Miami-Dade Transportation Planning Organization

South Dade TransitWay BRT Rail Conversion Guide Final Report

July 2024

 The preparation of this report has been financed in part from the U.S. Department of Transportation (USDOT) through the Federal Highway Administration (FHWA) and\or the Federal Transit Administration (FTA), the State Planning and Research Program (Section 505 of Title 23, U.S. Code) and 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.

Table of Contents

List of Tables

List of Figures

List of Acronyms

BABA	Buy America, Buy America
BRT	Bus Rapid Transit
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CIG	Capital Investment Grant
CIGP	County Investment Grant Program
CM/GM	Construction Management/General Contractor (CM/GM)
CMAQ	Congestion Mitigation and Air Quality
CTA	Chicago Transit Authority
DCE	Documented Categorical Exclusion
DMU	Diesel Multiple Unit
DSTT	Downtown Seattle Transit Tunnel
DTPW	Department of Transportation and Public Works (Miami-Dade County)
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMI	Stray Current/Electromagnetic Interference
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
LRT	Light Rail Transit
HOV	High Occupancy Vehicle
HRT	Heavy Rail Transit
IIJA	Infrastructure Investment and Jobs Act
LPA	Locally Preferred Alternative
LRT	Light Rail Transit
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
OCS	Overhead Catenary System
P3	Public Private Partnership
PD	Project Development
PROTECT	Promoting Resilient Operations for Transformative Efficient and Cost Saving Transportation
RAISE	Rebuild American Infrastructure with Sustainability and Equity
SCADA	Supervisory Control and Data Acquisition
SHS	State Highway System
SMART	Strategic Miami Area Rapid Transit
SOGR	State of Good Repair
TCAR	Transit Concepts and Alternatives Review
TDP	Transit Development Plan
TIFIA	Transportation Infrastructure Finance and Innovation Act
TPO	Transportation Planning Organization
TPSS	Traction Power Substations
TRB	Transportation Research Board
USDOT	U.S. Department of Transportation

1. South Dade TransitWay Executive Summary

The South Dade TransitWay is one the six premium transit corridors of the Strategic Miami Area Rapid Transit (SMART) Program. The location of the South Dade TransitWay, also referred to as the South Corridor in this report, is illustrated in **Figure 1**. The South Corridor is a Bus Rapid Transit (BRT) corridor that spans approximately 20 miles from SW 344th Street to the Dadeland South Metrorail Station.

The South Dade TransitWay is currently under construction. The Transit Way Corridor is envisioned to be converted to heavy rail operation at some point in the future. This 20-mile-long heavy rail extension was meant to preserve a "one seat ride" for passengers from the existing end of the line station at Dadeland South to Florida City. To that end, the BRT stations are being built to accommodate the operation of Metrorail heavy rail vehicles. The gate arm design at all intersections has been developed to account for the dynamic envelope of Metrorail vehicles retrofitted with a pantograph to draw electric power from an Overhead Contact System (OCS), as light rail systems.

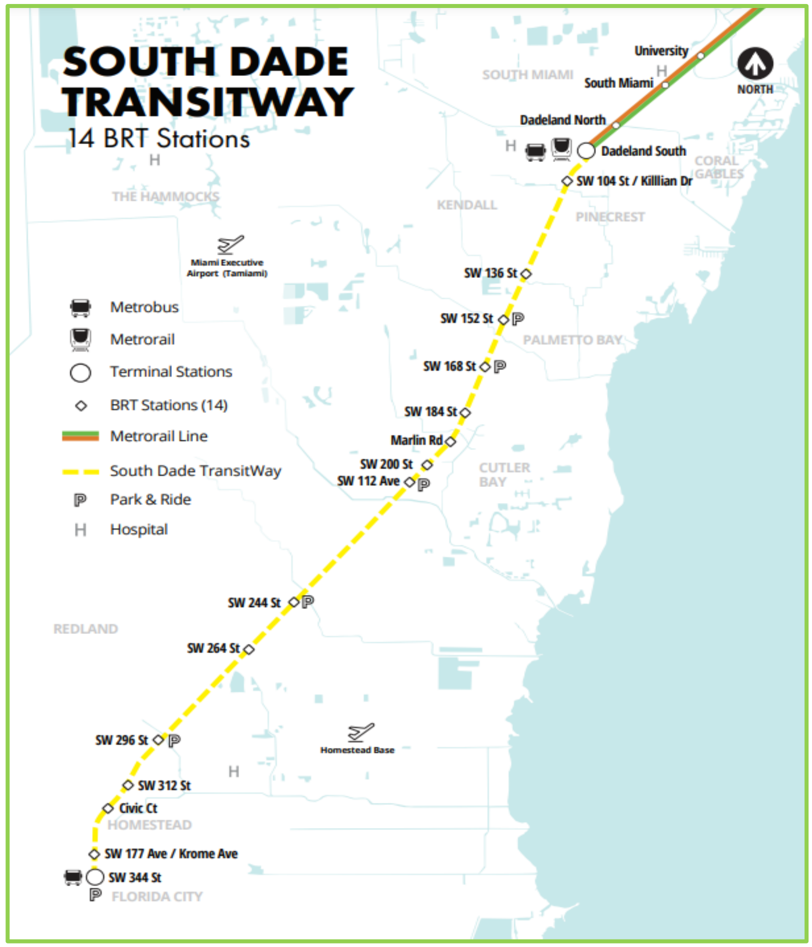


Figure 1 South Dade TransitWay Map (Small)

BRT-to-rail conversion projects are a popular consideration when designing or expanding a BRT system. Cities with heavy traffic congestion and high-capacity transit needs often opt for BRT over Light Rail Transit (LRT) or Heavy Rail Transit (HRT) due to the lower up-front costs and greater flexibility but want to keep the possibility of future conversion to LRT or HRT open.

While numerous BRT projects have been designed with rail conversions in mind, there are very few examples of completed BRT to rail projects in the U.S. and Canada. As such, this report largely focuses on information from the Ottawa Canada BRT to LRT conversion project. The extent to which BRT to rail projects can successfully convert to rail varies based on a number of factors, including the type and size of BRT and rail vehicles, physical station characteristics, and compatibility with current technologies.

This report includes the following sections: a Literature Review, a BRT to Rail Conversion Guide, and the South Dade TransitWay BRT to Rail Blueprint. The Literature Review is comprised of a summary of BRT to rail projects in the United States and Canada. The BRT to Rail Conversion Guide explores applicable federal, state, and local regulations in further detail, as well as any potential constraints of converting the South Dade TransitWay Corridor from BRT to rail. The South Corridor BRT to Rail Blueprint provides a roadmap for the conversion of the South Dade Transitway from BRT to modified Metrorail heavy rail technology.

2. BRT to Rail Conversion Studies- Literature Review

The literature review includes a review and summary of BRT to rail conversion projects in the United States and Canada, as well as key conversion considerations outlined in the 2006 Transportation Research Board (TRB) report, *Designing Bus Rapid Transit for Light Rail Transit Convertibility: Introduction for Planners and Decision Makers*[1]. A preliminary review of relevant U.S. Department of Transportation (USDOT) Federal Transit Administration (FTA), Federal Highway Administration (FHWA), and Florida Department of Transportation (FDOT) regulations, guidance and project development processes is also included, to be more fully examined later in the report.

2.1. Proposed BRT to Rail Conversion Projects

U.S. Examples

Houston, TX

The City of Houston has the Post Oak Boulevard Transitway. This transitway opened in August 2020 but has not come close to achieving the projected ridership. This is due largely to the pandemic and the Bellaire Transit Center being still under development. The BRT line was designed as part of a broader reconstruction of Post Oak Boulevard and includes the basic geometry for conversion to rail. However, given the low ridership and other competing interests for rail in Harris County, Texas there are no current BRT to rail conversion plans[2].

Los Angeles, CA

The Los Angeles County Transportation Expenditure Plan, or Measure R, includes budget amounts for several improvements to the Orange Line BRT, including plans to convert the Orange Line BRT to rail, beginning in 2051[3]. However, current conditions in Los Angeles post-pandemic strongly support continued operation of BRT along this corridor. The original BRT was built and opened in October 2005 within an existing abandoned rail right of way and included significant improvements, such as a dedicated bikeway/pedestrian path and a concrete running way that could accommodate light rail as well as electrical conduit and ductwork that could be conducive to LRT operation.

Currently, plans for the conversion from BRT to rail have been put on hold since the riding public finds the existing BRT system very functional and the planned improvements of two major grade separations at Van Nuys Boulevard and Sepulveda Boulevard coupled with the introduction of gate arms at all the other grade crossing will be enough to satisfy operational and service demands for the foreseeable future.

Seattle, WA

The TRB report, *Designing Bus Rapid Transit for Light Rail Transit Convertibility – Introduction for Planners and Decision Makers* identifies the Downtown Seattle Transit Tunnel (DSTT) as a successful BRT to LRT conversion project. The portion of the BRT system that was converted to rail, however, is limited to a 1.3-

mile-long tunnel. Overall design details for future rail conversion are limited, and despite their best intentions, the rail system installed at the time the tunnel was built was not able to be used and had to be replaced.

The Downtown Seattle Transit Tunnel, also referred to as the Metrobus Tunnel, is a pair of 1.3-mile-long transit tunnels, with four stations, and is used today by the 1 Line Link light rail trains between Westlake and International District/Chinatown stations. According to the article, *Street Railways in Seattle*[4], Planning for the tunnel began in 1974 but construction did not begin until 1987. Although light rail tracks were installed in anticipation of future light rail service, due to issues with the construction and insulation they were not able to be used.

Regular bus service through the tunnel began in 1990, and it was used exclusively by dual mode electric-diesel buses, which ran as trolleys in the tunnel, and diesel buses on surface streets, until 2005. The tunnel was closed from 2005 to 2007 for construction to accommodate both buses and light rail (now the 1 Line trains) with shared lanes and platforms. This required the roadway surface to be lowered by eight inches. Rail services began in 2009 and operated alongside buses until 2019 when bus service ceased, and the remaining bus routes were moved to surface streets.[5] Ownership of the tunnel was recently transferred from King County Metro to Sound Transit, which plans to spend $96 million in necessary upgrades to the stations, utilities, elevators and more.[6]

North America Examples

Toronto, Canada

Ontario Province is developing a full BRT network of more than 150km to support transit in the greater Toronto area. As currently designed, the system will be convertible to a light rail system that can interface with Toronto's subway system and other transit operating within the Greater Toronto Area. The conversion will take place over the coming decades as ridership builds and funding becomes available.

2.2. Completed BRT to Rail Conversion Projects

North America Examples

Ottawa, Canada

Ottawa, capital city of Canada, serves as one of the few examples in North America to successfully convert a BRT line to Light Rail Transit (LRT). Plans for Ottawa's BRT system was originally developed in the 1960s with several modifications before it was opened in stages between 1983 and 1996. When Ottawa began its bus-way initiative, there were very few reference materials or working examples available, with none featuring a similar northern climate. They performed local trials and data collection to arrive at a design, and although BRT was chosen, it was decided to prepare for conversion to LRT where it was cost-effective. This involved structural design, clearances, and grades that complied with LRT operations.

Transitway stations in Ottawa are substantial, distinct facilities, heavily influenced by the winter weather. Heated, enclosed on-platform waiting areas provide winter relief and central locations for passenger information. All stations are four lanes wide to allow express buses to pass stopped ones. Movement between platforms is by a bridge accessed by stairs and elevator.

Ottawa's BRT station characteristics include the following:

- Station Characteristics: 55-meter x 6-meter platforms, enclosed (heated) & open shelters, pedestrian bridge, or underpass
- Cross Section at Stations: 4.0 meter through lanes + 3.5 meter stopping lanes + 1.5-meter median barrier
- Cross section between stations: 4-meter lanes + 2.5-meter shoulders[7]

Converting to LRT

The actual conversion from BRT to LRT in Ottawa did not begin until many years later. The city relied heavily on bus transit prior to 2001, when a five-station Diesel Multiple Unit (DMU) Rail pilot project was opened as part of the Trillium Line Pilot project, which upgraded an existing abandoned freight rail corridor and was not a BRT conversion. In the following years, conversion, and expansion of the BRT system to LRT faced ongoing political challenges and the initial LRT project (extension of the Trillium Line pilot project) was cancelled in 2007. Despite these challenges, a new expansion plan was developed and approved in 2008 and the design of the current electrified O-train began in 2009.[8,9]

The first stage of the O-Train BRT to LRT conversion, the Confederation Line shown below in **Figure 2**, opened in 2019, and connects 13 stations across 12.5 km, with 15 trains each with a 600-passenger capacity. The system today consists of both BRT routes and the converted O-train LRT, and operates seven days a week, 365 days a year, across 57 stations, with dedicated train and bus corridors. The network carries 340,000 passengers a day with over 900 vehicles.[10] The stage 2 LRT expansion is underway, with lines expanding in 3 directions, consisting of 44 km of rail, and 24 new stations. It is estimated that the stage 2 expansion will replace more than 900,000 annual rush hour bus trips.[11]

Figure 2 Confederation Line (Ottawa, CA) BRT to Rail Conversion Project Images

Transit Research Board (TRB) Report: Designing Bus Rapid Transit for Light Rail Transit Convertibility – Introduction for Planners and Decision Makers[i]

This 2006 TRB paper includes a review of existing BRT systems, discusses issues related to BRT and LRT conversion, and outlines considerations that should be included in the design of a BRT facility for future conversion from BRT to LRT. Supporters of conversion point to the higher maximum carrying capacity of LRT Vehicles, and lower operating costs due to the need for fewer vehicles and drivers. Those who opposed conversion of BRT to LRT claimed the capital costs associated with the conversion process outweigh any savings derived from possible lower operating costs and that demand must be extremely high to reap those operating cost savings. Other considerations included integration with the larger regional transit system, the ease of transfers between transit modes, and the effect of different modes on land development.

At the time the TRB paper was written, no successful conversions had been completed; however, many BRT projects were designed with rail in mind and included some provisions for a future conversion to LRT. Key considerations included:

- Vehicle type (e.g., LRT, bus, guided bus) should be considered when the typical cross section for a project is being determined. For example, the minimum guided busway cross section is smaller than the typical LRT cross section; however, for a standard bus, the cross section can exceed the LRT requirement once lane widths, shoulder requirements, and possible passing lanes are considered.
- The arrangement of BRT cross sections varies considerably. The systems that use buses have only one lane in each direction with no physical barrier or separation between the lanes. The BRT systems used by buses and general/high-occupancy vehicle (HOV) traffic include physical separation between the lanes and much wider shoulders.
- Although this study did not specifically review LRT projects, it was found that typical LRT cross sections do not vary as much as for BRT. The total width required for two-track (one in each direction) LRT is between 30 and 35 feet.
- The horizontal and vertical geometric constraints and the vehicle envelopes of both the BRT and LRT vehicles are the critical elements that must be considered for future conversion to LRT. LRT design constraints would control the design of a BRT project if future modal flexibility choices are to be accommodated.
- The construction activities required for conversion will include modification to both the main line and stations. If no provisions for LRT are included in the busway construction, the cost of conversion will be significantly higher because of the need for more extreme modification or total reconstruction of structures and other facilities. Also, provisions to accommodate existing BRT service during conversion should be considered.

Table 1 and **Table 2** list U.S. projects that included LRT considerations in their initial BRT design characteristics, separated by BRTs with bus only right of way, versus those that cross general traffic.

Table 1 BRT Projects that Included LRT Provisions (as of 2006) in the U.S.: Bus Only Right of Way

Project	Existing or Proposed	Rail Provisions
Boston, MA — Silver Line tunnel sections	Existing	Yes* The early designs for the Boston Silver Line (originally South Boston Piers busway) were designed for conversion to rail.
Hartford, CT — New Britain-Hartford Busway	Proposed	Yes*
Jacksonville, FL — North-Southeast Busway	Proposed	Yes Horizontal and vertical alignment considered LRT requirements
Los Angeles, CA — Metro Orange Line	Existing	Yes Some allowances for LRT included: • 90% of the horizontal alignment suitable for rail • Vertical geometry suitable for LRT conversion (guideway constructed within an abandoned heavy rail alignment) • Structures constructed for LRT loading; however, some of the bridges need to be rebuilt • Platforms would need to be rebuilt; currently short platforms (suitable for buses only) on the far side of intersections • Alignment is not grade-separated at intersections (36 intersections along alignment)
Pittsburgh, PA — East/South and West Busway	Existing	Yes Some allowances for LRT included • Notches in the retaining walls for future catenary columns • Additional weights or loadings of the track structure and revenue vehicles in the design of the roadway pavement slab and bridge structures • Additional horizontal and vertical clearances for the added track structure and LRT vehicle dynamic envelope, including overhead catenary system and side poles, span wires, and mounting brackets • Alignment (including horizontal and vertical curves and grades) • Clearances are set to allow for light rail vehicles and catenary columns
Seattle, WA — Downtown Seattle Transit Tunnel	Existing	Yes • Adequate clearances for LRT vehicles • Alignment (including horizontal and vertical curves and grades)

*Limited information available

Table 2 BRT Projects with Bus and General Traffic or HOV Interaction (as of 2006) in the U.S.

Project	Existing or Proposed	Rail Provisions
Boston, MA — Silver Line (arterial sections)	Existing	Yes (early stages only) * The early designs for the Boston Silver Line (originally South Boston Piers Busway) were designed for conversion to LRT.
Cleveland, OH — Euclid Avenue BRT	Proposed	No Early stages planned for LRT; however, current design and operation plans would make it difficult for conversion.
Los Angeles, CA—El Monte Busway	Existing	Yes* • Aerial structures designed to accommodate LRT • El Monte busway designed for eventual conversion; however, based on current operation, it appears unlikely that this will happen

*Limited information available on the LRT components included.

Based on the review of the above projects, along with other international BRT and rail projects, this paper identified several key criteria to incorporate into BRT projects to facilitate future rail conversion. Design elements can be categorized into several key areas:

- Horizontal geometry (alignment)
- Vertical geometry (grades and clearances)
- Cross-sectional width
- Structural elements (loading, pavement, and stray current protection)
- Utility accommodation (relocation, new services, and drainage)
- Future guideway construction details to facilitate later removal and replacement with rail.

3. BRT to Rail Conversion Guide

This BRT to Rail Conversion Guide explores relevant federal, state, and local policies and regulations (including the FTA, FHWA, Federal Railroad Administration (FRA), FDOT, and Miami-Dade County), as well as any potential constraints and opportunities as they relate to the conversion of Miami-Dade County's existing BRT system to HRT. A conversion from BRT to HRT would result in a rail system operating within the same right-of-way as the BRT, with any necessary modifications to accommodate updated rail track geometry and other unique features.

3.1. Federal, State, and Local Regulations

This section presents preliminary information and considerations about constraints and opportunities in the regulations and guidance promulgated by the United States Department of Transportation's Federal Transit Administration (USDOT FTA), FHWA, and FDOT that are relevant to the potential conversion from the existing BRT system into a rail system. For the purposes of this exercise, it was assumed that the HRT system would operate within the same right-of-way with modifications to accommodate rail track geometry.

Additional detailed information will need to be prepared after consultation with stakeholder agencies and grantors on the ease of conversion and associated procedural steps and project development timelines.

Background Context

The following background informs key considerations about the justification and procedures to upgrade the South Dade TransitWay corridor into Metrorail heavy rail operation. Only the use of existing Metrorail rolling stock was evaluated as part of this study. In order to utilize LRT technology a new transfer would need to be created at Dadeland South Station, and this addition was not considered in this study.

The potential conversion project will be along the South Dade TransitWay BRT in Miami-Dade County. The project is mostly within the existing public right-of-way, in an area that extends approximately 20 miles, with adjoining stations and 47 roadway crossings.

The South Dade TransitWay BRT project (see **Figure 3**), currently under construction, is using a design build (DB) delivery approach that includes design, permitting, construction, and commissioning. The project includes the design and construction of 14 new BRT stations at existing bus shelter locations, rehabilitation of 32 local bus stops, demolition of existing bus shelter and ancillary structures, rehabilitation of approximately 16 existing transitway stations, and construction of a new 636-space park-and-ride garage integrated with a BRT station located at 168th Street. The project involves extensive coordination work with stakeholder agencies, including FTA, FDOT, Miami-Dade County Department of Transportation and Public Works (DTPW), utility agency owners, Village of Pinecrest, Village of Palmetto Bay, Town of Cutler Bay, City of Homestead, and City of Florida City.

In February 2020, the South Dade TransitWay BRT project received an overall "high" rating from the FTA. In June 2020, the FDOT and DTPW executed an agreement for FDOT to provide up to $100 million as 33% of the local match for the FTA grant. A summary of the South Dade TransitWay BRT total funding plan is shown in **Table 3 South Dade TransitWay BRT Financial Plan.**

Table 3 South Dade TransitWay BRT Financial Plan

Source of Funds	Total Funds ($million)	Percent of Total
Federal: Section 5309 Small Starts	$100.00	33.4%
State: Florida Department of Transportation New Starts Program	$99.90	33.3%
Local: Miami-Dade County People's Transportation Plan Sales Tax Revenue	$99.90	33.3%
Total:	**$299.80**	**100.0%**

Source: Federal Transit Administration (2019). South Corridor Rapid Transit Project, Miami, Florida, Small Starts Project Development Project Profile[12]

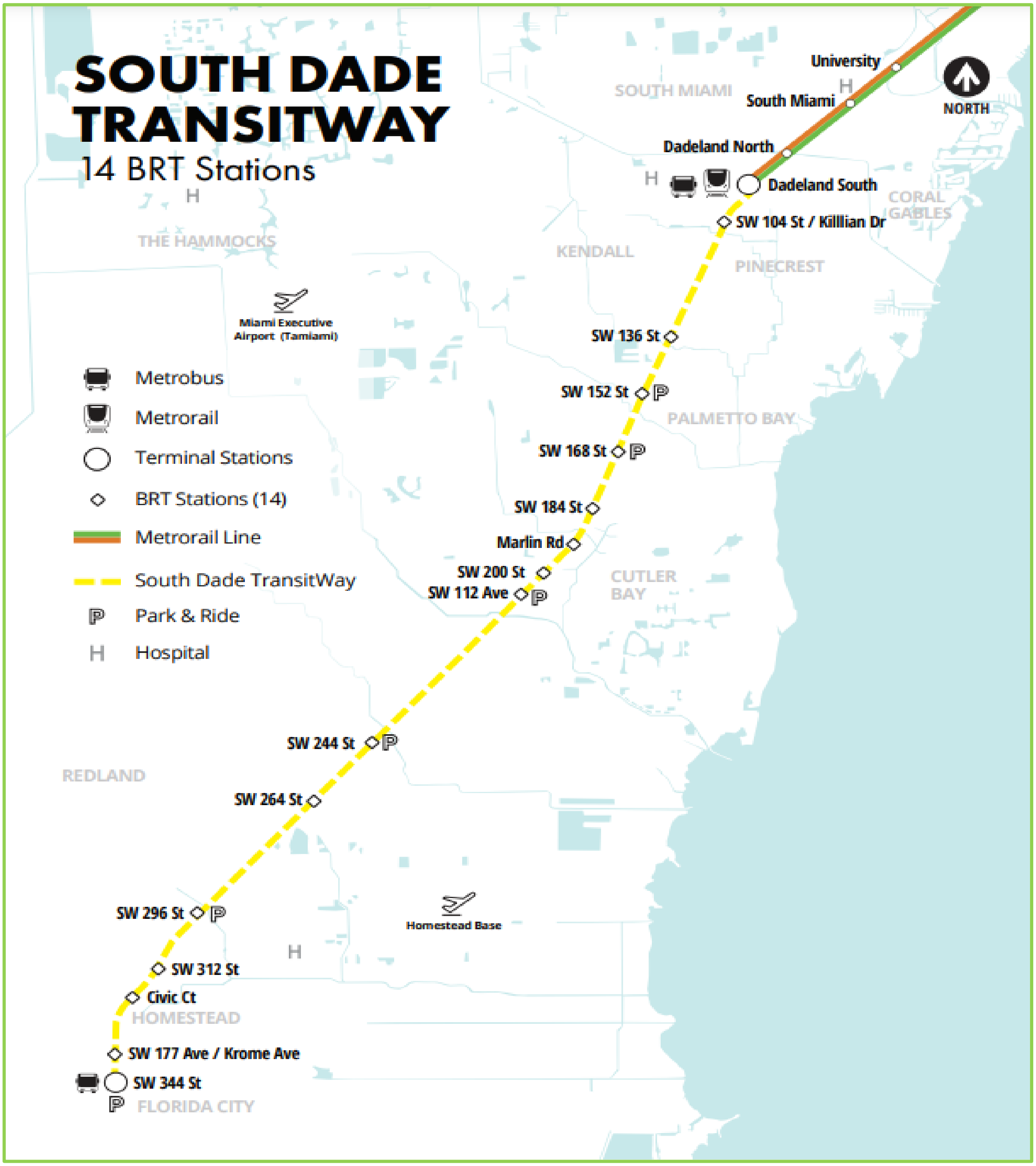


Figure 3 South Dade TransitWay Map (Large)

Federal Transit Administration (FTA) and Regional Partners

FTA Funding Requirements

FTA is typically the lead agency for transit projects when federal funding is used, meaning FTA oversees necessary approvals to move projects forward. Other agencies may be involved in the National Environmental Policy Act (NEPA) process, such as the FHWA, if the project involves an interstate facility or bridge; or the or FRA, if the project involves a freight or passenger railroad corridor, such as Amtrak.

FTA is likely to remain the lead agency for any conversion project, as it was in the prior BRT project that applied for a Small Starts grant funding through the multi-year, multi-step Capital Investment Grant (CIG) process. FTA has its own procedures for NEPA compliance (outlined in the section below), which includes this effort be embedded within the Project Development (PD) phase and completed within two years for funding program. FTA's goal is to maximize the linkages between the planning and NEPA phases to expedite completion of the process for a project.

There are no identified procedural constraints by funding stakeholders or grantors in moving the project forward to the next level of higher capacity transit service. Several of the BRT corridor assets paid by the FTA as outlined in the FTA Construction Grant Agreement, and the financial commitment by regional funding partners, can be leveraged to accommodate the new rail system, although there is a concern that converting the transitway to rail operation before the useful life of the BRT transitway components has been reached will require refunding some level of funding to the FTA. In the US, on average, bus rapid transit system infrastructure is designed and expected to have a useful life of 20-30 years before requiring system-wide upgrades or replacement. Replacing buses every 12-15 years allows the overall system to operate for its longer design life. Close coordination with FTA in the planning stages of the conversion project will be needed to determine if any funds from the original BRT project will need to be returned.

FDOT Integration with FTA

The FDOT transit development process is integrated with the FTA procedures. The typical steps of FDOT's transit project development process is:

- Planning & Community Support
- Concept development and alternatives review
- Transit Concepts and Alternatives Review (TCAR)

After a new transit project is identified and the decision is made to pursue federal funding, the next step is FTA's NEPA process, and Project Development (PD) phase. FTA's PD phase begins and is completed entirely within FDOT's Project Development and Environment (PD&E) Study. Next steps in the FTA process include Design, Construction and Operations. As with other transportation improvement projects, public involvement occurs throughout each step of this process.

Key Considerations:

- Pre-position the new project in the TPO decision-making process.
- Organize regional stakeholder engagements that explains the rationale and benefits of the conversion. Early stakeholder support and buy-in is fundamental to further project development.
- Prepare supporting pre-development studies and analysis that address qualitative/quantitative capacity and connectivity benefits of extending the existing Metrorail system, and initial estimation and measures of cost-effectiveness.

- Frame the proposed new rail project as a next generation investment, and that the BRT project was a “down payment” in the evolution of the transportation needs of the corridor.
- Justify the new project based on a comprehensive purpose/need statement addressing corridor mobility benefits and network growth and the need to accommodate new mobility demand.
- Prepare a “readiness” check based on the contents of a typical letter to Enter PD with the FTA for a New Starts project.
- Initially, using the existing Documented Categorical Exclusion (DCE), screen environmental issues through the lens of the rail to identify any pressing or adverse environmental considerations that may warrant additional environmental review.

National Environmental Policy Act (NEPA)

The South Dade TransitWay rail conversion project may be funded, in whole or in part, with federal funds and financial assistance, which may include the FTA and/or other federal discretionary and formula funds and programs. To ensure that the new project is eligible for federal funds and programs, the project will need to conform to FTA CIG requirements and all applicable federal laws and regulations (e.g., NEPA), funding agreements, and policies.[13]

NEPA review begins early in the project. The Class of Action determination should be established which would identify the level of environmental documentation needed. If a project meets certain criteria and does not have significant environmental impacts, it may qualify for a Categorical Exclusion (CE), which would simplify and expedite the NEPA process. If the project does not qualify for a CE, an Environmental Assessment (EA) must be conducted, which will either result in a Finding of No Significant Impact (FONSI) or require preparation of an Environmental Impact Statement (EIS). An EIS is a comprehensive document with extensive detailed requirements that may take 2-3 years to prepare. The Class of Action determination request, as specified in Title 23 of the Code of Federal Regulations Part 771.118I, requires a written request be submitted to FTA Region 4 staff. This request should include the following information:

- Project description
- Summary of prior planning products or decisions
- The summary of the alternatives screening
- Final draft purpose and need or a statement of need
- Maps or figures showing the location of the project, project termini, proposed station locations and sizes, and proposed vehicle storage and maintenance facility location
- Information concerning any known environmental issues and constraints
- Information describing other known project features
- A written response from FTA regarding the Class of Action should be requested and included in the project file.

In particular, noise and vibration impacts may require additional consideration with the conversion to rail, as well as any substantial construction/reconstruction related to station areas and rail yards.

3.2. Funding Opportunities

The section below outlines federal, state, and local funding opportunities that may be available to support portions of the BRT to HRT conversion project. Eligibility and funding amounts vary depending on project type and scope.

FTA Capital Investment Grants (CIG Section 5309)

Figure 4 Capital Investment Grant Process outlines the typical activities and timeline for the CIG grant process, which includes three grant categories: Small Starts, New Starts, and Core Capacity. All three categories have similar eligibility criteria but are separated by award amounts, with additional criteria for Core Capacity projects.

Small Starts

Small Starts projects must be new fixed guideway projects, extensions to existing fixed guideway systems, or corridor-based bus rapid transit projects. Small Starts projects must have a total estimated capital cost of less than $400 million and must be seeking less than $150 million in CIG program funds.

New Starts

New Starts projects must be new fixed guideway projects or extensions to existing fixed guideway systems that have a total estimated capital cost of $400 million or more or that are seeking $150 million or more in CIG program funds.

Core Capacity

Core Capacity projects must be a substantial corridor-based investment in an existing fixed guideway system and must:

- Be corridor specific, not system-wide, and be located in a corridor that is at or over capacity or will be in ten years
- Increase capacity by 10% over ten years
- Can not include project elements designated to maintain a state of good repair

Potential Uses: Technology, equipment, train cars, infrastructure if all aligned with capacity increases

State of Good Repair (SOGR) 5337 Formula

Section 5337 SOGR funds are non-competitive formula funds that are allocated based on transit ridership data, and population.

Eligibility: Maintenance, replacement, and rehab of high-intensity fixed guideway systems
Potential Uses: Train cars, equipment, line, power, signals, and communication

SOGR – Rail Vehicle- State of Good Repair (5337 Rail Vehicle Replacement, competitive)

Section 5337 Rail Vehicle Replacement funds are a new category of competitive funds made available under the Infrastructure Investment and Jobs Act (IIJA), also knowing as the Bipartisan Infrastructure Bill in 2021. These funds are awarded to successful applicants and can be used to replace rail rolling stock.

Eligibility: Financing for capital projects for the replacement of rail rolling stock
Potential Uses: Passenger train cars

Rebuild American Infrastructure with Sustainability and Equity (RAISE)

Eligibility: Surface transportation capital projects that are highway, bridge, or other road projects, public transportation projects, passenger, and freight rail transportation projects,

Potential Uses: Planning, NEPA, multimodal and multi-jurisdictional infrastructure, test pilots etc.

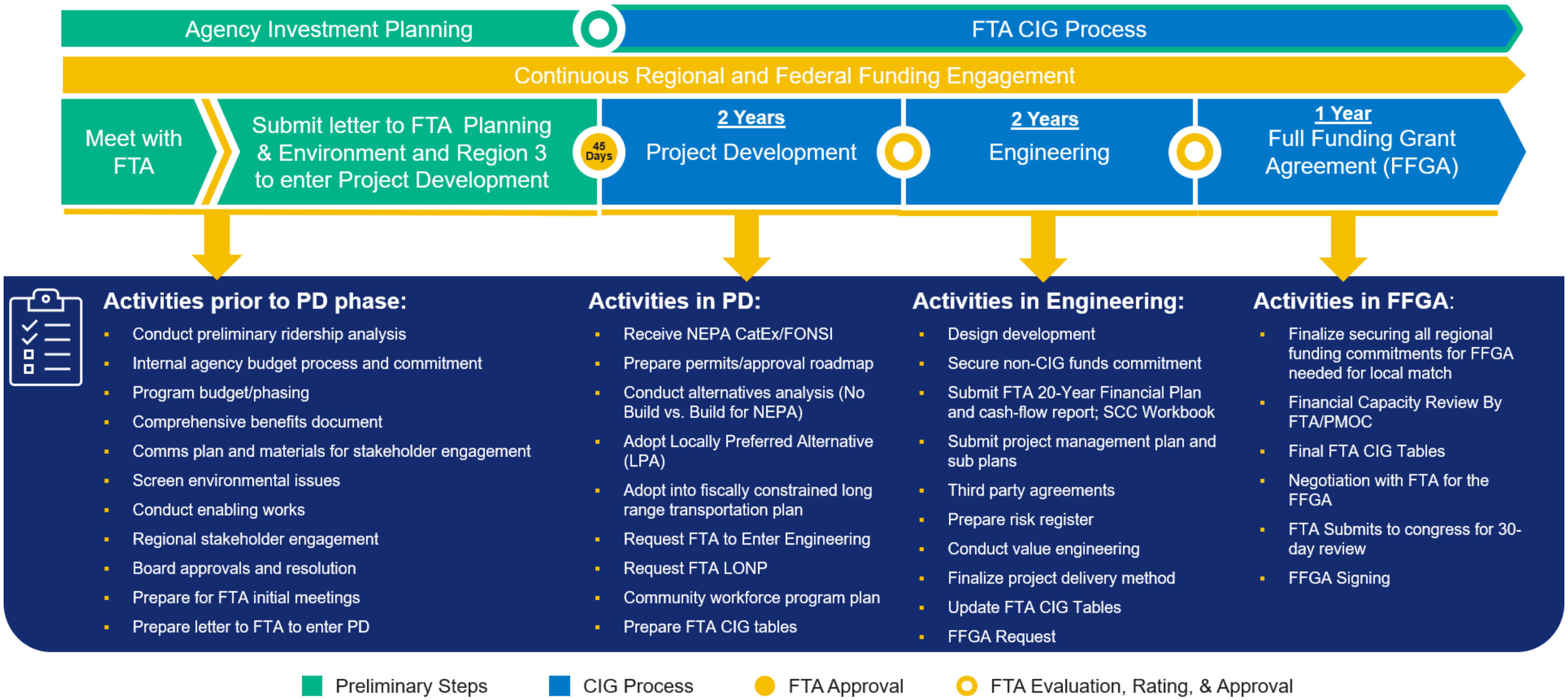


Figure 4 Capital Investment Grant Process

Original Source: FTA

Promoting Resilient Operations for Transformative Efficient and Cost Saving Transportation (PROTECT)

Eligibility: Surface transportation (highway, transit) resilience to natural hazards including climate change, sea level rise, flooding, extreme weather events, and other natural disasters

Potential Uses: Technology, communication software and hardware

Congestion Mitigation and Air Quality (CMAQ)

Eligibility: Funding to reduce congestion and improve air quality for areas that do not meet National Ambient Air Quality Standards.

Potential Uses: Funds may be used for any transit capital expenditures otherwise eligible for FTA funding if they have an air quality benefit. Project development; Design/Engineering phases

Transportation Infrastructure Finance and Innovation Act (TIFIA)

Eligibility Project must be identified in the State Transportation Improvement Plan (STIP); capital cost of at least $50 million (or 33.3% of a state's annual apportionment of Federal-aid funds, whichever is less); project must be supported in whole or in part from user charges or other non-Federal dedicated funding.

Potential Uses: Can be utilized as revenue source while FTA grant funds ramp up; low interest rate financing; 35-year to 75-year repayment period; deferrable repayment for five years after project completion. Any project or technology aligned with the CIG application for consistency and NEPA document.

State Funding Sources

Moving Florida Forward Infrastructure Initiative

The newly approved state budget includes $7-11 billion for the Governor's Moving Florida Forward Infrastructure Initiative to accelerate funding for major capacity projects, all aimed at reducing congestion throughout the state. The initiative will focus on critical improvements to ensure that transportation infrastructure can meet the demands of current and future residents and visitors, including investments to major interstates and arterial roadways to ensure people and goods can move safely. Details about the timing of funding availability and how to apply are not yet available.

County Incentive Grant Program (CIGP)

The CIGP was created to provide grants to counties to improve transportation facilities, including transit, which is located on the State Highway System (SHS), or which relieves traffic congestion on the SHS. Projects are evaluated based on economic benefits, project readiness, partnerships, new technologies, environmental sustainability, intermodal transportation, and safety. Grant funds can be used for 50 percent of eligible project costs. Typically, the total amount of funding available through CIGP is $4.5 - $4.7 million annually. Projects can be submitted on a rolling basis.

Public Transit Block Grant Program

Public Transit Block Grant funds can be used by public transit providers for eligible capital and operating costs upon the completion of an FDOT approved Transit Development Plan (TDP). Eligible transit capital costs include park and ride facilities, intermodal terminals, and passenger amenities at station locations. Projects must be consistent with applicable approved local government comprehensive plans. State participation is limited to 50% of the non-federal share of capital projects. The DTPW prepares a TDP annually with a TDP Major Update every five-years that provides strategic direction on eligible transit capital, service, and state of good repair investment projects.

Local Funding Process – Miami Dade County

Selection of the Locally Preferred Alternative

The selection of the Locally Preferred Alternative (LPA) will follow the same process as the South Dade TransitWay BRT. The Council on Environmental Quality (CEQ) provides guidance to the lead agency (FTA) on evaluating alternatives and selecting the LPA in accordance with NEPA regulations[14]. The project sponsor is required to document the evaluation of alternatives, incorporate public input in the selection process, and ultimately select a project scope that meets the project's purpose and need for the project, which then becomes the LPA. Once the LPA is identified, it must be adopted through local planning processes and appropriate state/local agencies and official boards.

3.3. General Funding Framework and Project Delivery Methods

Figure 5 illustrates a general funding framework for creating a capital stack to fund a project such as the South Dade TransitWay conversion project.

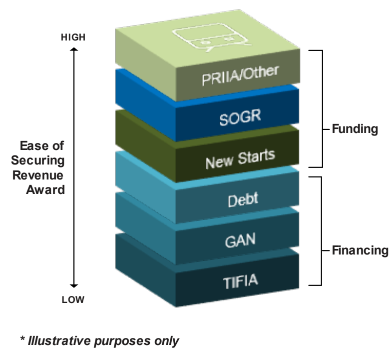


Figure 5 Illustration – Creating Capital Stack

Strategy Considerations:

- Total federal funds for any project type cannot exceed 80%
- The statutory funding match for local funds is 20-40%, but in practice, has been 50% or more
- Determine if the project is viable for CIG Project "bundling" (a new IIJA program)
- Show strong financial capacity, health, and cash flow projections
- $4.6 billion annual appropriation to FTA CIG (Sec 5309) that cycles down in four years
- Earn a "Medium" overall rating to get construction grant award
- If there is a Federal funding shortfall (e.g., receive less due to congressional appropriations), the full scope of the project needs to move forward. Provide evidence of financial capacity to provide additional non-federal funds (cash balances, additional debt capacity, additional funds from new or existing sources)
- FTA may waive the Build America Buy America (BABA) requirements for materials that increase project cost by 25% or more, based on new BABA administration rules in process.

Summary of Project Delivery Methods

Common project delivery methods include Design-Bid-Build, Design-Build, and Construction Management/General Contractor (CM/GC)[15]. The method selected will affect the types of third-party agreements that need to be completed between the Project Sponsor and necessary contractors.

Design-Bid-Build

Design-bid-build is a typical project delivery method, which provides the Project Sponsor and its design team significant time during the design phase to identify and negotiate all required agreements with third parties. The implications of each agreement with respect to the construction contract(s) to be awarded can then be incorporated by the design team or procurement specialist into the contract documents.

Design-Build

The risk related to third-party agreements for projects using the design-build delivery method is higher than for comparable projects delivered using either the design-bid-build or the CM/GC method. This is a result of two factors: first, a design-build contract is typically advertised at a much earlier point in the project life cycle when project definition is less well developed and fewer agreements have been executed; second, the design-build proposers will rely on the Project Sponsor's description of the obligations that have been or are likely to be imposed by third-parties in developing its approach, schedule and price for the work. Any inaccuracies in the characterization of the third-party agreements that affect the design-build scope, schedule, or cost are likely to result in a Change Order. To the extent that the Project Sponsor attempts to shift the risk associated with third-party agreements to the design-build contractor, a substantial risk premium is likely to be included in pricing.

Construction Management/General Contractor (CM/GC)

Of all delivery methods currently in use on transit projects, the CM/GC delivery method, because of its longer design phase, may provide the greatest opportunity to complete third-party agreements prior to the start of construction. This method also offers the greatest flexibility because of the collaboration between the Project Sponsor, designer, and the CM/GC contractor, in dealing equitably with the implications of incomplete agreements.

Other Delivery Methods

There are a number of delivery methods such as Design-Build-Operate-Maintain, Design-Build-Finance, and Public Private Partnerships (P3) that involve a private sector contactor or consortium providing financing, funding and/or operations and maintenance. The criticality of agreements with third parties depends on what rights and responsibilities are being delegated to the contractor and those that are being retained by the Project Sponsor. The critical agreements are those that would not allow the project, as planned, to be constructed or operated as intended.

4. South Dade TransitWay BRT to Rail Blueprint

4.1. Background

The South Dade TransitWay BRT to Rail Blueprint provides a roadmap for the conversion of the South Dade TransitWay from BRT to Metrorail Heavy Rail. The location of the existing South Dade TransitWay, which is also referred to as the South Corridor, is illustrated in Figure 2 South Dade TransitWay Map.

Based on a preliminary review of the existing BRT corridor, it can be assumed that conversion from BRT to Metrorail is possible, although the necessary rail geometry at SW 184th street may be challenging due to space constraints, which would require the purchase of additional right of way or the relocation of the station (see **Appendix A**, Sheet 10). Modifications at pedestrian crossings must be considered to provide safety gates at rail crossings and appropriate refuge areas. Some modifications to station areas and curb height will be also necessary, and space will need to be identified for power substations and other related equipment, but no fatal flaws have been identified. Later in this document, key feasibility, and planning considerations necessary to complete the conversion will be explored in further detail.

4.2. Blueprint Structure

The work outlined in this report is based in large part on experience the consultant firm developing this report has with conversion of the Ottawa, Canada BRT TransitWay to LRT technology. Previous studies undertaken with respect to the potential conversion of the South Dade TransitWay corridor are also referenced and relied upon, particularly with respect to the feasibility of converting stations and vehicles, and some of the high-level planning issues identified through that previous work.

Tasks are broken down by general project segment and consider the fundamental issues which will need to be addressed during each phase. This document can serve as an initial blueprint should the Miami-Dade County pursue conversion of the South Dade TransitWay.

This document is organized by key stages of the conversion process as shown in **Figure 6 Key Stages of the BRT to Rail Conversion Process** below**.**

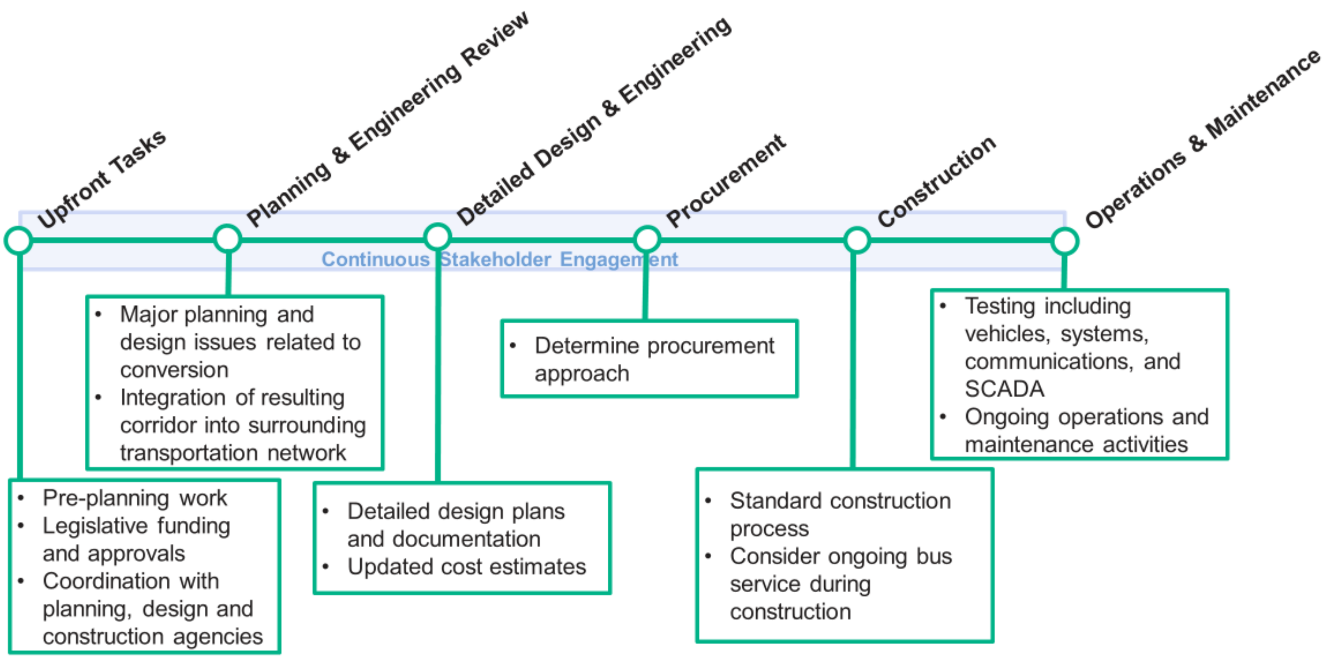


Figure 6 Key Stages of the BRT to Rail Conversion Process

4.3. Upfront Tasks

In the early planning stages of this conversion project, a number of funding related considerations and activities will need to take place. Some initial key items include:

1. Identifying Environmental/ NEPA process and Class of Action
2. Coordinating with the relevant federal, state, and local lead agencies:
    a. FTA, FRA, FHWA, FDOT, MD- DTPW, MDTPO, etc.
3. Developing funding considerations and scenarios

4. Conducting regional stakeholder outreach and establishing buy-in
5. Procuring environmental and conceptual engineering firms
6. Establishing public outreach programs

A major source of funding for large transit projects nationwide is FTA Section 5309 Capital Investment Grants. If it is anticipated that CIG funds will be used for this project (New Starts, Small Starts, Core Capacity) there are eligibility criteria that must be established and demonstrated through a multi-year, multi-step process. A high-level summary of the CIG process and key steps are included in **Figure 4 Capital Investment Grant Process**. There is considerable overlap in the preparatory and planning requirements among federal funding sources, so this figure contains relevant information, even if CIG funds will not be pursued for this project.

4.4. Initial Planning and Conceptual Design Review

There are key differences between BRT and rail technologies in terms of design standards and guidelines, including operations at level crossings and fire/life safety requirements. Geometric requirements for rail are also different from roadways, including minimum curve radii (horizontal and vertical), grades, etc.

Identify Key Pinch Points and Challenges

The first step in this task will be to identify key pinch points and challenges in the corridor and elsewhere which will impact conversion. This includes major project elements such as:

- Alignment and Stations
- Structures
- Fleet
- Maintenance and support facilities at SW 344th St Station

A key outcome of this task will be to identify the feasibility of supporting rail technology, and the resulting implications on design parameters (e.g., additional property requirements, new structures).

The conceptual planning task outlined below further elaborates on these elements and some key challenges identified in our initial review.

Vehicle Conversion and Retrofit Process/Fleet Planning

A previous South Corridor Study indicated that the existing fleet of Metrorail vehicles can be retrofitted to accommodate pantographs to allow for power collection from an Overhead Catenary System (OCS). Pantograph mounted vehicles have already been assessed as part of the AECOM study, *Rapid Transit Project Preliminary Environmental & Engineering Report.*[16] Results indicated the pantograph will maintain sufficient clearance from existing overhead structures (e.g., platform roof canopies), however further assessment of other Metrorail facilities such as shop tracks, maintenance buildings, etc. will need to be undertaken. As part of this task, modifications needed to existing facilities (e.g., roof inspection catwalks at maintenance facilities) will need to be confirmed. Other vehicle modifications to incorporate additional features needed to allow for at-grade operation (e.g., bells, warning lights) will need to be assessed. A key issue which may require further investigation is the crashworthiness of Metrorail vehicles when exposed to potential collision with road vehicles at the at-grade crossings.

While OCS is assumed to be a requirement to enable at-grade operation, it should be confirmed whether third rail (existing power collection method) would be acceptable to relevant approval authorities, such as the FTA and FDOT. While there are examples of rail systems in the U.S. with third rail power collection running through at-grade crossings, these are legacy systems. Third rail power collection is viewed as undesirable for operations through at-grade crossings given the additional safety hazard posed by proximity and potential access to the high voltage power rail versus OCS.

A key outcome of this task will also be to identify a timeline required for conversion of Metrorail vehicles and the potential impact on fleet planning and operations. Sufficient lead time will be required to enable new vehicles to be purchased and be available to cover existing service while current vehicles are retrofitted. This in turn may have impacts on existing yard facilities which may need to be expanded to accommodate a surge in vehicles before the new yard needed to support the South Dade TransitWay is available for use.

It will also need to be considered if the retrofit process can be supported within existing Metrorail facilities or if vehicles will need to be transported off-site to other manufacturing locations for the conversion process to occur.

Identify Deviations from Existing Metrorail Standards

In addition to new design standards and procedures that at-grade OCS powered vehicles will require, a review of existing Metrorail standards will need to be undertaken to confirm and address any new requirements and provide waivers where needed. Elements to be considered include:

> **Station platform length** – should the South Dade TransitWay stations accommodate six–car trains (470 feet) as existing or will four-car trains (320 feet) be sufficient given current operating practice?
>
> **Horizontal and vertical alignment** – based on conceptual design of heavy rail design are there locations where existing standards cannot be reasonably accommodated?
>
> **At-grade crossing design** – given there are no current at-grade road crossings on the Metrorail system, new Miami-Dade County DTPW design standards will need to be developed. These can be based off those being used for the current BRT TransitWay project but will need to be adapted to consider specific requirements for rail and additional elements such as anti-trespassing features.

Safety/Risk Assessment

As noted earlier, while OCS is assumed to be the preferred power supply system, the feasibility of third rail operation with at-grade crossings could be investigated. This would require a safety risk assessment which weighs the advantages of an OCS system (reduced access to high voltage power, improved life safety) against the disadvantages which conversion to this power system imposes on the overall Metrorail system.

There are existing third rail powered system segments in the US operated by the Chicago Transit Authority (CTA), Metro North Railroad, Long Island Railroad, and Southeastern Pennsylvania Transportation Authority. However, all of these locations were constructed in the early 20th century with no new third rail at grade operations being built since the 1970s. There have been several significant accidents at third rail at grade intesections that have led to additonal oversight and safety regulations by the FTA included as **Appendix B** FTA Special Safety Directive No. 18-3. Introducing third rail at grade intersections creates significant risk for the operating agency. For example, the CTA was found liable for an electrocution of a pedestrian trespassing on the tracks in 1977 (Supreme Court of Illinois, 1992).[17]

A further safety/risk assessment will be needed to determine if any existing at-grade crossings along the corridor would be candidates for grade-separation based on existing/future traffic volumes and any safety risks which rail technology may impose at specific locations due to issues such as sight lines. Some existing at-grade crossings may also warrant closure entirely, where traffic impacts are acceptable.

Traffic volumes in the northern part of the study area are higher and may warrant either grade-separation as part of this conversion project, or at least include the ability of eventual conversion to a future grade-separation. Given the proximity of U.S. Route 1 to the South Dade TransitWay corridor, rail over road grade-separation is the preferred configuration but will be challenging to retrofit once conversion to rail occurs.

4.5. Conceptual Blueprint Elements

This step will identify an initial design for all project elements, including plans and documentation, cost estimates and issues requiring further investigation. The following major elements have been identified, including some initial considerations based on our review of the corridor and requirements for conversion to support at-grade Metrorail operations. Typical conversion components are also summarized in **Table 4** and illustrated in **Figure 7**.

Corridor Footprint

The existing transitway corridor right of way will need to be reviewed to confirm it is adequate to accommodate the Metrorail alignment, stations, and ancillary facilities. This study has assumed that the extension would be configured to mimic existing Metrorail operations, which is based on a two-track system. Additional property requirements for elements such as Traction Power, Maintenance and Storage Facilities, local bus terminals, pedestrian connections, etc. will need to be identified for inclusion in the project design and cost estimate. This review will be based on conceptual design for specific elements outlined below.

Potential Additional Property Requirements:

- [ ] Traction Power
- [ ] Maintenance & Storage Facilities
- [ ] Local Bus Terminals
- [ ] Pedestrian Connections

Stations

It is assumed that all planned BRT stations would be maintained and converted to Metrorail stations, while local bus stops on the corridor will be decommissioned. Conceptual engineering will need to review the location and spacing of the stations further to ensure they support efficient Metrorail operations and are physically able to support conversion. Initial concept drawings included in **Appendix A**. Concept Plans indicate that all station locations appear to be able to support conversion with the exception of SW 184th Street where the existing alignment of the South Dade TransitWay and BRT station are of insufficient tangent length to accommodate the longer Metrorail station platforms. Further review at this location will be needed to determine if the station can be converted or will need to be relocated or removed.

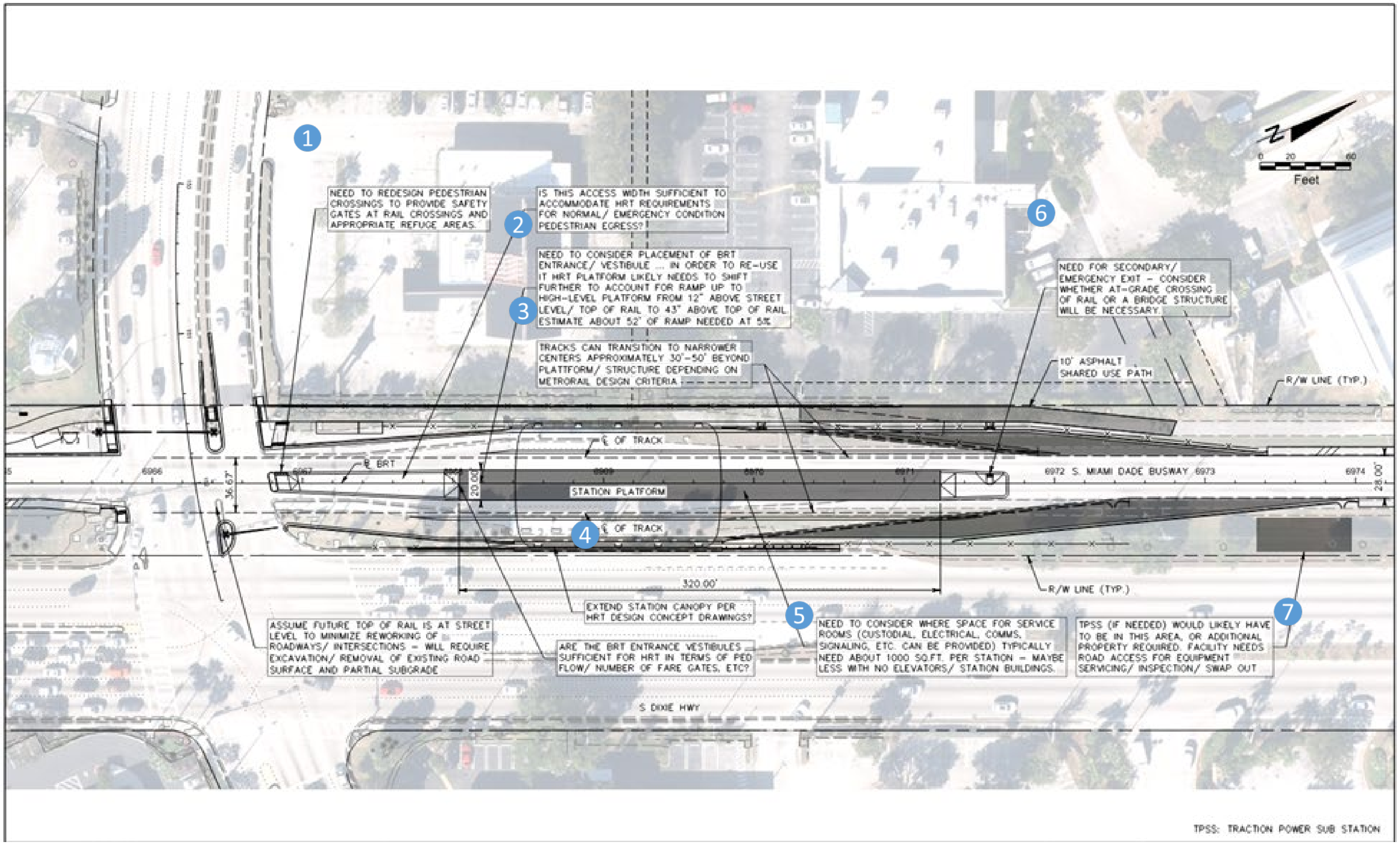


Figure 7 Typical Converted Metrorail Station Plan

Table 4 Typical Conversion Components

Component # (Figure 7)	Component Name	Description
1	At-grade crossing	Need to redesign pedestrian crossings to provide safety gates at rail crossings and appropriate refuge areas; assume future top of rail is at street level to minimize reworking of roadways / intersections – will require excavation / removal of existing road surface and partial subgrade.
2	Platform access	Need to confirm platform access width and BRT entrance vestibule is sufficient to accommodate HRT requirements for normal / emergency condition pedestrian egress (e.g., number of fare gates, pedestrian level of service). Need to consider placement of BRT entrance vestibule in order to re-use HRT platform may need to shift further to account for ramp up to high level platform from 12” above street level to 43” above top of rail. Estimate approximate 52-foot ramp needed at 5% grade.
3	Track alignment	Tracks can transition to narrower centers approximately 30-50 feet beyond platform / structure depending on Metrorail design criteria. Will require adjustments to adjacent shared use path.
4	Station canopy	Extend station canopy per HRT design concept drawings (optional).
5	Service Rooms	Need to consider space for service rooms (custodial, electrical, communications, signaling). Typical requirement is approximately 1,000 sq. ft. per station.
6	Emergency exit	Need for secondary / emergency exit from platform. Need to consider/confirm if at-grade crossing of rail or stairs/bridge structure will be necessary.
7	Traction Power Substation (TPSS)	Co-location of TPSS at stations will need to be considered. Facility needs road access and parking for equipment servicing / inspection / swap out.

Previous studies considered future conversion of BRT stations. The current design of the BRT station roof canopies has adequate vertical and horizontal clearances to accommodate conversion to Metrorail. Platforms would be raised and lengthened, and additional canopy structures spanning over the platforms and tracks constructed to extend weather protection along the full length of the platform. Beyond these basic design features, there are many other issues which will need to be addressed as part of conversion to Metrorail. **Figure 8** is a photo of a BRT canopy under construction.

Figure 8 Marlin Station - BRT Canopy During Construction

Station access and circulation must be reviewed further to ensure there is sufficient space available for pedestrians, including the number of fare gates and queueing/stacking space at the station entrances. Given that Metrorail trains can hold many more people than buses, the ability to accommodate greater passenger numbers, particularly in an emergency evacuation scenario will be a key issue in station design.

The most important considerations which need to be addressed include the need and ability to accommodate more stringent life safety features for rail rapid transit or "fixed guideway" transit systems. The National Fire Protection Association (NFPA) has developed standards (NFPA 130 Standard for Fixed Guideway Transit and Passenger Rail Systems). These standards provide guidance on system design, including emergency access, lighting, firefighting equipment, and other features which will need to be addressed. NFPA requires two independent means of egress from a station platform. This may result in the need for a second (emergency-only) platform exit, with stairs and an overhead structure across the tracks, similar to that found at the existing Palmetto Metrorail station.

Stations where there will be significant volumes of passengers transferring to local buses or other modes will require consideration of additional facilities (e.g., bus loops) both from a footprint and design perspective to ensure that stations can be accommodated in a safe and efficient manner.

Alignment/Runningway

In general, it appears that the existing South Dade TransitWay alignment can support Metrorail requirements. The only location that may encounter issues accommodating rail geometry is at SW 184th Street, where there may not be enough tangent length for longer Metrorail station platforms, and additional assessment is needed. The alignment/runningway consists of the Metrorail track as well as facilities such as emergency walkways, OCS poles, signaling, structures, at-grade crossings, and fencing. The cross-section (i.e., width/footprint) of all these facilities will generally fit within the existing property available.

At the north end of the corridor, a tie-in to the existing Metrorail track will be needed at the Dadeland South station or an alternate location. To avoid disruption to the existing Dadeland South Station during conversion, it is recommended that the transition from third rail to OCS occur at a point further south. This avoids the need to close the station during conversion to accommodate OCS. There are several potential alternative locations for this tie-in, including consideration of extending existing (i.e., grade-separated, third rail powered) Metrorail system to SW 104th Street. This would likely require closure of the existing at-grade crossing at SW 98th Street but otherwise appears to be straightforward.

While the existing South Dade TransitWay corridor appears to be adequate to accommodate Metrorail, consideration will need to be given to specific horizontal and vertical alignment requirements for rail track to avoid issues such as reverse curves and providing sufficient tangent length and consistent grades through station areas. Given issues identified below with the vertical alignment of the rail profile at at-grade crossings, it is likely that the TransitWay corridor will need to be lowered slightly from existing grade in the vicinity of roadway crossings, to enable the existing road profile to be maintained at the crossing locations.

Structures

A previous study by AECOM (2018)[16] assumed that the existing roadway structures supporting the BRT corridor over waterways would not need to be replaced as part of conversion to Metrorail, but that an additional structure for a parallel emergency roadway would be required. Further consideration will need to be given to ensure existing structures can accommodate rail design requirements (i.e., vehicle loading) and consider the adjacent parallel pathway either on the same or an adjacent structure.

Traction power

As indicated previously, an OCS is seen as the preferred power supply method given the issues with existing third rail power supply and at-grade crossings. OCS requires support poles spaced approximately 100 -150 feet apart either in a “center” pole or “side” pole configuration. Power is supplied to the OCS via TPSS, which are spaced approximately 1 to 1.5 miles apart. The TPSS converts power from the neighboring electricity grid, which may require upgrading or additional feeds depending on power availability and need/desire for redundancy.

TPSS need to be located immediately adjacent to the guideway and require space of the TPSS building itself (approximately 20 feet x 60 feet) as well as roadway access and parking for maintenance vehicles.

At-grade Crossings / Roadway Modifications

Modifications to at-grade crossings to accommodate Metrorail will need to consider the track profile in relation to existing roadway surfaces to prevent introduction of humps in the roadway at the track crossings as this could impact traffic speed and operation and has the potential to pose a safety risk should a long wheelbase vehicle (e.g., trailer) get hung up on the tracks and not be able to clear the crossing. **Figure 9** includes an example of the existing intersection and pedestrian crossing at SW 344th St., which would require modifications in order to provide access to a light maintenance shed south of the existing busway.

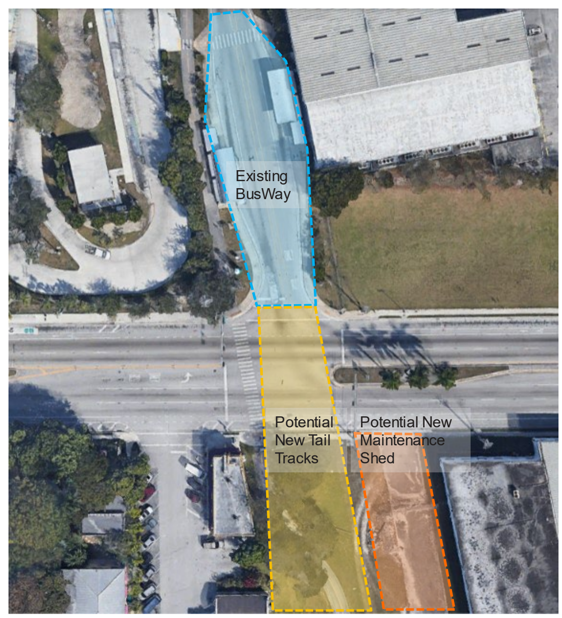


Figure 9 Existing Pedestrian Crossing at SW 344th St

As identified previously, a safety/risk assessment should be undertaken to identify if any of the at-grade crossings have issues, such as insufficient sightlines, which would preclude or pose an unacceptable risk to safe rail/roadway operations. Part of this assessment should also identify if there are any locations where existing or future auto/pedestrian volumes warrant grade-separation either as part of this project or for future consideration.

Trackwork

Track may be either ballasted track or direct fixation. Normally ballasted track is employed along at-grade corridors while direct fixation is employed where track is on an elevated structure. While it may be feasible to use the existing bus roadway to support new ballast and track structure, it is more likely that the roadway will need to be removed and the existing sub-base rehabilitated or replaced as part of conversion to Metrorail. This will depend on several factors, including pavement design, age and condition and the vertical roadway profile, particularly near stations and at-grade crossings.

Special trackwork consists of facilities such as universal crossovers and pocket or tail tracks. These are located at strategic locations to support rail operations, including turnback of trains at terminal stations and other intermediate points either as part of revenue operations or during planned/unplanned events. Pocket or tail tracks like the track shown in **Figure 10** allow online storage of trains, both to enable defective trains to be moved out of the way and for staging of service before peak times or special events. At a minimum, a universal crossover and tail tracks will be needed at SW 344th Street.

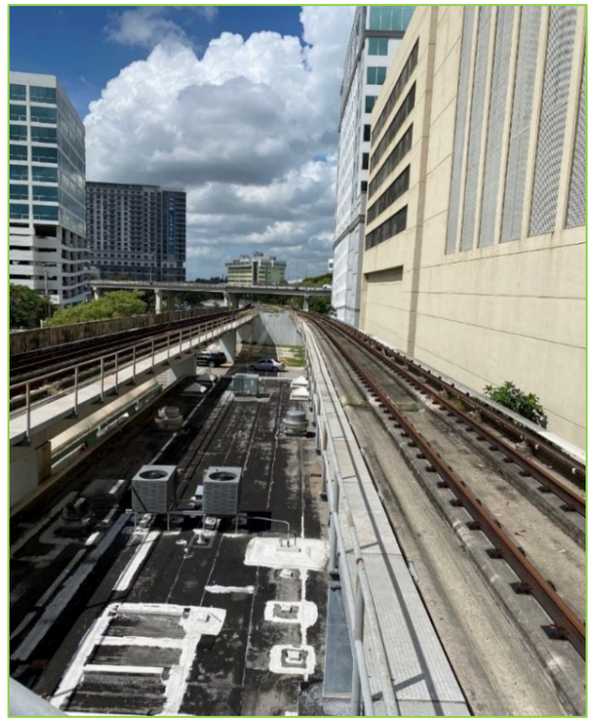


Figure 10 Existing Metrorail Tail Track at Dadeland South

Safety and Security

With conversion to Metrorail, additional safety and security features will need to be incorporated into the corridor design, including an emergency walkway along the tracks, emergency access points (required every 1,200 feet) and fencing. It is assumed that the existing parallel pedestrian/cycling pathway can be used for maintenance/emergency access along the corridor, and there is also the ability to provide for such access in the vicinity of at-grade crossings or from surrounding streets.

Drainage

Grading changes or alterations in the corridor required to support Metrorail will need to be reviewed for drainage impacts. Ballasted track offers the ability to store/retain some amount of storm runoff.

Supervisory Control and Data Acquisition (SCADA)/Communications/Signaling

Metrorail operations will require new SCADA facilities, including wiring along the guideway and within stations, electrical/communication rooms, and equipment cabinets. Typically, these are co-located at stations and will require space on or adjacent to the platforms.

Maintenance Facility

A previous study by AECOM (2018)[16] stated that the existing Metrorail maintenance and storage facility is nearing capacity and identified the need for a new maintenance and storage facility to support the expanded Metrorail fleet needed to support operations on the South Dade TransitWay. This facility would ideally be south of SW 344th Street and require additional property to construct.

In addition to the maintenance facility, the need for new/additional maintenance vehicles will also need to be considered. This would include hi-rail vehicles with lift buckets or other means to inspect and maintain the OCS.

Bus rerouting/route changes

With conversion of the corridor the Metrorail, existing bus services which use part, or all of the South Dade TransitWay corridor will need to be rerouted away, either onto parallel streets or to new bus loops/terminals providing intermodal (bus-rail) connections.

Utilities

Existing utility crossings of the corridor will need to be reviewed to determine the need for adjustments, relocations, and protection of utilities. In general, perpendicular crossings of rail corridors is acceptable, although the design and construction materials will need to be capable of supporting rail loads and not be susceptible to corrosion from stray current. Underground utilities (other than those needed to support rail operations) running parallel and within the rail corridor are not advisable due to the issues which maintenance or replacement of those utilities may have on rail operations.

Overhead utility crossings are acceptable, but care must be taken to ensure sufficient clearance is provided between those utilities and the OCS. It is possible there may be locations where existing high-voltage transmission lines will need to be raised or relocated to accommodate OCS. There are also some locations, particularly in the vicinity of stations, where overhead pole lines will need to be raised or relocated.

Stray Current/Electromagnetic Interference (EMI)

Introduction of OCS will require a review of existing structures and utilities to ensure proper grounding/bonding is achieved to reduce the potential for stray current. Electromagnetic interference is not an issue with modern OCS design, but any potential sensitive facilities along the corridor must be identified and addressed where needed. Future development close to the corridor may require additional measures or clauses warning of the potential for stray current and EMI impacts from Metrorail operations.

Parallel Pathway

The existing pedestrian/cycling pathway running in the BRT corridor may require realignment at some locations, particularly where stations are lengthened or where the alignment crosses over waterways. In some instances, the pathway may need to be relocated either within the existing corridor or onto adjacent lands to remain a continuous facility. As indicated, barrier fencing will be needed between the pathway and tracks and consideration will also be given to how the pathway may interact with the rail corridor, particularly near stations and at-grade crossings.

Operating Plan for Rail

An operating plan for future Metrorail will need to be developed, considering the impacts of the extension on existing rail operations (e.g., headways, fleet requirements) and anticipated ridership. This operating plan will identify how the extension integrates with existing Metrorail operations and inform the location of special trackwork and other facilities depending on whether all trains will run as far as SW 344th Street or if there will be any intermediate station turnback locations during some service hours. Operations for both planned and unplanned events will need to be considered.

Intermodal Connections

With relocation of existing bus services off the corridor, the interface between bus and rail modes will take the form of either on-street bus stops in the vicinity of stations, or the provision of off-street bus terminals at locations where larger volumes of bus routes and passengers are anticipated. The need for or ability to accommodate other intermodal connections, through the provision of park and ride or passenger pick-up and drop-off points may also be considered, although this is not likely to change from the BRT operation.

Project Staging

Future project stages should identify the potential for interim Metrorail terminus locations given the length of the BRT corridor. Interim terminals may serve a temporary function during construction or serve as part of a longer-term phased approach to conversion depending on funding availability, expected ridership and other factors.

Part of this staged approach should consider the feasibility of an initial Metrorail extension to SW 104^{th} Street with existing Metrorail technology to avoid the need to close Dadeland South and allow for the transition between OCS and third rail power supply.

Constructability

All of the above factors will need to be considered as part of an overall constructability review. At the conceptual level this focus on likely means and methods for conversion and identify preliminary solutions to issues. Additional requirements, such as staging and construction laydown areas, will be identified.

Figure 11 Ongoing Construction at the South Dade TransitWay Corridor Marlin Station

Transportation Impact Assessment

Changes to traffic circulation, including potential closure of some at-grade crossings both during and after construction will need to be assessed. A major part of this work will be identifying impacts to transit routings and travel times during construction so that appropriate measures (e.g., transit priority lanes, additional buses) can be put in place during construction to support transit riders.

Cost Estimates

Conceptual level cost estimates will be developed to confirm major project elements and allow the project to proceed to the next stages.

Environmental Impacts and Mitigation Required

At the conceptual level, this review will focus on the broad environmental impact of the project, including any changes in impacts versus the existing BRT operation. Noise and vibration impacts may require additional mitigation (e.g., noise walls, ballast mats) to reduce potential impacts where rail operations would occur in proximity to residences or other sensitive land uses. Other likely impacts include changes in drainage patterns.

Additional Approval Requirements

The conceptual design review will identify any additional approval requirements needed as part of the project, which will be addressed as part of future planning and design phases of the project. This would include any municipal, state, or federal approvals or permits needed as part of construction, operation, and maintenance of the rail corridor.

4.6. Preliminary / Detailed Design

Once conceptual design is complete, major project elements have been identified, and funding obtained the project can proceed to more detailed design stages, including preliminary engineering (e.g., 30% design level) and detailed design (60-90% design level). This will be influenced by procurement method followed but generally consists of these two main phases:

- Prepare detailed design plans and documentation including updated cost estimates
- Prepare tender drawings and documentation (depending on procurement approach)

4.7. Procurement

A number of procurement and project delivery methods may be considered depending on the project structure. Additional information on procurement methods is included in the Summary of Project Delivery Methods section.

Determine procurement approach:

a. Design-Bid-Build
b. Design-Build
c. Construction Management/General Contractor (CM/GM)
d. Owners' Engineer
e. Public Private Partnership (P3)
f. Design-Build-Operate-Maintain
g. Design-Build-Finance

4.8. Construction

Construction of the project is likely to follow a standard process for transit infrastructure projects as outlined below. In terms of unique aspects of the project, the main challenge will be to continue to provide acceptable BRT and local bus services in the corridor while the South Dade TransitWay is closed for conversion and construction.

During some parts of construction, it may be feasible to operate on segments of the South Dade TransitWay, and even to allow for one-way operation of buses. Ultimately, unless the rail alignment is located adjacent to the busway, eventually buses will need to be completely removed from the corridor during construction. Impacts such as longer journey times will need to be assessed and thought given to the need for more buses and an increase in operating costs during construction to provide a similar level of service as currently exists.

A conceptual construction sequence for the BRT – Metrorail HRT conversion is as follows. Note that several stages could overlap or run consecutively depending on how the project is staged.

1. Enabling works
2. Removals
3. Temporary works
4. Alignment
5. Stations
6. Ancillary facilities
7. Testing and commissioning
8. Handover

4.9. Operations and Maintenance

The existing Metrorail fleet is stored and maintained at the Lehman Yard, located west of the Okeechobee station. This yard is expected to continue to be the full time operations and maintenance location since there are sufficient Metrorail cars in the current fleet to support the extension to Florida City.

There will need to be modifications made to this location to provide for the additional equiment related to the electrified OCS including spare catenary wire, droppers, steady arms, registration arms, poles, cantilevers and insulators. Given the configuration of the site there should be sufficient area to provide for storage of these items although the maintenance shop itself will likely need some modification to accommodate all components. If necessary, some components could be stored off site since they are not extraordinarily large and could be readily transported by conventional trucks or flatbeds.

Given the 20-mile length of the extension, it would be prudent to provide secure facilities for the storage of one or two train sets at the Florida City location for cleaning and light maintenance overnight and to minimize the need for deadheading trains in order to start and end service on a daily basis.

It will be necessary to provide staff training on the new OCS system operations and maintenance including additional safety and system inspection training and several bucket trucks will likely need to be acquired and stored at Lehman Yard to provide for field repair work and inspection services.

Prior to commencement of revenue service, an implementation plan will need to be developed. This plan will consider all aspects of the operation and maintenance of the Metrorail extension, including integrity of the existing system during expanded operations and address employee and user safety. A train operator educational component is included to address specific new operating activities such as level crossings, 3rd rail to OCS power change-over, emergency procedures and OCS safety. In addition, a safety and automobile driver awareness program will be developed to educate drivers along the alignment which would now operate trains instead of buses.

4.10. Conclusion and Summary of Findings

This report provides a review of numerous considerations for the process of converting the South Dade TransitWay from BRT to HRT, summarized in this section.

The FTA has indicated that the BRT currently under construction needs to operate for a minimum of a five year period before they will consider conversion to rail. Upon conclusion of this time period, the next step before consideration would be to perform a STOPS ridership model that would result in a competetive ranking in the FTA New Starts process, after which the following activites would be required:

- Perform Pre-FTA Planning/NEPA 3 years
- Program Local Funding PTP (26%) 2 years
- Secure FDOT funding 2 years
- FTA Project Development 2 years
- FTA Engineering Phase 2 years
- FTA Full Funding Grant Agreement 1 year
- Final Design and Construction 5 years
- Complete Rail Fleet Conversion 3 years
- Testing/Commissioning before Revenue Service 1 year

Early tasks include funding and financing considerations, as well as upfront planning tasks that include coordination with FTA, class of action determination, NEPA environmental review process, and stakeholder engagement.

Once the project moves to the design and engineering phase, additional evaluation will be needed to identify key pinch points and engineering challenges for major project elements, including alignment and stations, structures, fleet, and facilities. A more in-depth review of all existing infrastructure will be needed to identify where the existing corridor may not be able to support rail technology. A timeline for the conversion and fleet retrofitting process will also need to be developed with consideration for ongoing service during construction, and resources needed to support the conversion process itself. Conceptual engineering will result in initial designs and documentation for all project elements, including traction power, maintenance and storage facilities, local bus terminals, stations and station spacing, pedestrian connections, etc.

Summary Initial Findings:

Initial concept drawings included in **Appendix A** illustrate that all station locations appear to support the South Dade TransitWay Corridor's BRT to HRT conversion, with the exception of SW 184th Street where the existing alignment of the transitway and BRT station are of insufficient tangent length to accommodate the longer Metrorail station platforms. Further review at this location will be needed to determine if the station can be converted or will need to be relocated or removed. A summary of the anticipated components needed at each station and key elements along the corridor such as water crossings, pedestrian crossings, etc., is included in **Table 5**.

Existing BRT station roof canopies appear to have been designed with adequate vertical and horizontal clearances to accommodate conversion to rail. Platforms would be raised and lengthened, and additional canopy structures spanning over the platforms and tracks constructed to extend weather protection along the full length of the platform. Beyond these basic design features, there are still many issues that will need to be addressed as part of conversion to Metrorail, e.g. NFPA standards, which are explained in further detail in **Section 4.5 Conceptual Blueprint** Elements**.**

Additional considerations:

- What power supply type will be used along portions of the corridor, including OCS, and third rail power, and whether or not third rail power will be allowed at at-grade crossings, due to potential safety concerns. OCS is the preferred power supply method, where possible.
- A number of safety concerns will need to be taken into account, including emergency walkways along the tracks, and emergency access points.
- A new maintenance facility will be needed to support the expanded fleet, as well as additional maintenance vehicles to support rail operations.
- Overhead Utility crossing will need to be reviewed in depth to ensure compatibility.

For further detail on other elements that will need to be considered and reviewed as part of the Conversion Project, see the station concept plans provided in **Appendix A** and **Section 4.5 Conceptual Engineering**.

Table 5 Conversion Components Needed by Location

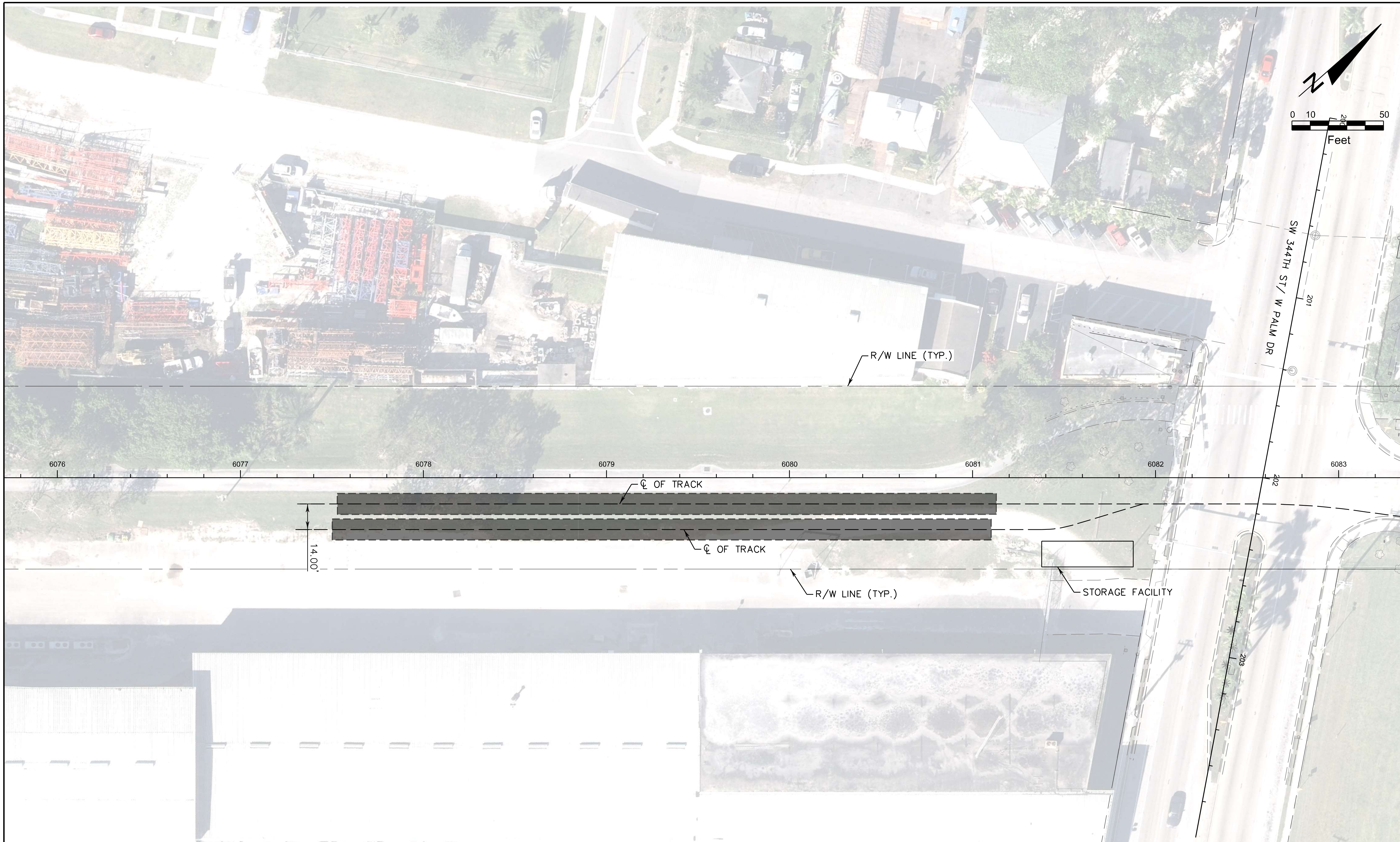
Station Location	Needed Components
South of SW 344 Street	Tail tracks and maintenance shed
SW 344 Street	New at-grade rail crossing
SW 344 Street Station	Station conversion and bus terminal reconfiguration to provide road access and rail platforms
W Davis Parkway	At-grade rail crossing
NW 14 Street	Pedestrian crossing
SW 328 Street	At-grade rail crossing. High voltage power line present
SW 328 Street – SW 324 Street	Confirm curves do not present sight line issues for safe crossing operations
SW 324 Street	At-grade rail crossing
S Krome Avenue Station	Station conversion – confirm horizontal/vertical alignment works
S Krome Avenue	At-grade rail crossing
E Mowry Drive	At-grade rail crossing
E Mowry – Civic Ct.	Reverse curves
Civic Ct.	At-grade rail crossing
Civic Ct. Station	Station conversion
900 feet North of Civic Ct.	Pedestrian crossing
South of SW 312 Street	Reverse curve
SW 312 Street	Station conversion – confirm horizontal alignment works
SW 312 Street	At-grade rail crossing
NE 11 Street	At-grade rail crossing
NE 15 Street	At-grade rail crossing
SW 296 Street	At-grade rail crossing
SW 296 Street Station	Station conversion
N. of SW 296 Street	Water crossing (Billy's Canal)
SW 160 Avenue	Pedestrian crossing
Biscayne Drive	At-grade rail crossing
SW 157 Avenue	At-grade rail crossing – reverse curves present
Waldin Drive	At-grade rail crossing
SW 272 Street	At-grade rail crossing
South of SW 164 Ct.	Water crossing
SW 264 Street	At-grade rail crossing – reverse curve
SW 264 Street	Station conversion
SW 260 Street	At-grade rail crossing
SW 252 Street	At-grade rail crossing
150 feet South of Tallahasse Rd	Pedestrian crossing
Tallahasse Road	At-grade rail crossing
Coconut Palm Drive	At-grade rail crossing
SW 244 Street Station	Station conversion
SW 244 Street	At-grade rail crossing – high voltage power lines present
N. of SW 244 Street	Water crossing
SW 132 Avenue	At-grade rail crossing
SW 238 Street	Closure of existing road access
SW 232 Street	At-grade rail crossing

Table 5 Conversion Components Needed by Location

Station Location	Needed Components
N. of SW 232 Street	Reverse curve
N. of SW 232 Street	Water crossing
Miami Avenue	At-grade rail crossing
SW 220 Street	At-grade rail crossing
SW 218 Street	Pedestrian crossing (informal)
SW 216 Street	At-grade rail crossing
N. of SW 216 Street	Reverse curve
S. of 117 Avenue	Water crossing (Black Creek)
SW 117 Avenue	At-grade rail crossing
SW 208 Drive	At-grade rail crossing
SW 208 Drive Station	Station conversion
SW 200 Street	At-grade rail crossing
SW 200 Street Station	Station conversion
Ronald Reagan Turnpike	Underpass structure – confirm clearances acceptable for rail; reverse curve to north
Marlin Road	At-grade rail crossing
Marlin Road Station	Station conversion
Belle Aire Canal	Water crossing
SW 186 Street	At-grade rail crossing
SW 184 Street Station	Station conversion – confirm horizontal alignment acceptable
SW 184 Street	At-grade rail crossing
W Hibiscus Street	At-grade rail crossing
Banyan Street	At-grade rail crossing
SW 168 Street	At-grade rail crossing
SW 168 Street Station	Station conversion – within parking garage structure
SW 160 Street	At-grade rail crossing
Vicinity SW 160 Street	Water crossing
SW 152 Street Station	Station conversion
SW 152 Street	At-grade rail crossing – high voltage power line present
SW 144 Street	At-grade rail crossing
South of SW 136 Street	High voltage power line crossing
South of SW 136 Street	Water crossing
SW 132 Street	At-grade rail crossing
SW 128 Street	At-grade rail crossing
SW 124 Street	At-grade rail crossing
SW 120 Street	Pedestrian crossing
SW 117 Terrace	High voltage power line crossing
SW 112 Street	At-grade rail crossing
South of SW 106 Street	Water crossing
SW 104 Street Station	Station conversion
SW 104 Street	At-grade rail crossing
SW 98 Street	At-grade rail crossing
North of SW 98 Street	Tie into existing Metrorail alignment

Appendices

Appendix A Station Plan Sets



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by EM				
Drawn by JMR				
Checked by JK				
DRAWING SCALE: 1"= 50'	No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

PARSONS

PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE | APPROVED | DATE 02/23/2024

$DATE$ $TIME$

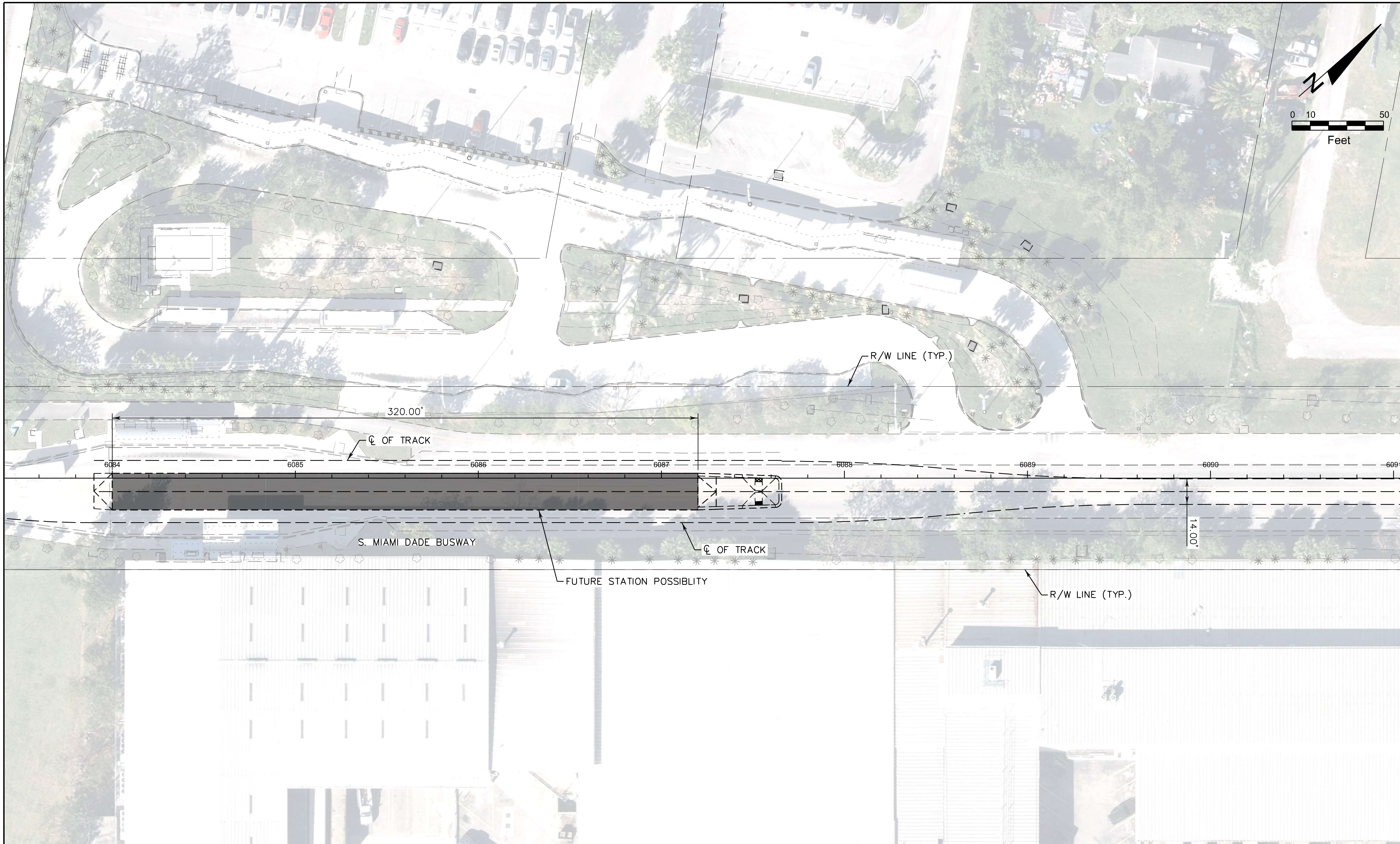
DRAWING TITLE:

SOUTH CORRIDOR RAIL MAINTENANCE FACILITY SW 344TH ST

DRAWING NO. TTP01

SHEET NO. 01

$USER$ $FILE$



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO
Miami-Dade Transportation Planning Organization

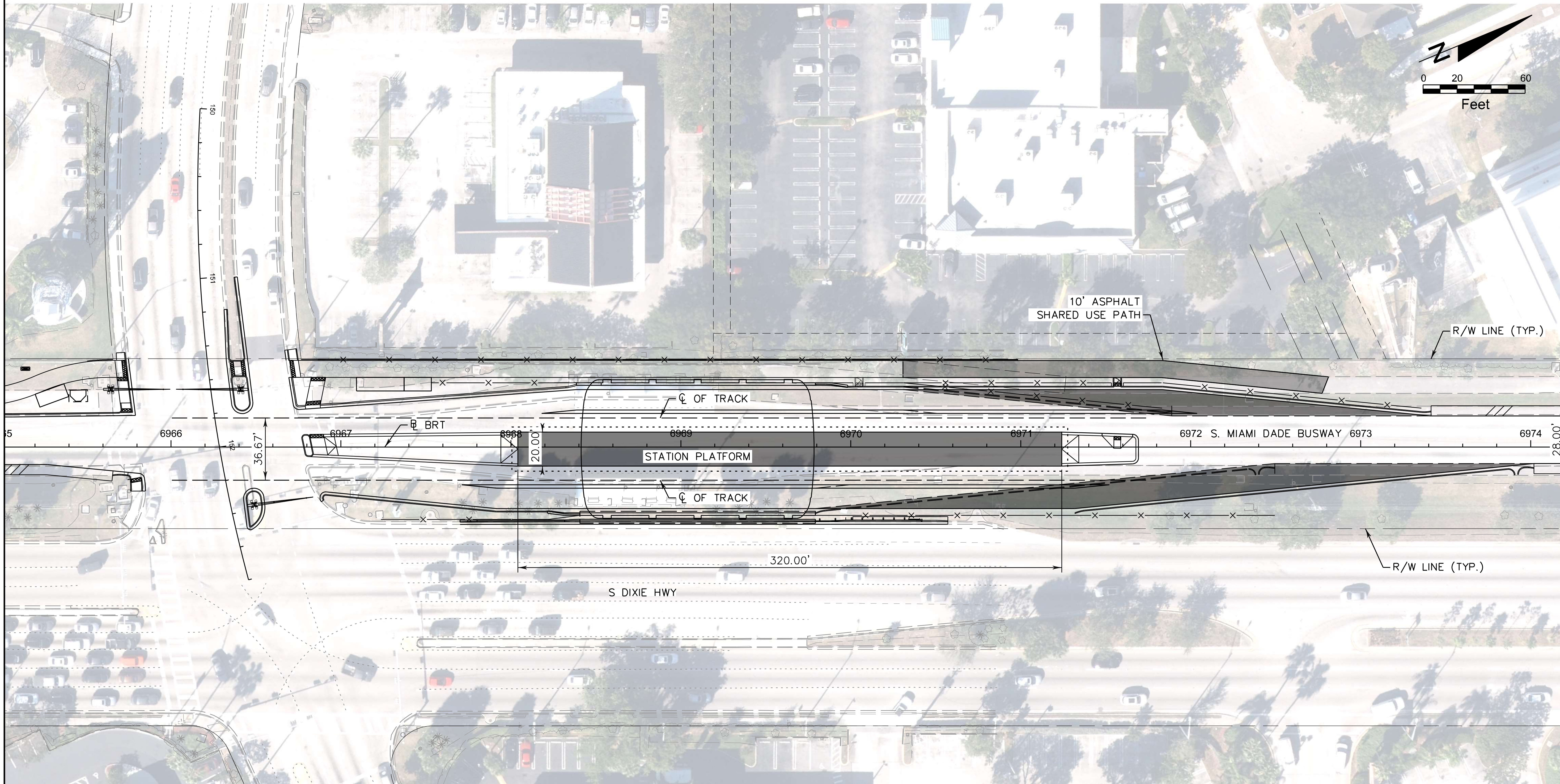
PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL MAINTENANCE FACILITY SW 344TH ST

DRAWING NO. TTP01 | SHEET NO. 02

$USER$ $DATE$ $TIME$ $FILE$



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 60'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

APPROVED DATE

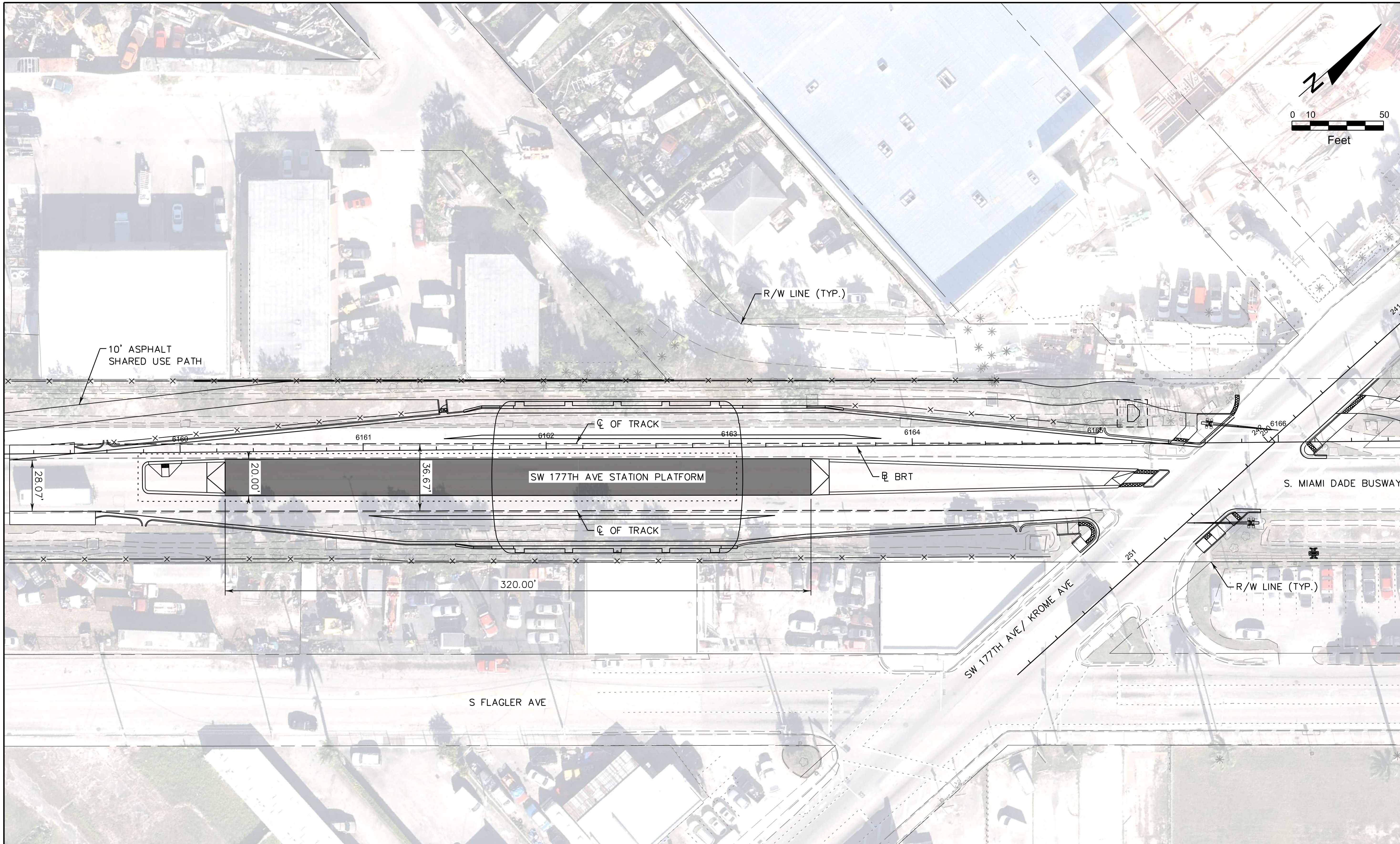
PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
TYPICAL STATION

DRAWING NO. TTP00
SHEET NO. 03

p002234E 7/6/2023 9:26:04 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1TTP-TYP-STATION.dgn



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by EM				
Drawn by JMR				
Checked by JK				
DRAWING SCALE: 1"= 50'	No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO
Miami-Dade Transportation Planning Organization

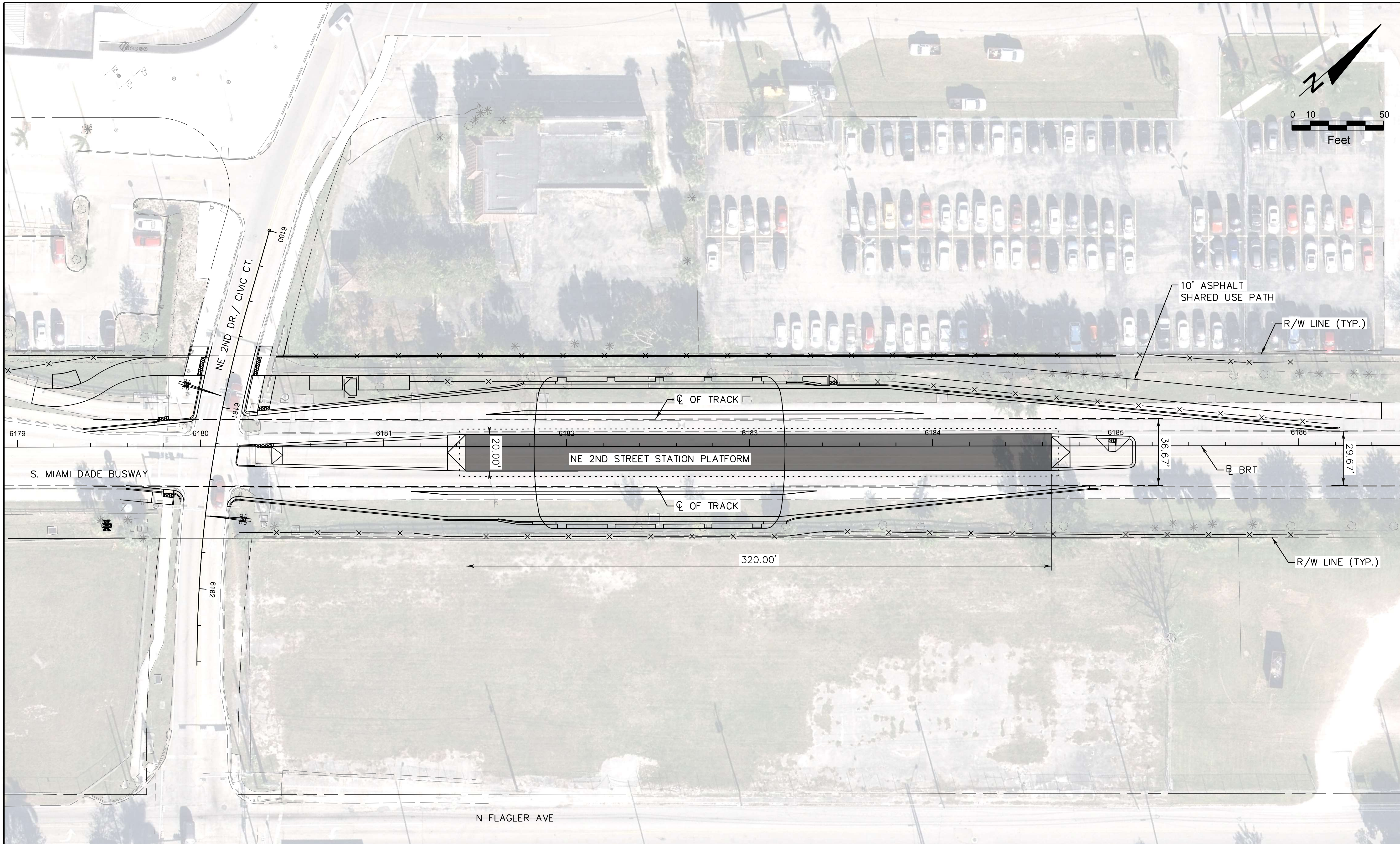
PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL STATION PLATFORM SW 177TH AVE

DRAWING NO. TTP01
SHEET NO. 04

p002234E 7/6/2023 9:27:05 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

PARSONS

PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:

SOUTH CORRIDOR RAIL STATION PLATFORM NE 2ND DRIVE

DRAWING NO. TTP01

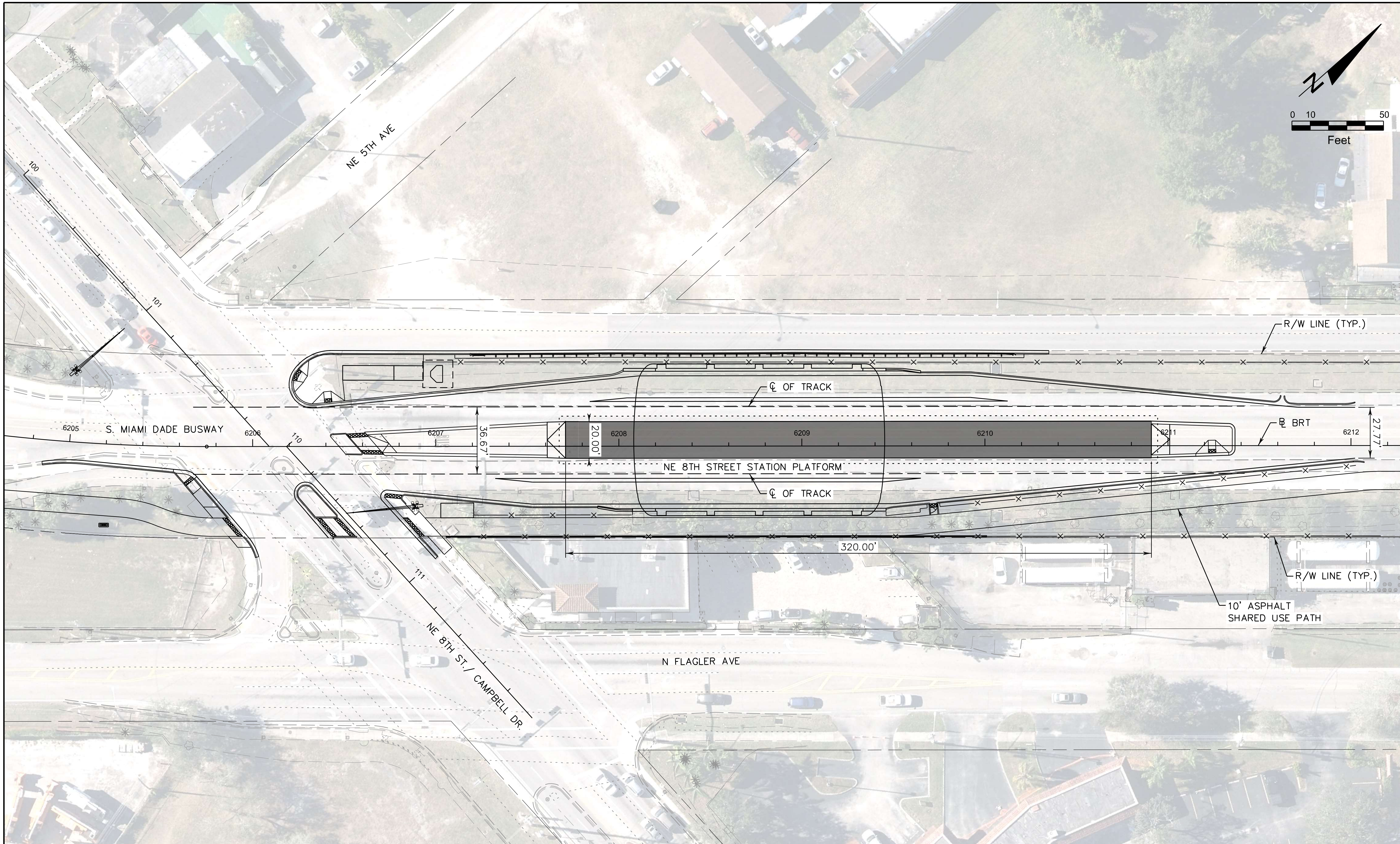
SHEET NO. 05

p002234E

7/6/2023 9:28:15 AM

C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO
Miami-Dade Transportation Planning Organization

APPROVED

DATE 7/6/2023 9:28:31 AM

PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED

DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
NE 8TH STREET

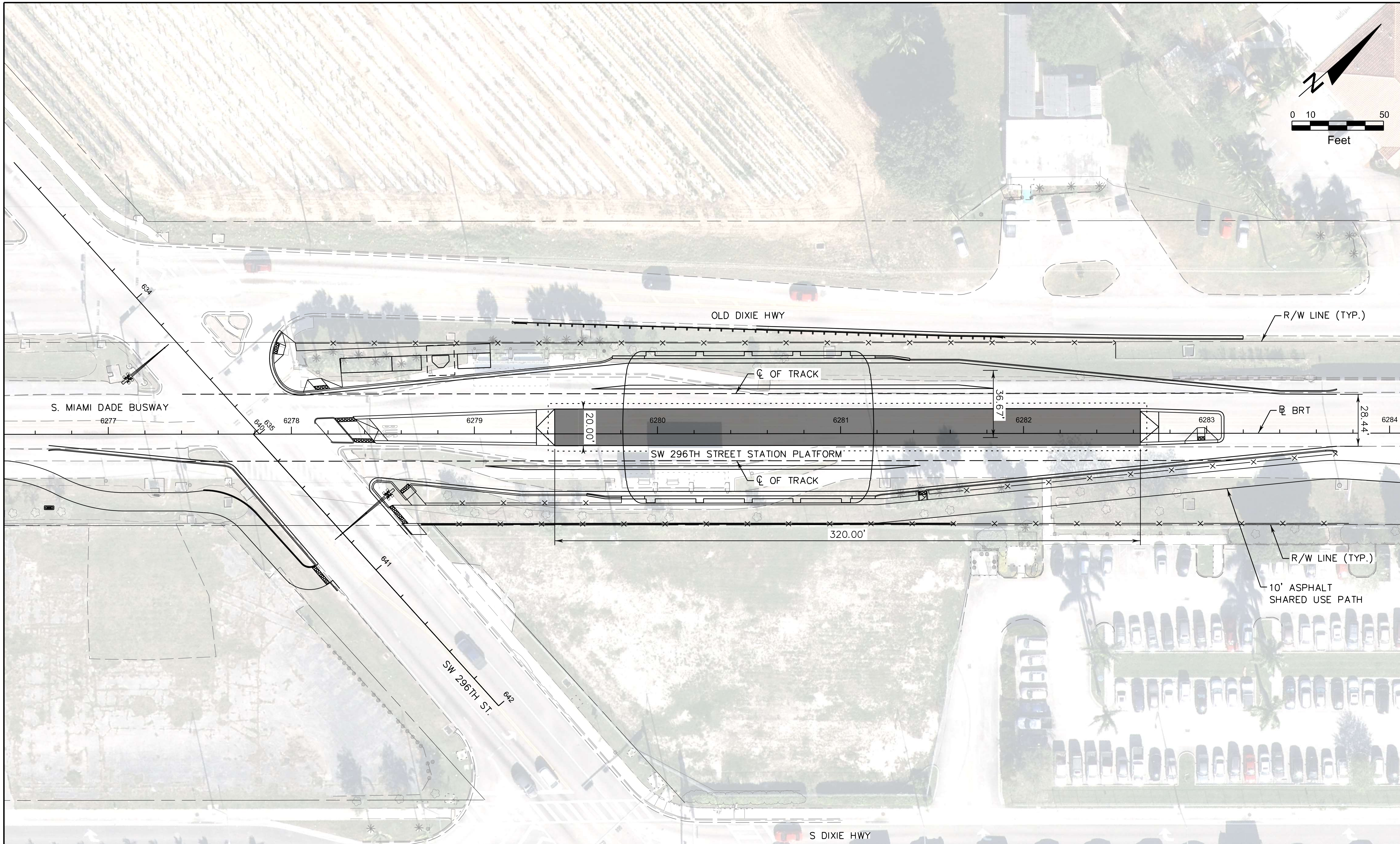
DRAWING NO. TTP01

SHEET NO. 06

p002234E

C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO
Miami-Dade Transportation Planning Organization

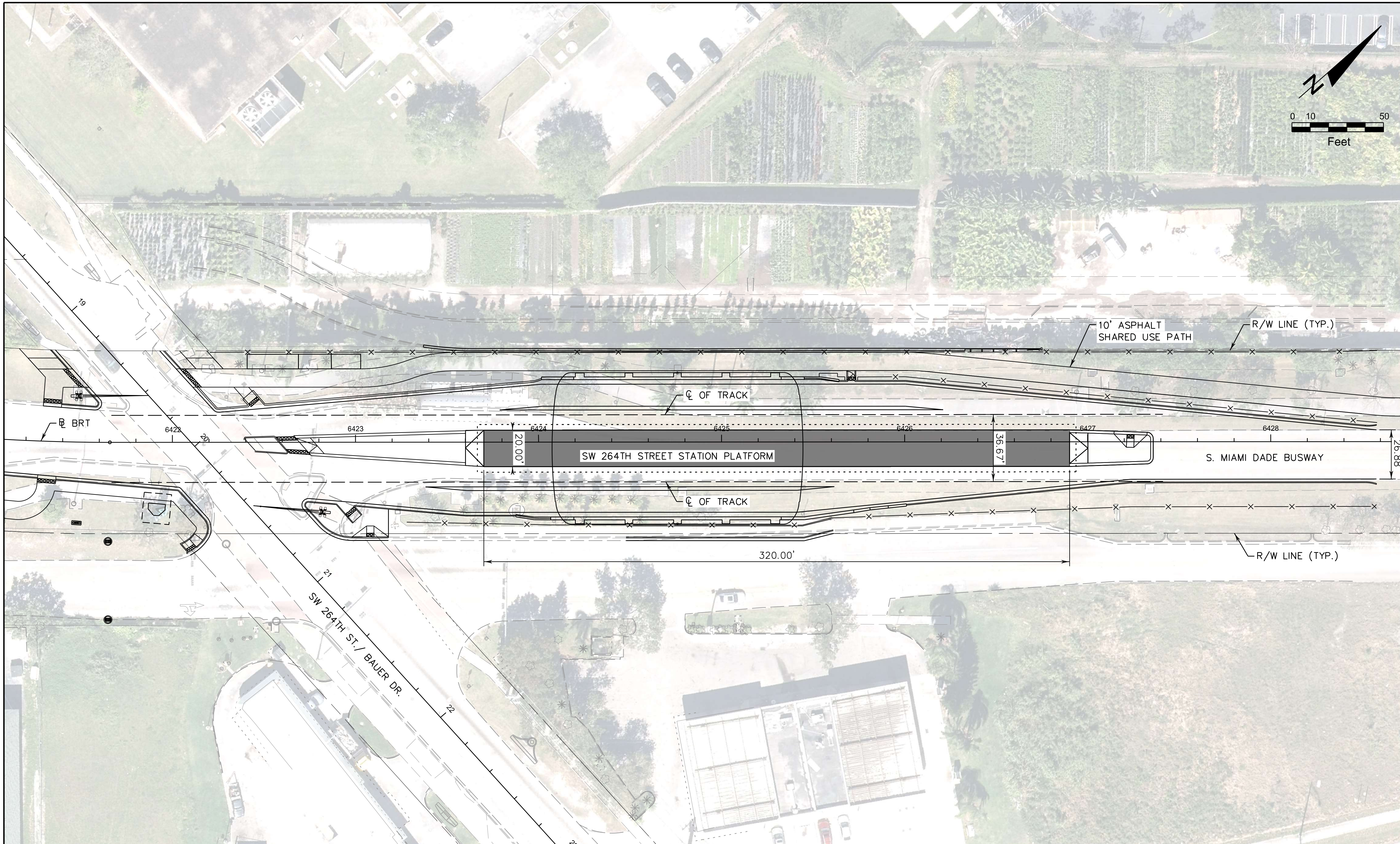
PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
SW 296TH STREET

DRAWING NO. TTP01 SHEET NO. 07

p002234E 7/6/2023 9:28:46 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No. | Date | App. | Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

PARSONS

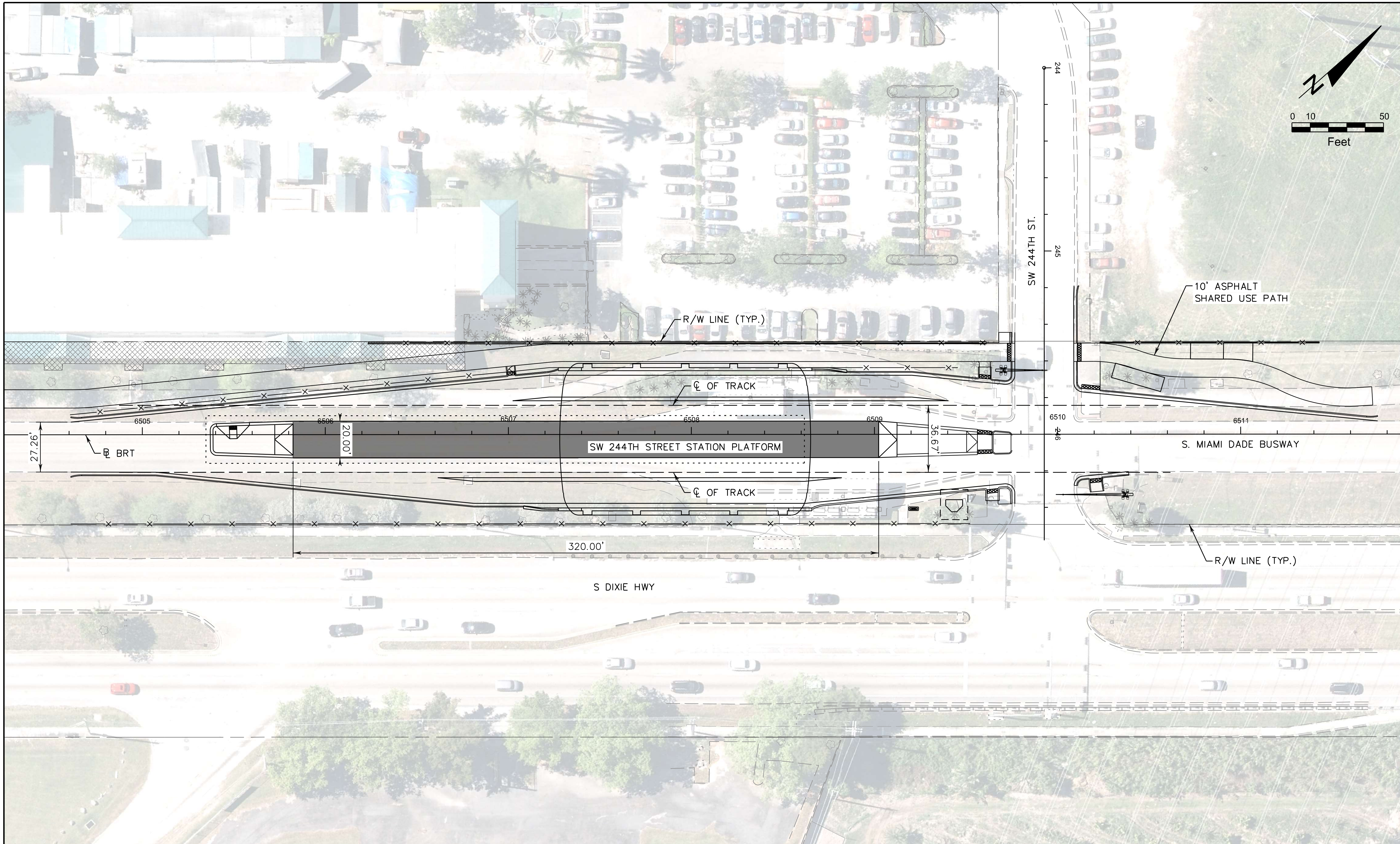
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
SW 264TH STREET

DRAWING NO. TTP01
SHEET NO. 08

p002234E 7/6/2023 9:29:01 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

PARSONS

PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

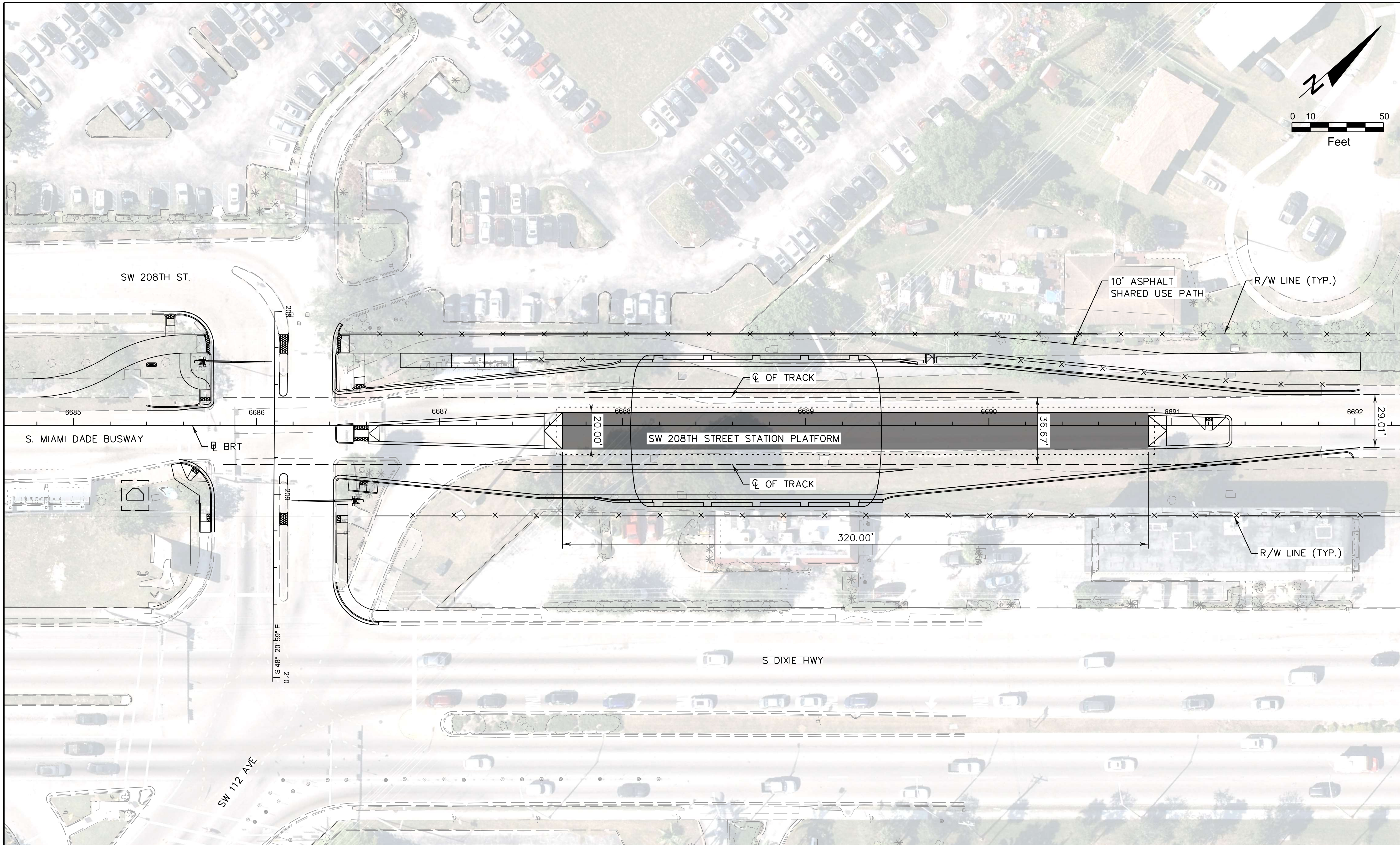
APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL STATION PLATFORM SW 244TH STREET

DRAWING NO. TTP01

SHEET NO. 09

p002234E 7/6/2023 9:29:15 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



Designed by EM	No.	Date	App.	Revisions
Drawn by JMR				
Checked by JK				
DRAWING SCALE: 1"= 50'				

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

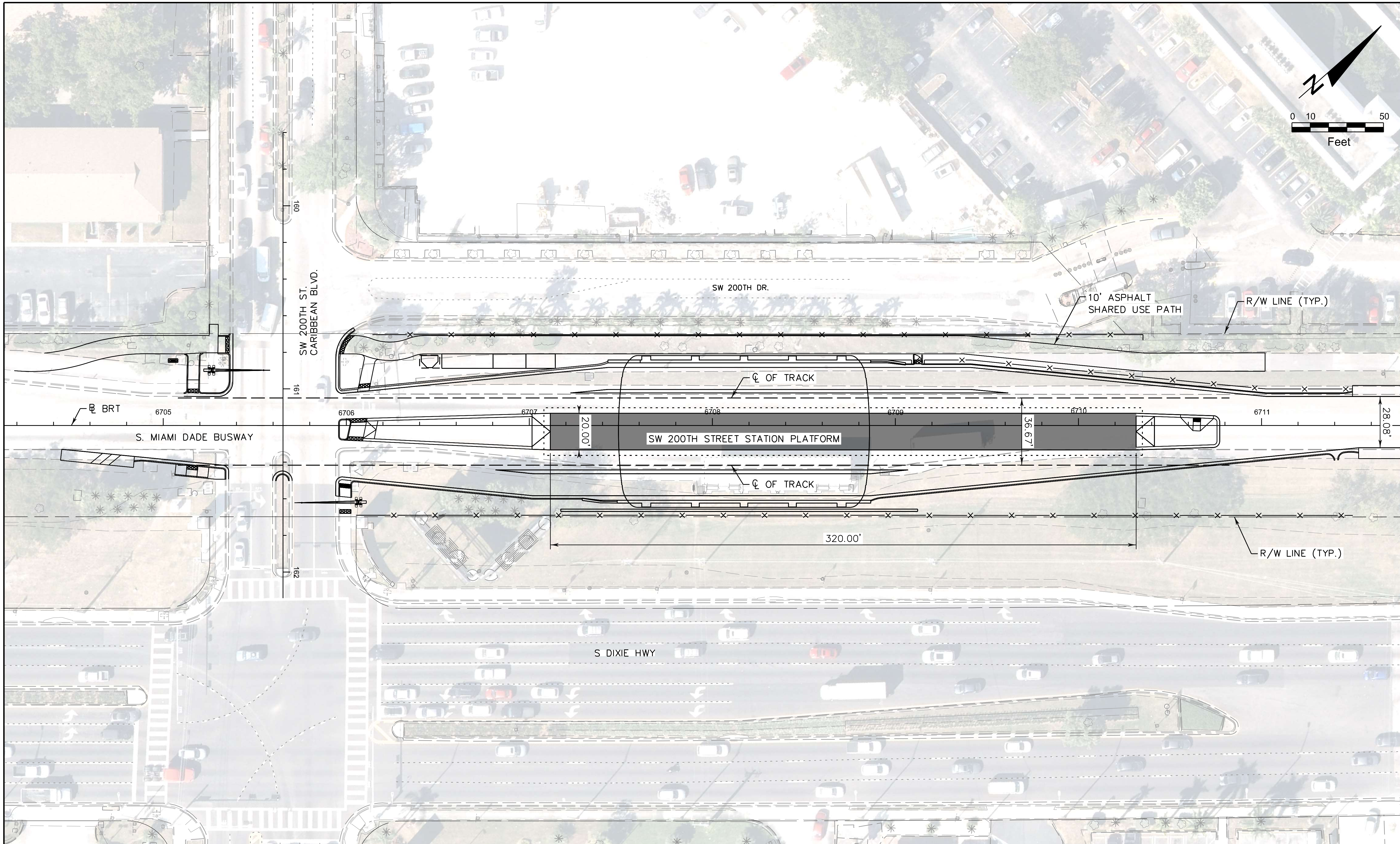
APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL STATION PLATFORM SW 208TH STREET

DRAWING NO. TTP01 | SHEET NO. 10

p002234E 7/6/2023 9:29:28 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	No.	Date	App.	Revisions
EM				
Drawn by JMR				
Checked by JK				
DRAWING SCALE: 1"= 50'				

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

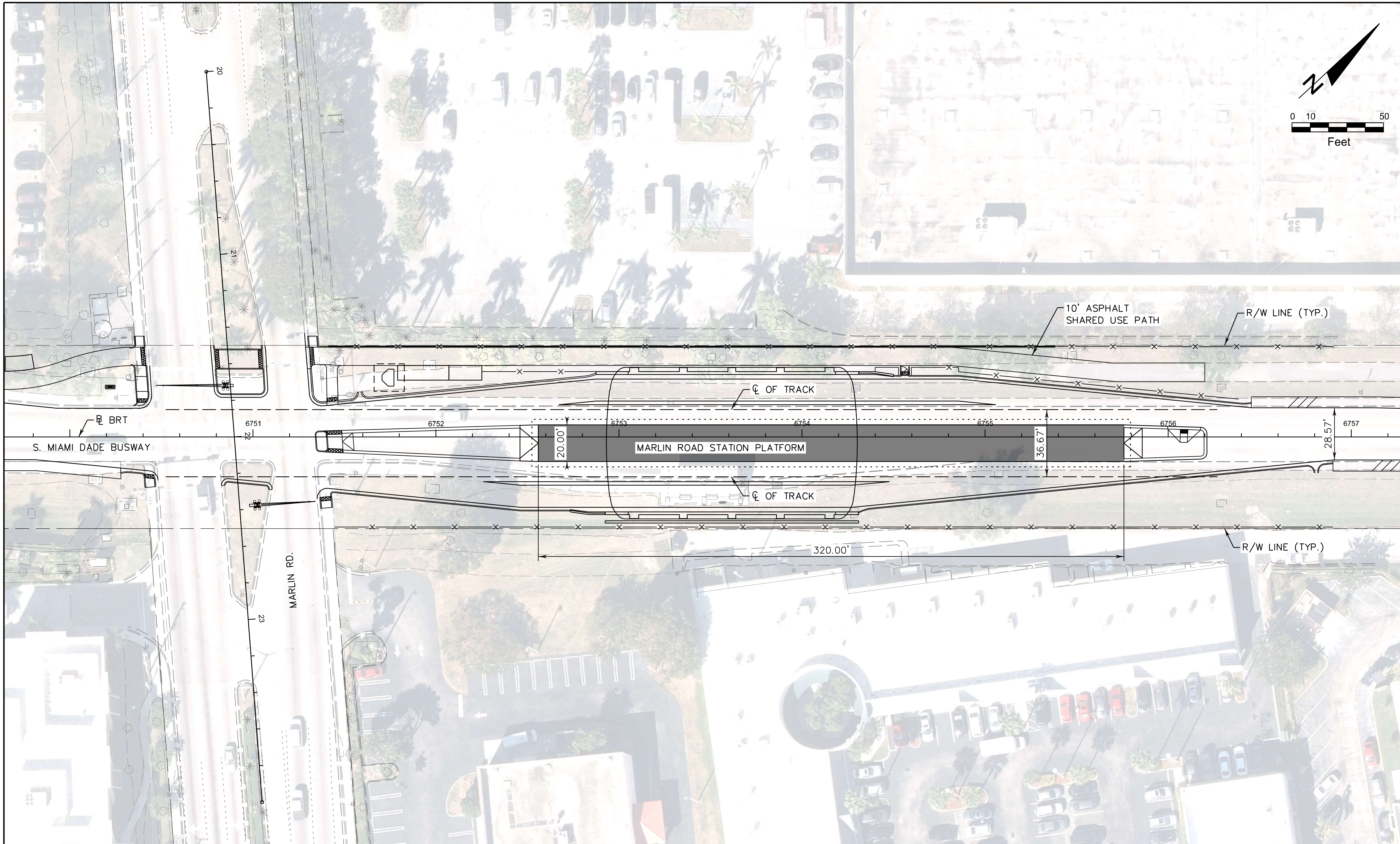
PARSONS
PARSONS TRANSPORTATION GROUP INC.
7600 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE
APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
SW 200TH STREET

DRAWING NO. TTP01
SHEET NO. 11

p002234E 7/6/2023 9:29:41 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO
Miami-Dade Transportation Planning Organization

PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

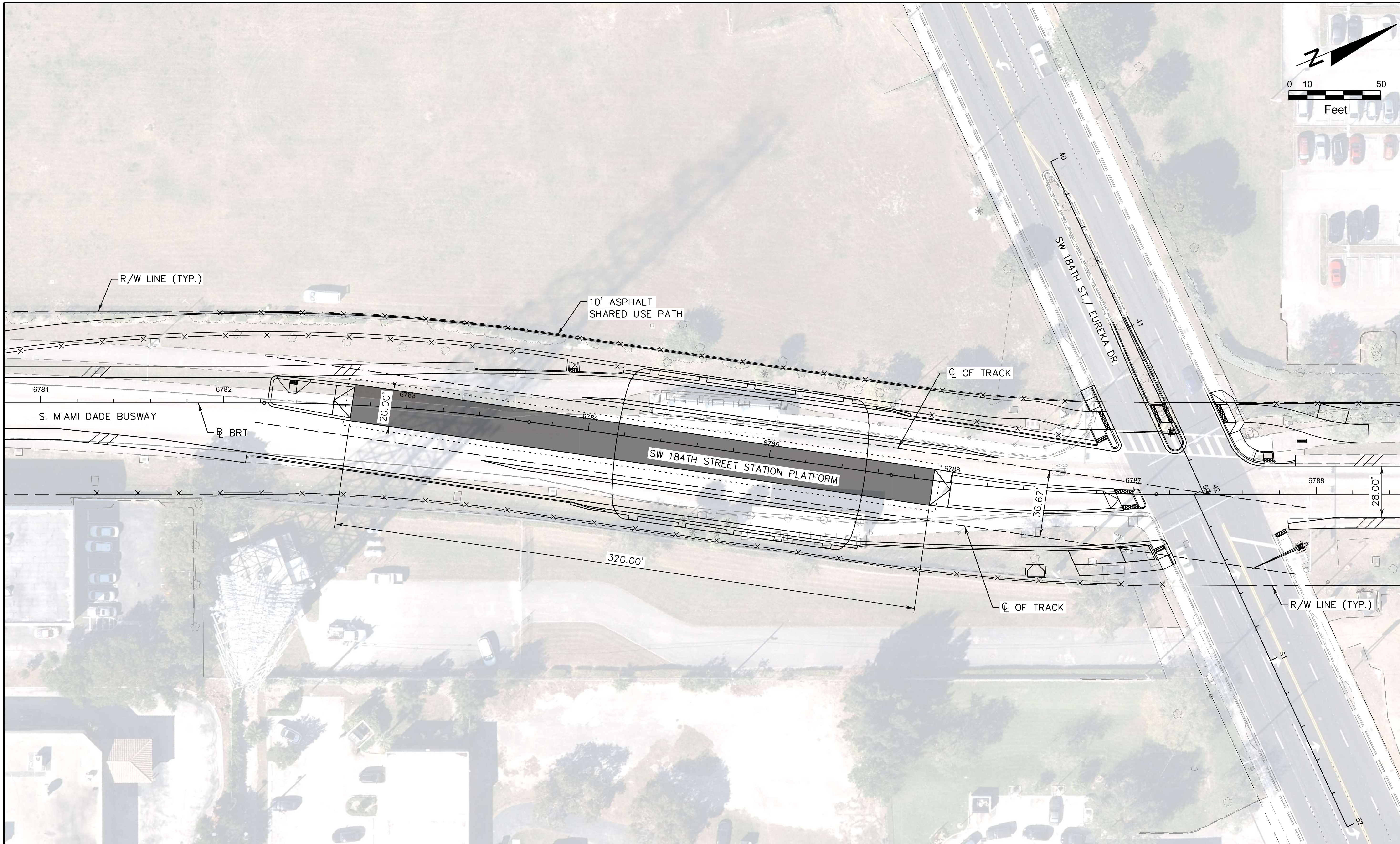
APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
MARLIN ROAD

DRAWING NO. TTP01

SHEET NO. 12

p002234E 7/6/2023 9:29:58 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO
Miami-Dade Transportation Planning Organization

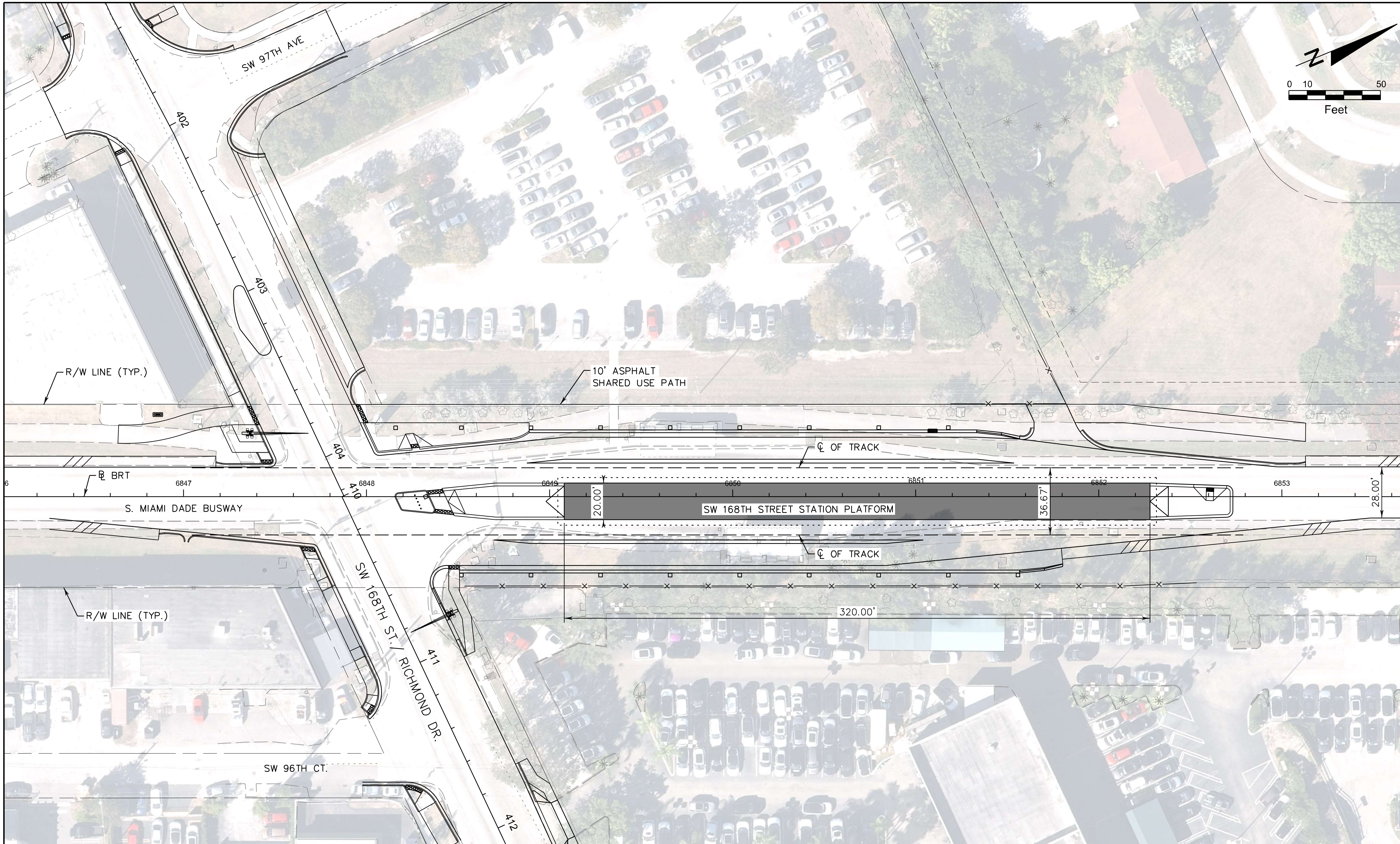
PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
SW 184TH STREET

DRAWING NO. TTP01
SHEET NO. 13

p002234E 7/6/2023 9:30:13 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



Designed by EM	No.	Date	App.	Revisions
Drawn by JMR				
Checked by JK				
DRAWING SCALE: 1"= 50'				

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

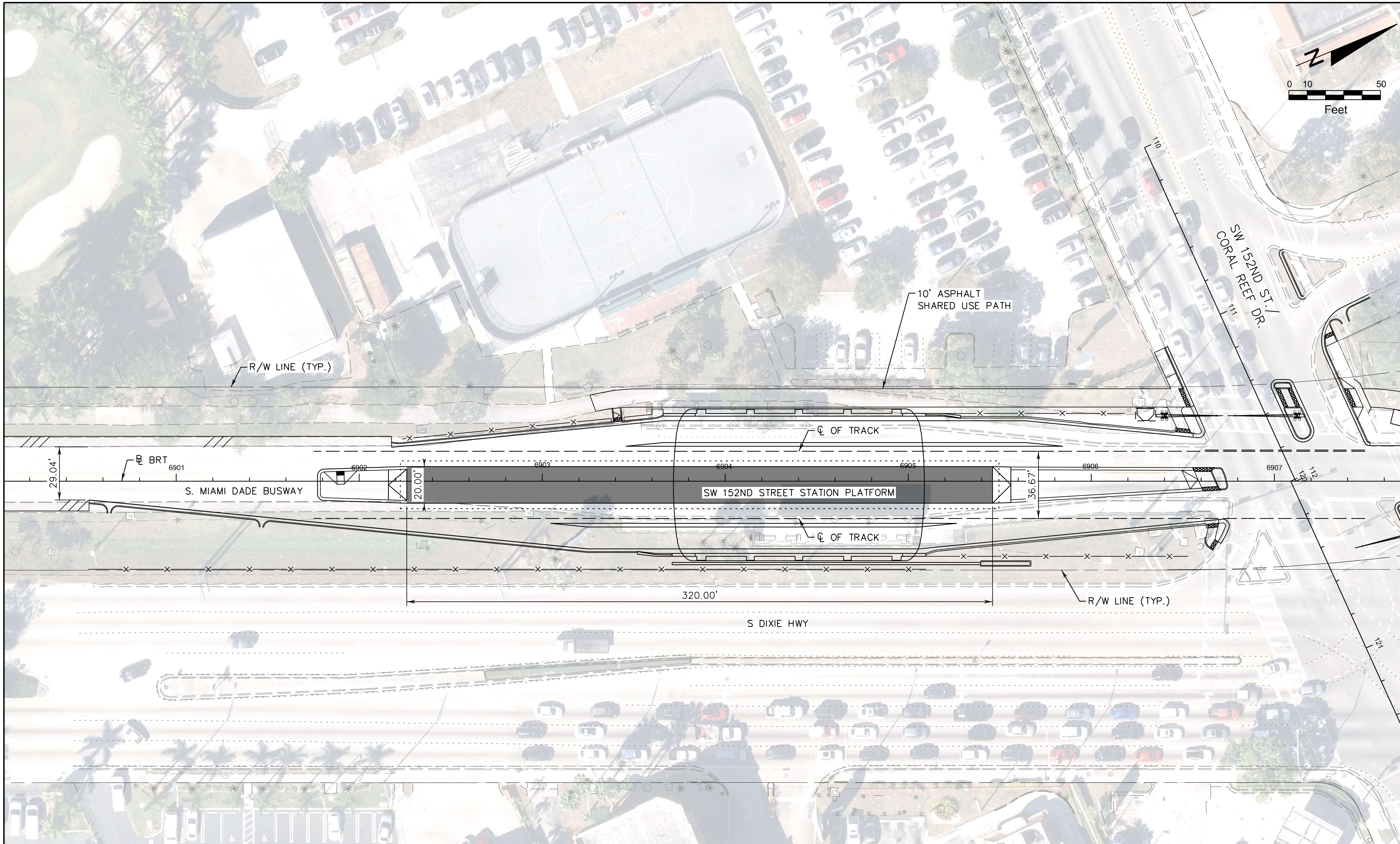
APPROVED | DATE | APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
SW 168TH STREET

DRAWING NO. TTP01 | SHEET NO. 14

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

p002234E 7/6/2023 9:40:04 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

APPROVED DATE

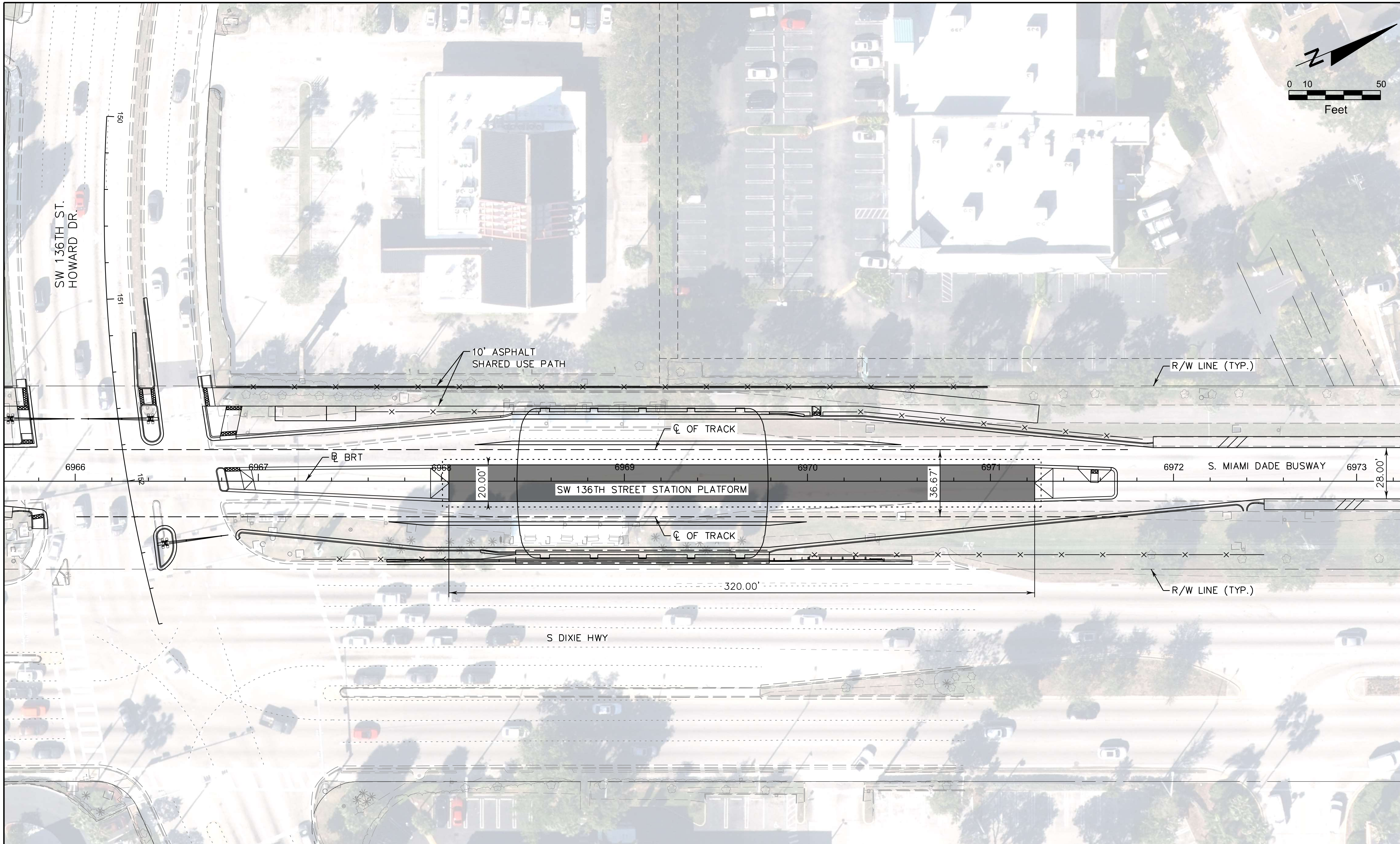
PARSONS
PARSONS TRANSPORTATION GROUP INC.
7600 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
SW 152ND STREET

DRAWING NO. TTP01
SHEET NO. 15

p002234E 7/6/2023 9:30:43 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO
Miami-Dade Transportation Planning Organization

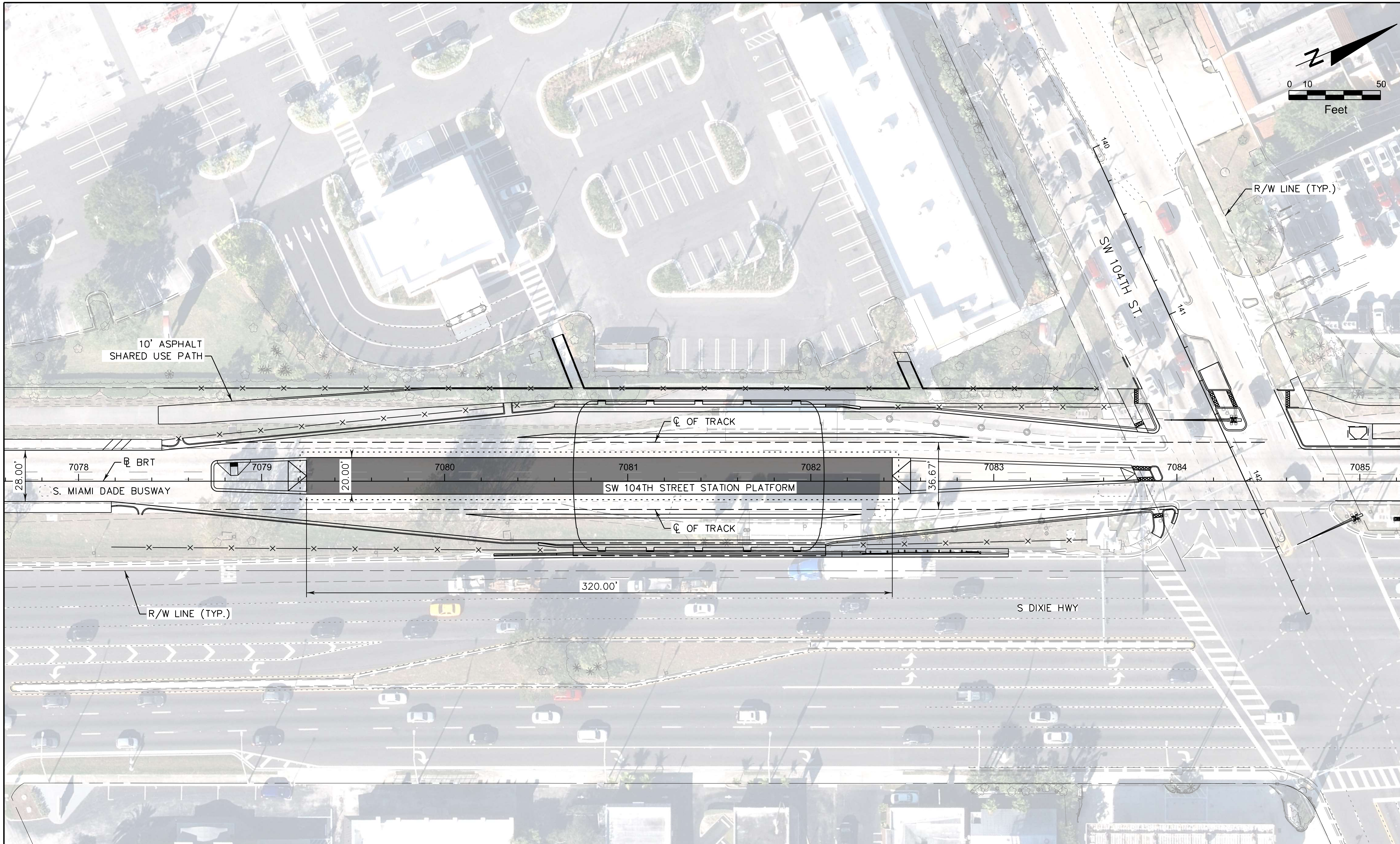
PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE
APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
STATION PLATFORM
SW 136TH STREET

DRAWING NO. TTP01
SHEET NO. 16

p002234E 7/6/2023 9:30:58 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn



Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No. | Date | App. | Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO Miami-Dade Transportation Planning Organization

PARSONS

PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE | APPROVED | DATE 02/23/2024

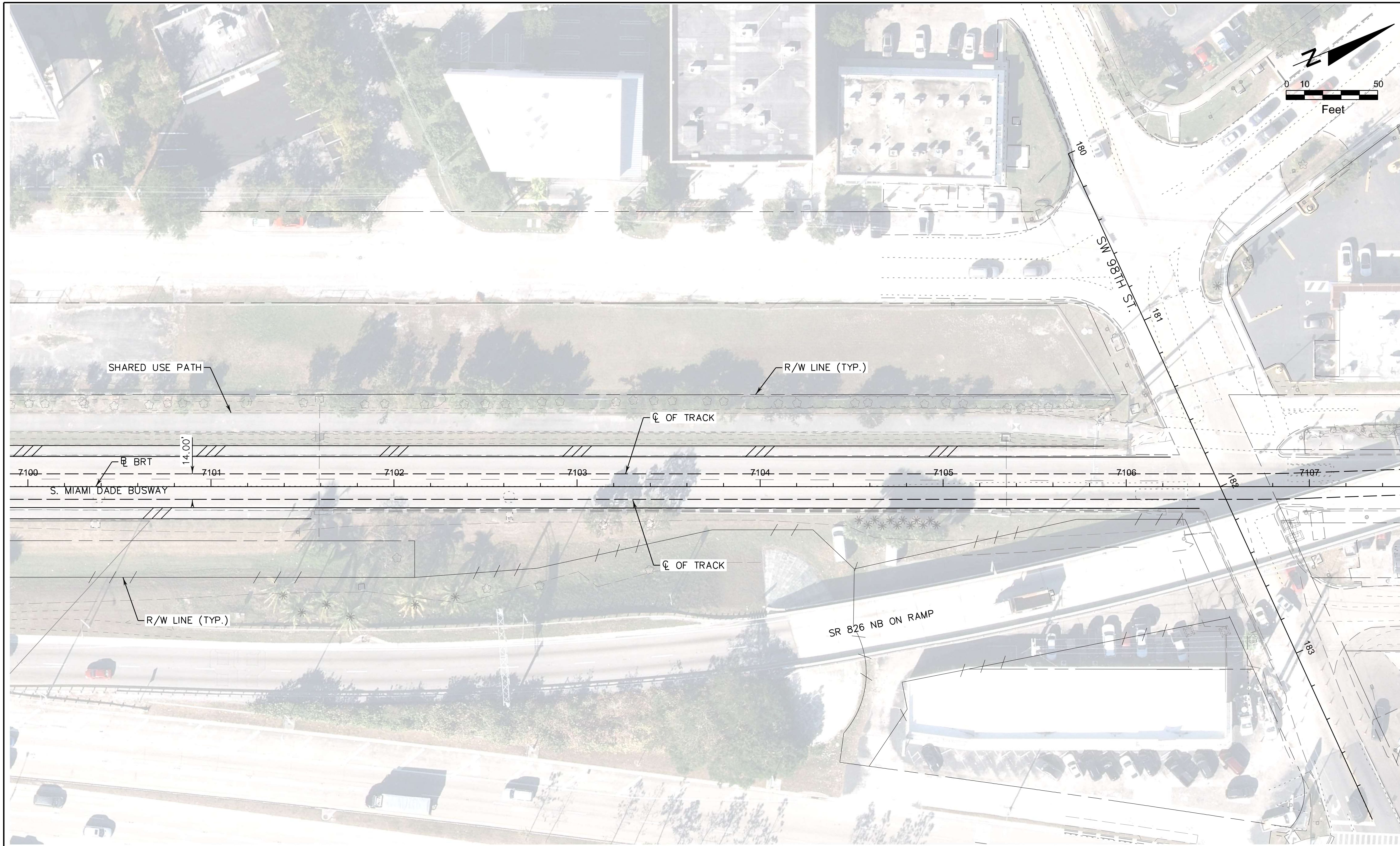
DRAWING TITLE:
SOUTH CORRIDOR RAIL STATION PLATFORM SW 104TH STREET

DRAWING NO. TTP01

SHEET NO. 17

p002234E 7/6/2023 9:31:13 AM C:\Users\p002234E\Desktop\SC_PTO_RAIL\SC1CSM-DFP00.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO
Miami-Dade Transportation Planning Organization

PARSONS
PARSONS TRANSPORTATION GROUP INC.
7600 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED | DATE
APPROVED | DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
NORTH END TIE IN
SW 98TH STREET

DRAWING NO. TTP01
SHEET NO. 18

$USER$ $DATE$ $TIME$ $FILE$

Designed by	EM
Drawn by	JMR
Checked by	JK
DRAWING SCALE:	1"= 50'

No.	Date	App.	Revisions

CONTRACT NO.: CIP155-DTPW19-DB

SOUTH CORRIDOR (SOUTH DADE TRANSITWAY) RAPID TRANSIT PROJECT

TPO
Miami-Dade Transportation Planning Organization

APPROVED
DATE

PARSONS
PARSONS TRANSPORTATION GROUP INC.
7800 CORPORATE CENTER DRIVE, SUITE 104, MIAMI, FL 33126
PHONE (305) 507-5577

APPROVED
DATE 02/23/2024

DRAWING TITLE:
SOUTH CORRIDOR RAIL
NORTH END TIE IN
SW 98TH STREET

DRAWING NO. TTP01
SHEET NO. 19

$USER$ $DATE$ $TIME$ $FILE$

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Appendix B FTA Special Safety Directive No. 18-3

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

Special Directive No. 18-3

Special Directive to Chicago Transit Authority and the Illinois Department of Transportation to Address Risks Associated with the Proximity of Third Rail to Highway-Railroad Grade Crossings

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: The FTA issues Special Directive 18-3 to require the Chicago Transit Authority (CTA) to conduct a safety risk assessment of its highway grade crossings at or near its third rail system, and develop a corrective action plan of those railroad grade crossings deemed to have an unacceptable risk. FTA directs the Illinois Department of Transportation (IDOT) to review, validate, and approve CTA's risk assessment findings and corrective action plan, and then submit the findings to FTA based on the following timetable:

1. Within 30 days from the date of issuance of this Special Directive, CTA or IDOT may petition for special approval to take actions not in accordance with this Special Directive or may petition for reconsideration.
2. Within 120 days from the date of issuance of this Special Directive, CTA must conduct its safety risk assessment, develop a corrective action plan, and submit the plan to IDOT for review, validation, and approval.
3. Within 70 days of receipt of a corrective action plan submitted by CTA, IDOT must review the plan, return the plan to CTA with specific direction for additional actions to be completed or revised, if necessary, and approve the plan.
4. Within 190 days from the date of issuance of this Special Directive, IDOT is required to submit the findings to FTA.

FOR FURTHER INFORMATION, CONTACT: For questions pertaining to requirements of the Special Directive, please contact James Bartell, Program Analyst, FTA Office of System Safety, telephone (202) 366-5512 or James.Bartell@dot.gov; and for legal matters, Candace Key, Attorney Advisor, FTA, telephone (202) 366–9178 or Candace.Key@dot.gov.

SUPPLEMENTARY INFORMATION:

Background

On February 3, 2015, a vehicle traveled northwest on Commerce Street in Valhalla, New York, toward a highway-railroad grade crossing. The driver entered the boundary of the grade crossing and stopped. The driver then moved beyond the boundary and stopped adjacent to the railroad tracks. The grade crossing warning system activated and the gate came down, striking the rear of the vehicle. The passenger exited the vehicle, examined the gate, then returned to their vehicle and moved forward on to the tracks. Meanwhile, a Metro-North Railroad train approached the grade crossing. The engineer activated the emergency brakes and collided with the vehicle at 51 mph. The train and the vehicle continued north, damaging the electrified third rail which pierced the vehicle and penetrated the lead railcar. Five passengers died and nine passengers and the engineer were injured, all in the lead railcar. The driver of the vehicle also died. As a result of its accident investigation, the NTSB made new recommendations to the FTA; Metro-North Railroad; Long Island Rail Road, Amtrak, Port Authority Trans-Hudson Corporation, and Southeastern Pennsylvania Transportation Authority; the New York Department of Transportation, and the town of Mount Pleasant, New York.

The NTSB recommendations to FTA include Safety Recommendations R-17-007 and R-17-008:

NTSB Safety Recommendation R-17-007:

Notify all rail transit properties that have third rail systems at or near highway-railroad grade crossings about this accident and advise them to conduct a risk assessment for those highway-railroad grade crossings.

NTSB Safety Recommendation R-17-008:

After a full risk assessment is complete, require all rail transit properties to implement corrections based on their findings that will mitigate the risk of highway-railroad grade crossing accident severity.

CTA and IDOT responsibilities

In accordance with 49 C.F.R. § 659.13, a state oversight agency is to be responsible for establishing standards for rail safety and security practices and procedures to be used by rail transit agencies within its purview. In addition, the state oversight agency must oversee the execution of these practices and procedures, to ensure compliance with the provisions of 49 CFR Part 659. IDOT is the designated state oversight agency for CTA. As the state oversight agency, IDOT has developed a system safety program standard – a document that establishes the relationship between the oversight agency and the transit agency that specifies the requirements that the CTA must follow. The System Safety Program Standard and Procedures (SSPSP) includes minimum requirements for: (1) safety practices to reduce the likelihood of unintentional events that may lead to death, injury, or property damage; and (2) security practices to reduce intentional wrongful or criminal acts. Other responsibilities attributed to IDOT include: requiring CTA to develop a system safety program plan that complies with IDOT's SSPSP; requiring CTA to report occurrences of defined accidents, incidents, and hazardous conditions; and requiring CTA to prepare corrective action plans to minimize, control, correct or eliminate hazards.

The FTA determined through data reported to the National Transit Database, that only the CTA operates third rail service at or near highway-railroad grade crossings and receives federal financial assistance. Therefore, FTA issues Special Directive 18-3 to CTA and its state safety oversight agency, IDOT.

DIRECTIVE AND REQUIRED ACTIONS:

In response to the NTSB's Safety Recommendations R-17-007 and R-17-008, FTA directs CTA to conduct a safety risk assessment of each highway-railroad grade crossing at or near its third rail system, and develop a corrective action plan for those locations deemed to have an unacceptable risk. Within 120 days from the date of issuance of this Special Directive, CTA must conduct its safety risk assessment, develop a corrective action plan, and submit the plan to IDOT for review, validation, and approval. The highway-railroad grade crossing risk assessment and corrective action plan must:

1) identify the location of all highway-railroad grade crossings with third rail systems at or near the crossing;
2) assess the risk(s) associated with operating third rail power at a highway-railroad grade crossing; and
3) propose a corrective action plan for all locations deemded to have an unacceptable risk, along with a milestone schedule for completion of the required actions and a verification process to ensure required actions have been completed in a timely manner.

In accordance with the FTA rule for State Safety Oversight at 49 C.F.R. § 659.13, within 70 days of receipt of a corrective action plan submitted by CTA, IDOT must:

1) review the plan,
2) return the plan to CTA with specific direction for additional actions to be completed or revised, if necessary, and
3) approve the plan.

IDOT must monitor CTA's progress in carrying out the corrective action plan through unannounced, on-site inspections, or any other means it deems necessary or appropriate.

Petition for Reconsideration

Within 30 days of the issuance of this Special Directive, CTA or IDOT may petition for special approval to take actions not in accordance with this Special Directive or may petition for reconsideration. Any such petition must be submitted in accordance with 49 C.F.R. § 670.27.

In accordance with 49 C.F.R. § 670.27(g), the FTA Administrator or his or her designee reviews and disposes of petitions for reconsideration. Currently, the position of FTA Administrator is vacant, thus FTA's Deputy Administrator will review and dispose of a petition for reconsideration of this Special Directive. IDOT or CTA must transmit a petition to the Deputy Administrator via email through Aloha Ley, Acting Director, Office of System Safety, Aloha.Ley2@dot.gov.

Enforcement

Any violation of this Special Directive or the terms of any written plan adopted pursuant to this directive will be managed in accordance with the FTA's authorities under 49 U.S.C. § 5329, including but not limited to: (1) withholding up to 25 percent of financial assistance to CTA under 49 U.S.C. § 5329(g)(1)(E); (2) issuing restrictions, closures, or prohibitions on service as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury under 49 U.S.C. § 5329(h); and (3) directing CTA to use Federal financial assistance to correct safety deficiencies pursuant to 49 U.S.C. § 5329(g)(1)(D).

Issued on: March 30, 2018

Matthew J. Welbes
Executive Director
Federal Transit Administration

U.S. Department of Transportation

References

[1] Wood, E., Shelton, D. S., & Shelden, M. (2006). Designing Bus Rapid Transit for Light Rail Transit Convertibility: Introduction for Planners and Decision Makers. Transportation Research Record, 1955(1), 47–55. https://doi.org/10.1177/0361198106195500106

[2] Uptown Houston (2020). https://uptown-houston.com/about/projects/

[3] Los Angeles County Measure R Plan (2008). https://www.metro.net/about/measure-r/

[4] Crowley, W. (2000). Historylink.org: Street Railways in Seattle. https://www.historylink.org/File/2707

[5] Kershner, J. (2020). Historylink.org: King County Metro Transit. https://www.historylink.org/File/20968

[6] Seattle Times (2022). Seattle Times: Sound Transit Takes Ownership of Aging Downtown, October 27, 2022 issue. https://www.seattletimes.com/seattle-news/transportation/sound-transit-takes-ownership-of-aging-downtown-seattle-tunnel/

[7] Rathwell, S., Schijns, S. (2002). Journal of Public Transportation, Volume 5, Issue 2, Ottawa and Brisbane: Comparing a Mature Busway System with Its State-of-the-Art Progeny. https://www.sciencedirect.com/science/article/pii/S1077291X22004337

[8] Hua, J. (2008). CTV News: City Council Approves $7 billion Transit Plan. https://ottawa.ctvnews.ca/city-council-approves-7-billion-transit-plan-1.347011?cache=yes%3FautoPlay%3Dtrue%3FclipId%3D1921747%3FautoPlay%3Dtrue

[9] Schepers, N. (2010). Ottowa City Council Transit Committee Report: Downtown Ottawa Transit Tunnel (DOTT) Planning and Environmental Assessment Study - Recommended Plan. https://app06.ottawa.ca/calendar/ottawa/citycouncil/occ/2010/01-13/tc/ACS2009-ICS-PGM-0214.htm

[10] Octranspo.com https://www.octranspo.com/en/plan-your-trip/schedules-maps/rapid-network/

[11] Ottowa, Canada (2021) Stage 2 LRT Station Connectivity Enhancement Study Project Update https://ottawa.ca/en/city-hall/public-engagement/projects/stage-2-lrt-station-connectivity-enhancement-study

[12] Federal Transit Administration (2019). South Corridor Rapid Transit Project, Miami, Florida, Small Starts Project Development Project Profile. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/funding/grant-programs/capital-investments/130031/fl-miami-dade-county-south-corridor-rapid-transit-project-profile.pdf

[13] Refer to the new CIG Policy Guidelines (January 2023) at: https://www.transit.dot.gov/sites/fta.dot.gov/files/2023-01/CIG-Policy-Guidance-January-2023.pdf

[14] https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/regulations-and-guidance/environmental-programs/55966/05-alternatives.pdf

[15] https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/regulations-and-guidance/116521/op-39-3rd-party-agreements-01-2018.pdf

[16]AECOM. (2018). *Rapid Transit Project Preliminary Engineering & Environmental Report.* Miami: Miami Dade County Department of Transportation and Public Works.

[17] Supreme Court of Illinois. (1992). Lee v. Chicago Transit Authority, 605 N.E.2d 493 (1992) 152 Ill. 2d 432
178 Ill. Dec. 699

Miami-Dade Transportation Planning Organization

South Dade TransitWay BRT Rail Conversion Guide

Final Report

July 2024

PARSONS TRANSPORTATION GROUP INC