expectancy past 100K miles *with* EV incentives/credits and Battery Replacement Year 1 or 12K Miles Beyond 100K Miles

| | Purchase Price | Incentive / Credit | Net Price | Fuel Expense Up to 100K Miles | Maintenance Expenses Up To 100K Miles | Pollutant Externality Cost Up to 100K Miles | Year 1 or 12K Miles Beyond 100K Miles | Total Expense | Financial Impact – Fleet Total (405 EVs) |
|---|---|---|---|---|---|---|---|---|---|
| EV | $39,250 | ($7,500) | $31,750 | $5,976 | $9,500 | $5,453 | $15,000 | $67,679 | $27,409,920 |
| ICE | $23,800 | | $23,800 | $12,450 | $16,000 | $6,616 | $5,500 | $64,366 | $26,068,113 |
| Balance | | | $7,950 | ($6,474) | ($6,500) | ($1,163) | $9,500 | $3,313 | $1,341,808 |
| Accumulated Net Balance (Negative value = EV | | | $7,950 | $1,476 | ($5,024) | ($6,187) | $3,313 | | |

### Scenario 4 - Life Expectancy past 100K miles *without* EV incentives/credits and Battery Replacement Year 1 or 12K Miles Beyond 100K Miles

| | Purchase Price | Incentive / Credit | Net Price | Fuel Expense Up to 100K Miles | Maintenance Expenses Up To 100K Miles | Pollutant Externality Cost Up to 100K Miles | Year 1 or 12K Miles Beyond 100K Miles | Total Expense | Financial Impact – Fleet Total (405 EVs) |
|---|---|---|---|---|---|---|---|---|---|
| EV | $39,250 | $0 | $39,250 | $5,976 | $9,500 | $5,453 | $15,000 | $75,179 | $30,447,420 |
| ICE | $23,800 | | $23,800 | $12,450 | $16,000 | $6,616 | $5,500 | $64,366 | $26,068,113 |
| Balance | | | $15,450 | ($6,474) | ($6,500) | ($1,163) | $9,500 | $10,813 | $4,379,308 |
| Accumulated Net Balance (Negative value = EV | | | $15,450 | $8,976 | $2,476 | $1,313 | $10,813 | | |

### Scenario 5 - Life Expectancy past 100K miles *with* EV incentives/credits and Battery Replacement Year 2 or 24K Miles Beyond 100K Miles

| | Purchase Price | Incentive / Credit | Net Price | Fuel Expense Up to 100K Miles | Maintenance Expenses Up To 100K Miles | Pollutant Externality Cost Up to 100K Miles | Year 1 or 12K Miles Beyond 100K Miles | Year 2 or 24K Miles Beyond 100K Miles | Total Expense | Financial Impact – Fleet Total (405 EVs) |
|---|---|---|---|---|---|---|---|---|---|---|
| EV | $39,250 | ($7,500) | $31,750 | $5,976 | $9,500 | $5,453 | $0 | $15,000 | $67,679 | $27,409,920 |
| ICE | $23,800 | | $23,800 | $12,450 | $16,000 | $6,616 | $5,500 | $5,500 | $69,866 | $28,295,613 |
| Balance | | | $7,950 | ($6,474) | ($6,500) | ($1,163) | ($5,500) | $9,500 | ($2,187) | ($885,692) |
| Accumulated Net Balance (Negative value = EV | | | $7,950 | $1,476 | ($5,024) | ($6,187) | ($11,687) | ($2,187) | | |

### Scenario 6 - Life Expectancy past 100K miles *without* EV incentives/credits and Battery Replacement Year 2 or 24K Miles Beyond 100K Miles

| | Purchase Price | Incentive / Credit | Net Price | Fuel Expense Up to 100K Miles | Maintenance Expenses Up To 100K Miles | Pollutant Externality Cost Up to 100K Miles | Year 1 or 12K Miles Beyond 100K Miles | Year 2 or 24K Miles Beyond 100K Miles | Total Expense | Financial Impact – Fleet Total (405 EVs) |
|---|---|---|---|---|---|---|---|---|---|---|
| EV | $39,250 | $0 | $39,250 | $5,976 | $9,500 | $5,453 | $0 | $15,000 | $75,179 | $30,447,420 |
| ICE | $23,800 | | $23,800 | $12,450 | $16,000 | $6,616 | $5,500 | $5,500 | $69,866 | $28,295,613 |
| Balance | | | $15,450 | ($6,474) | ($6,500) | ($1,163) | ($5,500) | $9,500 | $5,313 | $2,151,808 |
| Accumulated Net Balance (Negative value = EV | | | $15,450 | $8,976 | $2,476 | $1,313 | ($4,187) | $5,313 | | |

### Scenario 7 - Life Expectancy past 100K miles *with* EV incentives/credits and Battery Replacement Year 3 or 36K Miles Beyond 100K Miles

| | Purchase Price | Incentive / Credit | Net Price | Fuel Expense Up to 100K Miles | Maintenance Expenses Up To 100K Miles | Pollutant Externality Cost Up to 100K Miles | Year 1 or 12K Miles Beyond 100K Miles | Year 2 or 24K Miles Beyond 100K Miles | Year 3 or 36K Miles Beyond 100K Miles | Total Expense | Financial Impact – Fleet Total (405 EVs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EV | $39,250 | ($7,500) | $31,750 | $5,976 | $9,500 | $5,453 | $0 | $0 | $15,000 | $67,679 | $27,409,920 |
| ICE | $23,800 | | $23,800 | $12,450 | $16,000 | $6,616 | $5,500 | $5,500 | $5,500 | $75,366 | $30,523,113 |
| Balance | | | $7,950 | ($6,474) | ($6,500) | ($1,163) | ($5,500) | ($5,500) | $9,500 | ($7,687) | ($3,113,192) |
| Accumulated Net Balance (Negative value = EV | | | $7,950 | $1,476 | ($5,024) | ($6,187) | ($11,687) | ($17,187) | ($7,687) | | |

### Scenario 8 - Life Expectancy past 100K miles *without* EV incentives/credits and Battery Replacement Year 3 or 36K Miles Beyond 100K Miles

| | Purchase Price | Incentive / Credit | Net Price | Fuel Expense Up to 100K Miles | Maintenance Expenses Up To 100K Miles | Pollutant Externality Cost Up to 100K Miles | Year 1 or 12K Miles Beyond 100K Miles | Year 2 or 24K Miles Beyond 100K Miles | Year 3 or 36K Miles Beyond 100K Miles | Total Expense | Financial Impact – Fleet Total (405 EVs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EV | $39,250 | $0 | $39,250 | $5,976 | $9,500 | $5,453 | $0 | $0 | $15,000 | $75,179 | $30,447,420 |
| ICE | $23,800 | | $23,800 | $12,450 | $16,000 | $6,616 | $5,500 | $5,500 | $5,500 | $75,366 | $30,523,113 |
| Balance | | | $15,450 | ($6,474) | ($6,500) | ($1,163) | ($5,500) | ($5,500) | $9,500 | ($187) | ($75,692) |
| Accumulated Net Balance (Negative value = EV | | | $15,450 | $8,976 | $2,476 | $1,313 | ($4,187) | ($9,687) | ($187) | | |

MDC020

**Attachment 2**

**BEBs Out of Service as of 3/1/2026**

| Bus Type | Bus | Out of Service - Cause |
|---|---|---|
| EV 60ft | B25525 | Awaiting Warranty Parts- Door System |
| EV 60ft | B23502 | Awaiting Warranty Parts- Seats |
| EV 60ft | B25507 | Awaiting Warranty Parts- Air Compressor |
| EV 60ft | B25502 | Awaiting Parts- Accident |
| EV 60ft | B25518 | Awaiting Warranty Parts- High Voltage Battery |
| EV 60ft | B23501 | Awaiting Warranty Parts- Air Compressor |
| EV 40ft | B22136 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22106 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22112 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22161 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22128 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22148 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22146 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22157 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22152 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22137 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22162 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22153 | Awaiting Warranty Parts- Compressor |
| EV 40ft | B22160 | Awaiting Warranty Repair |
| EV 40ft | B22168 | Awaiting Warranty Repair/Parts - Brakes |
| EV 40ft | B22139 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22143 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22120 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22154 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22125 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22109 | Awaiting Warranty Repair |
| EV 40ft | B22127 | Awaiting Warranty Repair |
| EV 40ft | B22101 | Awaiting Warranty Repair |
| EV 40ft | B22145 | Awaiting Warranty Parts - Battery/Gearbox |
| EV 40ft | B22151 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22132 | Awaiting Warranty Repair |
| EV 40ft | B22134 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22138 | Awaiting Warranty Repair |
| EV 40ft | B22116 | Awaiting Warranty Repair |
| EV 40ft | B22111 | Awaiting Warranty Repair |
| EV 40ft | B22115 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22141 | Awaiting Warranty Repair |
| EV 40ft | B22156 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22155 | Awaiting Warranty Parts - Battery |

| | | |
|---|---|---|
| EV 40ft | B22129 | Awaiting Warranty Repair |
| EV 40ft | B22169 | Awaiting Warranty Repair |
| EV 40ft | B22133 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22131 | Awaiting Warranty Repair |
| EV 40ft | B22158 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22163 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22166 | Awaiting Warranty Repair |
| EV 40ft | B22135 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22103 | Awaiting Warranty Parts - Gearbox/Battery |
| EV 40ft | B22144 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22142 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B21189 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22126 | Awaiting Warranty Repair |
| EV 40ft | B22149 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22130 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22117 | Awaiting Warranty Repair |
| EV 40ft | B22150 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22165 | Awaiting Warranty Repair |
| EV 40ft | B22147 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22102 | Awaiting Warranty Repair |
| EV 40ft | B22167 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22118 | Awaiting Warranty Parts- Gearbox |
| EV 40ft | B22140 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22122 | Awaiting Warranty Repair |
| EV 40ft | B22110 | Awaiting Warranty Repair |
| EV 40ft | B22121 | Awaiting Warranty Repair |
| EV 40ft | B22107 | Awaiting Warranty Repair |
| EV 40ft | B22113 | Awaiting Warranty Parts - Battery |
| EV 40ft | B22114 | Awaiting Warranty Repair |

# Attachment 3

| Cost / Metric Category | 40-foot CNG | 40-foot Battery Electric Buses (BEB) | Variance / Contrast (CNG vs EV) | 60-foot Diesel Hybrid Electric Vehicle (HEV) | 60-foot Battery Electric Buses (BEB) | Variance / Contrast (Hybrid vs BEB) |
|---|---|---|---|---|---|---|
| Number of vehicles in the fleet as of Feb 2026 | 560 | 69 | | 64 | 100 | |
| Purchase Date | 2018-2020 | 2022-2023 | | 2015-2018 | 2024 | |
| **Well-to-Wheels Petroleum Use and GHGs & Vehicle Operation Air Pollutants (Scenario 1)** | | | | | | |
| **Externalities - Pollution Costs Normalizing for mileage (40K/year)** | | | | | | |
| **Air Pollutant Health Cost** | $539.00 | $161.00 | | $4,437.00 | $161.00 | |
| **GHG Lifecycle Cost** | $7,239.00 | $3,542.00 | | $6,322.00 | $3,542.00 | |
| **Petroleum Use** | $5.00 | $2.00 | | $3,838.00 | $2.00 | |
| **Total Pollution and Health Cost** | $7,783.00 | $3,705.00 | | $14,597.00 | $3,705.00 | |
| **Total - Pollution Costs per mile** | $0.19 | $0.09 | | $0.36 | $0.09 | |
| **Total - Pollution Costs (≤250k miles)** | $48,643.75 | $23,156.25 | $(25,487.50) | $91,231.25 | $23,156.25 | $(68,075.00) |
| **Total - Pollution Costs (≤500k miles)** | $97,287.50 | $46,312.50 | $(50,975.00) | $182,462.50 | $46,312.50 | $(136,150.00) |
| | | | | | | |
| **Externalities - Pollution Costs Actual Mileage reported** | | | | | | |
| **Air Pollutant Health Cost** | $587.00 | $29.00 | | $1,065.00 | $18.00 | |
| **GHG Lifecycle Cost** | $7,896.00 | $641.00 | | $1,518.00 | $393.00 | |
| **Petroleum Use** | $5.00 | $- | | $921.00 | $- | |
| **Total Pollution and Health Cost** | $8,488.00 | $670.00 | | $3,504.00 | $411.00 | |
| **Total - Pollution Costs per mile** | $0.19 | $0.09 | | $0.36 | $0.09 | |
| **Total - Pollution Costs (≤250k miles)** | $48,641.00 | $23,158.01 | $(25,482.99) | $91,211.81 | $23,158.90 | $(68,052.91) |
| **Total - Pollution Costs (≤500k miles)** | $97,282.00 | $46,316.01 | $(50,965.98) | $182,423.61 | $46,317.79 | $(136,105.82) |

## Attachment 4

| Well-to-Wheels Petroleum Use and GHGs & Vehicle Operation Air Pollutants (Scenario 2) | | | | | | |
|---|---|---|---|---|---|---|
| **Externalities - Pollution Costs Normalizing for mileage (40K/year)** | | | | | | |
| **Air Pollutant Health Cost** | $8,638.00 | $15,582.00 | | $10,015.00 | $15,582.00 | |
| **GHG Lifecycle Cost** | $8,207.00 | $5,295.00 | | $7,260.00 | $5,295.00 | |
| **Petroleum Use** | $161.00 | $213.00 | | $3,987.00 | $213.00 | |
| **Total Pollution and Health Cost** | $17,006.00 | $21,090.00 | | $21,262.00 | $21,090.00 | |
| **Total - Pollution Costs per mile** | $0.43 | $0.53 | | $0.53 | $0.53 | |
| **Total - Pollution Costs (≤250k miles)** | $106,287.50 | $131,812.50 | $25,525.00 | $132,887.50 | $131,812.50 | $(1,075.00) |
| **Total - Pollution Costs (≤500k miles)** | $212,575.00 | $263,625.00 | $51,050.00 | $265,775.00 | $263,625.00 | $(2,150.00) |
| | | | | | | |
| **Externalities - Pollution Costs Actual Mileage reported** | | | | | | |
| **Air Pollutant Health Cost** | $9,421.00 | $2,818.00 | | $2,405.00 | $1,728.00 | |
| **GHG Lifecycle Cost** | $8,951.00 | $957.00 | | $1,743.00 | $587.00 | |
| **Petroleum Use** | $176.00 | $38.00 | | $957.00 | $24.00 | |
| **Total Pollution and Health Cost** | $18,548.00 | $3,813.00 | | $5,105.00 | $2,339.00 | |
| **Total - Pollution Costs per mile** | $0.43 | $0.53 | | $0.53 | $0.53 | |
| **Total - Pollution Costs (≤250k miles)** | $106,290.44 | $131,793.25 | $25,502.81 | $132,887.06 | $131,797.22 | $(1,089.84) |
| **Total - Pollution Costs (≤500k miles)** | $212,580.87 | 263,586.49 | $51,005.62 | $265,774.12 | $263,594.44 | $(2,179.68) |