

DRAFT CATEGORICAL EXCLUSION

for

NW 27th Avenue Enhanced Bus Project Miami-Dade County, Florida

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INFORMATION REQUIRED FOR PROBABLE CATEGORICAL EXCLUSION (Section 771.118(c)).

Pursuant to the 23 Code of Federal Regulations (CFR), Part 771, Section 118(c)(5)(7)(9), the proposed project can be classified as:

- (5) Action promoting safety, security, accessibility and effective communication such as the deployment of Intelligent Transportation Systems and components.
- (7) Acquisition, maintenance of vehicles/equipment including buses that can be accommodated by existing facilities or by new facilities that qualify for a Categorical Exclusion.
- (9) Assembly or construction of facilities such as bus transfer stations or intermodal terminals and parking facilities.

As such, the project meets the Federal criteria for a Categorical Exclusion.

A. DETAILED PROJECT DESCRIPTION AND PURPOSE AND NEED

Project Description

The NW 27th Avenue Enhanced Bus Service (EBS) project will build upon the incremental approach of improving rapid transit service that has recently been applied to the corridor with the implementation of the Route 297 Orange MAX service (Phase 1 of Enhanced Bus Service). The NW 27th Avenue EBS project represents Phase 2 of the proposed rapid service in the corridor.

The frequency of the rapid bus service in the corridor will be improved to every 10 minutes during peak periods and every 20 minutes during the off-peak. Service will be provided with new branded 60-foot articulated diesel/electric hybrid or alternative fuel buses with low-floor design for faster boarding and alighting. The buses will be equipped with Wi-Fi and provide larger seating areas with additional leg room for comfort. The buses will utilize general purpose traffic lanes; however, the proposed NW 27th Avenue EBS will benefit from transit signal priority (TSP) along the corridor for improved travel time and schedule adherence. In addition, bus queue jumps will be provided at several key intersections along the corridor.

The proposed project includes enhanced bus stations that will be spaced at approximately one-mile intervals along the corridor. Passenger amenities at the stations will include improved shelters and seating along with power, lighting, and real-time arrival traveler information displays. The stations will be branded and visibly recognizable as part of the NW 27th Avenue EBS.

An end-of-the-line transit terminal and park-and-ride facility will be constructed near the Broward County Line at NW 27th Avenue and NW 215th Street. The transit terminal and park-and-ride facility will be built on an approximately 14-acre property owned by Miami-Dade Transit within the political jurisdiction of the City of Miami-Gardens. Approximately 350 park-and-ride spaces are proposed for the facility along with kiss-and-ride/short-term parking accommodations, approximately ten bus bays, passenger seating under canopied areas, and a bus driver comfort station. The facility will serve as a hub for several Miami Dade Transit (MDT) and Broward County Transit (BCT) routes and will facilitate transfers between the

two systems. In addition, this facility will provide an end-of-the line layover for NW 27th Avenue EBS as well as Route 27, eliminating the two-mile turnaround presently required. The property also provides long-term transit-oriented development (TOD) opportunities, and the facility will be designed in a manner to preserve space for future Metrorail station development.

Though the final site plan configuration for the transit terminal and park-and-ride facility at NW 215th Street has not been determined, a conceptual site plan has been prepared and is included in **Appendix A**. The Miami-Dade County Department of Regulatory and Economic Resources (RER) conducted a Land Use Planning and Transit Study for the subject property. Consistent with the Miami-Dade County Comprehensive Development Master Plan (CDMP) designation as a Community Urban Center (CUC), the site is envisioned to accommodate transit facilities and TOD, while serving as a gateway into the City of Miami Gardens.

Purpose and Need

The NW 27th Avenue corridor has a relatively young and a high minority (African-American) population. The area is predominantly low-income and automobile ownership is low in the corridor. A high proportion of corridor residents are transit dependent. The NW 27th Avenue EBS project is intended to provide premium limited-stop transit service along the NW 27th Avenue corridor, from NW 215th Street at the Broward County Line to the Miami Intermodal Center (MIC), to enhance mobility for area residents. Transit connections at the MIC via Metrorail provide access to activity and job centers including the Health District, Government Center, and Downtown Miami.

NW 27th Avenue is one of the few continuous north-south arterials within Miami-Dade County. Travel patterns within the corridor tend to be in the north-south direction, as NW 27th Avenue serves as a primary gateway corridor between Broward County and central Miami-Dade County. Existing bus service operates in mixed-flow traffic lanes where buses often travel in congested traffic conditions, creating lengthy transit travel times and unreliable schedule adherence. The Intelligent Transportation Systems (ITS) and operational improvements for the NW 27th Avenue EBS include TSP and queue jumps to reduce travel time and improve schedule adherence.

This project will provide an attractive alternative transportation mode by connecting major activity centers in the corridor such as Miami-Dade College North Campus, North Dade Health Center, St. Thomas University, Sun Life Stadium, Wal-Mart Supercenter, Calder Casino & Race Course, Miami Gardens City Hall Complex, Miami Jobs Corps Center, North Dade Regional Library, and Jackson North Specialty and Diagnostic Center. Route 27 along NW 27th Avenue is one of the most utilized routes in the MDT system with approximately 10,000 daily riders. This project will attract additional transit riders in the corridor.

The project will provide a transportation alternative that will not contribute to additional ozone emissions and will help to maintain the County's federal designation as an air quality maintenance area for ozone. The use of diesel/electric hybrid or alternative fuel buses will result in improved fuel efficiency and carbon reduction, while promoting transit use to reduce vehicle miles traveled.

Development and redevelopment efforts within the corridor are hampered by the lack of good accessibility and mobility. Throughout the corridor there are opportunities for in-fill development and redevelopment with additional density. There is a need to provide transit services in the corridor to support current and future redevelopment efforts. Policies of Miami-Dade County encourage TOD at nodes around rapid transit stations. There are opportunities for TOD in the corridor including within the Cities of Opa-Locka and Miami Gardens, both of which are supportive of these efforts. Thus, the project will provide an economic benefit to the businesses and residents of the corridor.

B. LOCATION

Attach a site map or diagram, which identifies the land uses and resources on the site and the adjacent or nearby land uses and resources. This is used to determine the probability of impact on sensitive receptors (such as schools, hospitals, residences) and on protected resources.

The NW 27th Avenue corridor is a priority transit corridor in Miami-Dade County extending south from the Broward County Line at NW 215th Street to the Dr. Martin Luther King Jr. Metrorail Station near NW 62nd Street. The project limits for the NW 27th Avenue EBS have been extended south to the MIC adjacent to Miami International Airport. The length of the study corridor is approximately 13 miles. The project will also include the construction of an end-of-the-line transit terminal and park-and-ride facility near NW 215th Street. **Figure 1** provides a Project Location Map and **Figure 2** provides an Aerial Map of the project corridor. A conceptual site plan for the transit terminal and park-and-ride facility is attached as **Appendix A**.

C. METROPOLITAN PLANNING AND AIR QUALITY CONFORMITY

Is the proposed project “included” in the current adopted MPO plan, either explicitly or in a grouping of projects or activities? What is the conformity status of that plan? Is the proposed project, or are appropriate phases of the project included in the TIP? What is the conformity status of the TIP?

The proposed project is included in the Miami-Dade County Metropolitan Planning Organization’s (MPO’s) adopted Transportation Improvement Program (TIP) for Fiscal Years 2012/2013 – 2016/2017 (see **Appendix B** for the TIP listing – MPO Project Numbers TA4280111, TA4280112, TA4280113, and TA4280114). The TIP has been developed consistent with federal and state requirements, and has been adopted by the Miami-Dade MPO.

D. ZONING

Description of zoning, if applicable, and consistency with proposed use.

Miami-Dade County’s Comprehensive Development Master Plan (CDMP) includes growth policy that calls for the concentration and intensification of future development centered on a network of high-intensity urban centers well connected by multimodal transportation facilities. The CDMP requires all new development and redevelopment in existing and planned transit corridors and urban centers to be planned and designed to promote TOD with a mix of land uses and activities in nodes around rapid transit stations. The CDMP designates the NW 27th Avenue corridor as a Future Rapid Transit corridor and designates Urban Centers in the vicinity of NW 54th Street, NW 62nd Street, NW 79th Street, NW 119th

Street, Ali Baba Avenue, State Road (SR) 826/Palmetto Expressway, NW 183rd Street, NW 199th Street, and NW 215th Street. Proposed station locations for the NW 27th Avenue EBS project are consistent with the locations designated as Urban Centers along the corridor.

The North Central Urban Area District (NCUAD) zoning and land development regulations were adopted in 2011 for the portion of the NW 27th Avenue corridor located in unincorporated Miami-Dade County between NW 62nd Street and NW 135th Street. The zoning and land development regulations promote a compact urban form that is pedestrian friendly and promotes the use of mass transit.

The NW 215th Street transit terminal and park-and-ride facility site is within the political jurisdiction of the City of Miami Gardens. The majority of the 14-acre site is within an R-15 (Multiple Family) residential zoning district. Approximately 1 acre at the southwest corner of the site is within an R-1 (Single Family) residential zoning district. Because a transit terminal and park-and-ride facility is not a use that is allowed as a matter of right in these zoning districts, City of Miami Gardens staff has indicated that the site will need to be rezoned to PCD (Planned Corridor Development).

The Miami-Dade County RER led a Land Use Planning and Transit Study for the NW 215th Street transit terminal and park-and-ride facility site. Public meetings were held where a general project overview was provided and residents and stakeholders developed visions for the site, including the potential for future TOD. Participants were supportive of the project and provided input that vehicular access connectivity was not desired between the site and the surrounding residential neighborhood and that transit uses should be situated as far away from the surrounding residences as possible and be adequately buffered.

E. TRAFFIC IMPACTS

Describe potential traffic impacts, including whether the existing roadways have adequate capacity to handle increased bus and other vehicular traffic.

The project will improve the frequency of rapid bus service in the corridor from 15 to 10 minutes headway during the morning and afternoon peaks and from 30 to 20 minutes headway during the midday. The nominal increase in the number of buses in the corridor is not expected to result in adverse traffic impacts.

The project will include ITS and operational improvements, such as TSP and queue jumps, which will benefit the travel time and schedule adherence for the rapid bus service in the corridor. TSP alters traffic signal timing at intersections to give priority to transit vehicles. A queue jump lane allows transit vehicles to bypass general traffic at an intersection. TSP and queue jump operations can be an effective method to provide time savings in corridors where it is not feasible to dedicate an exclusive travel lane to buses. Implementation of TSP and queue jumps has resulted in significant improvements of bus operations around the nation, while impacts to automobile traffic have proven to be minor.

Enhanced bus stations will be installed at approximately one-mile intervals for the rapid bus service. Parking will not be provided at the intermediary bus stations along the corridor; the majority of transit riders using the system will access the stations as pedestrians or transfers from other bus routes. Therefore, traffic impacts are not anticipated in the vicinity of the intermediary bus stations.

The NW 215th Street transit terminal and park-and-ride facility will function as an intermodal hub anchoring the northern end of the project. The facility will be designed to include approximately 350 park-and-ride spaces, ten bus bays, and an area for kiss-and-ride.

The potential traffic impacts were estimated for the NW 215th Street transit terminal and park-and-ride facility. Existing bus traffic traveling along the corridor that will access the terminal will consist of MDT NW 27th Avenue EBS, MDT Route 27, MDT Route 99, BCT Route 2, BCT Route University Breeze, and BCT 95 Express routes. In the future, community shuttles operated by the Cities of Miami Gardens and Miramar may also access the terminal, as well as the future MDT Route 295 Express Bus. Based on the service frequency of these routes, approximately 35 buses per hour are expected to access the facility during peak periods. In addition to the bus traffic, passenger vehicles will access the site to use the park-and-ride and kiss-and-ride facilities. Based on an assumption that the approximately 350 park-and-ride spaces would become occupied over a three-hour period in the morning and would empty over a three-hour period in the afternoon, approximately 120 passenger vehicles per hour are expected to access the facility for park-and-ride during peak periods. A few additional passenger vehicles may access the facility during peak periods for kiss-and-ride. NW 27th Avenue currently operates at Level of Service (LOS) D during the peak hour, which is above the City of Miami Gardens standard of LOS E, and has available capacity to accommodate additional traffic associated with the activities at the transit terminal and park-and-ride facility.

F. CO HOT SPOTS

If there are serious traffic impacts at any affected intersection, and if the area is non-attainment for CO, demonstrate that CO hot spots will not result.

There are no adverse traffic impacts associated with the project and the project is not located in a non-attainment area for CO.

G. HISTORIC RESOURCES

Describe any cultural, historic, or archaeological resource that is located in the immediate vicinity of the proposed project and the impact of the project on the resource.

Based on a review of the Florida Master Site File (FMSF), there are no previously recorded archeological sites identified by the State Historic Preservation Officer (SHPO) that would be affected by the proposed project. There are three potentially eligible cultural resources, three National Register of Historic Places (*National Register*) listed structures, and two NRHP eligible structures documented within the vicinity of the project corridor. The *National Register* listed and eligible structures are listed in **Table 1**.

Table 1: Eligible National Register of Historic Places Structures

Structure	Address	Date listed
Helm Stores & Apartments	1217 Sharazad Boulevard	8/17/1987
Higgins Duplex	1210-1212 Sesame Street	8/17/1987
Taber Duplex	1214-1216 Sesame Street	8/17/1987
Westview Country Club	2601 NW 119 th Street	N/A
Al's Auto Service	17501 NW 27 th AVE	N/A

See **Appendix C** for the Florida Master Site File letter outlining historic resources in the vicinity of the project corridor. The project will not require right-of-way (R/W) or affect the access or parking for the *National Register* listed and eligible structures. Thus, the project is not expected to impact cultural resources listed or eligible for listing on the *National Register*.

H. NOISE

Compare the distance between the center of the proposed project and the nearest noise receptor to the screening distance for this type of project in FTA’s guidelines. If the screening distance is not achieved, attach a “General Noise Assessment” with conclusions.

Bus Service

The existing Route 297 Orange Max is a limited-stop express service that operates from 5:30 AM to 7:30 PM. The proposed NW 27th Avenue EBS will be increased by approximately 2 buses in each direction during the peak hours and 1 bus in each direction during the off-peak hours. Existing peak hour vehicular traffic volumes in the corridor range from approximately 2,500 to 4,200 vehicles. Using acoustical calculations, the additional NW 27th Avenue EBS buses were estimated to generate a negligible noise increase of approximately 0.1 dBA at any location along the project alignment, including locations near the bus stops. Sound level variations of less than 3.0 dBA are not detectable by the human ear. It is concluded that no impacts would occur as a result of the increase in service frequency.

Bus Stations

Passenger amenities at the bus stations will include improved shelters and seating along with power, lighting, and real-time arrival traveler information displays. The bus stations will not include any features or improvements that would result in higher noise emissions.

NW 215th Street Transit Terminal and Park-and-Ride Facility

A Noise and Vibration Analysis Report was prepared for the NW 215th Street transit terminal and park-and-ride facility to assess potential noise and vibration impacts. This study estimated existing noise conditions in the project area, identified noise-sensitive locations, and predicted future project noise and vibration levels. The noise analysis was prepared to satisfy National Environmental Policy Act (NEPA) requirements, using *Federal Transit Administration (FTA) Noise and Vibration Impact Assessment* [FTA 2006] criteria. A copy of the assessment is included in **Appendix D**.

Noise- and vibration-sensitive land uses potentially impacted by the project consist of single-family residences adjacent on the south and west. Existing noise levels at the residences range from approximately 61 dBA Ldn to 67 dBA Ldn. The following is a summary of the results of the analysis.

- Operation of the project would generate noise levels up to approximately 58 dBA Ldn at the residences, resulting in No Impact under FTA criteria.
- Operation of the project would generate negligible vibration levels. This impact is considered less than significant.
- Construction of the project would generate noise levels up to approximately 77 dBA Leq at the residences. These noise levels are less than the FTA daytime construction noise threshold. This impact is considered less than significant.
- Construction of the project would generate vibration levels up to approximately 76 VdB. This vibration level is below the FTA damage threshold but is higher than the FTA annoyance threshold. This is considered a temporary adverse impact. Implementation of a Vibration Control Plan and other measures could reduce construction vibration levels.

I. VIBRATION

If the proposed project involves new or relocated steel tracks, compare the distance between the center of the proposed project and the nearest vibration receptor to the screening distance for this type of project in FTA’s guidelines. If the screening distance is not achieved, attach a “General Vibration Assessment” with conclusions.

Not applicable.

J. ACQUISITION & RELOCATIONS REQUIRED

Describe land acquisitions and displacements of residences and businesses.

The project will not result in any displacements of residences or businesses.

Miami-Dade Transit (MDT) owns the vacant 14-acre parcel near the Broward County Line at NW 215th Street proposed for end-of-the-line transit terminal and park-and-ride facility. The property was acquired by Miami-Dade County in 2010 for the purpose of accommodating a park-and-ride facility. Therefore, R/W acquisition for this facility is not required.

The availability of R/W was a factor considered in the selection of bus station locations along the corridor. If stations could not be accommodated within the R/W, locations were identified that did not impact businesses by requiring the removal of parking spaces or closure of driveways. Minor R/W acquisition or easements are anticipated to be required for the proposed bus stations listed in **Table 2**.

Table 2: Bus Stations Requiring Minor Right-of-Way Acquisition or Easements

Station Location	Direction	Approximate R/W Required (Width x Length = Square-Feet)
NW 199 th Street	Southbound	10' x 25' = 250'
NW 183 rd Street	Northbound	9' x 25' = 225'
	Southbound	9' x 25' = 225'
NW 175 th Street	Northbound	2' x 26.25' = 52.50'
NW 160 th Street	Southbound	2' x 26.25' = 52.50'
Sesame Street	Southbound	2' x 26.25' = 52.50'
NW 135 th Street	Northbound	3' x 26.25' = 78.75'
	Southbound	4' x 26.25' = 105'
NW 103 rd Street	Northbound	3' x 26.25' = 78.75'

K. HAZARDOUS MATERIALS

If real property is to be acquired, has a Phase I site assessment for contaminated soil and groundwater been performed? If a Phase II site assessment is recommended, has it been performed? What steps will be taken to ensure that the community in which the project is located is protected from contamination during construction and operation of the project? State the results of consultation with the cognizant State agency regarding the proposed remediation.

To determine if potentially contaminated sites are located within the project corridor near proposed bus stations and the NW 215th Street transit terminal and park-and-ride facility, field reconnaissance was conducted and data was obtained and reviewed from the Miami-Dade RER and the Florida Department of Environmental Protection (FDEP) OCULUS on-line databases. The Miami-Dade County data revealed seven sites (listed below) in proximity to the proposed bus stations and the NW 215th Street transit terminal and park-and-ride facility site that are potentially contaminated. These sites are listed in **Table 3** and a map of potentially contaminated sites is provided as **Figure 3**.

Table 3: Potential Contamination Sites in Proximity to Proposed Bus Stations

Site Number	Site	Address	Facility Identification
1	MDT – Future Transit Terminal and Park-and-Ride Facility	Southwest corner of NW 27 th Avenue and NW 215 th Street	Folio: 3411330030010
2	Americlean	2760 NW 183 rd Street	139502409
3	Former Shell – Miami Best	2700 NW 183rd Street	8505389
4	Former H&V One Hour Cleaners	15978 NW 27 th Avenue	Folio: 3421160120030
5	Westview U-gas	13475 NW 27 th Avenue	8842260
6	Elegant Beauty Supplies/Salon (former Fina Gas Station)	2710 NW 135 th Street	8840811
7	Sunshine #212	10300 NW 27 th Avenue	8505598

The general construction of bus stations and improvements to existing bus stations will require minimal ground disturbance and is anticipated to be a low contamination risk, although there is potential for some ground disturbance to occur during the installation of underground utilities associated with the real-time travel displays for the passenger information system and for the construction of the NW 215th Street transit terminal and park-and-ride facility. Due to the limited amount of construction and site disturbance associated with the proposed bus stations, Potential Contamination Sites 2-7 are not expected to present significant contamination risk.

An overview of the potential contamination sites in proximity to proposed bus stations is provided below.

Site 1 – MDT – Future Transit terminal and Park & Ride Facility

This site is currently vacant land located at the southwest corner of NW 27th Avenue and NW 215th Street. This site was identified in the geographic information system (GIS) database as a potential contamination site. A monitoring well was located during site reconnaissance conducted on December 4, 2012. Review of documents in the Miami-Dade County RER database identified a Phase 1/Limited Phase 2 Environmental Site Assessment (ESA) was completed in October 2010, in which soil and groundwater contaminated with arsenic above FDEP cleanup target levels was found. Additional soil and groundwater assessment was recommended by RER and the previous owner was directed to submit a Site Assessment Report (SAR). MDT is currently coordinating with RER to complete the required site evaluation and to comply with the site assessment directive.

Site 2 – Americlean

This site is an active drycleaner located in the shopping plaza approximately 600 feet southwest of the proposed southbound bus station near the intersection of NW 27th Avenue and NW 183rd Street. According to RER, the site is within the assessment phase and requires the submittal of a SAR. However, dry cleaning solvent cleanup program risk assessment documents on the OCULUS database do not indicate that contaminants were detected.

Site 3 – Former Shell – Miami Best

This site was a former retail gas station located approximately 330 feet north of the proposed southbound bus station near the intersection of NW 27th Avenue and NW 183rd Street. Three unleaded gasoline underground storage tanks and piping were reportedly removed and discharges were documented. Voluntary assessment activities were initiated due to benzene concentrations in one of the monitoring wells exhibiting concentrations above groundwater cleanup target levels (GCTLs) and adsorbed phase hydrocarbon levels being above the residential exposure limit. According to RER, this site is still in the assessment phase and requires a SAR.

Site 4 – Former H&V One Hour Cleaners

This site is a former drycleaner that was located approximately 240 feet west of the proposed northbound bus station near the intersection of NW 27th Avenue and NW 160th Street. Evidence of soil contamination on the site was reported in the RER database as part of the North Corridor Metrorail Extension Phase I and II Site Assessments in March 2006 and July 2007, respectively. These documents reported that the site was eligible for remediation funding under the Dry Cleaner Solvent Cleanup Program. No additional documentation pertaining to this drycleaner was available on the RER database. There were no records available on the FDEP OCULUS database during the time of this review.

Site 5 – Westview U-gas

This site is an active retail gas station and convenience store located on an adjacent property north of the proposed northbound bus station near the intersection of NW 27th Avenue and NW 135th Street. According to the FDEP OCULUS database, two 12,000 gallon unleaded gasoline and one 12,000 gallon vehicular diesel underground storage tanks were installed in February 1988. Two discharges were reported, one on April 15, 1988, and one on August 12, 1999, which require cleanup, with the latter being eligible for state funding. The tanks were relined on April 19, 2010; however, according to OCULUS documents dated November 7, 2011, contamination onsite required further assessment. On January 31, 2012, in a Storage Tank Facility Annual Compliance Site Inspection Report, FDEP reported the site and facility to be in compliance.

RER documents indicate that the site has completed the assessment phase and is now required to submit a Remedial Action Plan (RAP) to address documented contamination. According to discussions with Jackie Llano of RER on January 31, 2013, a Source Removal Report and a Contamination Assessment Report (CAR) were filed in 2001 and a Limited CAR was filed in 2002. The RAP has not been filed. This site is being addressed by RER.

Site 6 – Elegant Beauty Supplies/Salon (Former Fina Gas Station)

This site was a former retail gas station and is now a retail store located adjacent to the proposed southbound bus station near the intersection of NW 27th Avenue and NW 135th Street. Five 6,000 gallon underground storage tanks were installed in June 1986 and were removed during initial remedial action on July 17, 1997. Contaminated soils were also removed on July 17, 1997. A Limited Scope SAR was filed in December 1998 in which groundwater contamination was documented. Based on groundwater flow determinations reported in the Limited Scope SAR, the groundwater flow on the site is to the northeast. Thus, any contamination plume present on the site would likely migrate to the northeast with

the groundwater flow. Because the proposed southbound bus station is located on the far eastern border of the site, it may not be affected by the contamination plume.

Site 7 – Sunshine #212

This site is currently a retail gas station located approximately 130 feet west of the proposed northbound bus station near the intersection of NW 27th Avenue and NW 103rd Street. Two 10,000 gallon underground storage tanks and two 5,000 gallon underground storage tanks were installed in December 1976 and were removed in 1985. Three 10,000 gallon underground storage tanks were installed in December 1985. An unknown discharge of approximately 5 gallons was reported on May 18, 1993. On February 9, 1996, a Site Rehabilitation Completion Report was filed and it was determined to be complete by FDEP on April 30, 1996. On June 26, 2003, a vehicle collided with a pump onsite that required the replacement of the pump and associated piping. Following the repair, soil and water samples were collected and were found to be below target levels and a No Further Action was requested. According to RER correspondence (email) dated November 12, 2003, a Source Removal Report was received for the above incident, no discharges were documented, and groundwater and soils tested below cleanup target levels for petroleum chemicals. Therefore, RER placed the document on file without generating paper correspondence and no further assessment was necessary.

L. COMMUNITY DISRUPTION AND ENVIRONMENTAL JUSTICE

Provide a socio-economic profile of the affected community. Describe the impacts of the proposed project on the community. Identify any community resources that would be affected and the nature of the effect.

In accordance with Executive Order 12898, consideration has been given to the possible environmental effects on minority and low-income communities. To determine the socio-economic profile, field reconnaissance was conducted in the corridor and in the vicinity of the proposed transit terminal and park-and-ride facility at NW 215th Street, and Census data was obtained and reviewed.

The majority of the residential development occurring in the area is located behind the commercial development that is immediately adjacent to NW 27th Avenue corridor. The prevalent land uses near the proposed transit terminal and park-and-ride facility at NW 215th Street are single and multi-family residential, commercial, and sports and entertainment facilities.

The project corridor is located within Census Tracts 4.02, 4.03, 4.04, 4.12, 5.01, 5.03, 5.04, 9.01, 9.02, 9.03, 10.03, 10.04, 15.02, 17.01, 17.02, 18.01, 18.03, 94, 95.03, 99.03, 99.04, 100.01, 100.11, and 100.12. According to the 2010 Census, minority populations for all those Census Blocks are greater than 95 percent; thus the areas within the vicinity of the project corridor and the proposed transit terminal and park-and-ride facility at NW 215th Street are considered minority populations. 2010 Census Ethnicity and 2010 Census Income Maps for the project corridor are provided as **Figure 4** and **Figure 5**, respectively.

The proposed project will not affect, separate or isolate any neighborhoods, ethnic groups, or minority and/or low-income populations. The project is intended to enhance accessibility and connectivity to the transit system and to provide amenities for users to increase their comfort and convenience. The project will benefit the surrounding community by providing premium transit service in the corridor that will

provide access to activity and job centers. The project will benefit the surrounding community by providing enhancements to the transit service within a corridor with a high level of transit dependency. Thus, disproportionate adverse impacts to minority or low-income populations are not expected.

M. USE OF PUBLIC PARKLAND AND RECREATION AREAS

Indicate parks and recreational areas on the site map. If the activities and purposes of these resources will be affected by the proposed project, state how.

Not applicable.

N. IMPACTS ON WETLANDS

Show potential wetlands on the site map. Describe the project's impact on on-site and adjacent wetlands.

Not applicable.

O. FLOODPLAIN IMPACTS

Is the proposed project located within the 100-year floodplain? If so, address possible flooding of the proposed project site and flooding induced by the proposed project due to its taking of floodplain capacity.

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Panel Number 12011C0120F was reviewed for the presence of floodplains. The project site for the proposed transit terminal and park-and-ride facility at NW 215th Street is located within FEMA Flood Zones AE, X and X500, which are areas subject to 100-year flood, areas outside the 500-year floodplain, and areas between the limits of the 100-year and 500-year flood, respectively. However, the proposed project will not: 1) affect flood heights or base floodplain limits, 2) result in increased or new adverse environmental impacts, 3) increase flood risks or damage, or 4) significantly change the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, this project does not encroach upon the base floodplain.

P. IMPACTS ON WATER QUALITY, NAVIGABLE WATERWAYS & COASTAL ZONES

If any of these are implicated, provide detailed analysis.

Not applicable.

Q. IMPACTS ON ECOLOGICALLY-SENSITIVE AREAS AND ENDANGERED SPECIES

Describe any natural areas (woodlands, prairies, wetlands, rivers, lakes, streams, designated wildlife or waterfowl refuges, and geological formations) on or near the proposed project area. If present, state the results of consultation with the state department of natural resources on the impacts to these natural areas and on threatened and endangered fauna and flora that may be affected.

Based on a field assessment of habitat availability, site observation and review of available database information from Florida Natural Areas Inventory (FNAI), Florida Fish and Wildlife Conservation Commission (FWC) and US Fish and Wildlife Service (USFWS), state and federally listed species, their habitats and natural areas do not occur along the NW 27th Avenue corridor or on the proposed NW 215th Street transit terminal and park-and-ride facility site. Thus, impacts to endangered and threatened species are not anticipated.

R. IMPACTS ON SAFETY AND SECURITY

Describe the measures that would need to be taken to provide for the safe and secure operation of the project after its construction.

Security will be provided to protect the public and transit users from crime and vandals at the proposed facilities. MDT currently contracts with a private security company to provide security service at stations and parking facilities, including the use of assigned personnel and roving patrols. This security will be extended to the new NW 215th Street transit terminal and park-and-ride facility and intermediary bus stations upon completion of the project.

S. IMPACTS CAUSED BY CONSTRUCTION

Describe the construction plan and identify impacts due to construction noise, utility disruption, debris and spoil disposal, air and water quality, safety and security, and disruptions of traffic and access to property.

All construction-related impacts related to the new NW 215th Street transit terminal and park-and-ride facility and intermediary bus stations will be temporary in nature. Best management practices in accordance with local, state and federal regulations will be implemented during project construction to minimize effects. Construction activities will cause minor short-term air quality impacts in the form of dust from earthwork and unpaved roads. These temporary construction impacts will be minimized by adherence to all federal, state and local regulations. These regulations include, but are not limited to, the Environmental Protection Agency (EPA) National Pollution Discharge Elimination System (NPDES), which is administered by the FDEP. As per the NPDES standards, typical construction best management practices may include construction fencing with wind screens, silt fences and erosion/inlet protection.

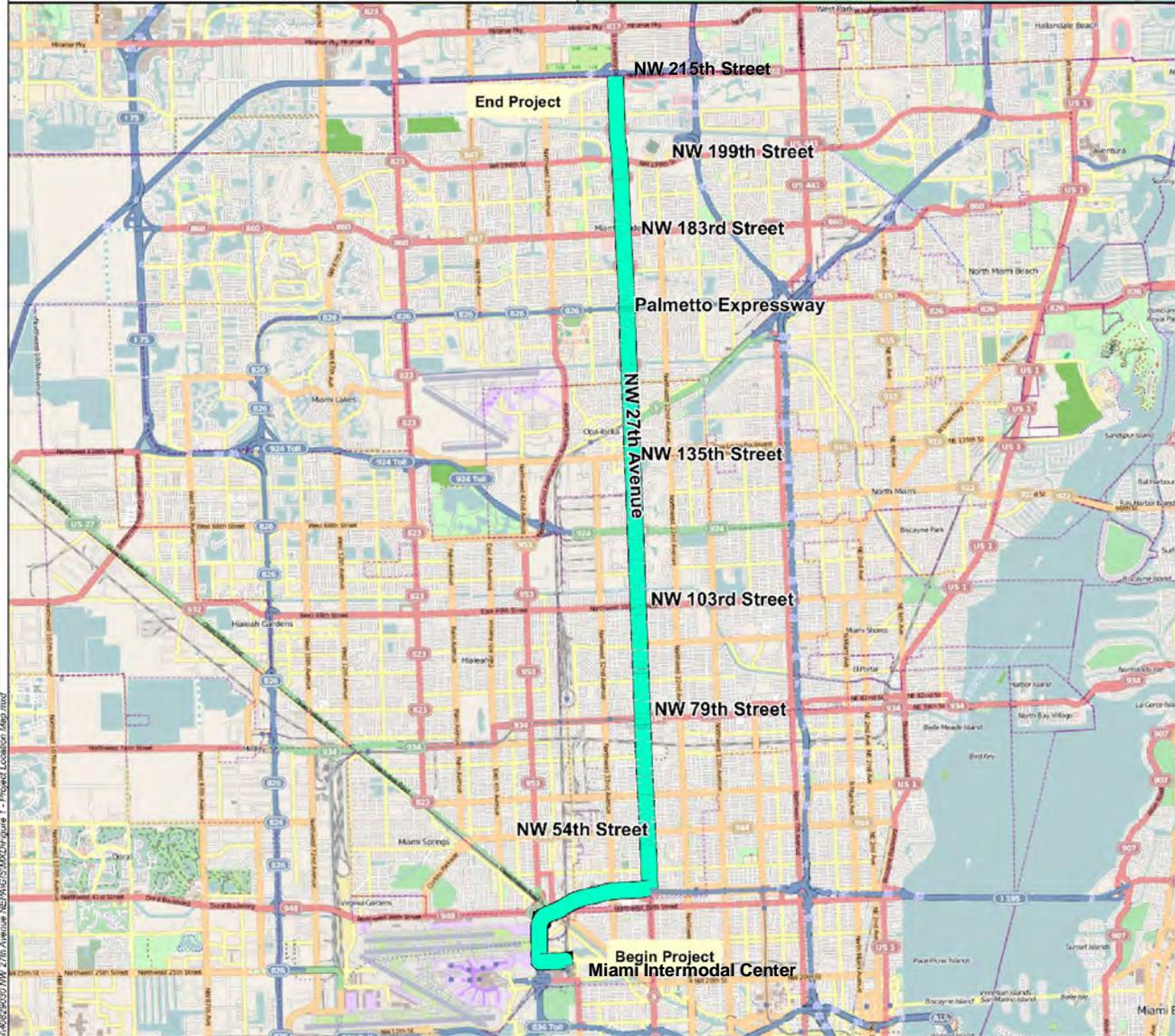
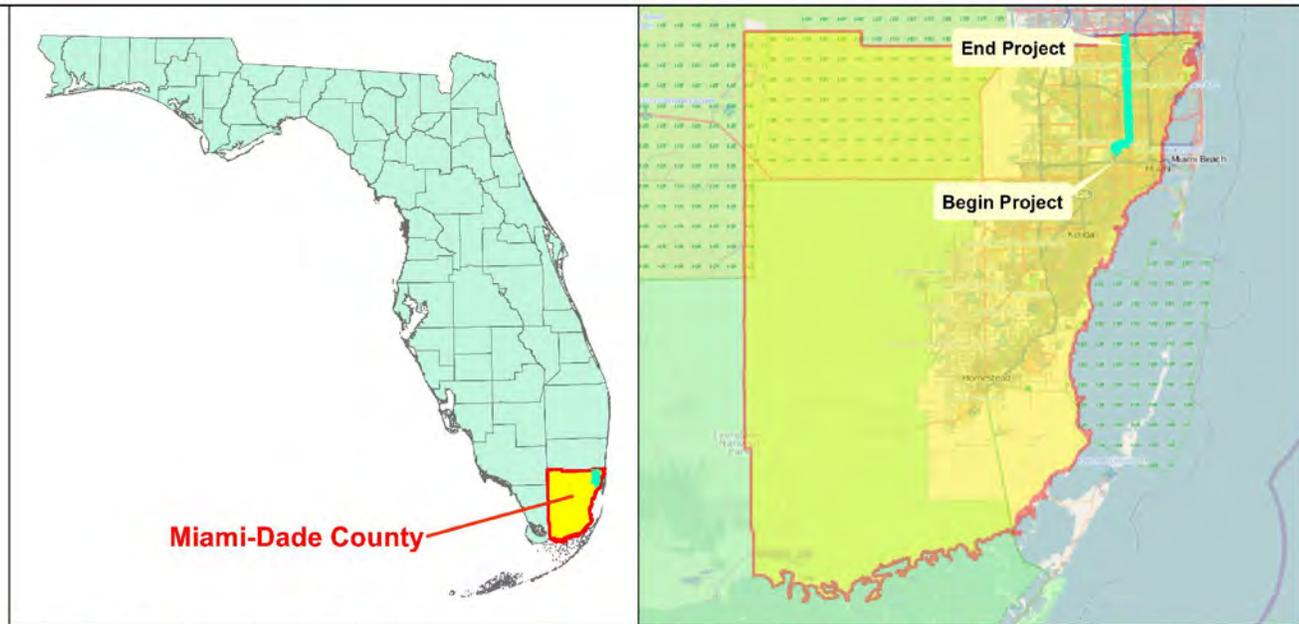
The action described above meets the criteria for a NEPA categorical exclusion (CE) in accordance with 23 CFR Part 771.118(c)(5)(7)(9).

Applicant's Environmental Reviewer

Date

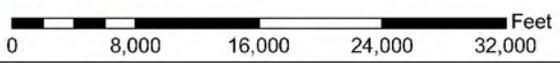
FTA Grant Representative

**FIGURE 1:
SITE LOCATION MAP**



Legend

 Project Corridor



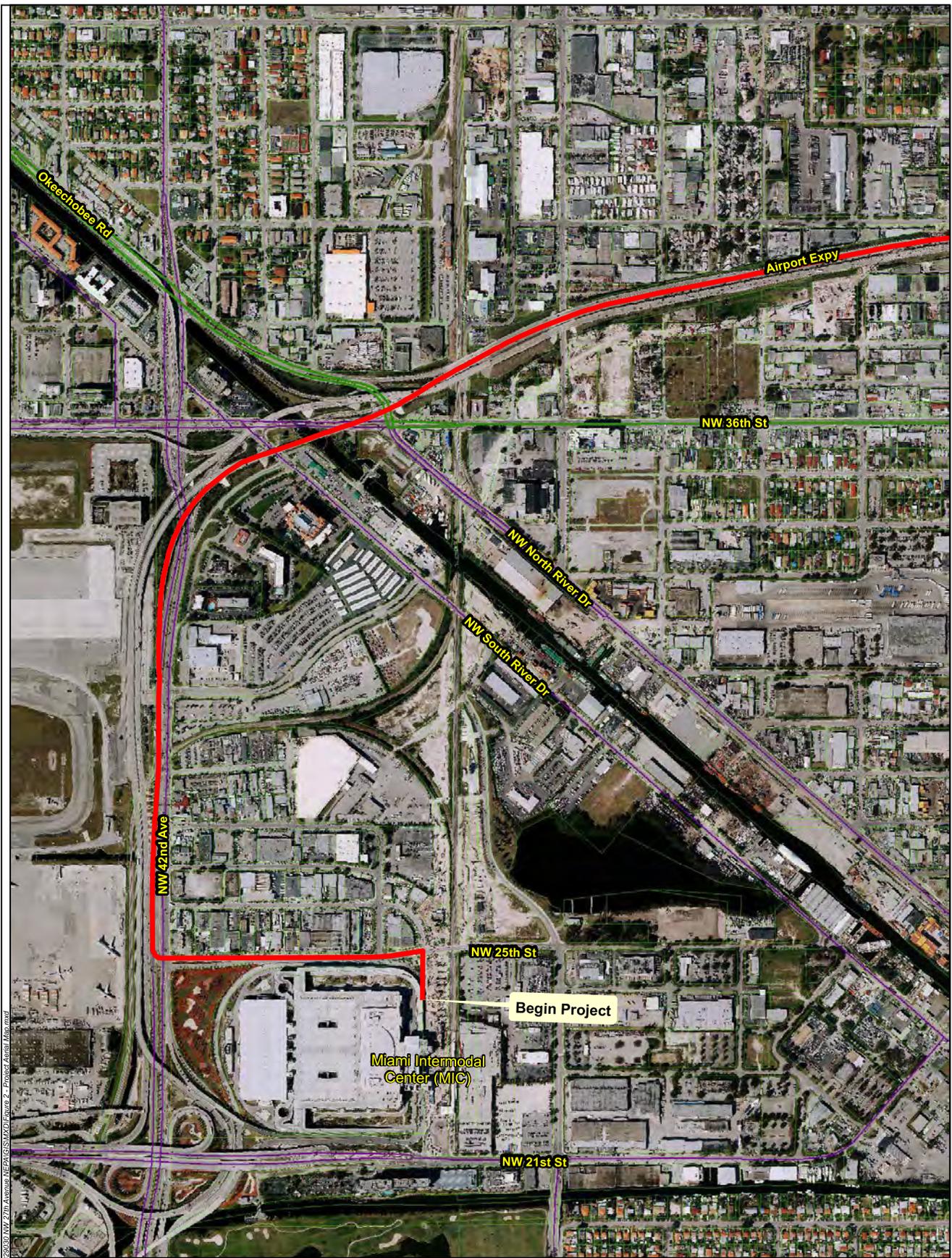
K:\VIB - Environmental\40629030\NW 27th Avenue\MAPS\GIS\Aerial\Figure 1 - Project Location Map.mxd
Source: Aerial Express, Inc. 2012

PROJECT AERIAL MAP

**NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA**



**FIGURE 2:
AERIAL MAP**



K:\VSB_Environmental\420909030\NW 27th Avenue NEPA\GIS\XDO\Figure 2 - Project Aerial Map.mxd
 Sources: Aerials Express, Inc. 2010

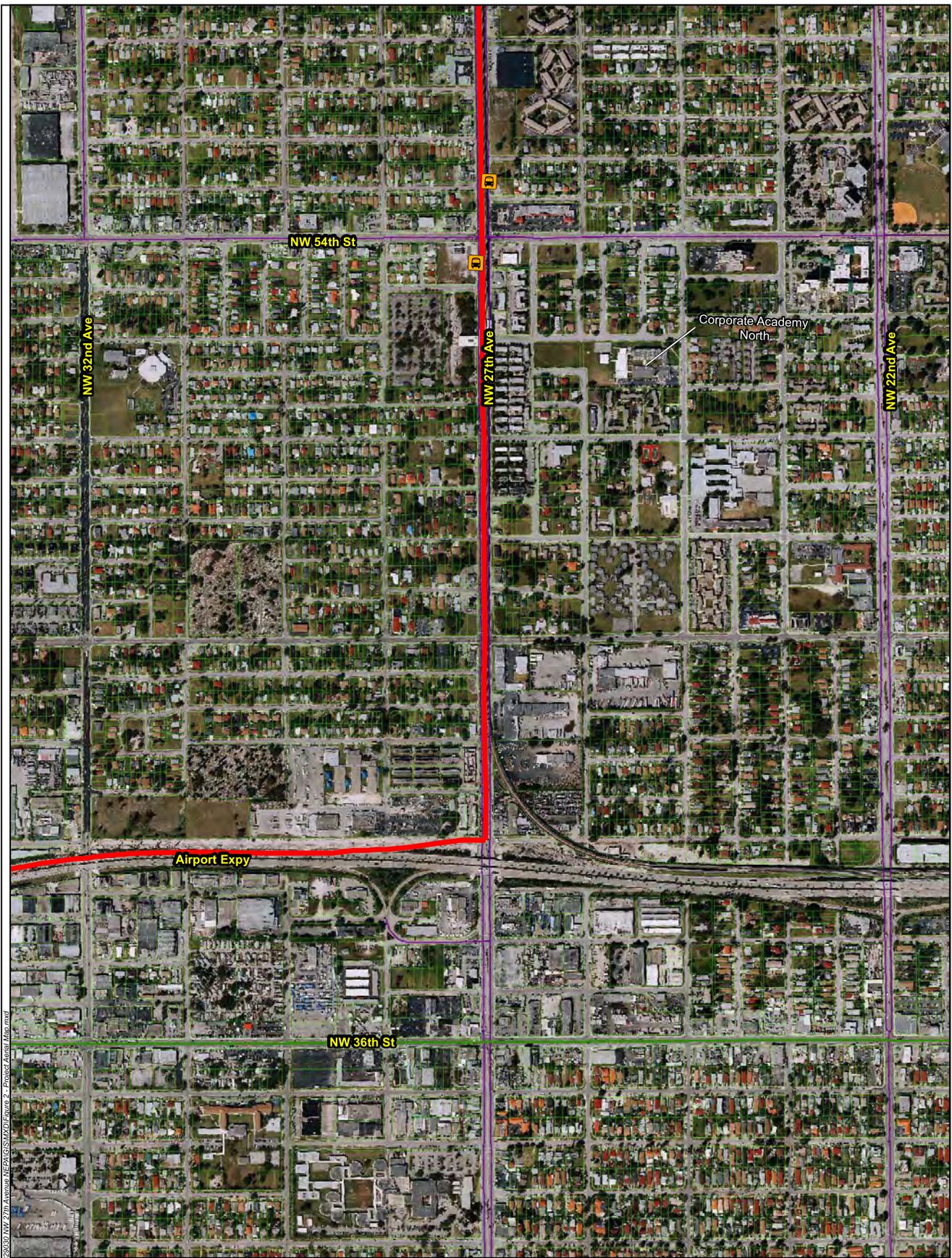
Legend

- Bus stations
- Project Corridor
- Parcels



Project Aerial Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB_Environmental\4249\03030\NW 27th Avenue NEPA\GIS\XDO\Figure 2 - Project Aerial Map.mxd
Sources: Aerials Express, Inc. 2010

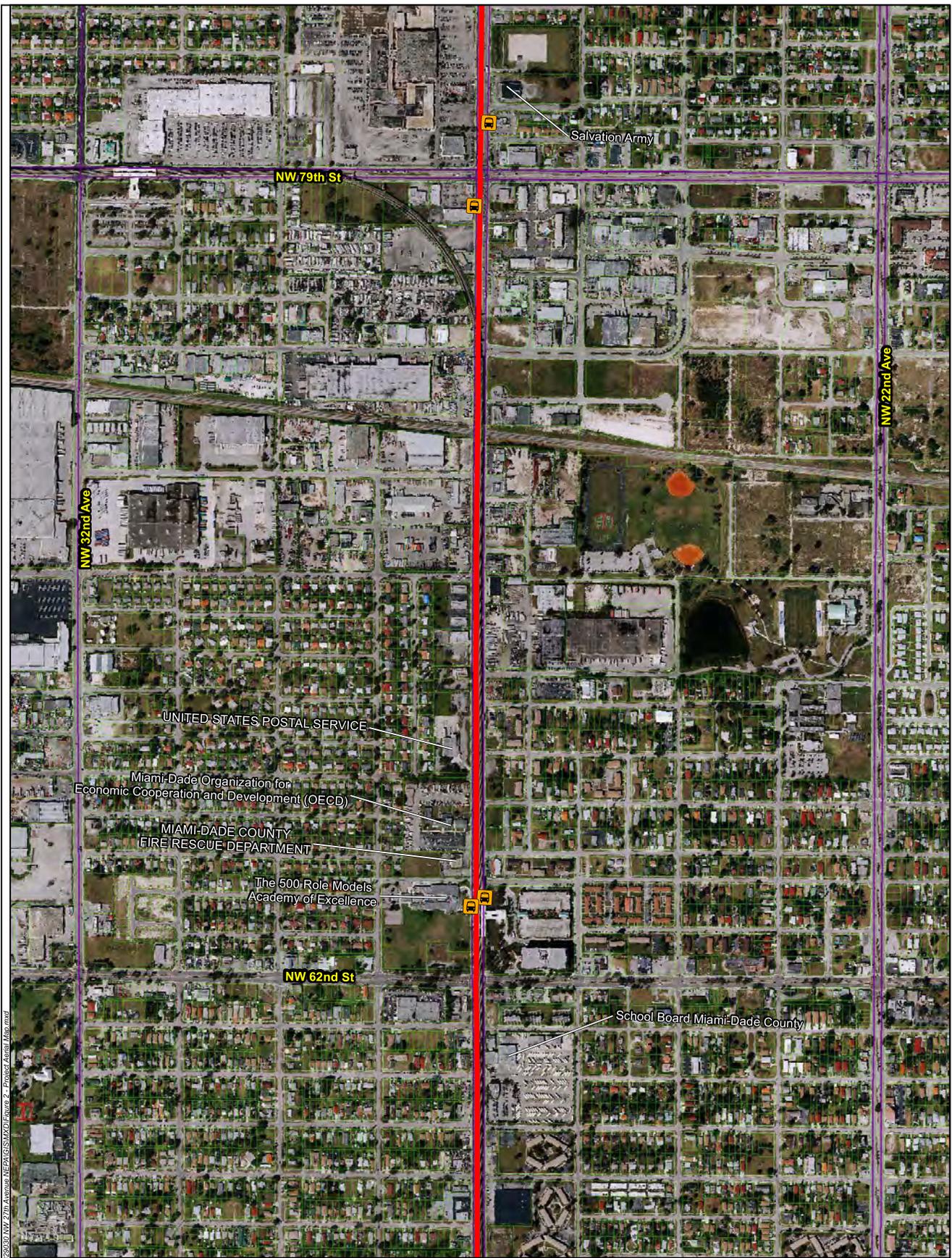
Legend

- Bus stations
- Project Corridor
- Parcels



Project Aerial Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB - Environmental\4292030\NW 27th Avenue NEPA\GIS\XK01\Figure 2 - Project Aerial Map.mxd
Sources: Aerials Express, Inc. 2010

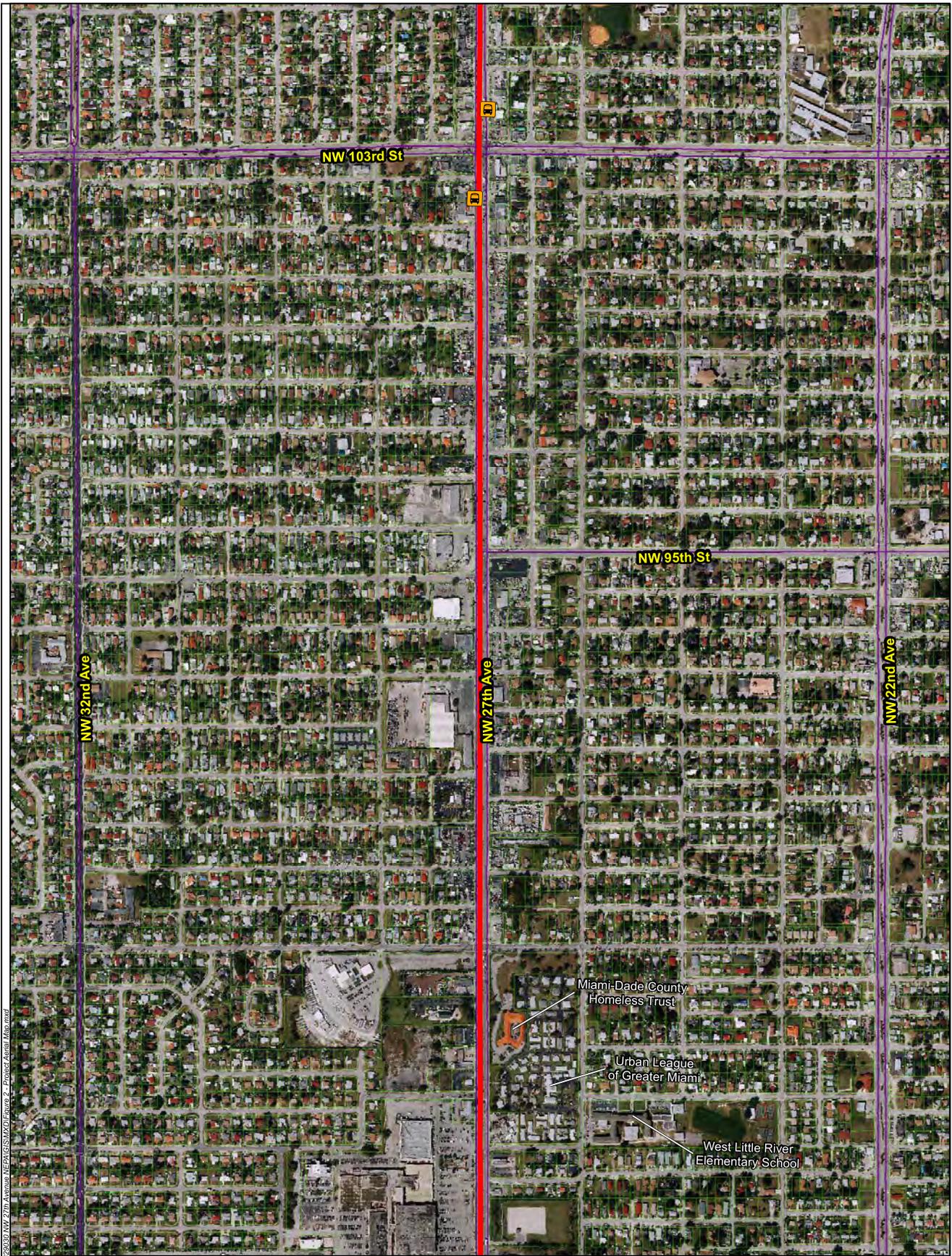
Legend

- Bus stations
- Project Corridor
- Parcels



Project Aerial Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB_Environmental\20120303\NW 27th Avenue NEPA\GIS\KXD\Figure 2 - Project Aerial Map.mxd
Sources: Aerials Express, Inc. 2010

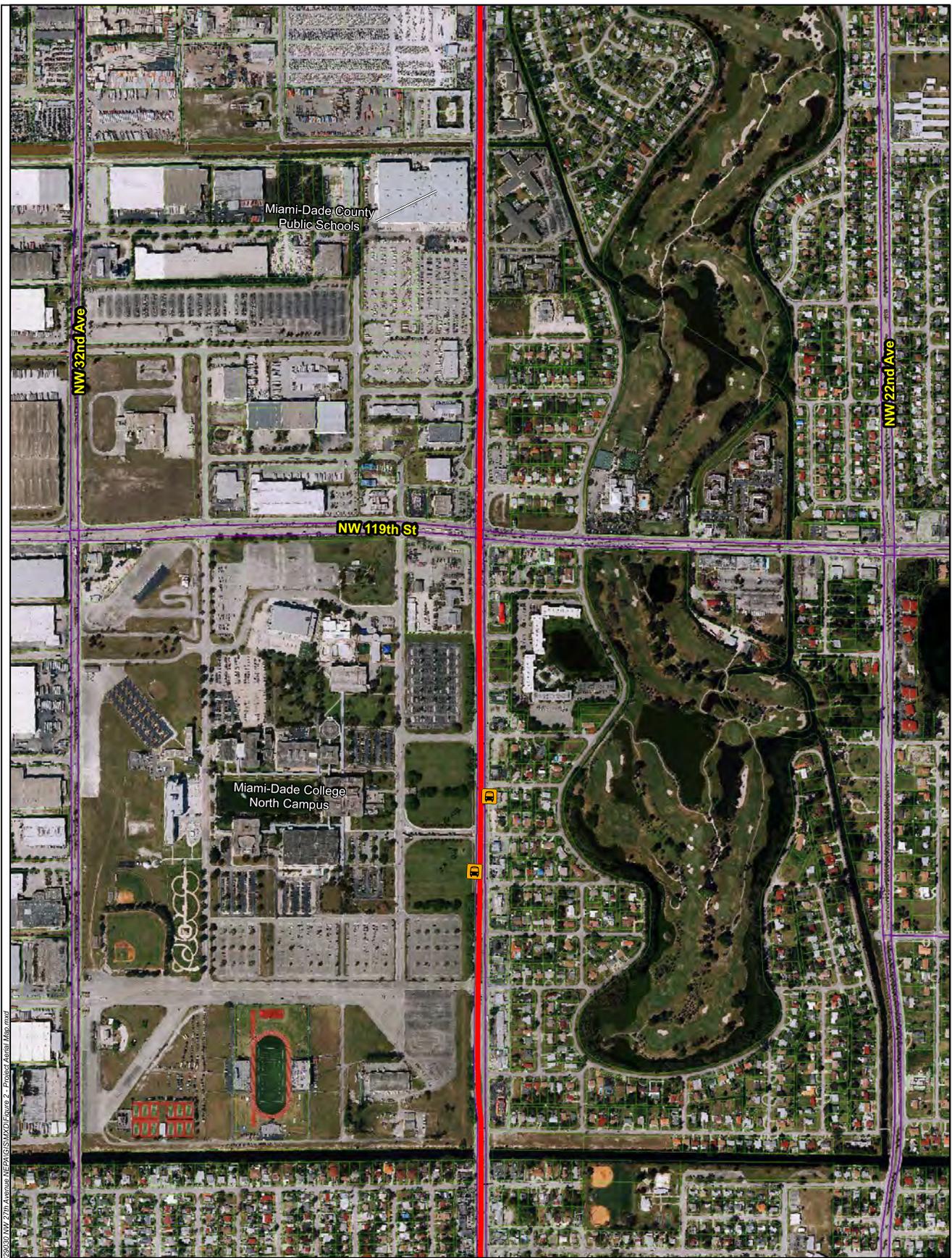
Legend

- Bus stations
- Project Corridor
- Parcels



Project Aerial Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VB\Environmental\429030\NW 27th Avenue NEPA\GIS\XK01\Figure 2 - Project Aerial Map.mxd
Sources: Aerials Express, Inc. 2010

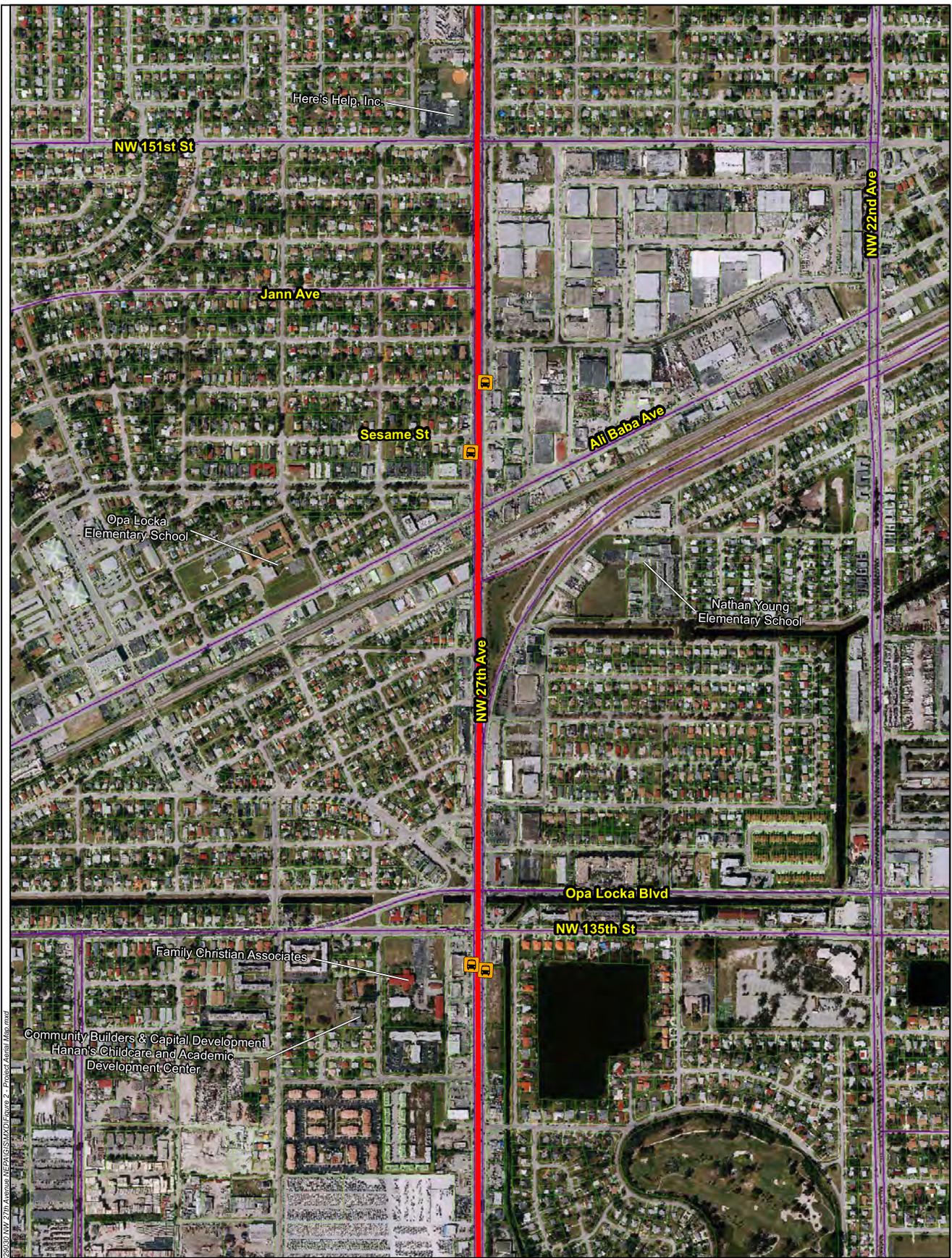
Legend

- Bus stations
- Project Corridor
- Parcels



Project Aerial Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\USB - Environmental\424930\00\NW 27th Avenue NEPA\GIS\XK\Figure 2 - Project Aerial Map.mxd
 Sources: Aerials Express, Inc. 2010

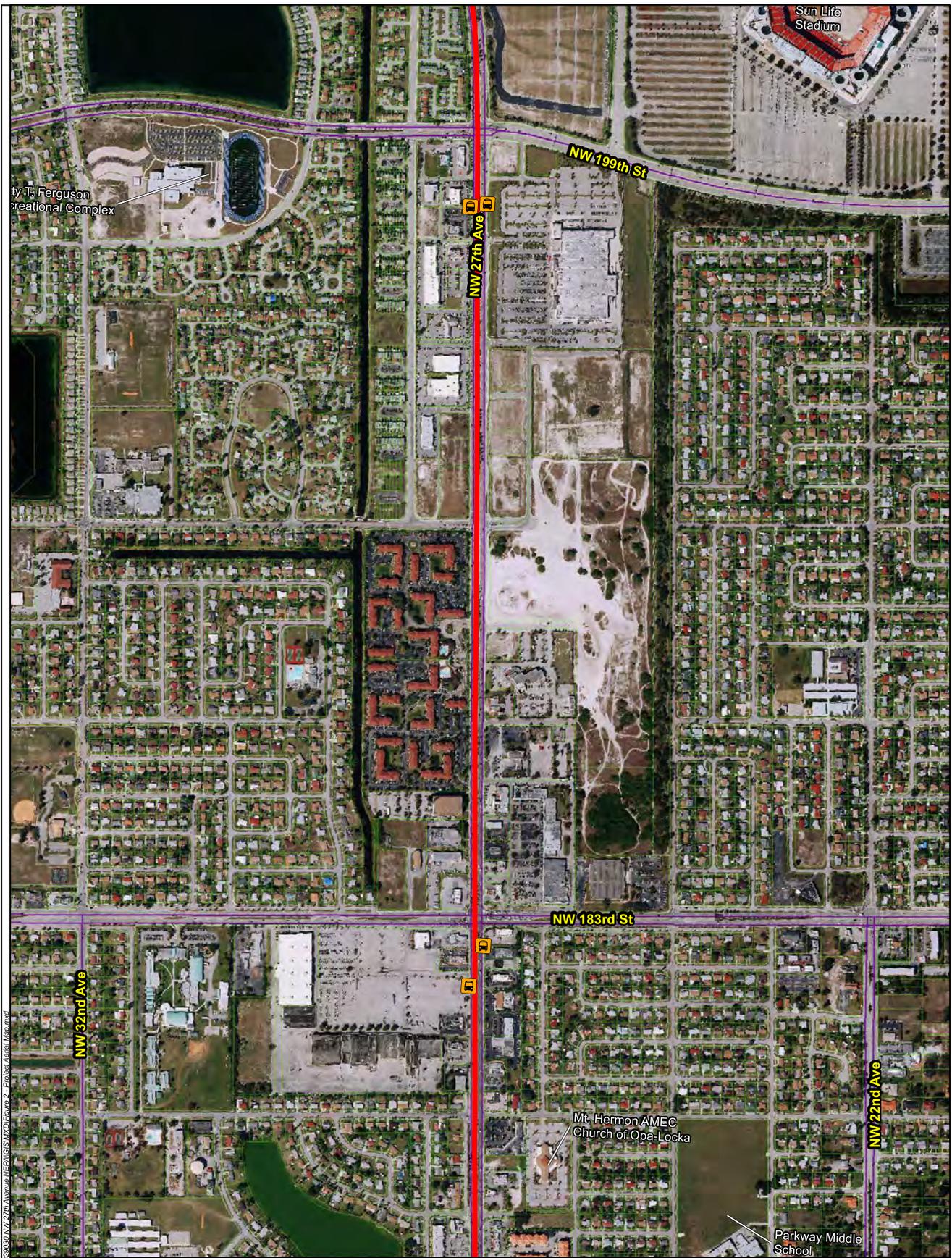
Legend

- Bus stations
- Project Corridor
- Parcels



Project Aerial Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB - Environmental\42493030\NW 27th Avenue NEPA\GIS\XDO\Figure 2 - Project Aerial Map.mxd
Sources: Aerials Express, Inc. 2010

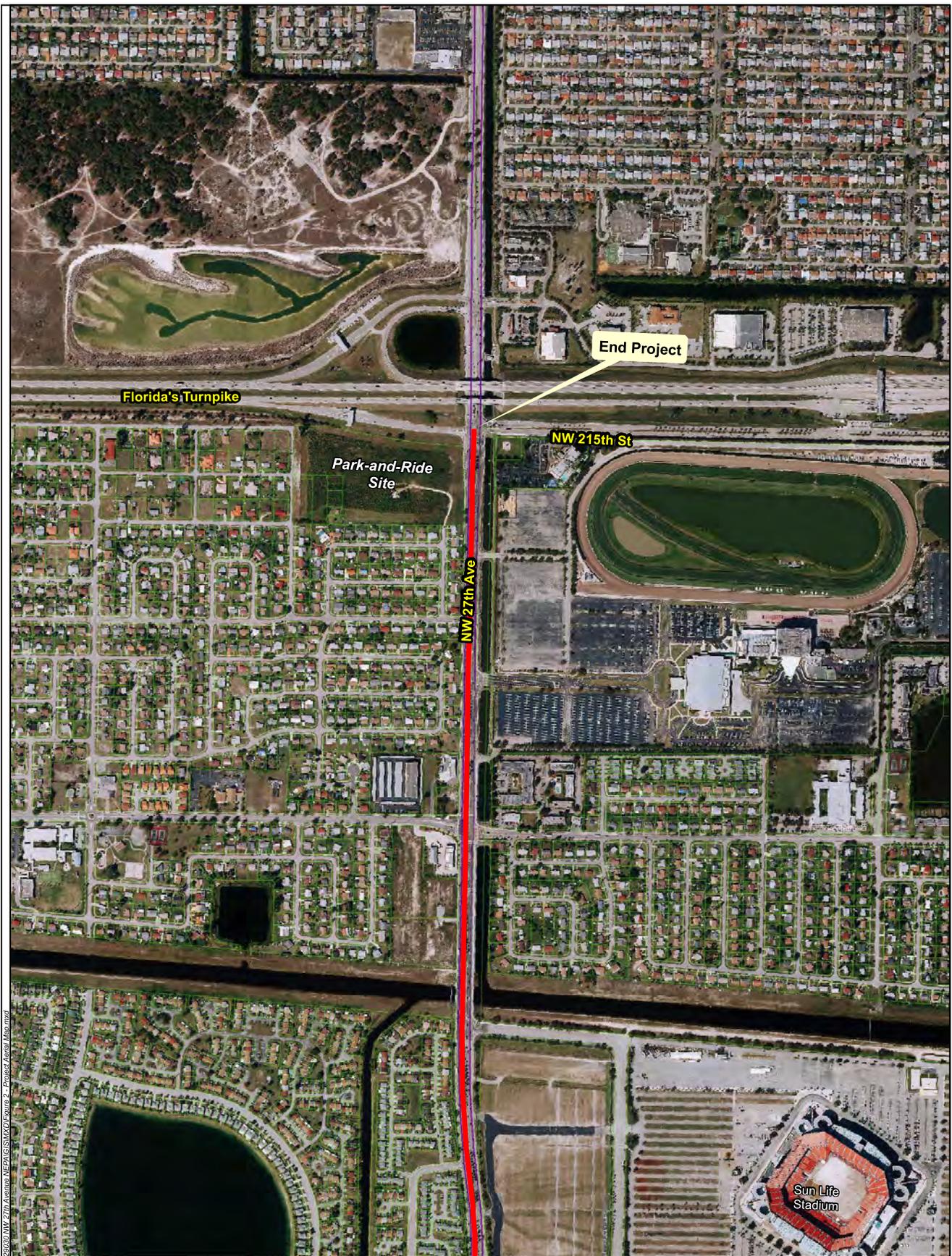
Legend

- Bus stations
- Project Corridor
- Parcels



Project Aerial Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA

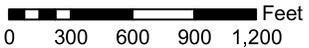




K:\VSB_Environmental\20120509\NW 27th Avenue NEPA\GIS\XKP\Figure 2 - Project Aerial Map.mxd

Legend

- Bus stations
- Project Corridor
- Parcels



Sources: Aerials Express, Inc. 2010

Project Aerial Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA



**FIGURE 3:
POTENTIAL CONTAMINATION SITES MAP**



K:\VSB_Environmental\20130303\NW 27th Avenue NEPA\GIS\XDO\Figure 3 - Potentially Contaminated Site Map.mxd

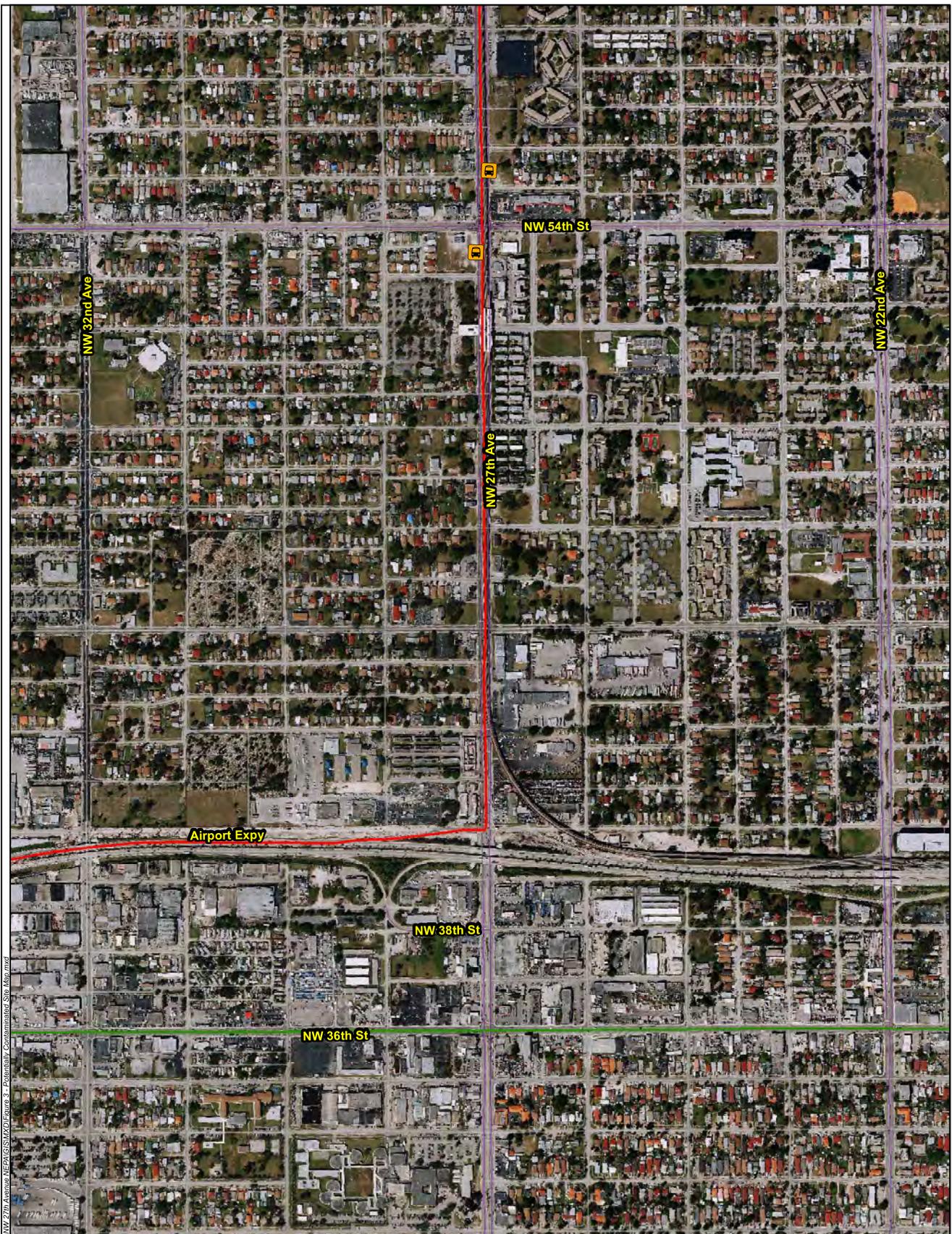
Legend

- Potential Contamination Site in Proximity to Proposed Bus Station
- Project Corridor
- Bus stations



Potentially Contaminated Sites Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB_Environmental\42829030\NW 27th Avenue NEPA\GIS\XDO\Figure 3 - Potential Contamination Site Map.mxd
Sources: Aerials Express, Inc. 2010

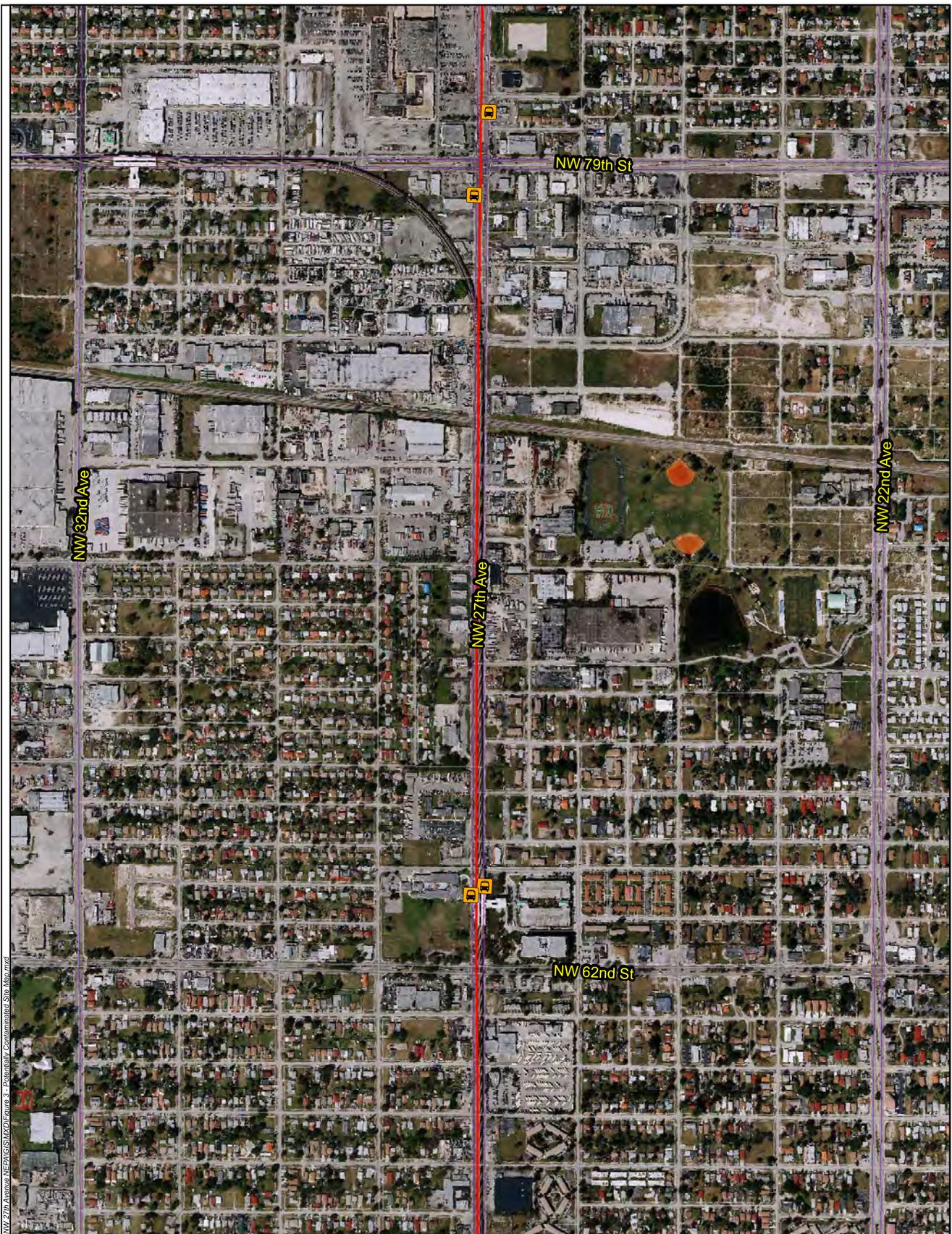
Legend

- Potential Contamination Site in Proximity to Proposed Bus Station
- Project Corridor
- B Bus stations



Potentially Contaminated Sites Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB_Environmental\42829030\NW 27th Avenue NEPA\GIS\XK01\Figure 3 - Potential Contamination Site Map.mxd

Legend

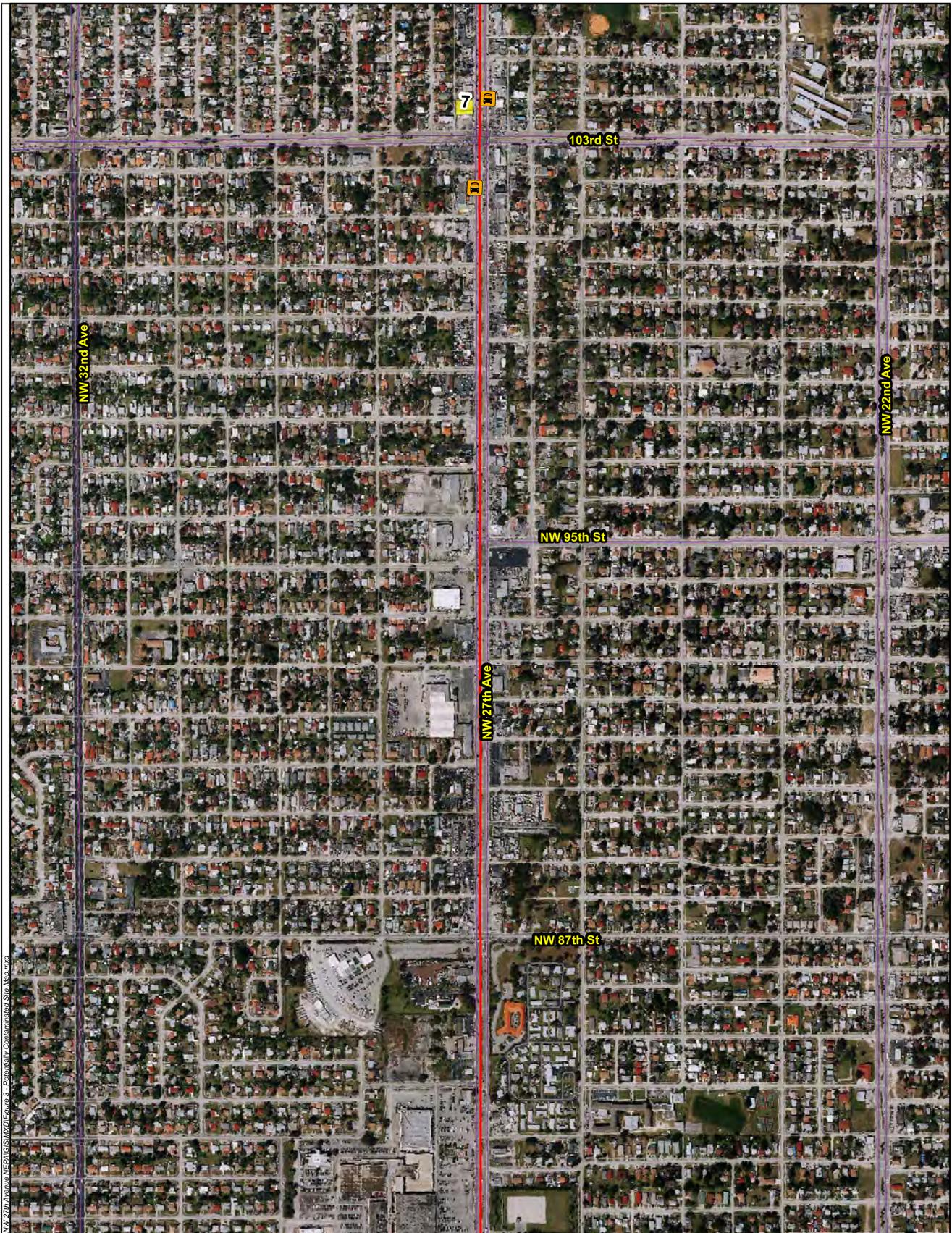
- Potential Contamination Site in Proximity to Proposed Bus Station
- Project Corridor
- B Bus stations



Source: Aerials Express, Inc. 2010

Potentially Contaminated Sites Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB - Environmental\42829030\NW 27th Avenue NEPA\GIS\10301\Figure 3 - Potentially Contaminated Sites Map.mxd
Sources: Aerials Express, Inc. 2010

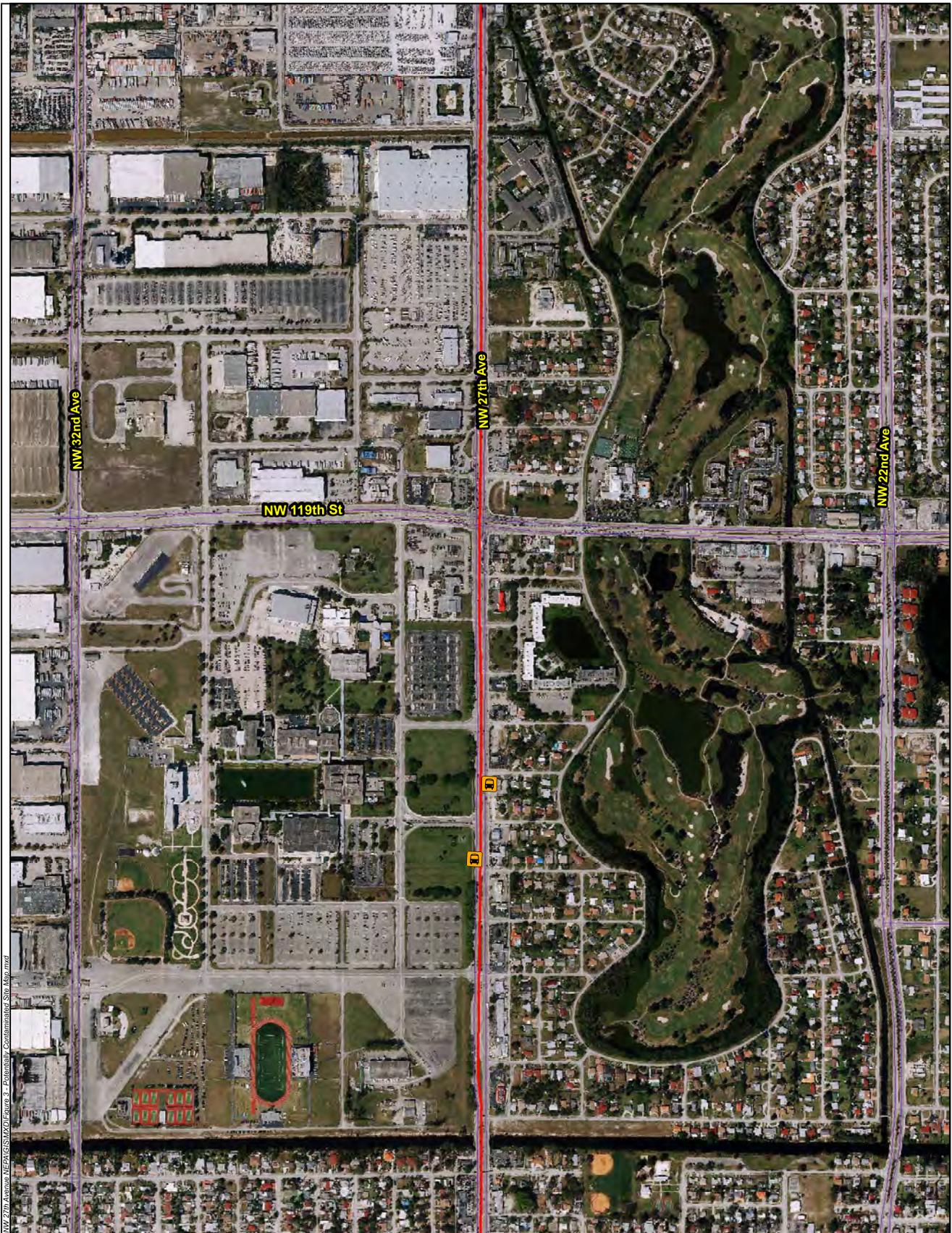
Legend

- Potential Contamination Site in Proximity to Proposed Bus Station
- Project Corridor
- 7 Bus stations



Potentially Contaminated Sites Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB_Environmental\42829030\NW 27th Avenue NEPA\GIS\1201\Figure 3 - Potentially Contaminated Sites Map.mxd
Sources: Aerials Express, Inc. 2010

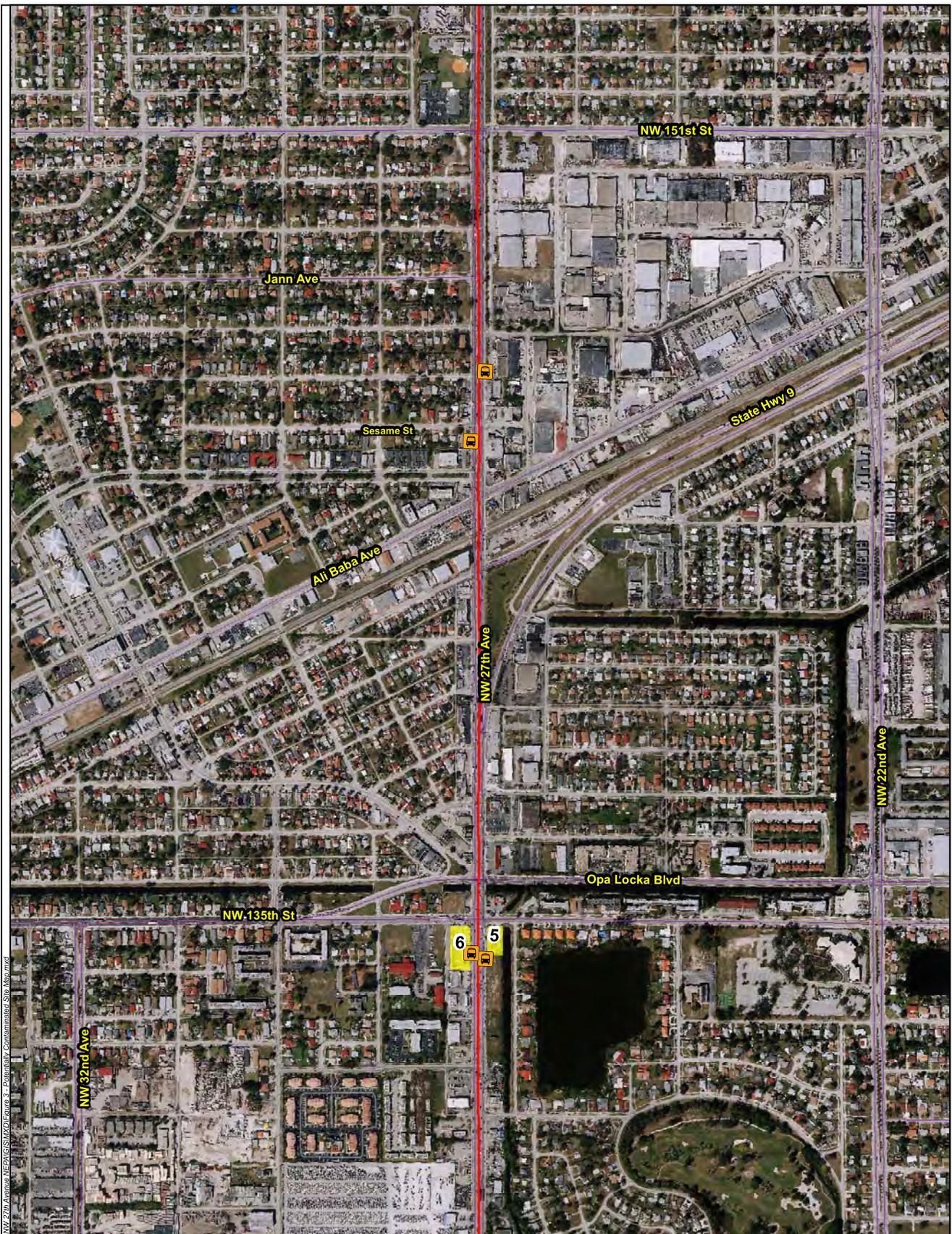
Legend

- Potential Contamination Site in Proximity to Proposed Bus Station
- Project Corridor
- B Bus stations



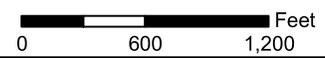
Potentially Contaminated Sites Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





Legend

- Potential Contamination Site in Proximity to Proposed Bus Station
- Project Corridor
- B Bus stations

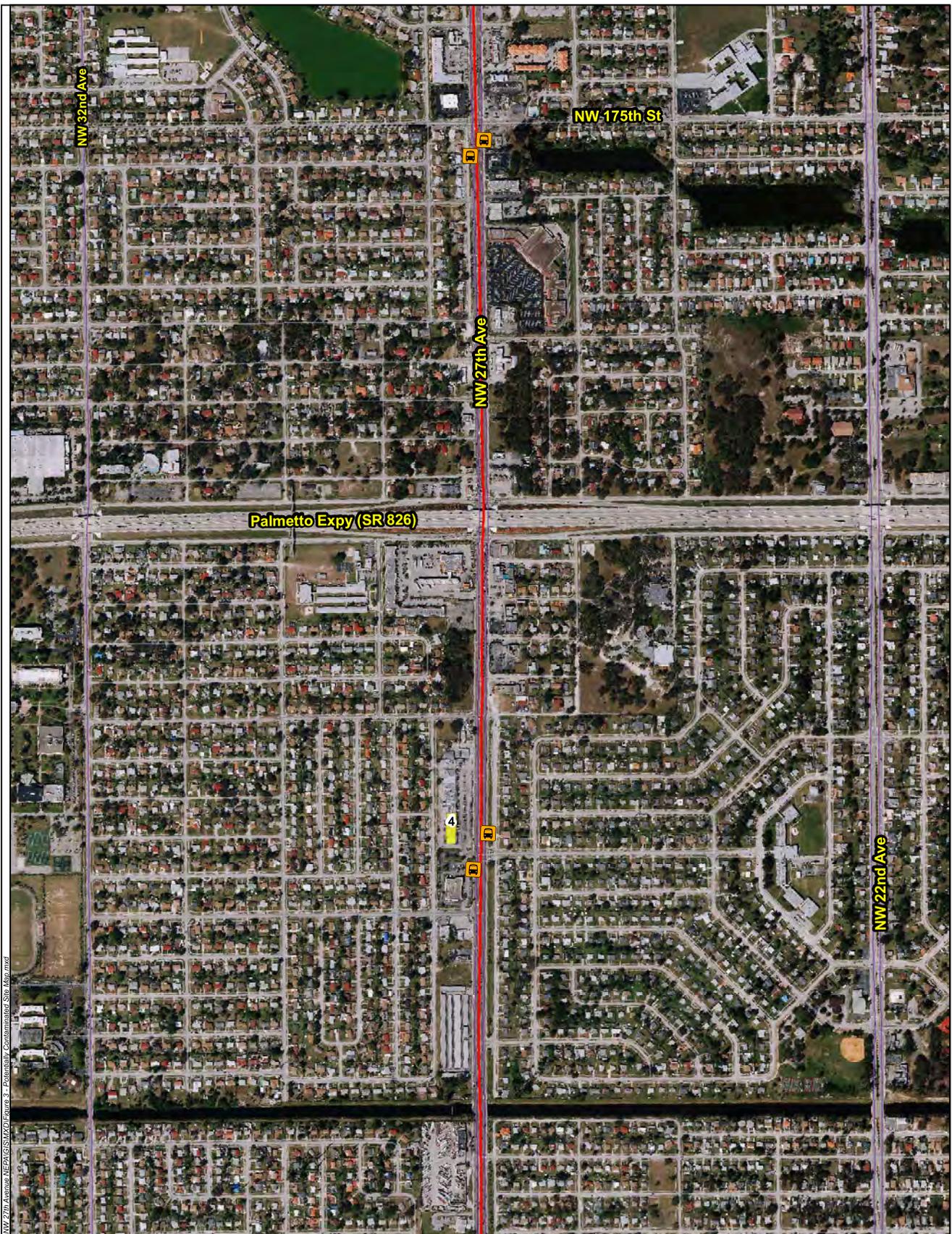


K:\VSB_Environmental\20130303\NW 27th Avenue NEPA\GIS\XDO\Figure 3 - Potential Contamination Site Map.mxd

Source: Aerials Express, Inc. 2010

Potentially Contaminated Sites Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB - Environmental\42829030\NW 27th Avenue NEPA\GIS\X2011\Figure 3 - Potential Contaminated Sites Map.mxd
Sources: Aerials Express, Inc. 2010

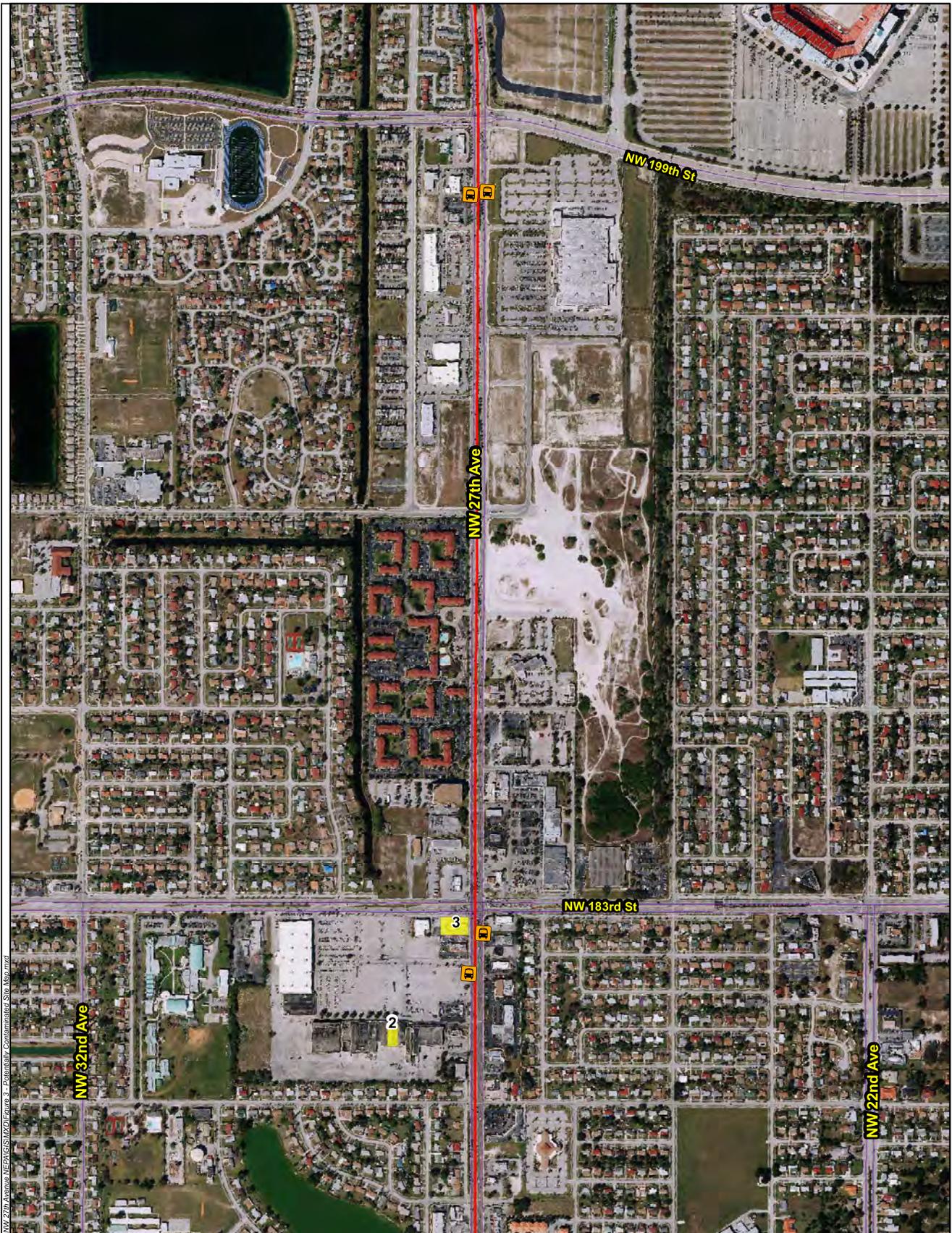
Legend

- Potential Contamination Site in Proximity to Proposed Bus Station
- Project Corridor
- B Bus stations



Potentially Contaminated Sites Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB - Environmental\42829030\NW 27th Avenue NEPA\GIS\XDO\Figure 3 - Potential Contamination Site Map.mxd
 Sources: Aerials Express, Inc. 2010

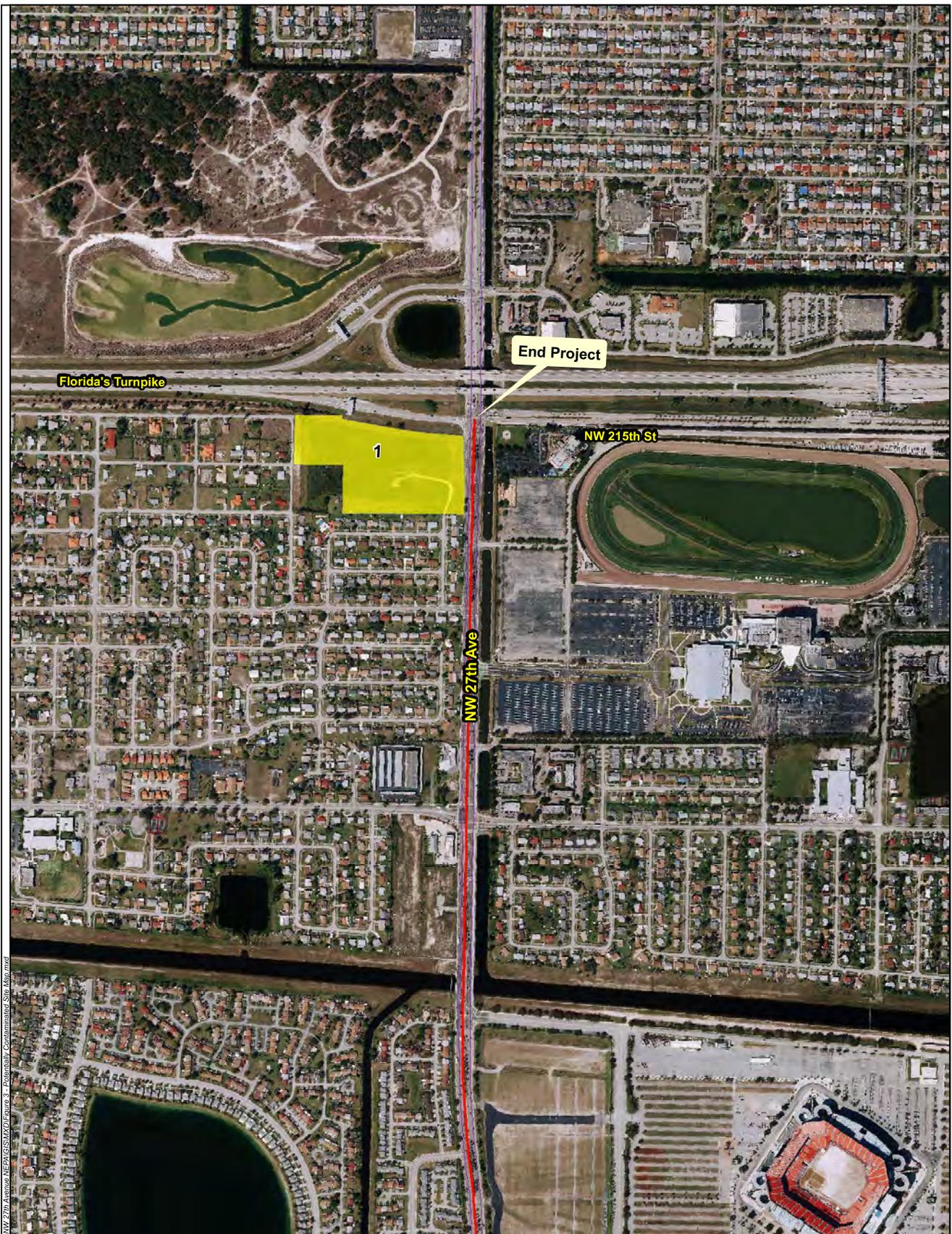
Legend

- Potential Contamination Site in Proximity to Proposed Bus Station
- Project Corridor
- B Bus stations



Potentially Contaminated Sites Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA





K:\VSB - Environmental\42829030\NW 27th Avenue NEPA\GIS\2013\Figure 3 - Potentially Contaminated Sites Map.mxd
Sources: Aerials Express, Inc. 2010

Legend

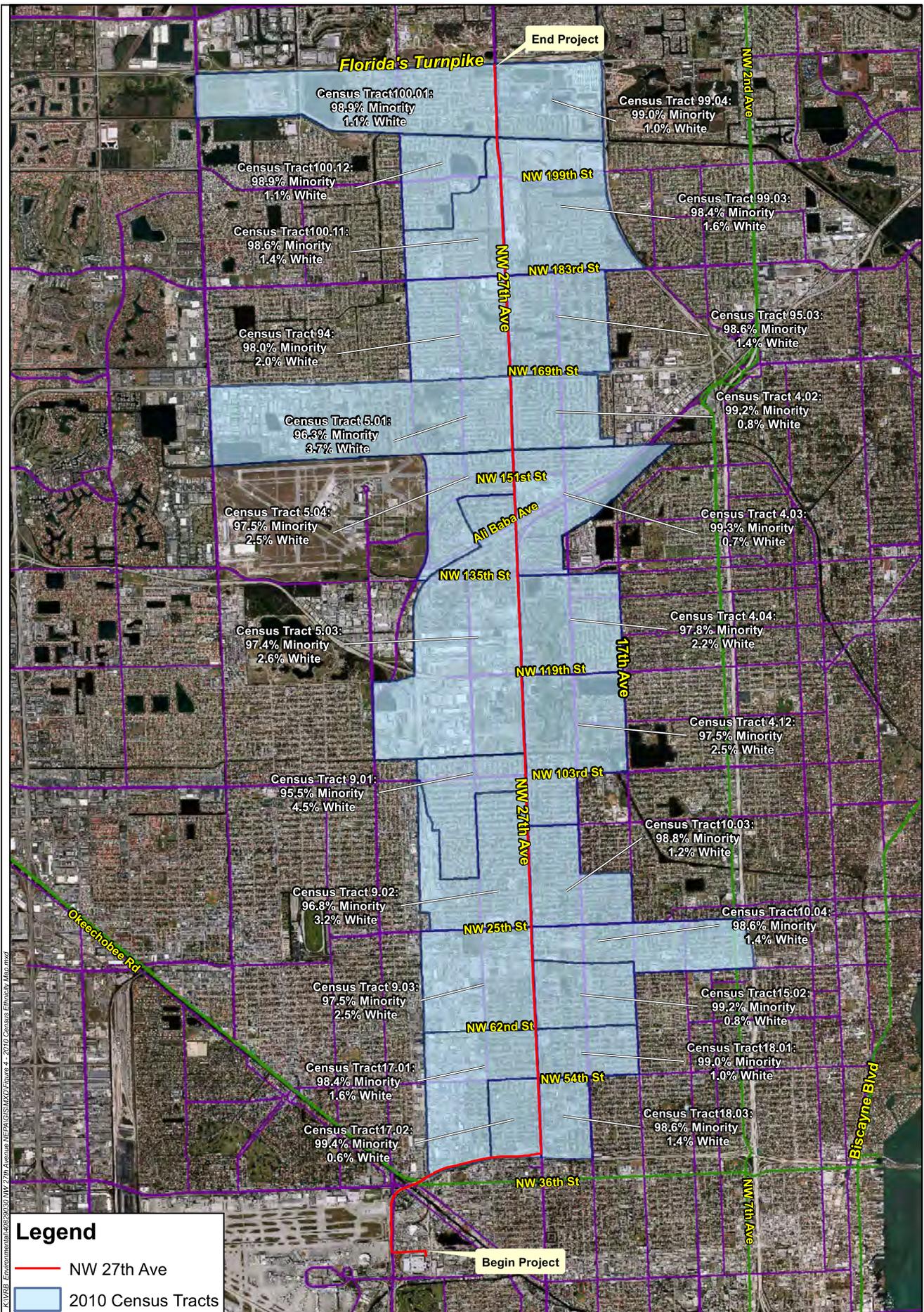
- Potential Contamination Site in Proximity to Proposed Bus Station
- Project Corridor
- Bus stations



Potentially Contaminated Sites Map
NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA



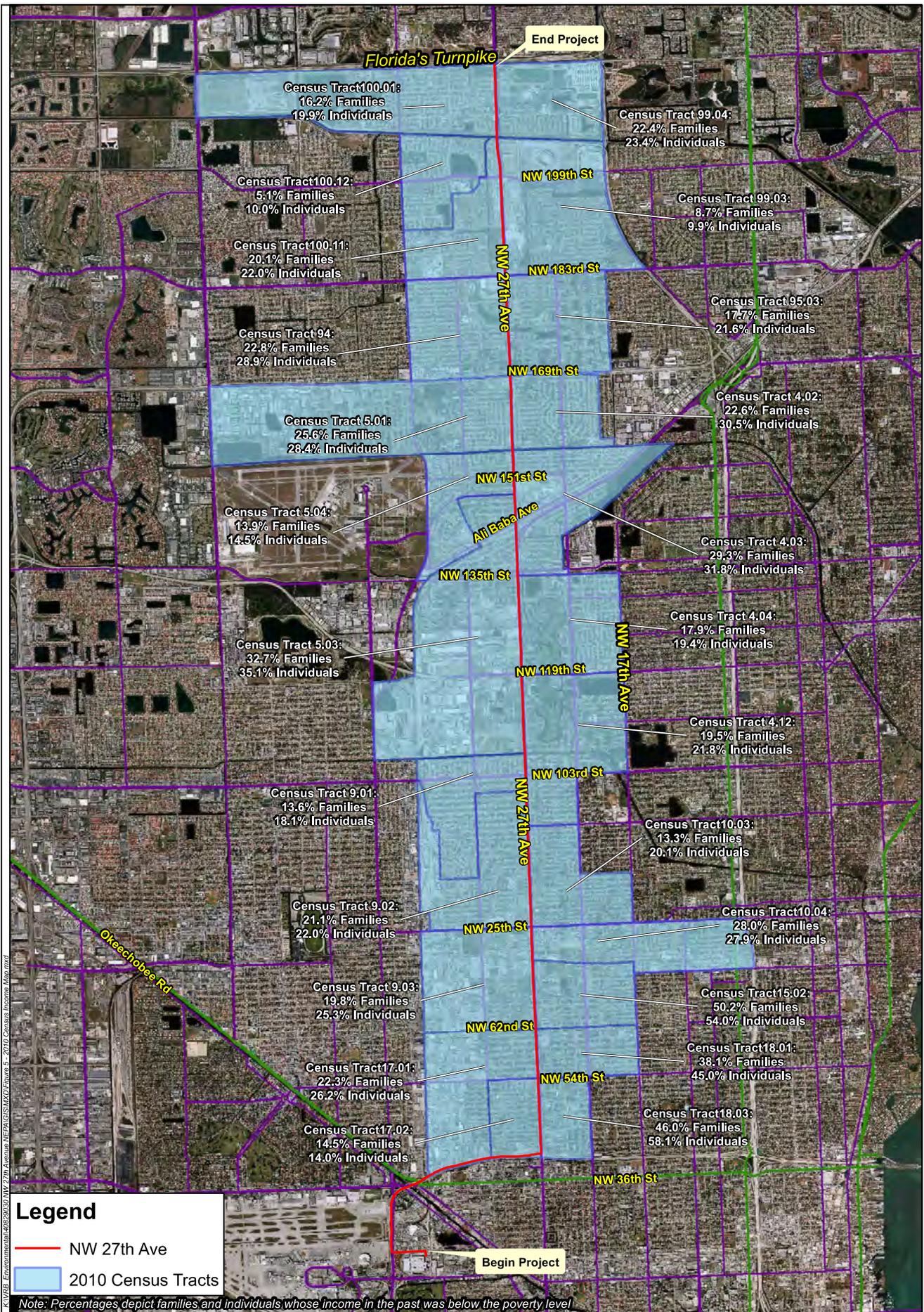
**FIGURE 4:
2010 CENSUS ETHNICITY MAP**



K:\VSB_Environmental\2010 Census\2010 Census Ethnicity Map.mxd
 Sources: Aerials Express, Inc. 2010



**FIGURE 5:
2010 CENSUS INCOME MAP**



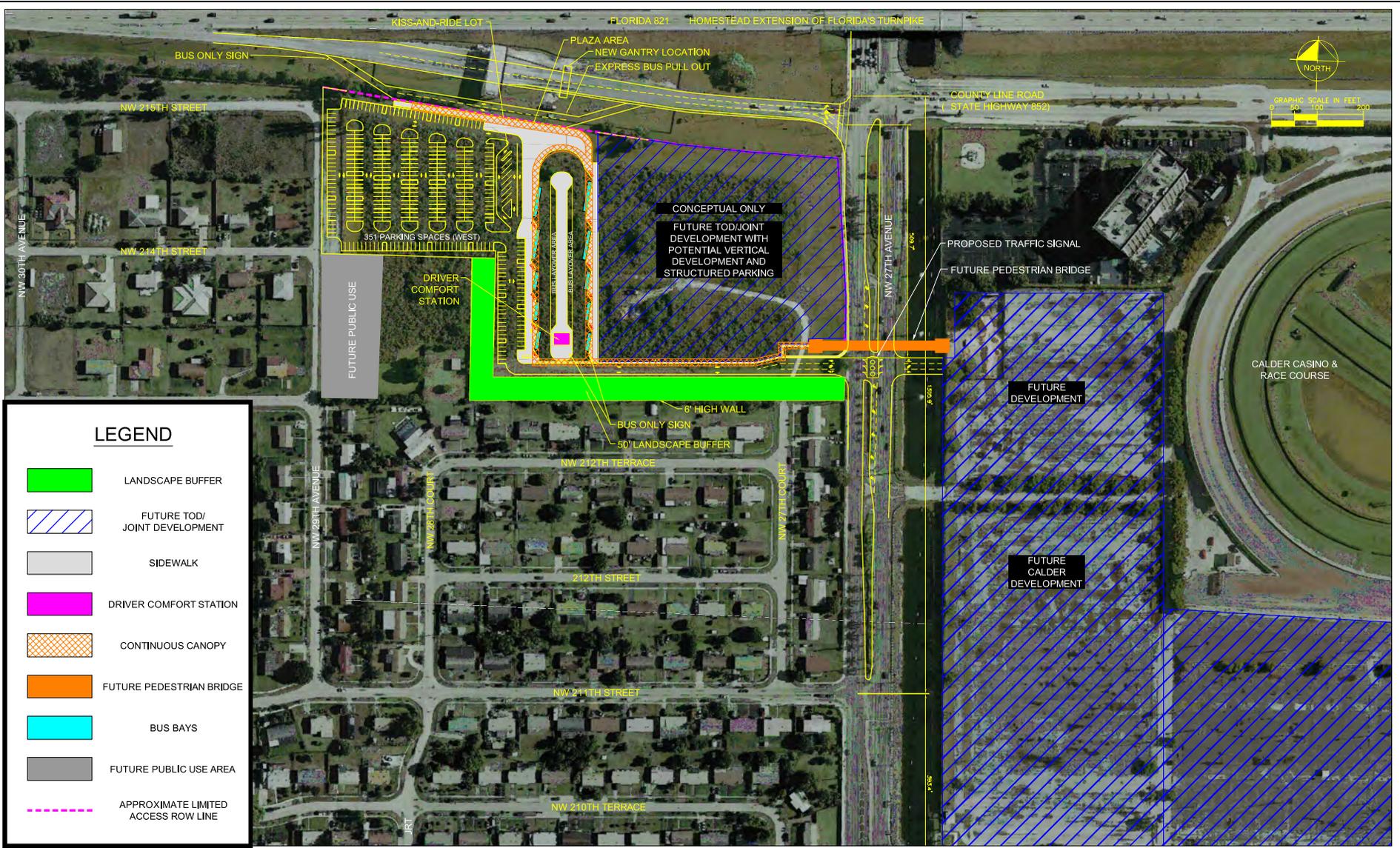
2010 Census Income Map

**NW 27TH AVENUE ENHANCED BUS PROJECT
FROM MIAMI INTERMODAL CENTER TO NW 215TH STREET
MIAMI-DADE COUNTY, FLORIDA**



**APPENDIX A:
CONCEPTUAL SITE PLAN FOR NW 215th STREET
TRANSIT TERMINAL AND PARK AND RIDE
FACILITY**

Plotted By: Vito, Kofie Sheet: Set: Pns Layout: Layout1 July 30, 2013 09:41:45am K:\MFE_Civil\040829030_BCT Bus Bay_2013_07-122_Site Plan.dwg
 This document, together with the drawings and design presented herein, is an instrument of service. It is prepared only for the specific project and shall be valid only if accompanied by a signed and stamped copy of the contract. Without either subscription or approval by Kimley-Horn and Associates, Inc. and the client, no part of this document shall be used for any other project or purpose.



LEGEND	
	LANDSCAPE BUFFER
	FUTURE TOD/ JOINT DEVELOPMENT
	SIDEWALK
	DRIVER COMFORT STATION
	CONTINUOUS CANOPY
	FUTURE PEDESTRIAN BRIDGE
	BUS BAYS
	FUTURE PUBLIC USE AREA
	APPROXIMATE LIMITED ACCESS ROW LINE

**Kimley-Horn
and Associates, Inc.**
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 1221 BRICKELL AVENUE, SUITE 400, MIAMI, FL 33131
 PHONE: 305-673-2025
 WWW.KIMLEY-HORN.COM CA 00000696

**PARK AND RIDE TRANSIT TERMINAL
 NW 215TH STREET AND NW 27TH AVENUE**

**CONCEPTUAL SITE PLAN
 OPTION 5**

SHEET NUMBER

APPENDIX B:
MIAMI-DADE METROPOLITAN PLANNING
ORGANIZATION TRANSPORTATION IMPROVEMENT
PROGRAM



20-THIRTEEN



**TRANSPORTATION IMPROVEMENT PROGRAM
FISCAL YEARS 2012/2013 to 2016/2017**

METROPOLITAN PLANNING ORGANIZATION FOR THE MIAMI URBANIZED AREA

Approved by MPO Governing Board on May 17th, 2012

This document was prepared by the Metropolitan Planning Organization for the Miami Urbanized Area in collaboration With the Florida Department of Transportation; Miami-Dade Expressway Authority; Florida's Turnpike Enterprise; South Florida Regional Transportation Authority; Miami-Dade County Public Works and Waste Management Department; Miami-Dade County Office of Strategic Business Management; Miami-Dade Transit Agency; Miami-Dade County Aviation Department; Miami-Dade Seaport Department; Miami-Dade County Department of Sustainability, Planning and Economic Enhancement; Miami-Dade County Department of Permitting, Environment and Regulatory Affairs; and The Miami-Dade County Developmental Impact Committee.

The Miami-Dade MPO complies with the provisions of Title VI of the Civil Rights Act of 1964, which states:
No person in the United States shall, on grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.

It is also the policy of the Miami-Dade MPO to comply with all of the requirements of the Americans with Disabilities Act.

For materials in accessible format please call 305-375-4507.

The preparation of this report has been financed in part through grant(s) from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 of Title 23, U.S. Code, as well as Miami-Dade County, Florida.

The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

MIAMI-DADE METROPOLITAN PLANNING ORGANIZATION
 TRANSPORTATION IMPROVEMENT PROGRAM
 PRIMARY STATE HIGHWAYS AND INTERMODAL



Public Transportation: MULTIMODAL FACILITY

MPO Project Num: **TA4280114**
 LRTP Ref.: p. 8-5
 County: **MIAMI-DADE**
 Roadway ID:
 Lanes Exist: 0
 Lanes Improved: 0
 Lanes Added: 0
 Project Length: 0
 District: 6

Project Description: **MDT - NW 27TH AVENUE**

**ENHANCED BUS SERVICE
 BUS TERMINAL**

Type of Work: **INTERMODAL HUB CAPACITY**

		Proposed Funding (in \$000s)								
		Funding Source	<2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	>2017	All Years
PHASE : Grants and Miscellaneous	DPTO		0	0	0	0	1,496	0	0	1,496
PHASE : Grants and Miscellaneous	DDR		0	0	0	0	99	0	0	99
PHASE : Grants and Miscellaneous	LF		0	0	0	0	1,595	0	0	1,595
RESPONSIBLE AGENCY: Managed by Miami-Dade Transit		Totals	0	0	0	0	3,190	0	0	3,190

Yearly Total	648,524	53,650	69,352	77,694	55,013	50,365	152,522	1,107,120
ic Transportation: MULTIMODAL FACITotals							5 Year TIP Total	#####

MIAMI-DADE METROPOLITAN PLANNING ORGANIZATION
 TRANSPORTATION IMPROVEMENT PROGRAM
 PRIMARY STATE HIGHWAYS AND INTERMODAL



Public Transportation: TRANSIT

MPO Project Num: **TA4280111**
 LRTP Ref.: p. F-9
 County: **MIAMI-DADE**
 Roadway ID:
 Lanes Exist: 0
 Lanes Improved: 0
 Lanes Added: 0
 Project Length: 0
 District: 6

Project Description: **MDT-FTA SEC 5309 NW 27TH AVE
 ENHANCED BUS SERVICE**

Type of Work: **CAPITAL FOR FIXED ROUTE**

		Proposed Funding (in \$000s)								
		Funding Source	<2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	>2017	All Years
PHASE : Grants and Miscellaneous	LF		0	0	457	436	0	0	0	893
PHASE : Grants and Miscellaneous	CM		0	0	1,629	1,629	0	0	0	3,258
PHASE : Grants and Miscellaneous	FTAT		0	0	1,829	1,744	0	0	0	3,573
PHASE : Grants and Miscellaneous	SU		0	0	200	115	0	0	0	315
RESPONSIBLE AGENCY: Managed by Miami-Dade Transit		Totals	0	0	4,115	3,924	0	0	0	8,039

MIAMI-DADE METROPOLITAN PLANNING ORGANIZATION
TRANSPORTATION IMPROVEMENT PROGRAM
PRIMARY STATE HIGHWAYS AND INTERMODAL



Public Transportation: TRANSIT

MPO Project Num: **TA4280112**
LRTP Ref.: p. F-9
County: **MIAMI-DADE**
Roadway ID:
Lanes Exist: 0
Lanes Improved: 0
Lanes Added: 0
Project Length: 0
District: 6

Project Description: **MDT-NW 27 AVENUE ENHANCED BUS
SERVICE PARK AND RIDE FACILITY**

Type of Work: **CAPITAL FOR FIXED ROUTE**

		Proposed Funding (in \$000s)								
		Funding Source	<2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	>2017	All Years
PHASE : Grants and Miscellaneous	LF		0	0	0	1,225	0	0	0	1,225
PHASE : Grants and Miscellaneous	CIGP		0	0	0	1,225	0	0	0	1,225
RESPONSIBLE AGENCY: Managed by Miami-Dade Transit		Totals	0	0	0	2,450	0	0	0	2,450

MPO Project Num: **TA4280113**
LRTP Ref.: p. F-9
County: **MIAMI-DADE**
Roadway ID:
Lanes Exist: 0
Lanes Improved: 0
Lanes Added: 0
Project Length: 0
District: 6

Project Description: **MDT-NW 27 AVENUE ENHANCED BUS
SERVICE BUS PURCHASE**

Type of Work: **CAPITAL FOR FIXED ROUTE**

		Proposed Funding (in \$000s)								
		Funding Source	<2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	>2017	All Years
PHASE : Grants and Miscellaneous	LF		0	0	2,643	2,582	0	0	0	5,225
PHASE : Grants and Miscellaneous	CIGP		0	0	2,643	2,582	0	0	0	5,225
RESPONSIBLE AGENCY: Managed by Miami-Dade Transit		Totals	0	0	5,286	5,164	0	0	0	10,450

**APPENDIX C:
FLORIDA MASTER SITE FILE DATA**



This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333 for project review information.

February 19, 2013



Steven Hitt
Environmental Analyst
445 24th St, Suite 200
Vero Beach, Florida 32960
Phone: 772.794.4100
Email: Steven.hitt@kimley-horn.com

In response to your inquiry of December 12, 2012, the Florida Master Site File lists no previously recorded archaeological sites, seven resource groups, and 157 standing structures found in the following area of Dade County:

The portions of T51S R41E Sections 33 & 34, of T52S R41E Sections 3, 4, 9, 10, 15, 16, 21, 22, 27, 28, 33, & 34, and of T53S R41E Sections 3, 4, 9, 10, 15, 16, 21, & 22 as indicated on the project area map submitted with the search request (including a 1/4 mile buffer).

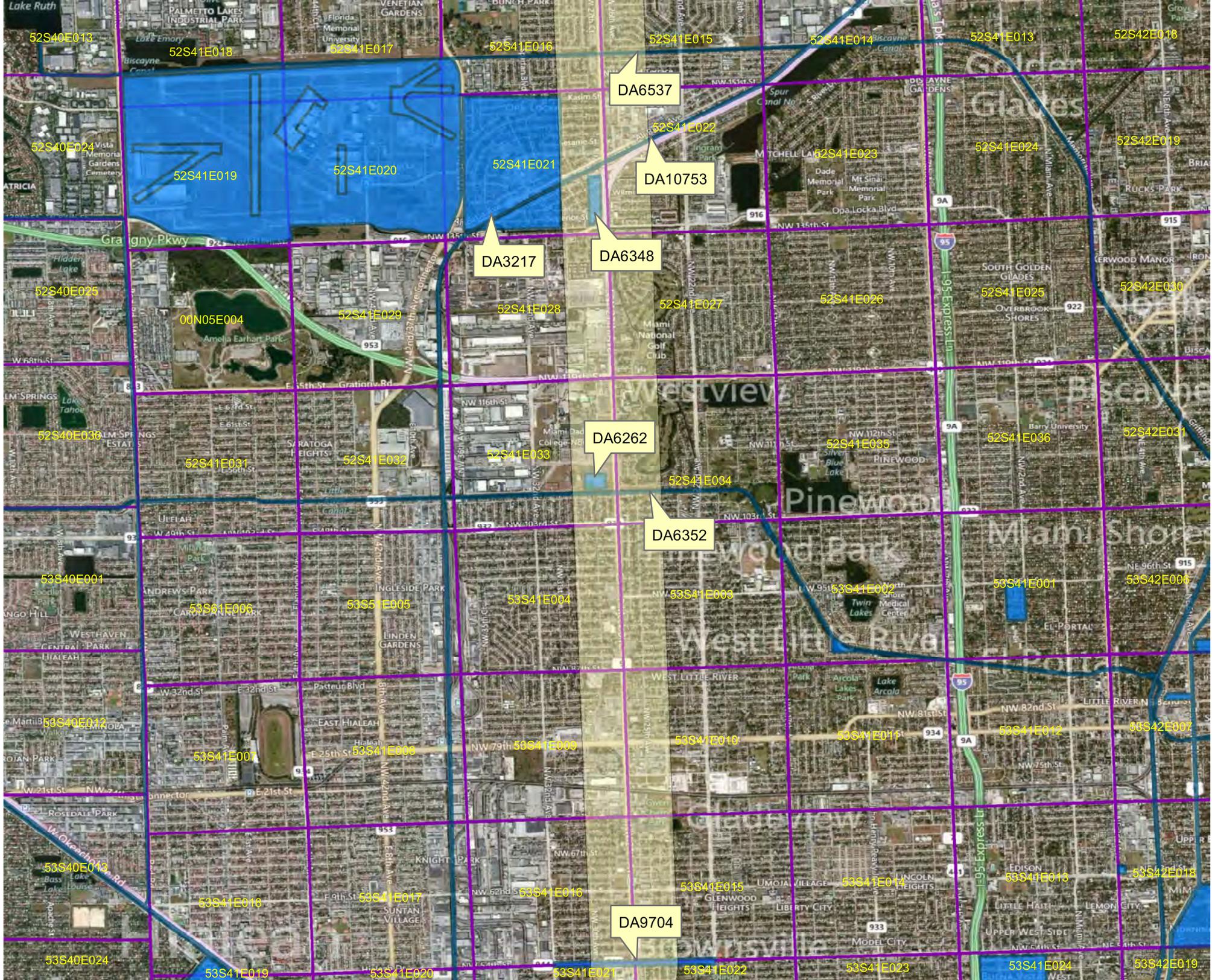
When interpreting the results of our search, please consider the following information:

- **This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.**
- **Because vandalism and looting are common at Florida sites, we ask that you limit the distribution of location information on archaeological sites.**
- **While many of our records document historically significant resources, the documentation of a resource at the Florida Master Site File does not necessarily mean the resource is historically significant.**
- **Federal, state and local laws require formal environmental review for most projects. This search DOES NOT constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333.**

Please do not hesitate to contact us if you have any questions regarding the results of this search.

Sincerely,

Sarah Liko
Archaeological Data Analyst
Florida Master Site File



DA6537

DA10753

DA3217

DA6348

DA6262

DA6352

DA9704

**APPENDIX D:
NOISE AND VIBRATION ANALYSIS**

DRAFT NOISE AND VIBRATION ANALYSIS REPORT

February 2013

NW 27th Avenue Park-and-Ride
Miami Gardens, FL

Prepared For:

Miami-Dade MPO
111 N.W. 1 Street, Suite 910
Miami, FL 33128

Prepared By:

Kimley-Horn and Associates, Inc.
401 B Street, Suite 600
San Diego, CA 92101

040829030
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EXECUTIVE SUMMARY

This Noise and Vibration Analysis Report assesses potential noise and vibration impacts due to the proposed NW 27th Avenue Park-and-Ride project. This study estimates existing noise conditions in the project area, identifies noise-sensitive locations, and predicts future project noise and vibration levels. The noise analysis was prepared to satisfy National Environmental Policy Act (NEPA) requirements, using Federal Transit Administration (FTA) Noise and Vibration Impact Assessment [FTA 2006] criteria.

The proposed project site is the vacant property at the southwest corner of NW 27th Avenue and the eastbound exit of the Homestead Extension of Florida's Turnpike (SR 821), in the City of Miami Gardens, within Miami-Dade County, Florida. The north property line of the project site is on the southern boundary of the City of Miramar and Broward County.

Noise- and vibration-sensitive land uses potentially impacted by the project consist of single-family residences adjacent on the south and west. Existing noise levels at the residences range from approximately 61 dBA Ldn to 67 dBA Ldn.

Operation of the project would generate noise levels up to approximately 58 dBA Ldn at the residences, resulting in No Impact under FTA criteria. This impact is considered less than significant.

Operation of the project would generate negligible vibration levels. This impact is considered less than significant.

Construction of the project would generate noise levels up to approximately 77 dBA Leq at the residences. These noise levels are less than the FTA daytime construction noise threshold. This impact is considered less than significant.

Construction of the project would generate vibration levels up to approximately 76 VdB. This vibration level is higher than the FTA annoyance threshold. This is considered a temporary adverse impact. Implementation of a Vibration Control Plan and other measures could reduce construction vibration levels.

1 INTRODUCTION

1.1 Proposed Project Description

The “North Corridor” is a priority transit corridor in Miami-Dade County extending along NW 27th Avenue south from the Broward County Line at NW 215th Street to the Dr. Martin Luther King Jr. Metrorail Station near NW 62nd Street.

Two MDT bus routes currently serve the NW 27th Avenue corridor. Route 27 operates 24 hours per day and provides service between NW 211th Street on the north and Coconut Grove on the south. Route 27 operates with 15 minutes headway during the peak period [MPO 2013]. Route 297 Orange MAX operates on weekdays between 5:30 AM and 7:30 PM with 15 minutes headway during the peak period and 30 minutes headway during the midday, and provides service between NW 207th Street and the Miami Intermodal Center adjacent to Miami International Airport. The NW 27th Avenue Enhanced BRT project would increase the Route 297 Orange MAX frequency to 10 minutes headway during the peak period and 20 minutes headway during the midday.

An end-of-the-line bus terminal and park-and-ride facility would be constructed near the Broward County Line at NW 215th Street, on an approximately 14-acre property owned by Miami-Dade Transit (MDT) within the political jurisdiction of the City of Miami Gardens. Up to 350 park-and-ride spaces are proposed for the facility, along with approximately ten bus bays, passenger seating under canopied areas, and a bus driver comfort station. The facility would serve as a hub for several MDT and Broward County Transit (BCT) routes, and would facilitate transfers between the two systems. In addition, this facility would provide an end-of-the line layover for Route 297 Orange MAX service as well as Route 27, eliminating the two-mile turnaround presently required. The property also provides long-term transit-oriented development (TOD) opportunities, and the facility would be designed in a manner to preserve space for future development.

Additional buses accessing the site could include MDT Route 99 (30 minutes headway in each direction [not end-of-line station] throughout most of the day), BCT Route 2 (20 minutes headway throughout the day and likely an end-of-line station), the BCT University Breeze route (30 minutes headway during morning and afternoon peak periods only and likely an end-of-line station), and BCT 95 Express (assumed 15 minutes headway in each direction [not an end-of-line station] during morning and afternoon peak periods only). Additional service accessing the site could include community shuttles/circulators operated by Cities of Miami Gardens and Miramar (assumed 15 minutes headway).

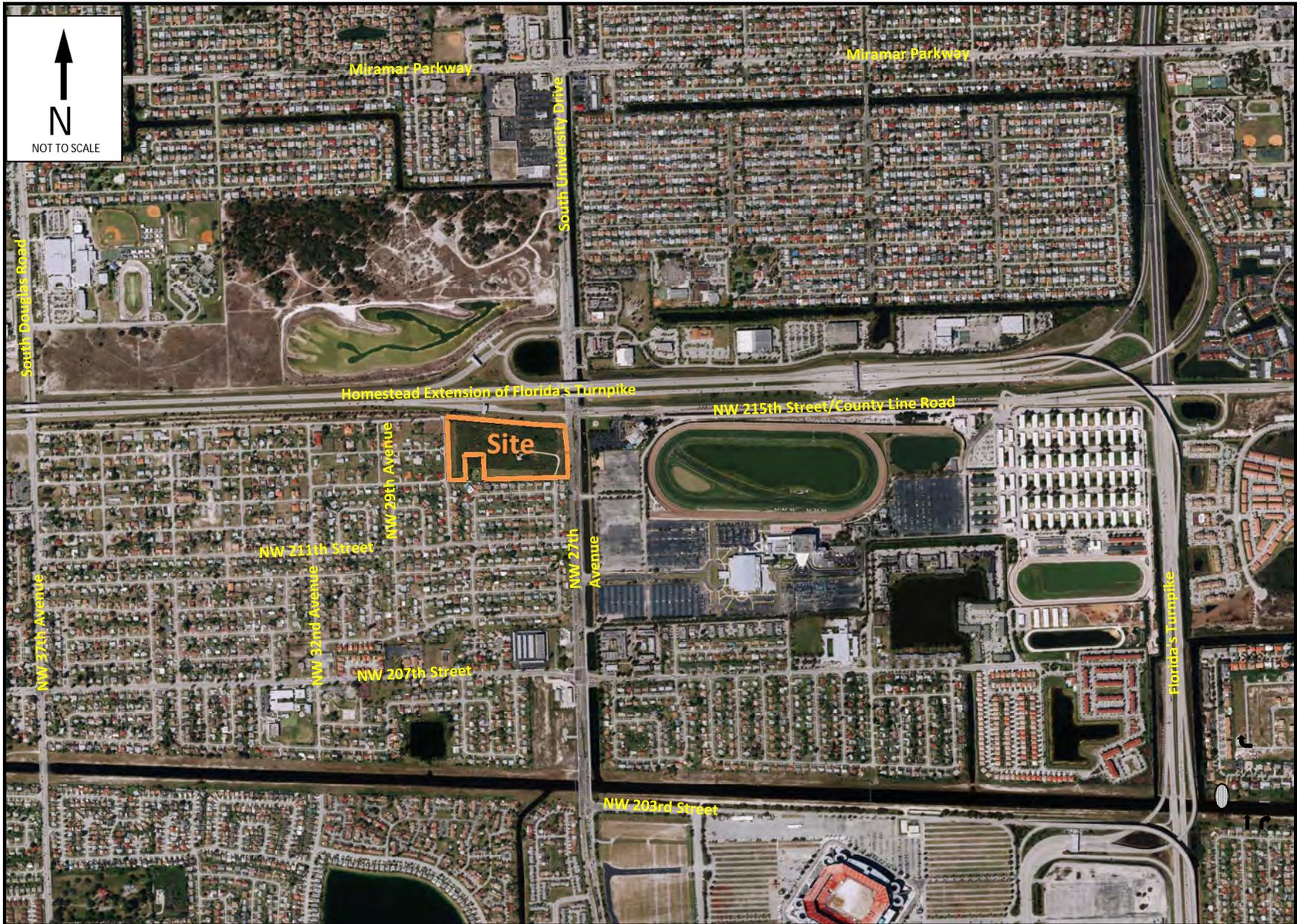


Figure 1
Location Map
NW 215th Street Park and Ride Facility

1.2 Noise Background

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Human environments are characterized by a generally consistent noise level which varies with each area. This level is called ambient noise. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, perceived importance of the noise and its appropriateness in the setting, time of day and type of activity during which the noise occurs, sensitivity of the individual, and change from ambient conditions.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in cycles per second, or hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. The average person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness; this relation holds true for sounds of any loudness. Sound levels of typical noise sources and environments are provided in Table 1.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. A simple rule is useful, however, in dealing with sound levels: if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example, $60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}$, and $80 \text{ dB} + 80 \text{ dB} = 83 \text{ dB}$.

The normal human ear can detect sounds that range in frequency from about 20 Hz to 20,000 Hz. However, all sounds in this wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the range of 1,000 Hz to 4,000 Hz. This frequency dependence can be taken into account by applying a correction to each frequency range to approximate the sensitivity of the human ear within each range. This is called A-weighting and is commonly used in measurements of community environmental noise. The A-weighted sound pressure level (abbreviated as dBA) is the sound level with the "A-weighting" frequency correction. In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Community noise levels usually change continuously during the day. The equivalent continuous A-weighted sound pressure level (L_{eq}) is normally used to describe community noise. The L_{eq} is the energy-averaged A-weighted sound level during a measured time interval, and is equal to the level of a continuous steady sound containing the same total acoustical energy over the averaging time period as the actual time-varying sound. Additionally, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the L_{max} and L_{min} indicators, which represent the root-mean-square maximum and minimum noise levels obtained during the measurement interval. The L_{min} value obtained for a particular monitoring location is often called the "acoustic floor" for that location.

To describe the time-varying character of environmental noise, the statistical noise descriptors L_{10} , L_{50} , and L_{90} are commonly used. They are the noise levels equaled or exceeded during 10, 50, and 90 percent of a stated time, respectively. Sound levels associated with L_{10} typically describe transient or short-term events, whereas levels associated with L_{90} describe the steady-state (or most prevalent) noise conditions.

Table 1. Typical Noise Levels and Noise Environments

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140 Decibels	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud Threshold of Pain
Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud Very Loud
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Higher Limit of Urban Ambient Sound	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)		70	Reference Loudness Moderately Loud
Normal Conversation (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud Quiet
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud Just Audible
		10	1/64 as loud
		0	1/128 as loud Threshold of Hearing

Source: Compiled by Kimley-Horn and Associates, Inc.

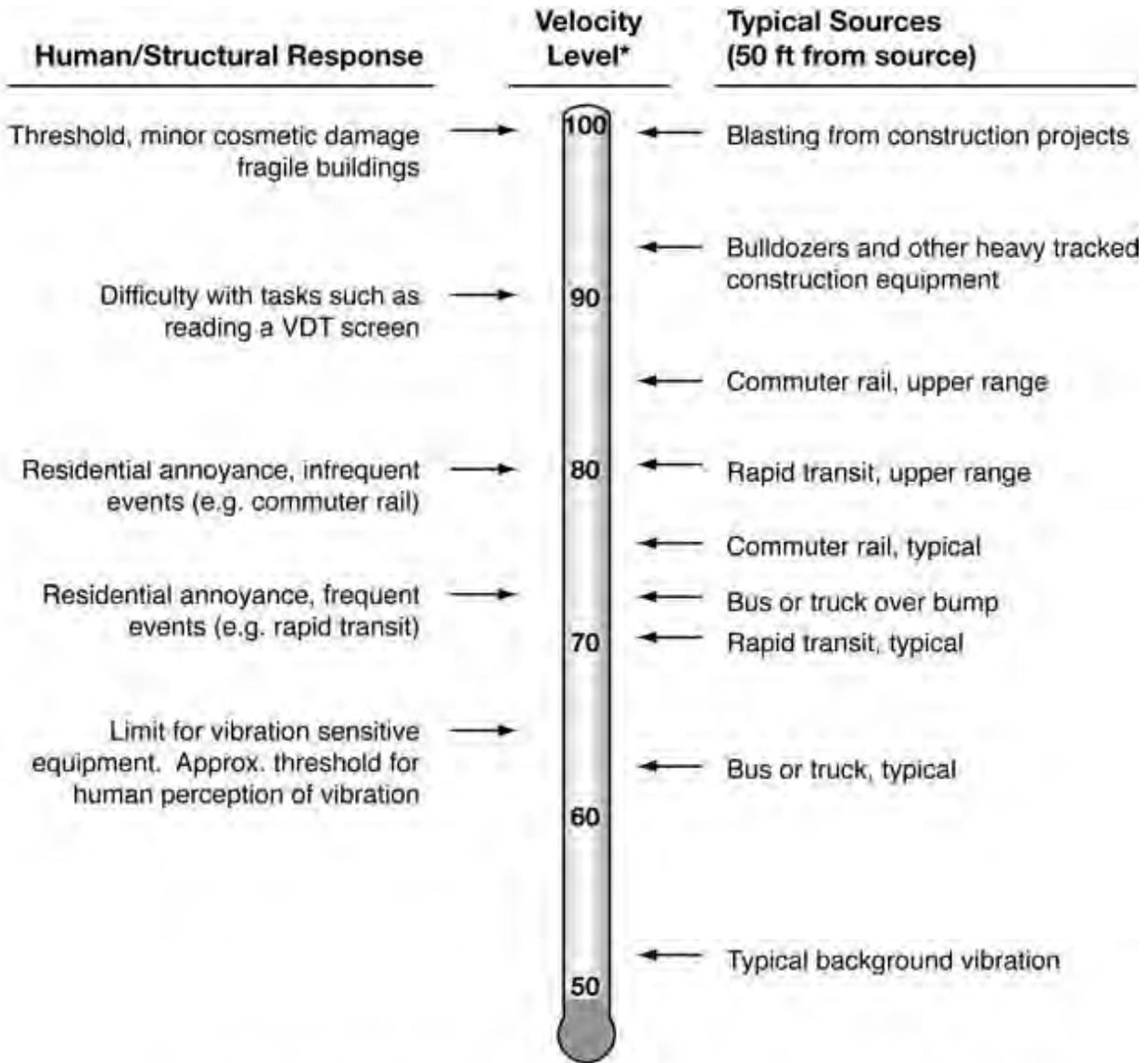
Another sound measure known as the Day-Night Level (Ldn) is an adjusted average sound level for a 24-hour day. It is calculated by adding a 10-dB penalty to sound levels during nighttime hours (10:00 p.m. to 7:00 a.m.). This penalty compensates for the increased sensitivity to noise during the typically quieter nighttime hours. The FTA uses Ldn and Leq to evaluate transportation noise impacts at the surrounding communities.

1.3 Vibration Methodology and Criteria

Vibration is defined as any oscillatory motion induced in a structure or mechanical device as a direct result of some type of applied force or displacement. Sources of groundborne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or manmade (explosions, machinery, traffic, construction equipment, etc.). Displacement, in the case of a vibrating floor, is simply the distance that a point on the floor moves away from its static position. The velocity describes the instantaneous speed of the floor movement and acceleration is the rate of change of the speed. The response of humans, buildings, and equipment to vibration is normally described using velocity or acceleration. FTA uses the abbreviation “VdB” for vibration decibels (relative to 10^{-6} inches/second) to reduce the potential for confusion with sound decibels.

Figure 2 illustrates common vibration sources and the human and structural responses to groundborne vibration. As illustrated, the threshold of perception for human response is approximately 65 VdB; however, human response to vibration is not usually significant unless the vibration exceeds 70 VdB. Vibration tolerance limits for sensitive instruments such as magnetic resonance imaging (MRI) or electron microscopes could be much lower than the human vibration perception threshold.

Figure 2. Typical Levels of Groundborne Vibration



* RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second

2 IMPACT CRITERIA

This section presents the guidelines, criteria, and regulations used to assess noise impacts associated with the proposed project.

2.1 Federal Transit Administration

2.1.1 Operational

The criteria in the *Transit Noise and Vibration Impact Assessment* guidance manual [FTA 2006] (FTA manual) were used to assess existing ambient noise levels and opening-year noise impacts from bus operations. These criteria were developed using well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. The amount that transit projects are allowed to change the overall noise environment is reduced with increasing levels of existing noise.

The FTA manual provides three levels of criteria for assessment of noise impact from transit projects: No Impact, Moderate Impact and Severe Impact. Noise-sensitive land uses are grouped into three categories: Category 1, Category 2 and Category 3. The categories are described in Table 2. The FTA noise impact thresholds, as indicated in Figure 3 and Figure 4, are based on the increase of the existing ambient noise level associated with operations of the project or in combination with other new planned projects (i.e., cumulative impact). The FTA manual specifies a particular noise metric to be used depending on the specific land-use (e.g., residential). The Ldn is typically used for residential uses.

The interpretations of these two levels (Moderate and Severe) of impact are summarized as follows:

Moderate Impact: The change in the cumulative noise level is noticeable to most people, but it may not be sufficient to cause strong, adverse reactions from the community.

Severe Impact: Project noise above the upper curve is considered to cause a Severe Impact since a substantial percentage of people would be highly annoyed by the new noise. Noise mitigation would normally be specified for severe impact areas unless there is no practical method of mitigating the noise.

Although the curves in Figure 3 and Figure 4 are defined in terms of the project noise exposure and existing noise exposure, it is important to emphasize that the increase in the cumulative noise – when the project noise is added to the existing noise – is the basis for the criteria.

Figure 3 shows that the criterion for impact allows a noise exposure increase of 10 dBA if the existing noise exposure is 42 dBA or less but only a 1 dBA increase when the existing noise exposure is 70 dBA. As the existing level of ambient noise increases, the allowable absolute level of project noise increases, but the total allowable increase in community noise exposure is reduced.

For residential land use, the noise criteria are to be applied outside the building locations at noise-sensitive areas with frequent human use, including outdoor patios, decks, pools, and play areas. If none, the criteria should be applied near building doors and windows.

Table 2. Land Use Categories and Metrics for Transit Noise Impact Criteria

Land Use Category	Noise Metric, dBA	Description of Land Use Category
1	Outdoor Leq(h)*	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use.
2	Outdoor Ldn	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor Leq(h)*	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Buildings with interior spaces where quiet is important, such as medical offices, conference rooms, recording studios, and concert halls fall into this category. Places for meditation or study associated with cemeteries, monuments, and museums. Certain historical sites, parks, and recreational facilities are also included.

Source: FTA 2006

Note: Leq for the noisiest hour of transit-related activity during hours of noise sensitivity.

Figure 3. FTA Noise Impact Criteria for Transit Projects

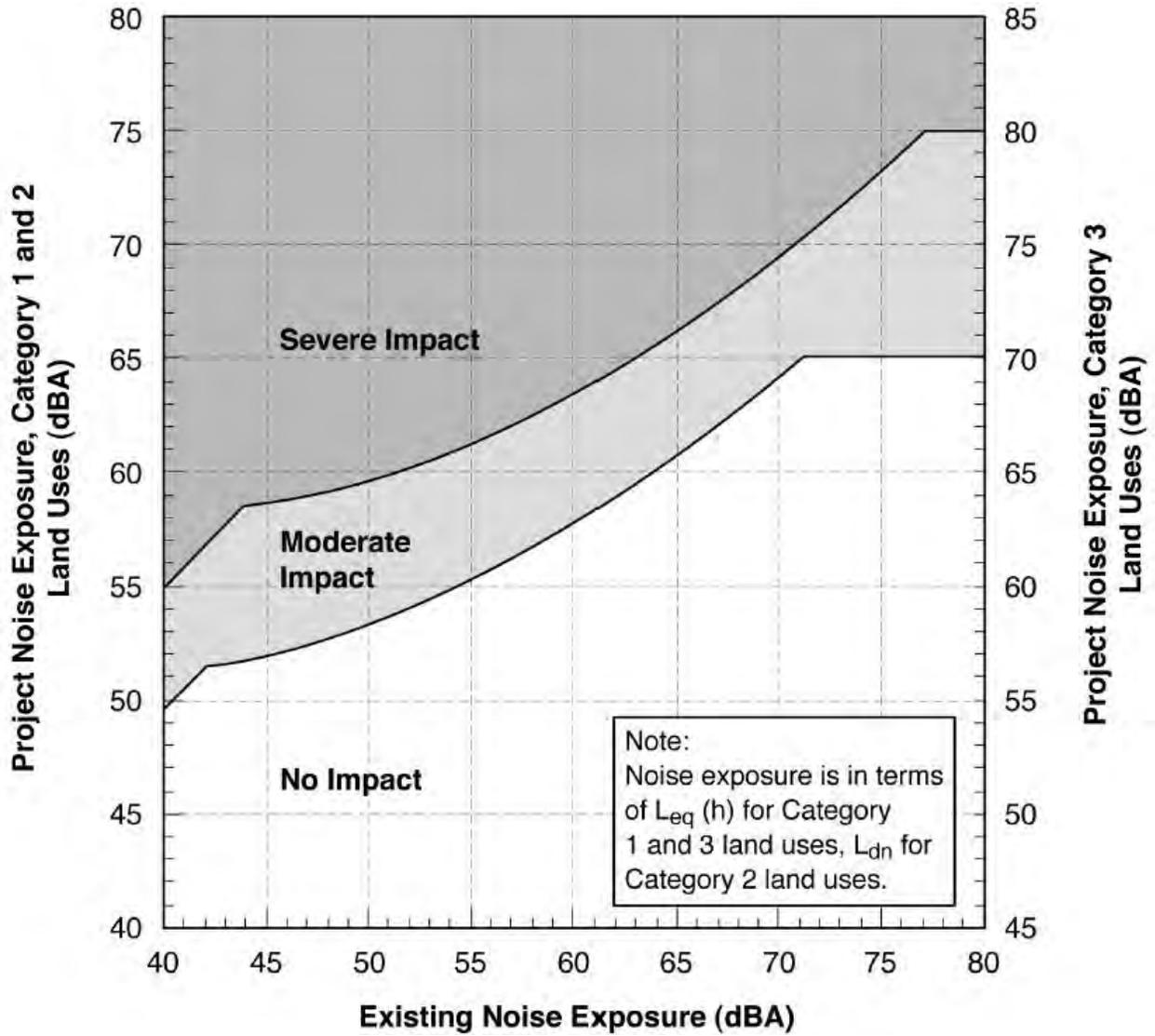
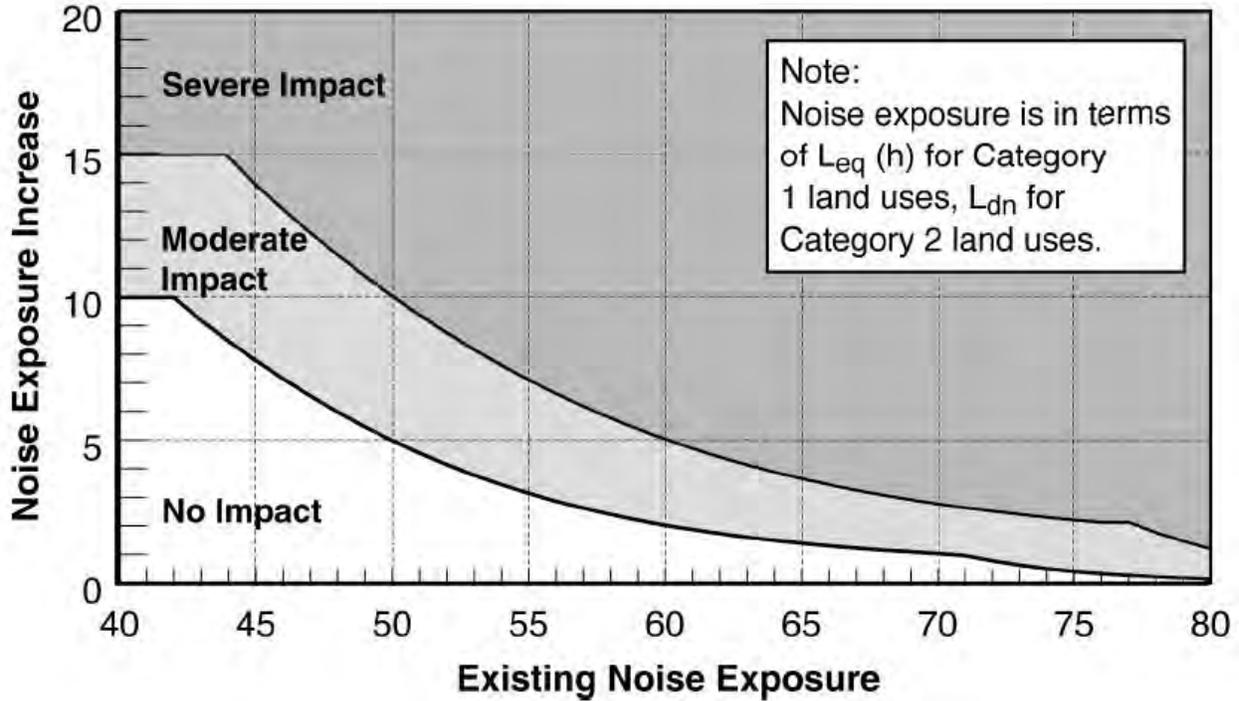


Figure 4. Increase in Cumulative Noise Levels Allowed by FTA Criteria



2.1.2 Construction

According to the FTA, project construction noise criteria should take the following into account: the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use (FTA 2006). Sound level guidelines suggested by the FTA for the evaluation of construction noise impacts are summarized below. In urban areas with high ambient noise levels (L_{dn} greater than 65 dBA), the sound level from construction should not exceed the ambient sound level by more than 10 dBA. If these criteria are exceeded, there may be adverse community reaction. FTA construction noise criteria are shown in Table 3.

Table 3. FTA Guidelines for Assessing Construction Noise Impacts

Land Use	8-Hour Leq (dBA)	
	Day	Night
Residential	80	75
Commercial	85	80
Industrial	90	85

Source: FTA 2006

2.1.3 Vibration Impact Criteria

Table 8-1 of the FTA manual (reproduced as Table 4 below) presents FTA vibration impact criteria for various land use categories. The criteria are based in part on the frequency of events and related to groundborne vibration that can cause human annoyance or interference with the use of vibration-sensitive equipment. The criteria for acceptable ground-borne vibration are expressed in terms of root mean square (RMS) velocity levels in VdB and are based on the maximum levels for a single event (Lmax).

Table 4. FTA Vibration Impact Criteria

Land Use Category	Frequent Events	Occasional Events	Infrequent Events
Category 1	65 VdB	65 VdB	65 VdB
Category 2	72 VdB	75 VdB	80 VdB
Category 3	75 VdB	78 VdB	83 VdB

Notes:

1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the Heating, Ventilating, and Air Conditioning (HVAC) systems and stiffened floors.
5. Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

VdB re 1 micro-inch/second

Source: FTA 2006

The land use categories in Table 4 are detailed below:

Vibration Category 1 - High Sensitivity: Included in Category 1 are buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance.

Vibration Category 2 - Residential: This category covers all residential land uses and any buildings where people sleep, such as hotels and hospitals. No differentiation is made between different types of residential areas.

Vibration Category 3 - Institutional: Vibration Category 3 includes schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.

The FTA manual provides a procedure to determine whether or not a transit project requires a vibration analysis. Transit projects that involve rubber tire vehicles rarely show potential for vibration impacts and do not require vibration analysis. Three factors are checked to determine if there is potential for vibration impacts from bus projects:

1. Would there be expansion joints, speed bumps, or other design features that result in unevenness in the road surface near vibration-sensitive buildings? Such irregularities can result in perceptible ground-borne vibration at distances up to 75 feet away.
2. Would buses, trucks, or other heavy vehicles be operating close to a sensitive building? Research using electron microscopes and manufacturing of computer chips are examples of vibration sensitive activities.
3. Does the project include operation of vehicles inside or directly underneath buildings that are vibration-sensitive? Special considerations are often required for shared use facilities such as bus stations located inside an office building complex.

Projects that do not include any of those three conditions are exempt from vibration analysis. Projects that do include one of the factors are then screened for distances from vibration-sensitive land uses. For bus projects, the vibration source must be a minimum of 100 feet from Category 1 land uses and 50 feet from Category 2 land uses. No distances are specified for Category 3.

Section 12.2.2 of the FTA Manual establishes construction vibration criteria. Table 12-3 of the FTA Manual (reproduced as Table 5 below) defines damage criteria in Peak Particle Velocity (PPV) in inches/second and Root Mean Square (RMS) velocity (Lv) in VdB at various building types.

Table 5. FTA Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate Lv [†]
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Notes:

[†] RMS Velocity in decibels (VdB) re 1 micro-inch/second

Source: FTA 2006

3 EXISTING NOISE ENVIRONMENT

Many land uses are considered sensitive to noise. Noise-sensitive receptors are land uses associated with indoor and/or outdoor activities that may be subject to stress and/or significant interference from noise, such as residential dwellings, transient lodging (hotels/motels), dormitories, hospitals, educational facilities, and libraries. Industrial and commercial land uses are generally not considered sensitive to noise. Analysis was conducted at noise-sensitive receptors in the project area.

Noise-sensitive land uses near the project include single-family residences adjacent on the south and west. These are considered by the FTA to be Land Use Category 2. The primary existing ambient noise source at the residences is vehicular traffic on SR 821 and NW 27th Avenue.

3.1 Noise Level Measurements

An ambient noise level survey was conducted to estimate the existing noise environment in the project area. Two unattended long-term (24-hour) measurements and five attended short-term (20-minute) measurements were conducted at or near exterior noise-sensitive areas.

The data collection devices included two Larson Davis Model 720 American National Standards Institute (ANSI) Type 2 Integrating Sound Level Meters (SLMs) and one RION Model NL-31 ANSI Type 1 Integrating SLM. The meters were field-calibrated with a Larson Davis Model CAL200 or CAL150 acoustic calibrator. The meters were set for “slow” time response and A-weighting for all measurements. The microphones were equipped with windscreens and placed approximately five feet above the ground to simulate the average height of the human ear. The microphones were placed at least five feet from all reflecting surfaces. All sound level measurements were in accordance with ISO 1996-1, -2, and -3. The accuracy of the equipment is maintained through a program established by the manufacturer, and is traceable to the National Institute of Standards and Technology (NIST).

Noise sources in the project area observed during the site visit included vehicular traffic on SR 821 and NW 27th Avenue, occasional distant aircraft, the Calder Casino & Race Course fountain, wind through the trees, birds, and occasional distant dogs barking.

The long-term measurements were conducted between Tuesday, January 29, 2013, and Wednesday, January 30, 2013. The measurements correspond to the locations depicted on Figure 5. The results of the long-term measurements are summarized in Table 6.

The hourly average sound levels (Leqs) measured at LT1 and LT2 were used to calculate the Ldn for each location. A review of Table 6 shows that a noise level of approximately 61 dBA Ldn was measured at LT1, and a noise level of approximately 67 dBA Ldn was measured at LT2.

Table 6. Long-Term Noise Measurements (dBA)

Date	Time	LT1	LT2
Tuesday, January 29, 2013	0900 – 1000	58.5 dBA Leq	-
	1000 – 1100	57.7 dBA Leq	-
	1100 – 1200	57.1 dBA Leq	64.0 dBA Leq
	1200 – 1300	57.2 dBA Leq	63.7 dBA Leq
	1300 – 1400	57.0 dBA Leq	64.6 dBA Leq
	1400 – 1500	57.6 dBA Leq	64.3 dBA Leq
	1500 – 1600	58.6 dBA Leq	64.9 dBA Leq
	1600 – 1700	59.4 dBA Leq	65.5 dBA Leq
	1700 – 1800	59.0 dBA Leq	64.4 dBA Leq
	1800 – 1900	58.5 dBA Leq	63.1 dBA Leq
	1900 – 2000	57.0 dBA Leq	62.6 dBA Leq
	2000 – 2100	56.5 dBA Leq	62.4 dBA Leq
	2100 – 2200	56.0 dBA Leq	62.4 dBA Leq
	2200 – 2300	55.4 dBA Leq	62.4 dBA Leq
	2300 – 2400	54.2 dBA Leq	61.4 dBA Leq
Wednesday, January 30, 2013	0000 – 0100	52.2 dBA Leq	59.3 dBA Leq
	0100 – 0200	50.3 dBA Leq	57.6 dBA Leq
	0200 – 0300	49.0 dBA Leq	56.9 dBA Leq
	0300 – 0400	50.8 dBA Leq	56.4 dBA Leq
	0400 – 0500	51.3 dBA Leq	57.4 dBA Leq
	0500 – 0600	54.0 dBA Leq	60.6 dBA Leq
	0600 – 0700	58.0 dBA Leq	63.4 dBA Leq
	0700 – 0800	59.8 dBA Leq	64.5 dBA Leq
	0800 – 0900	58.6 dBA Leq	64.5 dBA Leq
	0900 – 1000	-	63.8 dBA Leq
	1000 – 1100	-	64.9 dBA Leq
		61.0 dBA Ldn	67.4 dBA Ldn

Notes:

LT1 was conducted in the backyard of 2901 NW 213th Street.

LT2 was conducted in the backyard of 21241 NW 27th Court.

The short-term measurements were taken on Tuesday, January 29, 2013, during the daytime period (7:00 a.m. – 7:00 p.m.). Weather conditions during the short-term measurements ranged from 79-81°F, 70-88% relative humidity, 0-80% cloud cover, and 0-11 mph wind speeds. The measurements correspond to the locations depicted on Figure 5. The results of the short-term measurements are summarized in Table 7. A review of Table 7 shows that the measured daytime noise levels ranged from approximately 56 dBA Leq to 66 dBA Leq.

The primary noise source affecting ST1 and ST3 was NW 27th Avenue; this was also the primary noise source affecting LT2. The Ldns at ST1 and ST3 were estimated by correlating the short-term noise measurements with the measured noise level during the same hourly period at LT2. Similarly, the Ldns at ST2, ST4, and ST5 were estimated using LT1. The estimated Ldns are shown in Table 7.

Table 7. Short-Term Noise Measurements (dBA)

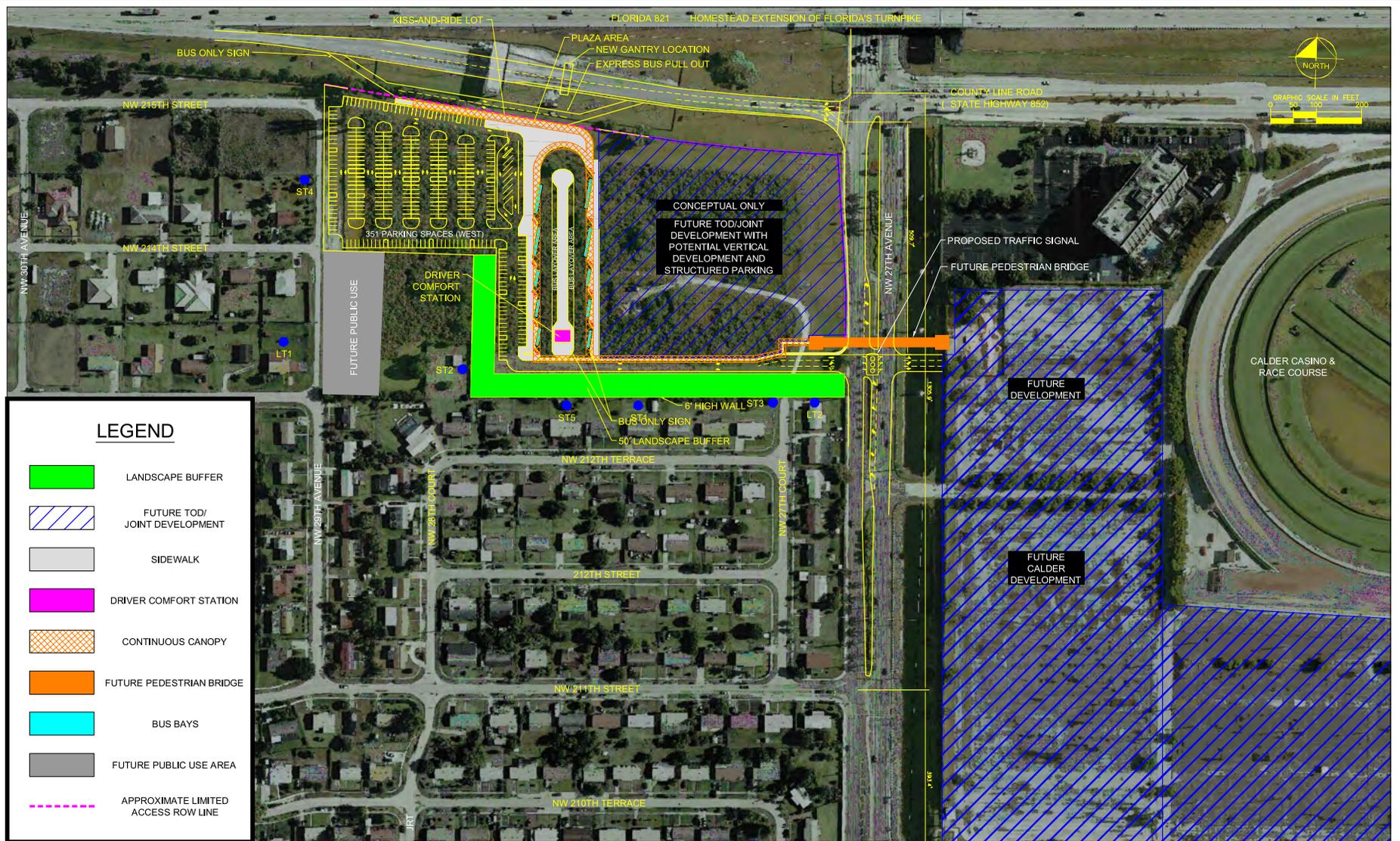
Measurement	Location / Address	Time	Leq	Lmin	Lmax	L10	L50	L90	Ldn*
ST1	2793 NW 212th Terrace – backyard	0845 - 0905	58.2	53.1	62.7	59.6	57.9	56.0	61
ST2	2843 NW 212th Terrace – backyard	0925 - 0945	55.5	51.2	62.0	57.0	55.1	53.3	58
ST3	2763 NW 212th Terrace – backyard	0955 - 1015	59.0	53.5	67.7	60.7	58.4	55.8	62
ST4	2901 NW 214th Street – backyard	1425 - 1445	61.7	56.4	68.8	63.7	61.0	59.1	65
ST5	2813 NW 212th Terrace – backyard	1505 - 1525	59.0	54.2	63.4	60.7	58.7	56.5	61

Note:

All measurements conducted on Tuesday, January 29, 2013.

*Ldn estimated by correlating ST1 and ST3 to LT2, and correlating ST2, ST4, and ST5 to LT1, as described above.

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**PARK AND RIDE TRANSIT TERMINAL
 NW 215TH STREET AND NW 27TH AVENUE
 CONCEPTUAL SITE PLAN**

NOISE MEASUREMENT LOCATIONS
 LT = LONG-TERM ST = SHORT-TERM

4 IMPACTS

4.1 Significance Criteria

The proposed project could have a significant effect with respect to noise or vibration if:

- The projected noise level increase over existing conditions at a noise sensitive land use resulting from operations exceeds the FTA Severe Impact threshold shown in Figure 3 or Figure 4.
- The projected 8-hour equivalent noise level from construction activities, including staging areas, exceeds the guidelines shown in Table 3 at a noise sensitive land use.
- The projected vibration level exceeds an FTA impact level identified in Table 4 or an FTA damage threshold identified in Table 5.

4.2 Operational

The Federal Highway Administration (FHWA) Traffic Noise Model (TNM) (version 2.5) was used to estimate project noise levels from the onsite vehicle operations. The modeling effort considered the peak-hour traffic volume and average estimated vehicle speed. The peak-hour traffic noise level was considered to be equivalent to the Ldn.

The peak-hour bus traffic directly associated with the project was assumed to consist of four MDT Route 27 buses and six MDT Route 297 Orange MAX buses. Peak-hour bus traffic indirectly associated with the project was assumed to consist of four MDT Route 99 buses, three BCT Route 2 buses, two BCT University Breeze buses, eight BCT 95 buses, and eight community shuttles/circulators. The passenger vehicle parking lot was conservatively assumed to experience a full changeover, or 350 cars in and out of the project site, during the peak hour. The kiss-n-ride drop-off / pick-up area south of the bus terminal was assumed to experience 50 cars during the peak hour.

The vehicle paths of travel were generated from the conceptual site plan of the project layout. All (35) buses and all (400) cars were assumed to enter and exit at the driveway on NW 27th Avenue; the buses were assumed to proceed directly to the bus terminal, 350 of the cars were assumed to proceed to the vehicle parking lot, and 50 cars were assumed to proceed to the kiss-n-ride lot. All onsite traffic was assumed to operate at a speed of 15 miles per hour (mph).

A default ground type of “pavement” was used in the model. This parameter affects propagation conditions, which represent noise attenuation caused by sound waves interacting with ground surfaces between the source and receiver. Sound levels caused by line sources (i.e., variable or moving sound sources such as traffic) decrease at a rate of 3.0 to 4.5 dBA when the distance from the road is doubled, depending on the ground surface hardness between the source and the receiving property. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures, barriers, and topography. However, the noise attenuating effects of changes in elevation, topography, and intervening structures (walls and buildings) were not included in the model. Therefore, the modeling effort is considered a worst-case representation of the roadway noise.

The noise emission specifications of the specific project buses were not available. Therefore, it was assumed that the buses would produce noise levels less than or equal to the default TNM 2.5 ‘bus’ vehicle type, which was used in the analysis. The noise emission level of the standard TNM 2.5 ‘bus’ vehicle type is such that the hourly average noise level produced by a long flat straight roadway carrying one vehicle per minute at a constant speed of 30 mph is approximately 60 dBA Leq at 50 feet from the centerline.

4.2.1 Project Effect on Existing Conditions

Table 8 shows estimated existing noise levels in the project area with and without the project. Existing noise levels at residences without a measurement were estimated based on nearby measurements. Note that all noise levels are rounded to the nearest decibel. Existing-plus-project noise levels were compared to existing (without-project) noise levels, and evaluated against FTA criteria.

Table 8. Existing-Plus-Project Noise Levels (dBA Ldn)

Address	ML	Existing Noise Level	FTA Impact Classification			Project Noise Level	FTA Impact: No / Moderate / Severe
			Noise Exposure [No Impact]	Noise Exposure [Moderate Impact]	Noise Exposure [Severe Impact]		
21241 NW 27th Court	LT2	67	< 63	63 – 67	> 67	58	No
2763 NW 212th Terrace	ST3	62	< 59	59 – 64	> 64	58	No
2773 NW 212th Terrace	(ST3)	62	< 59	59 – 64	> 64	56	No
2783 NW 212th Terrace	(ST1)	61	< 59	59 – 64	> 64	55	No
2793 NW 212th Terrace	ST1	61	< 59	59 – 64	> 64	54	No
2803 NW 212th Terrace	(ST1)	61	< 59	59 – 64	> 64	53	No
2813 NW 212th Terrace	ST5	61	< 59	59 – 64	> 64	52	No
2823 NW 212th Terrace	(ST5 / ST2)	60	< 58	58 – 63	> 63	52	No
2833 NW 212th Terrace	(ST2 / ST5)	59	< 58	58 – 63	> 63	51	No
2843 NW 212th Terrace	ST2	58	< 57	57 – 62	> 62	52	No
2853 NW 212th Terrace	(ST2)	58	< 57	57 – 62	> 62	49	No
21241 NW 29th Avenue	(ST2 / LT1)	59	< 58	58 – 63	> 63	48	No
21220 NW 29th Avenue	(LT1 / ST2)	60	< 58	58 – 63	> 63	47	No
2901 NW 213th Street	LT1	61	< 59	59 – 64	> 64	48	No
2900 NW 214th Street	(LT1 / ST4)	63	< 60	60 – 65	> 65	50	No
2901 NW 214th Street	ST4	65	< 61	61 – 66	> 66	52	No

Notes:

ML = Measurement Location

Parentheses indicate reference ML.

FTA Impact thresholds are reported for Land Use Category 2.

A review of Table 8 shows that the project noise levels would be considered by FTA to generate No Impact when compared with existing conditions. A No Impact classification under the FTA criteria indicates that the proposed project would have no noise impact since, on the average, the introduction of the project would result in an insignificant increase in the number of people highly annoyed by new noise. Therefore, for purposes of this study, a no impact finding under FTA criteria is considered a less than significant impact.

4.2.2 Operational Vibration

Vibration-sensitive land uses near the project include single-family residences adjacent on the south and west. These are considered by the FTA to be Land Use Category 2.

Routine operation and maintenance activities associated with the proposed Project would include the use of buses on the project site and general maintenance of project infrastructure. Operation of buses on the project site would not generate groundborne vibration.

There would not be expansion joints, speed bumps, or other design features that result in unevenness in the road surface near vibration-sensitive buildings. There are no known vibration sensitive manufacturing or research land uses close to buses operating on the project site. The park-and-ride facility would provide a smooth, stable and sturdy pavement surface. Buses would not operate inside or directly underneath buildings that are vibration sensitive. Buses have rubber tires and suspension systems that isolate vibrations from the ground.

A screening evaluation was performed, incorporating the environmental factors and characteristics of bus operations described above, to determine whether buses might generate vibrations affecting land uses adjacent to the Project site. The screening procedure did not identify any areas where operational vibration impacts have the possibility to create a significant impact. Therefore, a more detailed general assessment of impacts is not warranted per FTA guidance (FTA 2006).

4.3 Construction

4.3.1 Construction Noise

Project construction would include grading the site, paving the roadways and parking lots, and constructing the bus terminal. All construction would occur during daytime hours of 7:00 a.m. to 10:00 p.m. in all areas.

Construction noise varies depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work.

This construction noise analysis assumes that noise would decrease at a rate of 6 dBA per doubling of distance from the construction site. At this early stage of the project, there is no detailed schedule of the actual equipment involved during construction. However, for the purpose of this initial noise evaluation, the effect of using typical heavy equipment during construction has been evaluated. Noise levels are reported in terms of 8-hour Leq. Construction equipment was assumed to have a noise source height of 11 feet above local ground level.

The highest sound levels would be expected during grading, when equipment such as scrapers, bulldozers, backhoes and water trucks would be used. Grading typically occurs over a large area and the equipment is not located at a particular location for long periods. Sound levels during the remaining construction phases would be expected to be at least 10 dB less than during grading activity. No blasting or pile driving would be necessary.

A grading plan and construction phasing plan has not been developed at this time; therefore, only a general estimate of construction noise levels can be provided. Noise levels associated with equipment used for grading are shown in Table 9.

Table 9. Grading Noise Source Levels

Noise Source	Noise Level
Bulldozer	85 dBA at 50 feet
Scraper	85 dBA at 50 feet
Backhoe	85 dBA at 50 feet
Water Truck	85 dBA at 50 feet

Acoustical calculations were performed to estimate sound levels from grading at the closest residences. The south project property line is contiguous with the north residential property line, which is approximately 300 feet from the center of the project site. It was assumed that two bulldozers, two scrapers, one backhoe, and one water truck would operate continuously in the center of the property. A combined point source level of 93 dBA at 50 feet would attenuate to approximately 77 dBA at 300 feet, the distance from the center of the site to the closest residences. This is lower than the FTA daytime construction noise threshold of 80 dBA Leq. In practice, the sound level at the residences would be less than this estimate because no correction was applied for downtime associated with equipment maintenance, breaks, or similar situations. Noise from construction is considered to be a short-term adverse impact; however, because FTA construction noise limits would not be exceeded, noise from construction is considered to result in no impact.

4.3.2 Construction Vibration

Project construction would involve the use of equipment as described in Section 4.3.1. The vibration levels associated with vibration-producing construction equipment are shown in Table 10. Source vibration levels were obtained from Table 12-2 of the FTA Manual. Construction equipment for which no vibration data is provided by the FTA manual was assumed to generate negligible vibration and was therefore not included in the analysis.

Two types of potential construction-induced vibration impacts were evaluated at the residences: Annoyance and Building Damage. The criterion used in assessing annoyance is contained in the FTA guidance manual and presented in Section 2.3.2. The criteria relating to potential cosmetic damage (i.e., cracking) due to building vibration is 0.2 in/sec PPV based on the FTA guidelines. It is important to recognize that the thresholds do not represent a level at which damage would occur; rather, as long as the vibration does not exceed these limits, building damage, even minor cosmetic damage, is very unlikely.

A 50-foot-wide landscape buffer would be provided along the south and west sides of the project site. Construction activity would occur up to within 50 feet of the property line. The ten residences along NW 212th Terrace are generally located approximately 50 feet south of this property line; however, the residence at 21241 NW 27th Court is approximately 10 feet from this property line. The vibration calculations were conducted at distances of 60 feet and 100 feet.

Table 10. Construction Equipment Vibration Levels

Equipment	PPV Source Level (at 25') ¹	RMS Source Level (at 25') ¹	PPV at Façade	RMS at Façade	PPV at Façade	RMS at Façade
			Distance to Façade: 60 feet		Distance to Façade: 100 feet	
Large Bulldozer	0.089 in/sec	87 VdB	0.034 in/sec	76 VdB	0.019 in/sec	69 VdB
Water Truck	0.076 in/sec	86 VdB	0.029 in/sec	75 VdB	0.017 in/sec	68 VdB
Concrete Mixer Truck	0.076 in/sec	86 VdB	0.029 in/sec	75 VdB	0.017 in/sec	68 VdB
Jackhammer	0.035 in/sec	79 VdB	0.013 in/sec	68 VdB	0.008 in/sec	61 VdB
Small Bulldozer (Bobcat)	0.003 in/sec	58 VdB	0.011 in/sec	49 VdB	0.007 in/sec	40 VdB

¹ Source: FTA 2006

Resultant vibration levels at façades were calculated using the methods detailed in Section 12.2.1 of the FTA Manual. It was assumed that only one piece of vibration-producing equipment would be used at one time. The threshold of damage at Category III (non-engineered timber and masonry) buildings is 0.2 in/sec, and the threshold of annoyance at Category 2 (residential) buildings is 72 VdB for frequent events. A review of Table 10 shows that at the residence at 21241 NW 27th Court, the damage (PPV) threshold would not be exceeded, but the annoyance (RMS) threshold could be exceeded. However, at all other residences in the project area, neither the damage (PPV) threshold nor the annoyance (RMS) threshold would be exceeded.

Operation of the large bulldozer, water truck, and/or concrete mixer truck within 100 feet of the residence at 21241 NW 27th Court, which would generate construction vibration levels over 72 VdB at this residence, is expected to be less than one week in duration. Thus, the impact is considered adverse and temporary.

4.4 Mitigation

4.4.1 Operational

No impacts were identified. No mitigation is necessary.

4.4.2 Construction Noise

No impacts were identified. No mitigation is necessary.

4.4.3 Construction Vibration

Vibration levels during construction would not exceed the damage threshold at any structures.

Project construction within 100 feet of the residential structure at 21241 NW 27th Court has the potential to generate vibration exceeding the annoyance threshold. This is considered a temporary adverse impact. Measures to reduce and minimize construction vibration include:

Develop a Vibration Control Plan prior to the start of construction to minimize construction vibration annoyance where feasible. The plan should establish vibration thresholds for annoyance and maximum allowable vibration values for potentially affected structures based on an assessment of each structure's ability to withstand the loads and displacements due to construction vibrations. The plan should include a standard pre-construction survey to document the existing condition of all structures within 100 feet of

the construction area. The plan should also include a vibration monitoring plan to verify that no construction activities exceed the annoyance threshold and maximum allowable vibration values established by the Vibration Control Plan, and the implementation of a compliance monitoring program during construction. The vibration monitoring program should identify the duration of monitoring, proposed monitoring equipment, who would perform the monitoring, action that would be taken to correct exceedances, and follow-up procedure. The Vibration Control Plan should be included in the contractor's construction specifications.

Where feasible, require low vibration construction procedures. For instance, perform demolition, earth-moving and ground-impacting operations during non-overlapping phases, where feasible. Unlike noise, total vibration level produced can be substantially reduced when each vibration source operates separately as opposed to simultaneously.

Distribute public notification and complaint response procedures to the resident at 21241 NW 27th Court no less than 5 days prior to the start of construction. The notification should describe the planned work, the days and hours of construction, and the procedures for submitting a complaint or an inquiry. At minimum, include a contact number for the construction manager or their designee with each notification to expedite the handling of complaints or inquiries.

4.5 Summary of Impacts and Mitigation

4.5.1 Operational Noise

Operation of the project would result in noise levels up to 58 dBA Ldn at noise-sensitive land uses in the project area. The noise levels are considered to constitute No Impact with regard to FTA thresholds; no Moderate or Severe Impact would occur. Noise from project operation would result in a less than significant impact.

4.5.2 Operational Vibration

Operation of the project would result in negligible vibration levels. Vibration from project operation would result in a less than significant impact.

4.5.3 Construction Noise

Construction of the project would result in noise levels up to 77 dBA Leq (8 hours) at noise-sensitive land uses in the project area. The noise levels are lower than the FTA daytime construction noise threshold of 80 dBA Leq (8 hours) at Category 2 land uses. Noise from project construction would result in a less than significant impact.

4.5.4 Construction Vibration

Construction of the project would result in vibration levels up to 76 VdB at the residential structure at 21241 NW 217th Court. This vibration level is higher than the FTA annoyance threshold of 72 VdB for frequent events at Category 2 land uses. This is considered a temporary adverse impact. Vibration levels can be reduced with implementation of a Vibration Control Plan, use of low-vibration construction procedures, and exposure of persons to this vibration can be reduced with implementation of public coordination procedures.

5 REFERENCES

- Federal Transit Administration (FTA). 2006. *Transit Noise and Vibration Impact Assessment*. FTA-VA-90-1003-06. May.
- Harris, Cyril M. 1998. *Handbook of Acoustical Measurements and Noise Control*, Third Edition. Acoustical Society of America. Woodbury, NY.
- International Organization For Standardization (ISO). 1996a. *Description and Measurement of Environmental Noise, Basic Quantities and Procedures Part 1*. ISO 1996/1.
- 1996b. *Description and Measurement of Environmental Noise, Basic Quantities and Procedures, Acquisition of Data Pertinent to Land Use, Part 2*. ISO 1996/2.
- 1996c. *Description and Measurement of Environmental Noise, Basic Quantities and Procedures, Application to Noise Limits, Part 3*. ISO 1996/3.

INPUT: ROADWAYS

NW 27th Park-and-Ride

Kimley-Horn and Associates, Inc.				12 February 2013							
SPF				TNM 2.5							
INPUT: ROADWAYS							Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA				
PROJECT/CONTRACT:		NW 27th Park-and-Ride									
RUN:		Project									
Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Kiss-n-ride	12.0	point56	56	903,006.0	595,763.8	0.00				Average	
		point55	55	902,959.1	595,763.1	0.00				Average	
		point54	54	902,855.1	595,758.9	0.00				Average	
		point53	53	902,837.9	595,763.8	0.00				Average	
		point52	52	902,832.5	595,780.6	0.00				Average	
		point51	51	902,828.6	595,873.8	0.00				Average	
		point50	50	902,822.6	595,886.3	0.00				Average	
		point49	49	902,809.5	595,891.9	0.00				Average	
		point48	48	902,715.8	595,900.0	0.00				Average	
		point47	47	902,537.2	595,893.0	0.00				Average	
		point46	46	902,529.8	595,890.2	0.00				Average	
		point45	45	902,526.2	595,882.9	0.00				Average	
		point44	44	902,528.7	595,829.9	0.00				Average	
		point43	43	902,530.1	595,820.2	0.00				Average	
		point42	42	902,537.9	595,813.9	0.00				Average	
		point41	41	902,800.1	595,824.6	0.00				Average	
		point40	40	902,813.2	595,819.8	0.00				Average	
		point39	39	902,819.3	595,809.3	0.00				Average	
		point38	38	902,821.6	595,765.0	0.00				Average	
		point37	37	902,828.3	595,751.8	0.00				Average	
		point36	36	902,846.6	595,745.6	0.00				Average	
		point35	35	902,982.8	595,752.9	0.00					
Car parking	12.0	point104	104	903,339.4	595,746.9	0.00				Average	
		point103	103	903,346.9	595,763.4	0.00				Average	
		point102	102	903,363.9	595,768.2	0.00				Average	

INPUT: ROADWAYS

NW 27th Park-and-Ride

	point101	101	903,481.5	595,772.6	0.00				Average
	point100	100	903,493.6	595,777.6	0.00				Average
	point99	99	903,500.2	595,792.6	0.00				Average
	point98	98	903,493.5	595,947.2	0.00				Average
	point97	97	903,486.6	595,956.9	0.00				Average
	point96	96	903,472.4	595,962.1	0.00				Average
	point95	95	903,040.3	595,943.4	0.00				Average
	point94	94	903,026.1	595,938.5	0.00				Average
	point93	93	903,020.1	595,924.4	0.00				Average
	point92	92	903,026.6	595,784.8	0.00				Average
	point91	91	903,031.0	595,777.3	0.00				Average
	point90	90	903,037.0	595,777.3	0.00				Average
	point89	89	903,040.2	595,785.6	0.00				Average
	point88	88	903,032.2	595,921.9	0.00				Average
	point87	87	903,035.4	595,929.6	0.00				Average
	point86	86	903,046.2	595,934.4	0.00				Average
	point85	85	903,464.2	595,951.5	0.00				Average
	point84	84	903,477.9	595,946.8	0.00				Average
	point83	83	903,484.9	595,935.9	0.00				Average
	point82	82	903,485.8	595,921.1	0.00				Average
	point81	81	903,479.2	595,906.0	0.00				Average
	point80	80	903,465.4	595,900.0	0.00				Average
	point79	79	903,059.5	595,885.6	0.00				Average
	point78	78	903,044.9	595,882.6	0.00				Average
	point77	77	903,045.9	595,874.9	0.00				Average
	point76	76	903,059.2	595,873.6	0.00				Average
	point75	75	903,466.4	595,890.7	0.00				Average
	point74	74	903,481.9	595,886.5	0.00				Average
	point73	73	903,487.3	595,876.6	0.00				Average
	point72	72	903,488.1	595,861.1	0.00				Average
	point71	71	903,481.2	595,846.5	0.00				Average
	point70	70	903,466.9	595,841.9	0.00				Average
	point69	69	903,062.7	595,825.3	0.00				Average
	point68	68	903,050.9	595,822.0	0.00				Average
	point67	67	903,051.2	595,813.4	0.00				Average
	point66	66	903,064.0	595,812.9	0.00				Average
	point65	65	903,468.6	595,831.6	0.00				Average
	point64	64	903,485.0	595,824.9	0.00				Average
	point63	63	903,489.8	595,811.9	0.00				Average

INPUT: ROADWAYS

NW 27th Park-and-Ride

		point62	62	903,490.0	595,801.2	0.00				Average
		point61	61	903,482.7	595,789.6	0.00				Average
		point60	60	903,468.1	595,785.8	0.00				Average
		point59	59	903,353.4	595,780.7	0.00				Average
		point58	58	903,332.6	595,764.4	0.00				Average
		point57	57	903,328.4	595,745.8	0.00				
Bus inbound	12.0	point121	121	903,339.4	595,746.9	0.00				Average
		point29	29	903,332.6	595,764.4	0.00				Average
		point28	28	903,316.2	595,776.1	0.00				Average
		point27	27	903,006.0	595,763.8	0.00				
Bus terminal	12.0	point123	123	903,006.0	595,763.8	0.00				Average
		point26	26	902,980.3	595,773.2	0.00				Average
		point25	25	902,969.3	595,792.1	0.00				Average
		point24	24	902,966.3	595,863.4	0.00				Average
		point23	23	902,946.2	595,889.8	0.00				Average
		point22	22	902,917.5	595,899.3	0.00				Average
		point21	21	902,541.4	595,946.4	0.00				Average
		point20	20	902,520.8	595,957.3	0.00				Average
		point19	19	902,512.3	595,979.0	0.00				Average
		point18	18	902,523.2	596,059.4	0.00				Average
		point17	17	902,536.4	596,079.9	0.00				Average
		point16	16	902,559.1	596,084.6	0.00				Average
		point15	15	902,934.1	596,037.1	0.00				Average
		point14	14	902,947.9	596,026.0	0.00				Average
		point13	13	902,955.3	596,010.6	0.00				Average
		point12	12	902,946.2	595,889.8	0.00				Average
		point11	11	902,946.1	595,869.2	0.00				Average
		point10	10	902,949.6	595,786.1	0.00				Average
		point9	9	902,959.1	595,763.1	0.00				Average
		point8	8	902,982.8	595,752.9	0.00				
Bus outbound	12.0	point124	124	902,982.8	595,752.9	0.00				Average
		point7	7	903,308.5	595,766.4	0.00				Average
		point6	6	903,322.2	595,759.2	0.00				Average
		point5	5	903,328.4	595,745.8	0.00				
All inbound and outbound	12.0	point122	122	903,328.4	595,745.8	0.00				Average
		point4	4	903,335.8	595,573.2	0.00				Average
		point3	3	903,343.6	595,554.8	0.00				Average
		point2	2	903,366.6	595,546.6	0.00				Average
		point125	125	903,578.1	595,554.9	0.00				Average

INPUT: ROADWAYS**NW 27th Park-and-Ride**

		point34	34	903,577.7	595,566.8	0.00				Average	
		point33	33	903,371.1	595,558.2	0.00				Average	
		point32	32	903,354.6	595,564.6	0.00				Average	
		point31	31	903,346.4	595,583.2	0.00				Average	
		point30	30	903,339.4	595,746.9	0.00					

INPUT: TRAFFIC FOR LAeq1h Volumes

NW 27th Park-and-Ride

Kimley-Horn and Associates, Inc.		12 February 2013										
SPF		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		NW 27th Park-and-Ride										
RUN:		Project										
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Kiss-n-ride	point56	56	50	15	0	0	0	0	0	0	0	0
	point55	55	50	15	0	0	0	0	0	0	0	0
	point54	54	50	15	0	0	0	0	0	0	0	0
	point53	53	50	15	0	0	0	0	0	0	0	0
	point52	52	50	15	0	0	0	0	0	0	0	0
	point51	51	50	15	0	0	0	0	0	0	0	0
	point50	50	50	15	0	0	0	0	0	0	0	0
	point49	49	50	15	0	0	0	0	0	0	0	0
	point48	48	50	15	0	0	0	0	0	0	0	0
	point47	47	50	15	0	0	0	0	0	0	0	0
	point46	46	50	15	0	0	0	0	0	0	0	0
	point45	45	50	15	0	0	0	0	0	0	0	0
	point44	44	50	15	0	0	0	0	0	0	0	0
	point43	43	50	15	0	0	0	0	0	0	0	0
	point42	42	50	15	0	0	0	0	0	0	0	0
	point41	41	50	15	0	0	0	0	0	0	0	0
	point40	40	50	15	0	0	0	0	0	0	0	0
	point39	39	50	15	0	0	0	0	0	0	0	0
	point38	38	50	15	0	0	0	0	0	0	0	0
	point37	37	50	15	0	0	0	0	0	0	0	0
	point36	36	50	15	0	0	0	0	0	0	0	0
	point35	35										
Car parking	point104	104	350	15	0	0	0	0	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes

NW 27th Park-and-Ride

	point103	103	350	15	0	0	0	0	0	0	0	0
	point102	102	350	15	0	0	0	0	0	0	0	0
	point101	101	350	15	0	0	0	0	0	0	0	0
	point100	100	350	15	0	0	0	0	0	0	0	0
	point99	99	350	15	0	0	0	0	0	0	0	0
	point98	98	350	15	0	0	0	0	0	0	0	0
	point97	97	350	15	0	0	0	0	0	0	0	0
	point96	96	350	15	0	0	0	0	0	0	0	0
	point95	95	350	15	0	0	0	0	0	0	0	0
	point94	94	350	15	0	0	0	0	0	0	0	0
	point93	93	350	15	0	0	0	0	0	0	0	0
	point92	92	350	15	0	0	0	0	0	0	0	0
	point91	91	350	15	0	0	0	0	0	0	0	0
	point90	90	350	15	0	0	0	0	0	0	0	0
	point89	89	350	15	0	0	0	0	0	0	0	0
	point88	88	350	15	0	0	0	0	0	0	0	0
	point87	87	350	15	0	0	0	0	0	0	0	0
	point86	86	350	15	0	0	0	0	0	0	0	0
	point85	85	350	15	0	0	0	0	0	0	0	0
	point84	84	350	15	0	0	0	0	0	0	0	0
	point83	83	350	15	0	0	0	0	0	0	0	0
	point82	82	350	15	0	0	0	0	0	0	0	0
	point81	81	350	15	0	0	0	0	0	0	0	0
	point80	80	350	15	0	0	0	0	0	0	0	0
	point79	79	350	15	0	0	0	0	0	0	0	0
	point78	78	350	15	0	0	0	0	0	0	0	0
	point77	77	350	15	0	0	0	0	0	0	0	0
	point76	76	350	15	0	0	0	0	0	0	0	0
	point75	75	350	15	0	0	0	0	0	0	0	0
	point74	74	350	15	0	0	0	0	0	0	0	0
	point73	73	350	15	0	0	0	0	0	0	0	0
	point72	72	350	15	0	0	0	0	0	0	0	0
	point71	71	350	15	0	0	0	0	0	0	0	0
	point70	70	350	15	0	0	0	0	0	0	0	0
	point69	69	350	15	0	0	0	0	0	0	0	0
	point68	68	350	15	0	0	0	0	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes

NW 27th Park-and-Ride

	point67	67	350	15	0	0	0	0	0	0	0	0
	point66	66	350	15	0	0	0	0	0	0	0	0
	point65	65	350	15	0	0	0	0	0	0	0	0
	point64	64	350	15	0	0	0	0	0	0	0	0
	point63	63	350	15	0	0	0	0	0	0	0	0
	point62	62	350	15	0	0	0	0	0	0	0	0
	point61	61	350	15	0	0	0	0	0	0	0	0
	point60	60	350	15	0	0	0	0	0	0	0	0
	point59	59	350	15	0	0	0	0	0	0	0	0
	point58	58	350	15	0	0	0	0	0	0	0	0
	point57	57										
Bus inbound	point121	121	0	0	0	0	0	0	35	15	0	0
	point29	29	0	0	0	0	0	0	35	15	0	0
	point28	28	0	0	0	0	0	0	35	15	0	0
	point27	27										
Bus terminal	point123	123	0	0	0	0	0	0	35	15	0	0
	point26	26	0	0	0	0	0	0	35	15	0	0
	point25	25	0	0	0	0	0	0	35	15	0	0
	point24	24	0	0	0	0	0	0	35	15	0	0
	point23	23	0	0	0	0	0	0	35	15	0	0
	point22	22	0	0	0	0	0	0	35	15	0	0
	point21	21	0	0	0	0	0	0	35	15	0	0
	point20	20	0	0	0	0	0	0	35	15	0	0
	point19	19	0	0	0	0	0	0	35	15	0	0
	point18	18	0	0	0	0	0	0	35	15	0	0
	point17	17	0	0	0	0	0	0	35	15	0	0
	point16	16	0	0	0	0	0	0	35	15	0	0
	point15	15	0	0	0	0	0	0	35	15	0	0
	point14	14	0	0	0	0	0	0	35	15	0	0
	point13	13	0	0	0	0	0	0	35	15	0	0
	point12	12	0	0	0	0	0	0	35	15	0	0
	point11	11	0	0	0	0	0	0	35	15	0	0
	point10	10	0	0	0	0	0	0	35	15	0	0
	point9	9	0	0	0	0	0	0	35	15	0	0
	point8	8										
Bus outbound	point124	124	0	0	0	0	0	0	35	15	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes

NW 27th Park-and-Ride

	point7	7	0	0	0	0	0	0	35	15	0	0
	point6	6	0	0	0	0	0	0	35	15	0	0
	point5	5										
All inbound and outbound	point122	122	400	15	0	0	0	0	35	15	0	0
	point4	4	400	15	0	0	0	0	35	15	0	0
	point3	3	400	15	0	0	0	0	35	15	0	0
	point2	2	400	15	0	0	0	5	35	15	0	0
	point125	125	400	15	0	0	0	0	35	15	0	0
	point34	34	400	15	0	0	0	0	35	15	0	0
	point33	33	400	15	0	0	0	0	35	15	0	0
	point32	32	400	15	0	0	0	0	35	15	0	0
	point31	31	400	15	0	0	0	0	35	15	0	0
	point30	30										

INPUT: RECEIVERS

NW 27th Park-and-Ride

Kimley-Horn and Associates, Inc.							12 February 2013				
SPF							TNM 2.5				
INPUT: RECEIVERS											
PROJECT/CONTRACT:			NW 27th Park-and-Ride								
RUN:			Project								
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	
			ft	ft	ft	ft	dBA	dBA	dB	dB	
21241 NW 27th Court	1	1	903,510.9	595,466.0	0.00	4.92	0.00	66	10.0	8.0	Y
2763 NW 212th Terrace	2	1	903,368.5	595,453.1	0.00	4.92	0.00	66	10.0	8.0	Y
2773 NW 212th Terrace	3	1	903,291.3	595,449.1	0.00	4.92	0.00	66	10.0	8.0	Y
2783 NW 212th Terrace	4	1	903,208.7	595,446.6	0.00	4.92	0.00	66	10.0	8.0	Y
2793 NW 212th Terrace	5	1	903,125.8	595,445.1	0.00	4.92	0.00	66	10.0	8.0	Y
2803 NW 212th Terrace	6	1	903,046.4	595,441.8	0.00	4.92	0.00	66	10.0	8.0	Y
2813 NW 212th Terrace	7	1	902,969.0	595,440.1	0.00	4.92	0.00	66	10.0	8.0	Y
2823 NW 212th Terrace	8	1	902,889.6	595,435.8	0.00	4.92	0.00	66	10.0	8.0	Y
2833 NW 212th Terrace	9	1	902,805.8	595,433.3	0.00	4.92	0.00	66	10.0	8.0	Y
2843 NW 212th Terrace	10	1	902,735.7	595,545.3	0.00	4.92	0.00	66	10.0	8.0	Y
2853 NW 212th Terrace	11	1	902,643.6	595,426.5	0.00	4.92	0.00	66	10.0	8.0	Y
21241 NW 29th Avenue	12	1	902,533.3	595,429.2	0.00	4.92	0.00	66	10.0	8.0	Y
21220 NW 29th Avenue	13	1	902,381.4	595,394.9	0.00	4.92	0.00	66	10.0	8.0	Y
2901 NW 213th Street	14	1	902,380.4	595,578.2	0.00	4.92	0.00	66	10.0	8.0	Y
2900 NW 214th Street	15	1	902,376.1	595,727.1	0.00	4.92	0.00	66	10.0	8.0	Y
2901 NW 214th Street	16	1	902,368.4	595,904.4	0.00	4.92	0.00	66	10.0	8.0	Y

RESULTS: SOUND LEVELS

NW 27th Park-and-Ride

Kimley-Horn and Associates, Inc. SPF										12 February 2013 TNM 2.5 Calculated with TNM 2.5			
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		NW 27th Park-and-Ride											
RUN:		Project											
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.					
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name		No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type	With Barrier		Noise Reduction	
					Calculated	Crit'n	Calculated	Crit'n	Impact	Calculated LAeq1h	Calculated	Goal	Calculated minus Goal
				dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
21241 NW 27th Court		1	1	0.0	57.9	66	57.9	10	----	57.9	0.0	8	-8.0
2763 NW 212th Terrace		2	1	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
2773 NW 212th Terrace		3	1	0.0	56.2	66	56.2	10	----	56.2	0.0	8	-8.0
2783 NW 212th Terrace		4	1	0.0	54.7	66	54.7	10	----	54.7	0.0	8	-8.0
2793 NW 212th Terrace		5	1	0.0	53.7	66	53.7	10	----	53.7	0.0	8	-8.0
2803 NW 212th Terrace		6	1	0.0	52.9	66	52.9	10	----	52.9	0.0	8	-8.0
2813 NW 212th Terrace		7	1	0.0	52.2	66	52.2	10	----	52.2	0.0	8	-8.0
2823 NW 212th Terrace		8	1	0.0	51.5	66	51.5	10	----	51.5	0.0	8	-8.0
2833 NW 212th Terrace		9	1	0.0	50.8	66	50.8	10	----	50.8	0.0	8	-8.0
2843 NW 212th Terrace		10	1	0.0	51.7	66	51.7	10	----	51.7	0.0	8	-8.0
2853 NW 212th Terrace		11	1	0.0	49.3	66	49.3	10	----	49.3	0.0	8	-8.0
21241 NW 29th Avenue		12	1	0.0	48.4	66	48.4	10	----	48.4	0.0	8	-8.0
21220 NW 29th Avenue		13	1	0.0	46.8	66	46.8	10	----	46.8	0.0	8	-8.0
2901 NW 213th Street		14	1	0.0	48.3	66	48.3	10	----	48.3	0.0	8	-8.0
2900 NW 214th Street		15	1	0.0	49.9	66	49.9	10	----	49.9	0.0	8	-8.0
2901 NW 214th Street		16	1	0.0	51.8	66	51.8	10	----	51.8	0.0	8	-8.0
Dwelling Units			# DUs	Noise Reduction									
				Min	Avg	Max							
				dB	dB	dB							
All Selected			16	0.0	0.0	0.0							
All Impacted			0	0.0	0.0	0.0							
All that meet NR Goal			0	0.0	0.0	0.0							