

Metrorail M-Path Master Plan



Prepared for



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Miami-Dade County MPO Metrorail M-Path Master Plan

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Chapter 1. Introduction

M-Path Overview

The M-Path is a nine-mile paved multi-use path in urban Miami-Dade County. The M-Path was built in 1983 by Miami-Dade Transit (MDT) as part of the original Metrorail construction. The path or trail meanders within Miami-Dade Transit right-of-way under the elevated Metrorail guideways.

The M-Path provides a course of travel from SW 67th Avenue in South Miami to SW 3rd Street, north of the Miami River in downtown Miami. The M-Path is approximately six to eight feet wide, with a surface varying from asphalt path to concrete sidewalk. The current trail alignment includes portions of a separated multi-use trail and sidewalks adjacent to roadways. Some portions of the trail have been rerouted or completely removed due to land leases for parking lots.

The M-Path generally follows US 1 – South Dixie Highway and crosses 28 roadway intersections. The path connects six Metrorail stations: Brickell, Vizcaya, Coconut Grove, Douglas Road, the Uni-

versity of Miami, and South Miami. The path is primarily utilized as a bicycle commuter route and jogging or walking trail.

Plans are underway to extend the M-Path south to the South Miami-Dade Busway at the Dadeland South metrorail station. The extension will connect to the South Dade Trail that runs along the Busway to Florida City. When completed, the 30-mile long South Dade Trail/M-Path system will be one of the longest non-motorized trail facilities in Florida. It will also be a key component of the larger East Coast Greenway trail extending from Key West to Canada.

The M-Path is owned and operated by Miami-Dade Transit. Maintenance crews regularly clear debris and maintain the landscape along the trail corridor. The Miami-Dade County Metropolitan Planning Organization's (MPO) Bicycle and Pedestrian Program has included the trail as a significant component of the regional greenways and trails network. The MPO has identified improvements to the trail as a priority project in the Miami-Dade 2030 Long Range Transportation Plan.

Master Plan Purpose

The purpose of the Metrorail M-Path Master Plan is to address operational issues and problem areas within a comprehensive development program for the path as a whole. Project objectives such as addressing signage, improving safety, and maximizing Metrorail station connections will be achieved through the application of uniform trail standards. These standards will guide improvements for existing segments and serve as a development guide for future segments and connections to the M-Path.

Specific areas such as roadway intersections, Metrorail station plazas, and sites of adjacent private development will not be addressed individually, but will be looked at as components of the path as a whole. Such areas of concern will be subject to the development standards and typical treatments recommended for the project. The Master Plan is intended to apply a set of prescribed standards consistently throughout the M-Path corridor, and ensure a quality user experience.



M-Path Issues & Problem Areas



Missing trail segments

Unnecessary jogs in the path alignment should be eliminated so path users travel the most continuous route possible. At the beginning of this jog, a foot path has been worn into the landscaping by path users connecting two segments of the path.



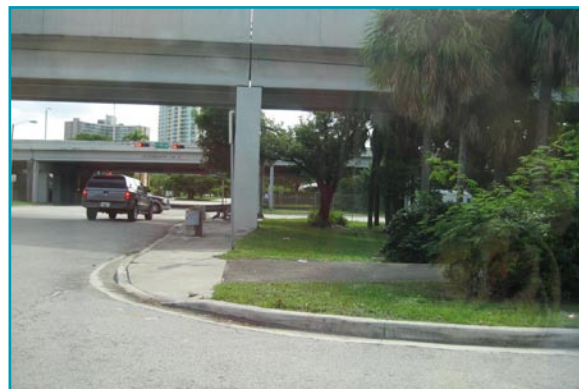
Lack of trail continuity and connectivity

Signs currently delineate where the M-Path stops abruptly at intersections then starts again on the other side. This contributes to a lack of continuity and encourages unsafe crossings.



Limited signage

This fork in the path is the perfect location for directional signage. Trail users approaching this fork may not know which route to take in order to continue on the M-Path or navigate to a Metrorail station.



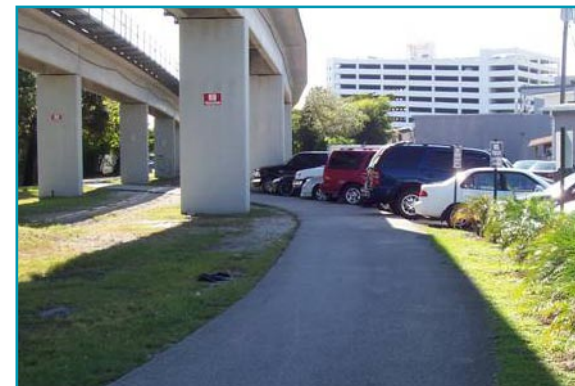
Substandard design

At this point near the Rickenbacker Causeway, trail users are directed to an unmarked roadway crossing and a poorly aligned curb ramp.



Poor visibility

This intersection approach is dangerous due to obstructions in the line of sight between drivers and path users, substandard fencing installation, and a poorly located crossing.



Encroachment of the trail

Encroachment of the M-Path trail by motor vehicles creates a potential safety hazard for users.



Deteriorating pavement conditions

This section of the M-Path is badly deteriorated due to root damage and needs resurfacing.

Chapter 2. Issues and Guiding Principles

M-Path Issues and Problem Areas

The project team for the Master Plan relied on a variety of different forums and sources for operational information on the M-Path trail. Interviews, field inventories, stakeholder meetings, public workshops, advisory committee presentations, staff consultation and team meetings were used to document the current issues affecting the potential success of the M-Path trail as a viable form of transportation and recognized community asset.

The following issues were identified and are addressed in the Master Plan:

- Trail user safety
- Missing trail segments
- Lack of trail continuity and connectivity
- Deteriorating pavement conditions
- Poor visibility
- Encroachment of the trail
- Substandard design
- Limited signage
- Trail identity

Two main principles have been developed to guide development standards for the M-path and address issues that have been previously identified. The two principles are supported throughout the Master Plan by each trail standard to ensure a consistent focus on the project purpose.

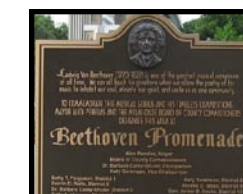
Guiding Principle I – *Develop an identity for the M-Path*

Currently the M-Path is underutilized and does not have a visible identity. Gaps in the trail, due to parking lots under the Metrorail guideways and inadequate signage, contribute to a lack of continuity throughout the M-Path corridor. ‘Begin’ and ‘end’ M-Path signs featuring the Metrorail logo are installed at numerous roadway crossings, creating an impression that the M-Path is not a continuous facility. The M-Path has also been realigned or completely removed in parking lots and approaches to existing sidewalks at intersections.



MUTCD bicycle route sign M1-8, is a familiar symbol for cyclists. It will serve as the basis for the M-Path directional signage. In place of a bike route number, the M-Path directional signs will feature the letter “M”.

Guiding Principle I must be supported in all development standards and potential trail realignments. Consistent improvements to entrance points, trail heads and signage will help to improve the volume of potential trail users and demark an identifiable trail system for the M-Path. Trail identity will be strengthened through the development of an M-Path logo that will be used consistently for signage, way-finding, and pavement markers.



Guiding Principle II – *Apply consistent trail standards throughout the entire corridor*

The M-Path trail will be 25 years old in 2008. The trail was constructed before many multi-use trail standards and guidelines were developed. The trail has excessive meanders around the Metrorail guideway support structures, has a sub-standard design, and has areas of poor visibility. The existing trail width does not safely accommodate two-way trail traffic and lacks regulatory signs. ‘No Parking’ signs have been installed within the M-Path asphalt, posing a potential safety hazard. A majority of the intersection or mid-block crossings do not have pedestrian activated signals, crosswalks or consistently aligned curb ramps.

Guiding Principle II will ensure consistency of the trail user’s experience and predictability of operation throughout the corridor. Use of consistent trail standards will improve safe use of the trail, reduce conflicts, and reduce trail encroachment. Consistent trail standards will apply to all agencies responsible for recommended improvements, including local governments, MDT, Florida Department of Transportation, and adjacent property owners and developers. Standards shall apply to all trail improvements regardless of location, conditions, or previous design precedent.

Chapter 3. M-Path Development Standards

Industry Standards and Guidelines

Several sources were used to determine the development standards for operational and design issues, including the Florida Department of Transportation (FDOT), the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the US Department of Transportation Federal Highway Administration (FHWA). Together these sources represent the industry standard for bicycle and pedestrian facility design. Publications cited in this document include:

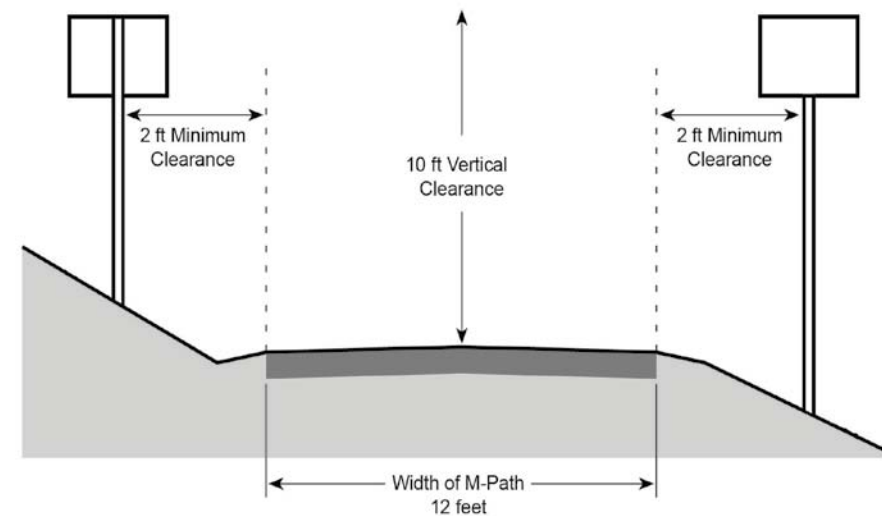
- FDOT Bicycle Facilities Planning and Design Handbook (*FDOT Bike*)
- FDOT Design Standards
- FDOT Pedestrian Planning & Design Handbook (*FDOT Ped*)
- FDOT Plans and Preparations Manual (*FDOT PPM*)
- Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways (Commonly known as the “Florida Greenbook”) (*Greenbook*)
- FHWA’s Manual on Uniform Traffic Control Devices for Streets and Highways (*MUTCD*)
- AASHTO Guide for the Development of Bicycle Facilities (*AASHTO Bike*)
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (*AASHTO Ped*)
- ITE Innovative Bicycle Treatments

M-Path Standards

The M-Path development standards represent the minimum conditions for safe and pleasurable operation of the trail by the traveling public. Standards shall be implemented consistently throughout the trail corridor, providing clear and concise direction for public and private entities responsible for trail and intersection improvements.

1. M-Path Design

- 1.1 The design speed for the M-Path shall be 20 mph.
- 1.2 In constrained areas, the design speed for the M-Path shall be 12 mph including, but not limited to: meanders under Metrorail guideways, and intersection, parking lot, and Metrorail plaza transition areas.
- 1.3 A pavement width of 12 feet is recommended for the entire length of the M-Path trail.



- 1.4 A two-foot clear zone shall be established from the edge of the M-Path pavement to any lateral barrier, including fencing, Metrorail guideways, mature trees, or other permanent structures.
- 1.5 A pavement width of ten feet will be allowed as an exception in areas where lateral obstructions exist adjacent to the trail and no other trail alignment is feasible.



Constrained areas should be carefully examined for other feasible trail alignments before reducing the path width to ten feet.



In areas where low clearance obstacles cannot be adjusted to meet the eight-foot height requirement, signage shall be used to warn trail users that they are approaching a low clearance area.

1.6 Non-motorized bridges should have 14-foot wide decks (ten-foot path width plus two-foot clear zones on either side) with 42” high railings and should be installed over water channels¹.

1.7 A ten-foot vertical clearance is recommended and an eight-foot vertical clearance, if allowed, in areas with a landscape canopy or any overhanging structure (see Sign standards for vertical clearance of trail signs).

¹ AASHTO Bike, p. 55

1.8 The existing M-Path trail shall be re-aligned to provide for standards 1.1 – 1.7, safer operations, and an enhanced user experience.

2. Crossings

2.1 Longitudinal ('ladder') and transverse (from curb to curb) crosswalk markings shall be installed at all signalized or stop-controlled intersections and raised crossings, and shall be 12-feet in width².



Additional pavement coloring, as shown in this picture, should be utilized to emphasize M-Path crossings.

2.2 Crosswalks should include colored pavements between crosswalk lines to emphasize the presence of the crosswalk; however, the supplemental coloring will not serve as a traffic control device³.



Pedestrian signal heads should feature countdown timers whenever possible.

2.3 Curb ramps at marked crossings shall be wholly contained within the 12-foot wide crosswalks excluding any flared sides.⁴

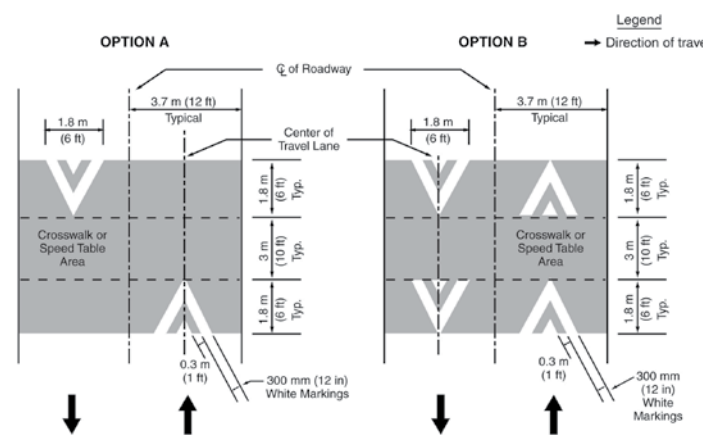
2.4 Detectable truncated-dome warnings, shall be provided for the full width of curb ramps to mark the street edge⁵.

2.5 Countdown pedestrian signals should be installed at all signalized crossings, timed for a four feet/second travel speed⁶, and installed per MUTCD standards⁷.

2.6 Stop lines for intersecting vehicular traffic should be placed no less than four feet in advance of and parallel to the nearest crosswalk marking⁸.

2.7 Raised 12-foot wide mid-block crosswalks shall be installed on low-volume, two-lane roadways with crossing distances less than 60 feet (unless a median or crossing island is provided), speed limits are less than 40 mph⁹ and following an engineering study of the location¹⁰.

Figure 3B-30. Examples of Pavement Markings for Speed Tables or Speed Humps with Crosswalks



This figure, from the MUTCD, illustrates the pavement markings for raised crosswalks.

2.8 Refuge islands shall be installed on two-step crossings of intersecting roadways where current median pavement striping exists.



The mid-block crossing shown in this picture features a raised colored crosswalk along with a pedestrian refuge island.

2.9 Raised crosswalks shall be provided for all driveways intersecting the M-Path corridor.

3. Signs

3.1 Bicycle Warning signs (W11-1) with a '250 FT' supplemental plaque shall be installed on adjacent roadways 250 feet in advance of adjacent M-Path crosswalks and mid-block crossings.

3.2 Bicycle Warning signs with a supplemental plaque featuring a downward-pointing diagonal arrow (W16-7p) shall be installed at all M-Path crosswalks and mid-block crossings to show the location of the crossing.

3.3 Bicycle Warning signs and supplemental plaques shall be a fluorescent yellow-green background color with a black legend and border¹¹.



Advance warning signs, like the one shown, will alert drivers of M-Path crossings.

² AASHTO Ped, p. 82

³ MUTCD Colored Pavements, 3E.01

⁴ Greenbook, C.10.a.4; AASHTO Bike, p. 51

⁵ AASHTO, Ped, p. 85, FDOT Design Standards Index 304

⁶ AASHTO Ped, 2.2.1

⁷ MUTCD, Section 4E.07

⁸ MUTCD 3B.16

⁹ MUTCD, 3B.26

¹⁰ PPM 8.3.3.1

¹¹ MUTCD 9B.17

- 3.4 M-Path directional signs (M1-8) with the letter symbol ‘M’ should be installed near intersections and at approximate half-mile intervals along the M-Path, with auxiliary milepost and ‘Distance to Metrorail Station’ information included.
- 3.5 No signs shall be installed within the M-Path pavement surface or two-foot clear zone, and new signs shall be installed a minimum of three feet and maximum of six feet outside the edge of pavement¹².
- 3.6 ‘No Unauthorized Motor Vehicles’ signs should be installed at existing or potential motor vehicle access points to prevent unauthorized access to the M-Path.
- 3.7 Countdown pedestrian signal signs¹³ shall be installed at all signalized intersections.

4. Pavement Markings

- 4.1 Regulatory traffic control devices, such as a stop bar and ‘STOP’ pavement marking, shall be installed on the M-Path prior to the back-of-sidewalk at all path-roadway intersections¹⁴.
- 4.2 Solid yellow centerline stripes and ‘SLOW’, ‘KEEP RIGHT’ pavement markings with a directional arrow shall be installed through every meandering horizontal curve under the Metrorail guideways and other 12 mph design speed areas.



Pavement markings, like these shown above, will be used as traffic calming devices in constrained or limited-visibility areas, such as locations where the M-Path meanders through the Metrorail support columns.

- 4.3 White edge striping shall be included at the edge of the M-Path pavement adjacent to any permanent lateral barrier within the clear zone as defined in Standard 1.4.
- 4.4 A pavement marking for the M-Path shall be developed using the ‘M’ symbol with a direction arrow and used interchangeably with M-Path directional signs at locations specified in Standard 3.4.

5. Safety

- 5.1 Emergency call boxes shall be installed in areas with known criminal activity, poor lighting, and segments with a high volume of night traffic (i.e. Metrorail station approaches, underneath Metrorail guideways, and segments adjacent to the University of Miami along Ponce de Leon Drive).
- 5.2 Lighting should be considered where night use is expected, such as segments serving college students or commuters, and at roadway intersections¹⁵.



¹⁵ PPM, 8.6.12



Light fixtures, like the one above, can enhance the look of the M-Path and be functional too, as is the case in this ideal stretch of the path near the University of Miami (left).



Opaque walls, like the one shown above, limit the ability of trail users to see what is around them. Conditions like this may cause M-Path users to feel unsafe and may encourage criminal activity.

- 5.3 Lighting should be installed in areas with known or recorded criminal activity.
- 5.4 The feasibility of solar generated lighting should be evaluated in areas where electricity is currently not available.
- 5.5 Construction of new fencing or walls, within or adjacent to Metrorail right-of-way, shall be made of non-opaque materials such as chain link, wrought iron, metal tubular, etc. Use of solid or opaque fencing materials shall be discouraged.
- 5.6 Existing opaque fencing should be evaluated for replacement based on the extent of criminal activity, aesthetics and function.
- 5.7 Steel pedestrian/bicycle picket railing shall be installed on sidewalks at intersections where drop-off hazards exceed two-feet six inches or where required by design¹⁶.
- 5.8 Aluminum pipe guardrail shall be installed on sidewalks at intersections where drop-off hazards are less than two-feet six inches¹⁷.

¹⁶ FDOT Design Standards Index 820, 850, 860

¹⁷ FDOT Design Standards Index 870

¹² AASHTO Bike, p. 36; MUTCD

¹³ MUTCD R10-3e

¹⁴ AASHTO Bike, p. 49

6. Encroachment

6.1 Landscaping, bollards, signage, and low-level non-opaque fencing shall be installed to discourage unauthorized motor vehicle parking within the Miami-Dade Transit right-of-way.



Removable bollards such as these may be used to prevent unauthorized access along the trail.

6.2 Removable bollards shall be installed to allow for Miami-Dade Transit maintenance vehicle access.



A 'No Unauthorized Motor Vehicles' sign at this location could discourage trail use by unauthorized motor vehicles.

6.3 Wheel-stops shall be installed in parking stalls perpendicular to the M-Path to prevent motor vehicle encroachment within the clear zone.



Installing wheel-stops in the spaces adjacent to this section of M-Path will minimize encroachment of the trail.

6.4 Miami-Dade Transit Leasing Office shall require the following to be shown on site and/or development plans during review and approval of Miami-Dade Transit right-of-way leases:

- a. Miami-Dade Transit right-of-way
- b. Existing M-Path alignment as illustrated in the M-Path Master Plan
- c. New Path alignment as illustrated in the M-Path Master Plan
- d. New alignment of any proposed re-routing of the M-Path
- e. Raised crosswalks with standard pavement markings for new or existing driveways
- f. M-Path connections to adjacent intersections and roadway crossings
- g. Maintenance agreement for M-Path and any new landscaping
- h. Application of Development Standards as set forth in this Master Plan document

6.5 Miami-Dade Transit, Florida Department of Transportation, Miami-Dade Metropolitan Planning Organization, and applicable local governments shall apply the Development Standards set forth in this Master Plan document for any proposed plans and/or improvements to M-Path, adjacent roadways/intersections, and properties intersecting or adjacent to the M-Path corridor.

7. Landscaping

7.1 When the M-Path trail alignment is located adjacent to a roadway, a five-foot landscaped separation should be provided¹⁸.



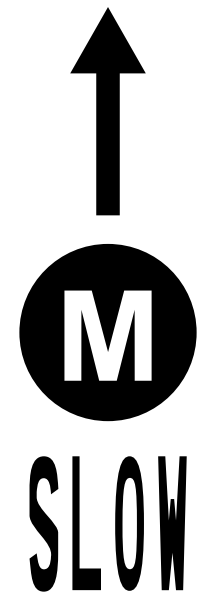
Landscaping contributes to the enjoyment of traveling the M-Path, but should be well maintained so as not to become an obstacle for trail users.

7.2 Landscape barriers to discourage encroachment shall include low-level shrubs and not exceed 42" in height.

7.3 Surface areas of M-Path with tree root damage shall be improved or retrofitted with root barriers.

7.4 Site-specific areas for shade trees shall be identified for future landscape improvements based on tree species and need for additional shade or encroachment prevention.

7.5 Landscaping improvements for leased Miami-Dade Transit right-of-way, medians, and adjacent developments should be based on minimizing maintenance costs and watering requirements, such as xeric landscaping plants.



Pavement marking for Metrorail station plaza approaches.

¹⁸ PPM, 8.6.10

8. Metrorail Plaza Treatments

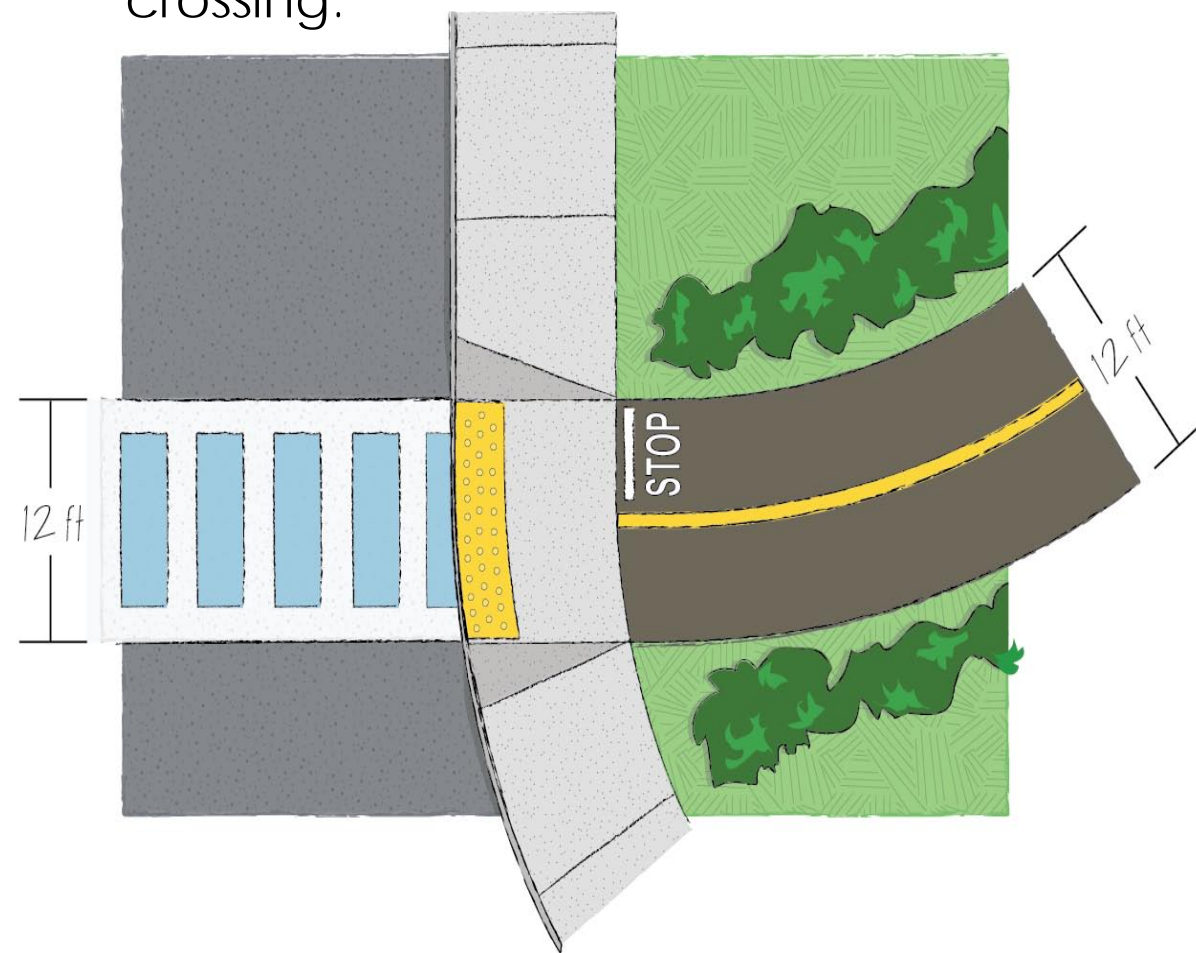
8.1 Wayfinding signs should be installed in high-traffic areas of Metrorail Stations, such as station entrance plazas, with 'You Are Here' maps of the M-Path corridor and local landmark information.

8.2 The M-Path 'M' symbol, directional arrow, 'SLOW' pavement marking, and '[bicycle symbol] YIELD TO PEDS' sign¹⁹ shall be installed within 50 feet of Metrorail Station approaches.

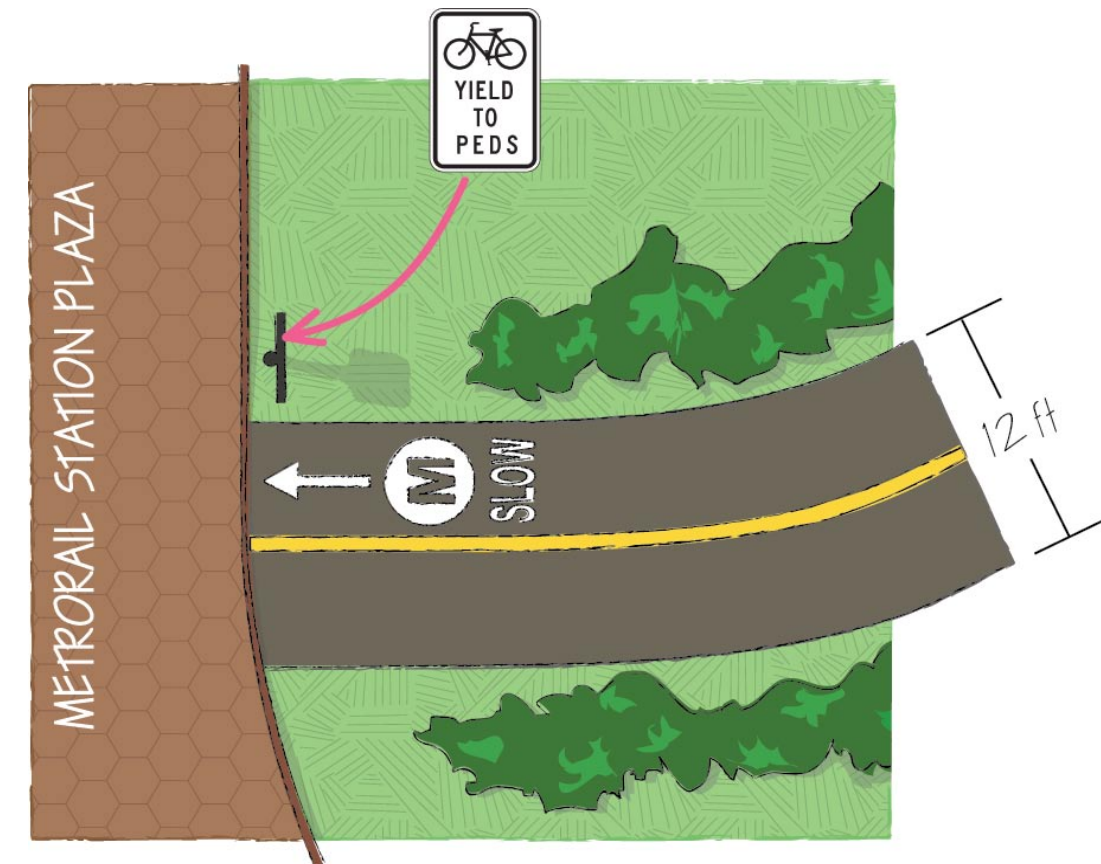
8.3 Landscaping may be used within 50 feet of Metrorail Station approaches as a traffic calming measure and an aesthetic enhancement.

8.4 Water fountains should be installed outside Metrorail Stations.

Conceptual application of M-Path standards at intersection approach and crossing.



Conceptual application of M-Path standards at a Metrorail station approach.



¹⁹ MUTCD, R9-6

Chapter 4. Development Phasing Plan

The M-Path Master Plan represents a significant opportunity to improve an underutilized urban commuter and recreational trail system in the Miami-Dade region. Improvements are focused on ‘common sense’ solutions to safety and operational issues and problem areas. Short-term Master Plan implementation will be guided by available funding and the ability to construct low-cost improvements, such as signs and pavement markings. Long-term improvements will require significant capital expenditures to fund large-scale projects, such as path rehabilitation, intersection reconfigurations, and landscaping.

The following phasing plan has been outlined to guide initial trail investments and allow for stakeholders to use this Master Plan document to leverage future funding. The M-Path will be celebrating 25 years of operation in 2008, and this milestone could be used as a target timeline for short-term improvements with a high visual impact. Construction of the improvements could be coordinated in conjunction with a public relations campaign and celebratory event to commemorate the M-Path trail.



Short-term Improvements

- 1) Resurface critical sections
 - a) Tree root damage area in the vicinity of SW 22nd Road and SW 21st Road
 - b) South of Viscaya Metrorail Station
- 2) Provide advance warning signs and re-stripe crosswalks
- 3) Install directional signs with milepost distance to Metrorail station information
- 4) Install pavement markings (‘STOP’) near intersections
- 5) Provide constrained-area pavement markings (Meanders around guideway supports)
- 6) Construct missing links at University of Miami parking lot
- 7) Realign M-Path at South Miami Metrorail station and close existing sidewalk (high crime area)
- 8) Install emergency call boxes in high-crime areas
- 9) Implement encroachment prevention measures
- 10) Apply development standards during site plan review and approval

Long-term Improvements

- 1) Realign sub-standard path meanders
- 2) Rehabilitate M-Path to a twelve-foot wide facility
- 3) Install countdown pedestrian signals and intersection reconfigurations (crosswalk realignments, refuge islands, raised intersections, bollards)
- 4) Install lighting
- 5) Enhance landscaping
- 6) Provide wayfinding at Metrorail station plazas
- 7) Construct non-motorized bridge at Coral Gables Waterway
- 8) Coordinate Deel Volvo property lease/easement exchange

Other Considerations

- 1) Existing Metrorail bicycle locker locations should be maintained and enhanced
- 2) Landscaping throughout M-Path corridor should be enhanced
- 3) Alternative M-Path management strategies (i.e. Miami-Dade Parks and Recreation, adopt-a-trail programs, etc.) should be considered

Chapter 5. Cost Estimates

Funding for the design and construction of M-Path improvements will come from a variety of sources, including but not limited to Miami-Dade Transit, Miami-Dade County, Florida Department of Transportation, developer agreements and grant sources. The following planning-level cost estimate has been developed to determine the funding needs for the project management, design, and construction of the proposed improvements to the M-Path trail.

Unit types and prices are based on the current set price from the Miami-Dade County Public Works Department (June 2006). The current set price is the average of unit prices on projects completed for Miami-Dade County from January 2006 to June 2006. Soft costs are based on experience with similar projects and a range of standard percentages used by the Florida Department of Transportation for design and construction administrative services.

The cost to remove, realign, and resurface the entire M-Path corridor, not including other improvements, is approximately \$1.5 million. A cost-saving measure was included in the estimate by using all asphalt material removed from realignment segments as additional base material for the widening and resurfacing of the trail.

The estimated cost of phased improvements as described in Chapter 4, *Development Phasing Plan*, is \$683,524.55 for short-term improvements and \$2,512,435.82 for long-term improvements.

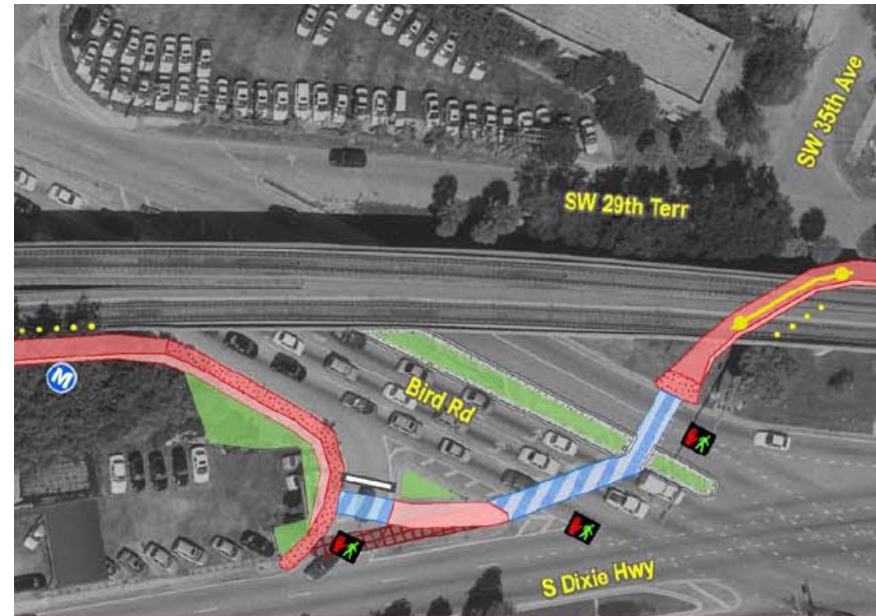
M-Path Improvement Cost Estimate Table

Base Bid Item No.	Elements	Estimated Quantity	Unit	Unit Price	Cost
1	Decorative Bollards (non-lit)	11	EA	\$ 500.00	\$ 5,500.00
2	Advance Warning Signs				
a	Advance Warning Sign with "250 FT" placard	75	EA	\$ 150.00	\$ 11,250.00
b	Warning Sign at Intersection Crosswalk with arrow placard	75	EA	\$ 150.00	\$ 11,250.00
3	Interpretive Wayfinding Sign	7	EA	\$ 1,500.00	\$ 10,500.00
4	Directional Signs	25	EA	\$ 150.00	\$ 3,750.00
5	Emergency Call Box	6	EA	\$ 7,500.00	\$ 45,000.00
6	Bridges (+/- 102 ft span)	1	EA	\$ 102,000.00	\$ 102,000.00
7	Landscape Buffer (18")	7,948	LF	\$ 3.00	\$ 23,844.00
8	Low Landscape (Grass)	78,345	SY	\$ 4.02	\$ 314,946.90
9	Colored cross Walks - includes sub-base - Base	22,826	SF	\$ 6.66	\$ 152,021.16
10	Raised colored cross Walks (6") - includes sub-base - Base	6,713	SF	\$ 16.22	\$ 108,884.86
11	Typical Plaza treatment (sign, marking, fountain etc)	6	EA	\$ 20,000.00	\$ 120,000.00
12	New Asphalt Path	236,400	SF		
a	Lime rock base	26,267	SY		
	Lime rock base	16,738	SY	\$ 10.91	\$ 182,607.94
	Lime rock base (use demolished path materials)	9,529	SY	\$ 4.00	\$ 38,116.00
b	Type B Stabilization	26,267	SY	\$ 2.10	\$ 55,160.00
c	Type S-1 Asphaltic Concrete	1,313	TN	\$ 85.28	\$ 112,001.07
d	Asphaltic Concrete Friction Course (FC-3)	1,459	TN	\$ 108.56	\$ 158,417.19
13	Resurfacing of existing Path	206,439	SF		
a	1" Milling of existing Asphalt Path	22,938	SY	\$ 2.77	\$ 63,537.03
b	Type S-1 Asphaltic Concrete	1,147	TN	\$ 85.28	\$ 97,805.74
c	Asphaltic Concrete Friction Course (FC-3)	1,274	TN	\$ 108.56	\$ 138,338.95
14	Pavement Markings (6" wide)	1,543	LF	\$ 0.46	\$ 709.78
15	Pavement Markings (12" Cross Walk, 12" white @ 24")	14,770	LF	\$ 1.70	\$ 25,108.15
16	Pavement Markings (24" White)	112	LF	\$ 3.36	\$ 376.32
17	Pavement Markings (Letters and Symbols)	76	EA	\$ 119.83	\$ 9,107.08
18	Wrought iron safety fencing	209	LF	\$ 19.00	\$ 3,971.00
19	Lighting including Pole, Luminaire, Conduit etc.	60	EA	\$ 1,600.00	\$ 96,000.00
20	Pedestrian signal head with timer with wire, conduit etc.	30	EA	\$ 1,500.00	\$ 45,000.00
21	Concrete Curbs	221	LF	\$ 43.00	\$ 9,503.00
22	Curb Island	2,272	SY	\$ 41.33	\$ 93,901.76
23	Remove Asphalt Path	9,529	SY	\$ 15.00	\$ 142,935.00
	Subtotal				\$ 2,181,542.92
	Design & Constr. Admin 15%	1	Allow	\$ 327,231.44	\$ 327,231.44
	Project Management 12%	1	Allow	\$ 261,785.15	\$ 261,785.15
	General Requirements 6%	1	Allow	\$ 130,892.58	\$ 130,892.58
	Bond & Insurance 1%	1	Allow	\$ 21,815.43	\$ 21,815.43
	Traffic Maintenance 2.5%	1	Allow	\$ 54,538.57	\$ 54,538.57
	Contingency 10%	1	Allow	\$ 218,154.29	\$ 218,154.29
	Subtotal Soft Costs				\$ 1,014,417.46
	Grand-total Costs				\$ 3,195,960.37

Chapter 6. Map Section

The map section of this document illustrates conceptual improvements recommended for the M-Path corridor. The primary purpose of the map section is to illustrate the current alignment of the M-Path and how the proposed improvements support the two Guiding Principles for the M-Path Master Plan. The maps also provide an overview of the M-Path trail as a continuous facility to illustrate the potential of the M-Path as a signature nine-mile transportation and recreational asset in the Miami-Dade region.

The maps identify the location of specific intersection improvements, including new crosswalk alignments, pavement markings, pedestrian signals and signs. The maps are intended for planning purposes and to assist responsible parties in the design and implementation of M-Path Development Standards as outlined in Chapter 3.



This detail shows the addition of a multi-step signalized crossing at the intersection of Bird Road and South Dixie Highway.

The map section includes 44 individual segment details beginning at SW 67th Avenue in South Miami and continuing to SW 3rd Street in Downtown Miami. Each segment illustrates the existing M-Path trail, intersecting sidewalks or trails, proposed realignments, intersection improvements, emergency call box locations, warning signs, and encroachment prevention areas. Additionally, specific locations have been recommended for specially-designed directional signs and/or markings on the path.

Improvements not shown in the conceptual map illustrations include, but are not limited to:

- Bicycle stop bars and ‘STOP’ markings
- Bicycle warning signs at crosswalk locations

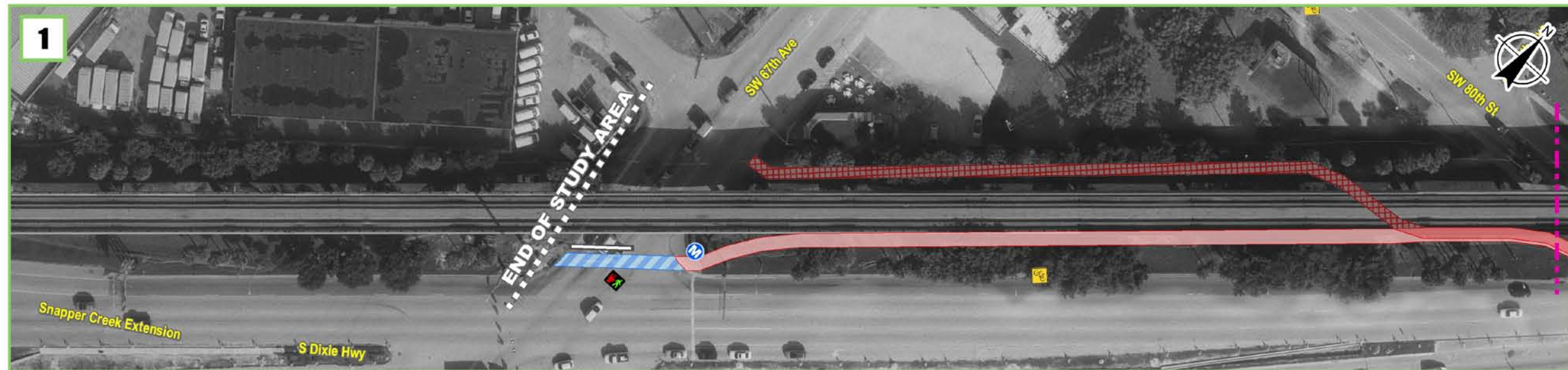


- 'M' with arrow pavement markings for Metrorail station plaza approaches
- Pedestrian countdown timers
- Curb ramps with reflective truncated-dome warnings
- 'No Unauthorized Motor Vehicle' signs
- 'Bike Yield to Peds' signs at Metrorail Station approaches

- White striping adjacent to any lateral obstructions
- Wheel-stops for parking lots
- Wayfinding signs at Metrorail Station plazas

The location and construction of improvements, not shown on the maps, shall be in accordance with the procedures described in Chapter 3, *M-Path Development Standards*. The development standards are

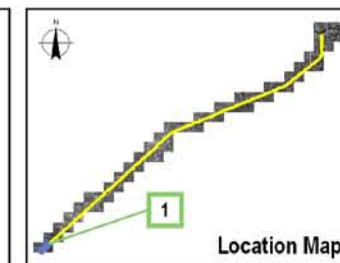
designed for universal application along the M-Path corridor depending on the type of the standard and location of the improvement. The improvements illustrated in the map section supplement the M-Path Development Standards as described in this Master Plan document by providing the physical location for proposed trail improvements.



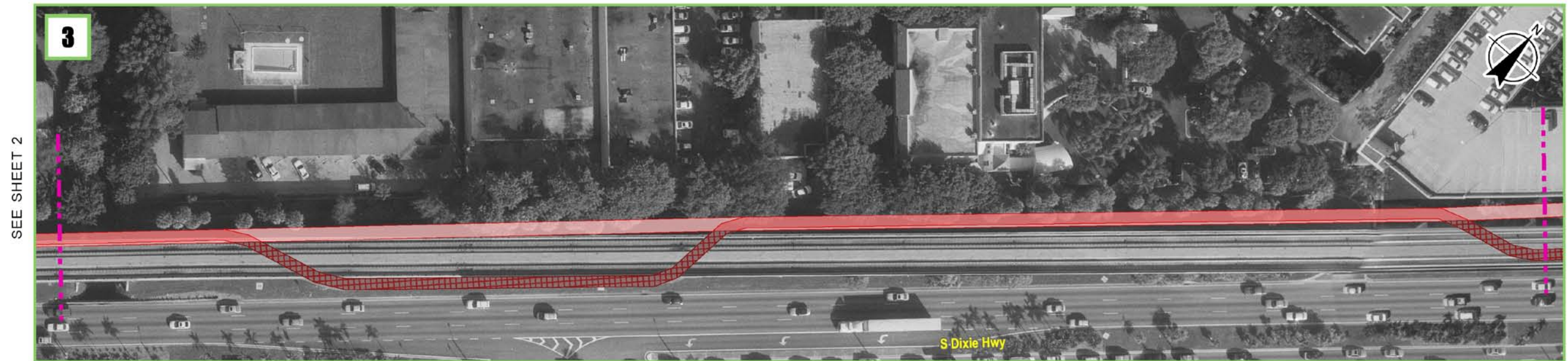
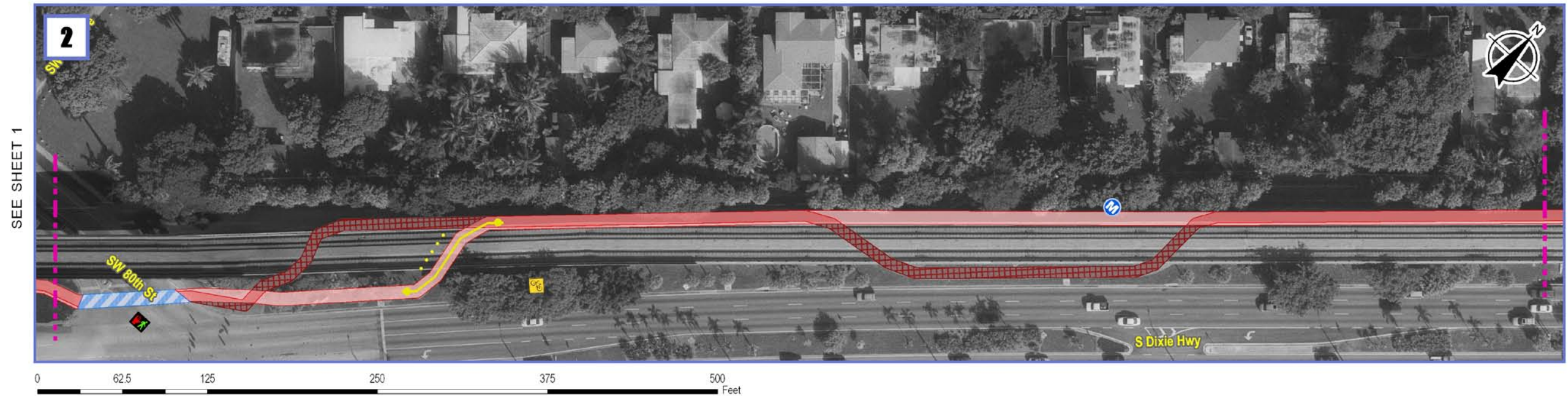
SEE SHEET 2

Legend

Existing Conditions		Master Plan Improvements											
	Paved path		Advance Warning Sign		Pedestrian Signal		Removable Bollards		Lighting		New Path		New Curb
	Crosswalk		Directional Sign		Wayfinding Sign		Low Landscaped Buffer		Pavement Markings		Remove Path		Low Landscaping
	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Colored Crosswalk		Raised Colored Crosswalk		Bike-Ped Bridge
	Secondary Path											Plaza Improvements	

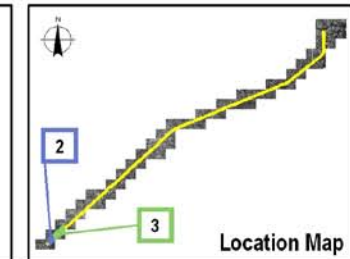


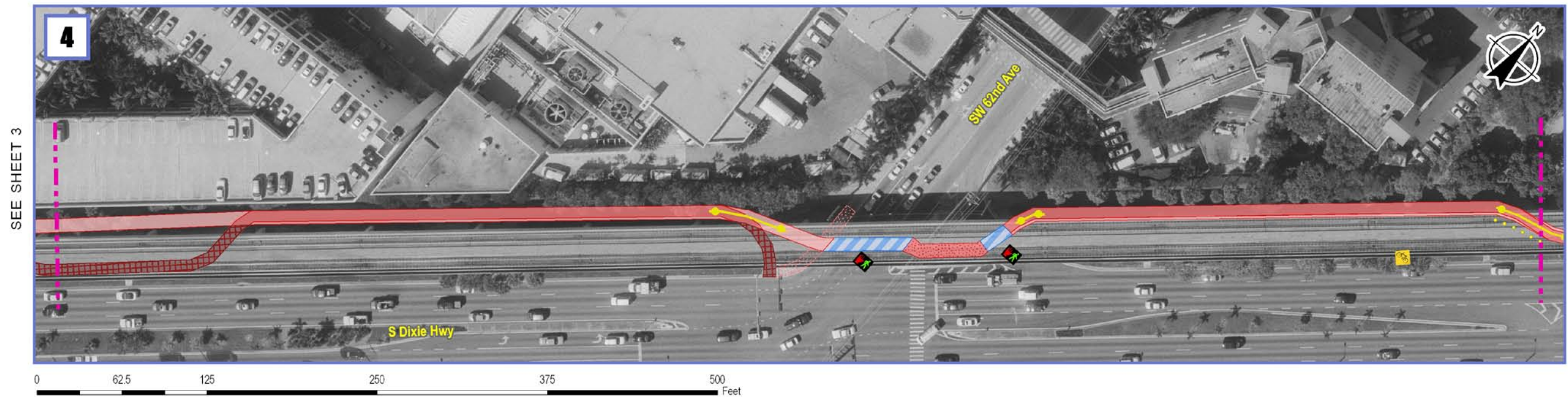
Metrorail M-Path Master Plan



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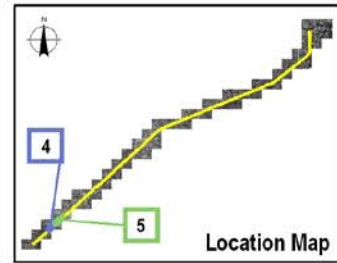
Existing Conditions		Master Plan Improvements											
	Paved path		Advance Warning Sign		Pedestrian Signal		Removable Bollards		Lighting		New Path		New Curb
	Crosswalk		Directional Sign		Wayfinding Sign		Low Landscaped Buffer		Pavement Markings		Remove Path		Low Landscaping
	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Colored Crosswalk		Raised Colored Crosswalk		Bike-Ped Bridge
	Secondary Path								Plaza Improvements				



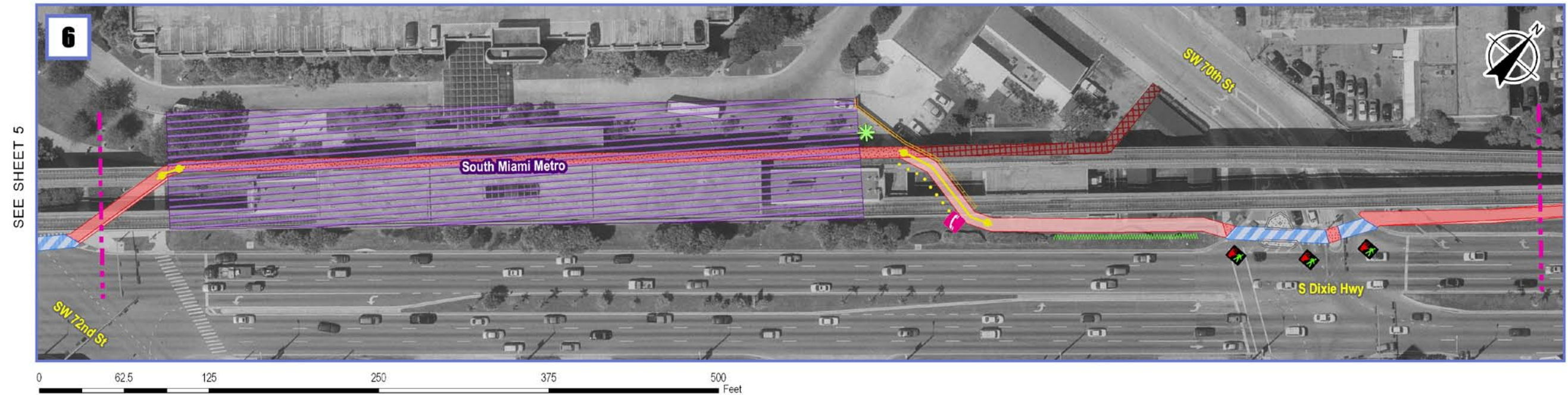


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Existing Conditions		Master Plan Improvements	
	Paved path		Advance Warning Sign
	Crosswalk		Directional Sign
	Sidewalk		Emergency Call Box
	Secondary Path		Pedestrian Signal
			Wayfinding Sign
			Removable Bollards
			Low Landscaped Buffer
			Safety Fencing
			Lighting
			Pavement Markings
			New Path
			Remove Path
			Colored Crosswalk
			Raised Colored Crosswalk
			New Curb
			Low Landscaping
			Bike-Ped Bridge
			Plaza Improvements
			Stop Bar

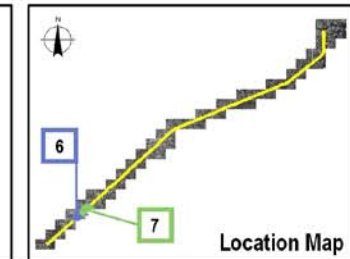


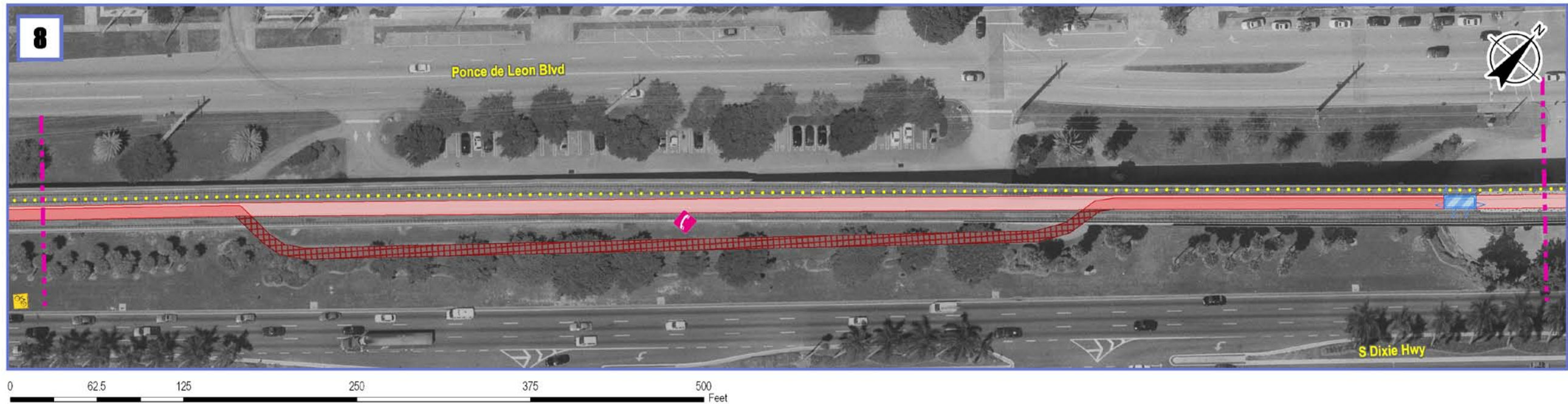
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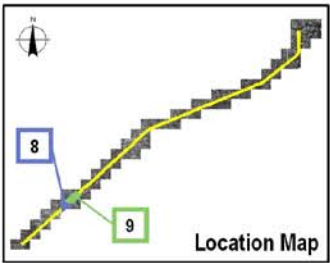
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	Crosswalk		Directional Sign		Wayfinding Sign		Colored Crosswalk
	Sidewalk		Emergency Call Box		Low Landscaped Buffer		Raised Colored Crosswalk
	Secondary Path		Removable Bollards		Safety Fencing		Stop Bar
			Lighting		New Path		New Curb
			Pavement Markings		Remove Path		Low Landscaping
			Stop Bar		Colored Crosswalk		Bike-Ped Bridge
					Raised Colored Crosswalk		Plaza Improvements





Legend

Existing Conditions		Master Plan Improvements					
	Paved path		Advance Warning Sign		Pedestrian Signal		Remove Path
	Crosswalk		Directional Sign		Wayfinding Sign		New Path
	Sidewalk		Emergency Call Box		Low Landscaped Buffer		Colored Crosswalk
	Secondary Path		Safety Fencing		Low Landscaping		Raised Colored Crosswalk
			Removable Bollards		Lighting		New Curb
			Low Landscaped Buffer		Pavement Markings		Low Landscaping
			Safety Fencing		Stop Bar		Bike-Ped Bridge
							Plaza Improvements

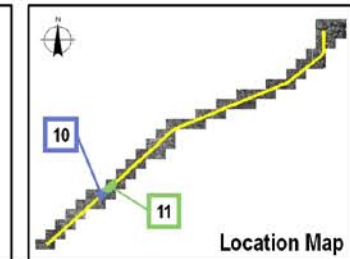


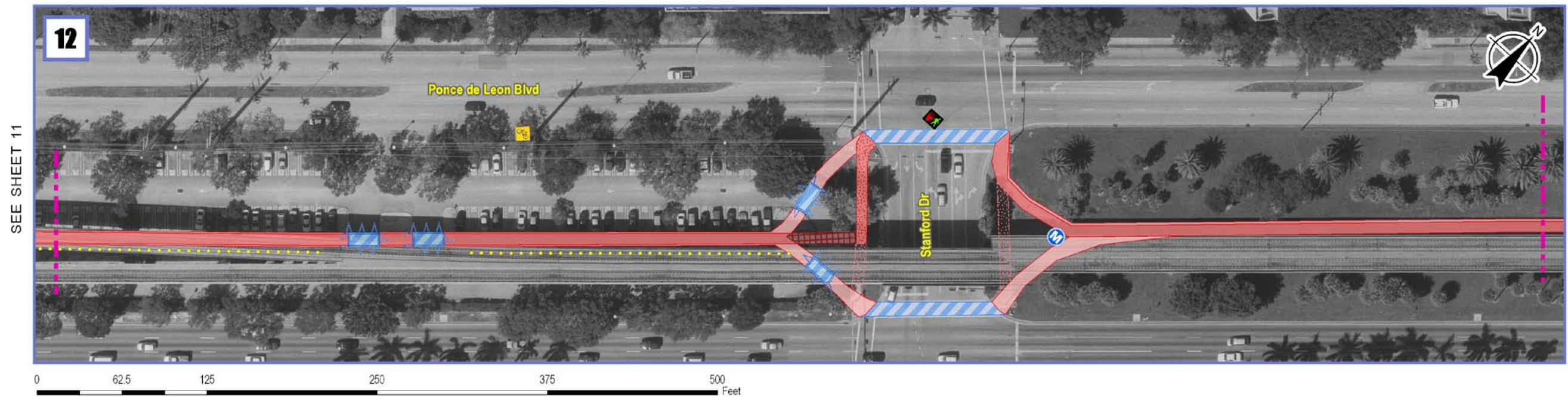
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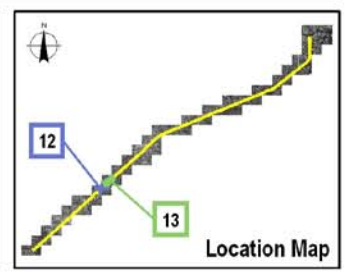
Existing Conditions		Master Plan Improvements											
	Paved path		Advance Warning Sign		Pedestrian Signal		Removable Bollards		Lighting		New Path		New Curb
	Crosswalk		Directional Sign		Wayfinding Sign		Low Landscaped Buffer		Pavement Markings		Remove Path		Low Landscaping
	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Colored Crosswalk		Raised Colored Crosswalk		Bike-Ped Bridge
	Secondary Path										Plaza Improvements		



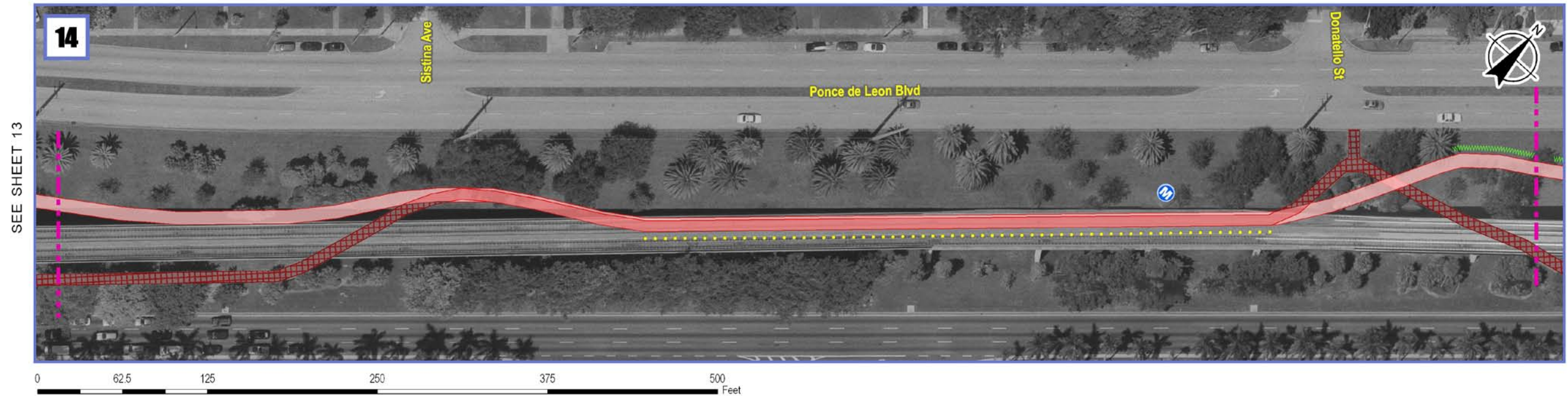


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Existing Conditions		Master Plan Improvements															
	Paved path		Advance Warning Sign		Pedestrian Signal		Directional Sign		Remove Path		Low Landscaping		Colored Crosswalk		Bike-Ped Bridge		Plaza Improvements
	Crosswalk		Wayfinding Sign		Low Landscaped Buffer		Lighting		New Path		Pavement Markings		Stop Bar		Raised Colored Crosswalk		
	Sidewalk		Safety Fencing		Removable Bollards		Stop Bar		New Path		Stop Bar				New Curb		
	Secondary Path				Removable Bollards				New Path					Raised Colored Crosswalk			

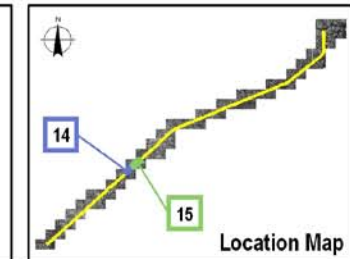


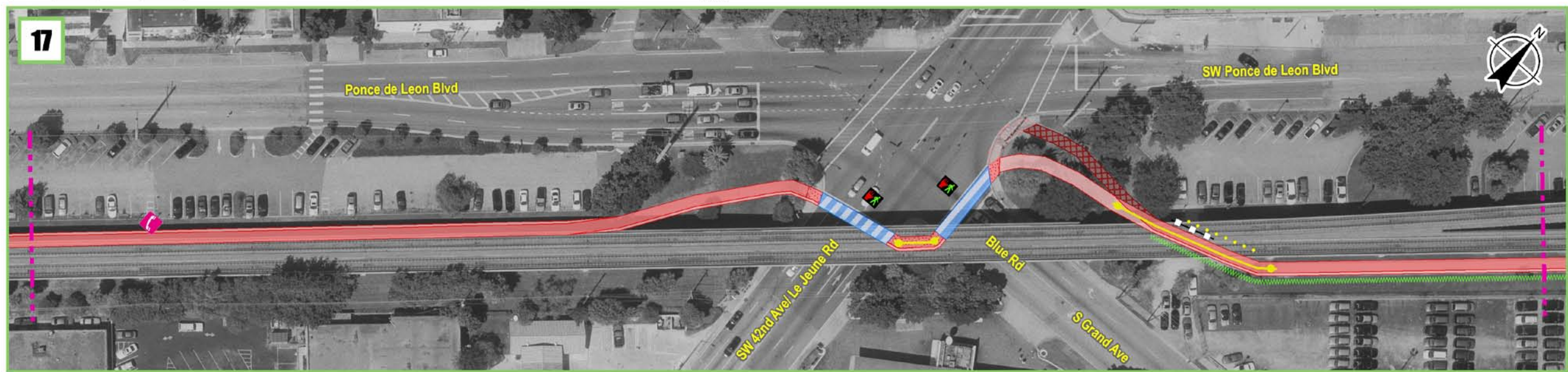
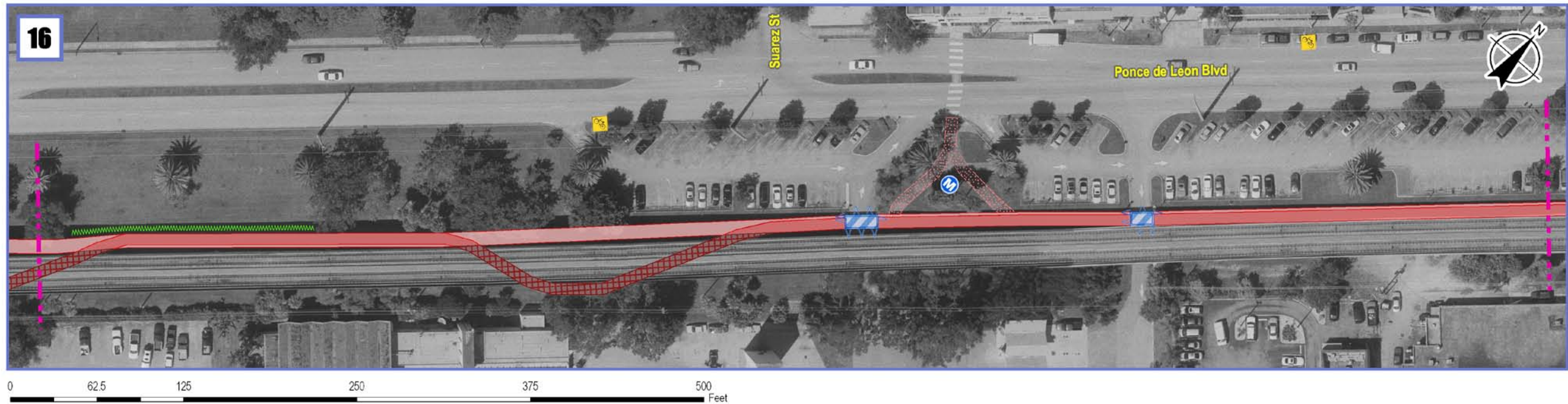
Metrorail M-Path Master Plan



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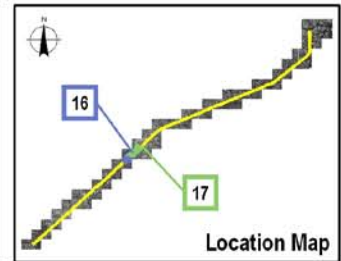
Existing Conditions		Master Plan Improvements	
	Paved path		Advance Warning Sign
	Crosswalk		Pedestrian Signal
	Sidewalk		Wayfinding Sign
	Secondary Path		Directional Sign
			Emergency Call Box
			Removable Bollards
			Low Landscaped Buffer
			Safety Fencing
			Lighting
			Pavement Markings
			Stop Bar
			New Path
			Remove Path
			Colored Crosswalk
			Raised Colored Crosswalk
			New Curb
			Low Landscaping
			Bike-Ped Bridge
			Plaza Improvements



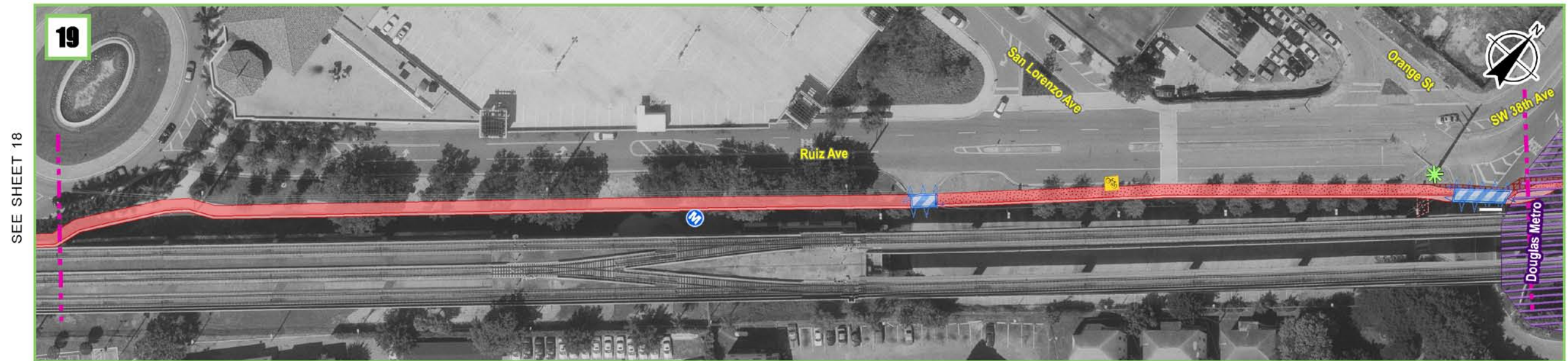


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Existing Conditions		Master Plan Improvements					
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	Crosswalk		Directional Sign		Wayfinding Sign		New Path
	Sidewalk		Emergency Call Box		Low Landscaped Buffer		Lighting
	Secondary Path		Removable Bollards		Safety Fencing		Pavement Markings
			Stop Bar		Colored Crosswalk		Raised Colored Crosswalk
			New Curb		Low Landscaping		Bike-Ped Bridge
			Plaza Improvements				

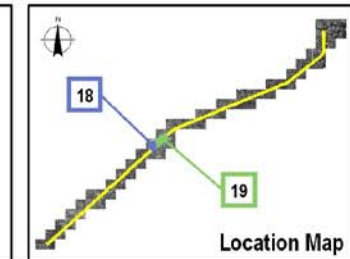


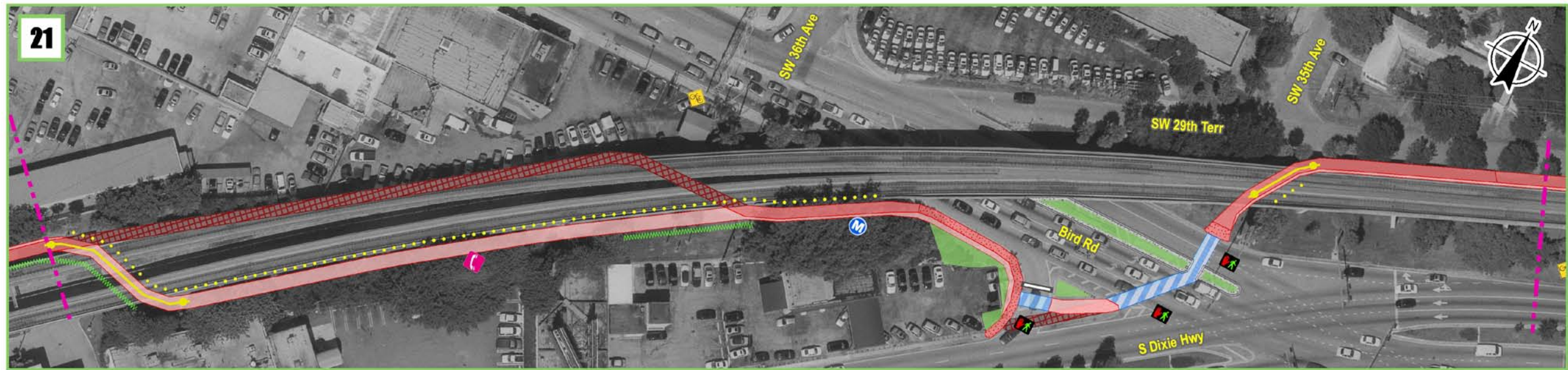
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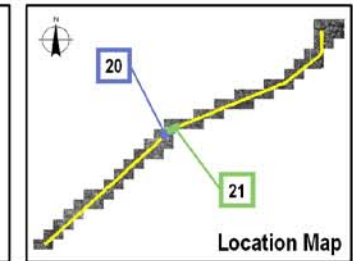
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	Crosswalk		Directional Sign		Wayfinding Sign		Remove Path
	Sidewalk		Emergency Call Box		Low Landscaped Buffer		Colored Crosswalk
	Secondary Path		Removable Bollards		Lighting		Raised Colored Crosswalk
			Directional Sign		Low Landscaped Buffer		Stop Bar
			Emergency Call Box		Safety Fencing		Stop Bar
					Lighting		New Path
					Pavement Markings		Remove Path
					Stop Bar		Colored Crosswalk
					Stop Bar		Raised Colored Crosswalk
							New Curb
							Low Landscaping
							Bike-Ped Bridge
							Plaza Improvements



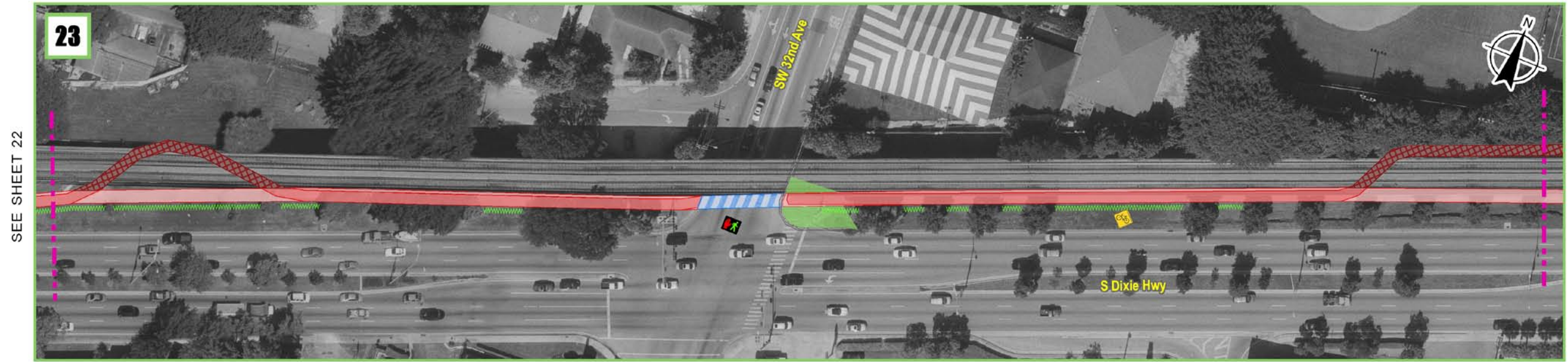
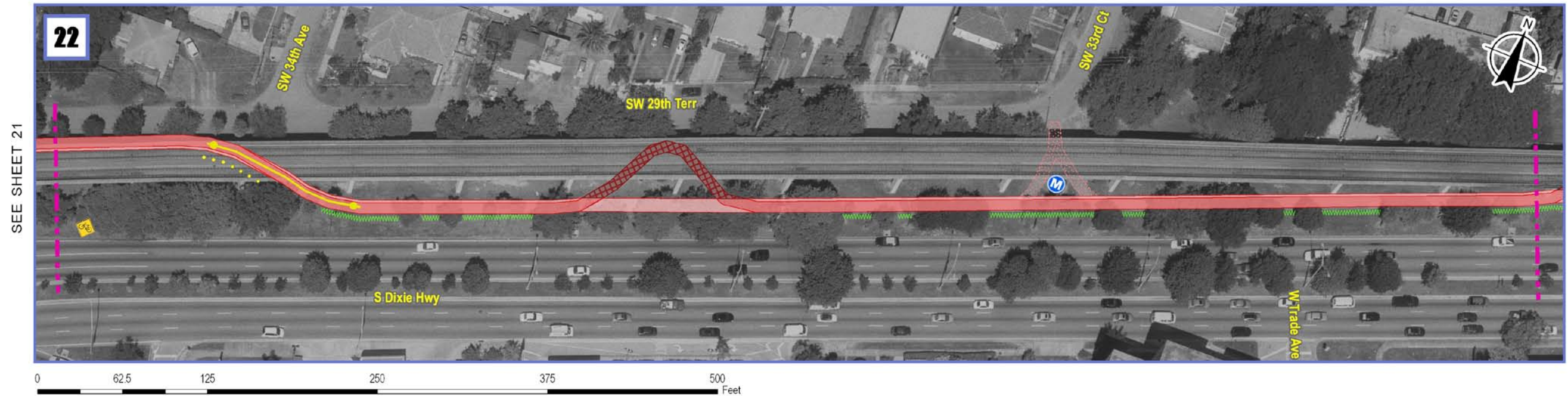


Legend

Existing Conditions		Master Plan Improvements	
	Paved path		Advance Warning Sign
	Crosswalk		Directional Sign
	Sidewalk		Emergency Call Box
	Secondary Path		Pedestrian Signal
			Wayfinding Sign
			Removable Bollards
			Low Landscaped Buffer
			Safety Fencing
			Lighting
			Pavement Markings
			Stop Bar
			New Path
			Remove Path
			Colored Crosswalk
			Raised Colored Crosswalk
			New Curb
			Low Landscaping
			Bike-Ped Bridge
			Plaza Improvements

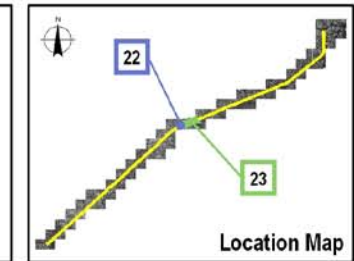


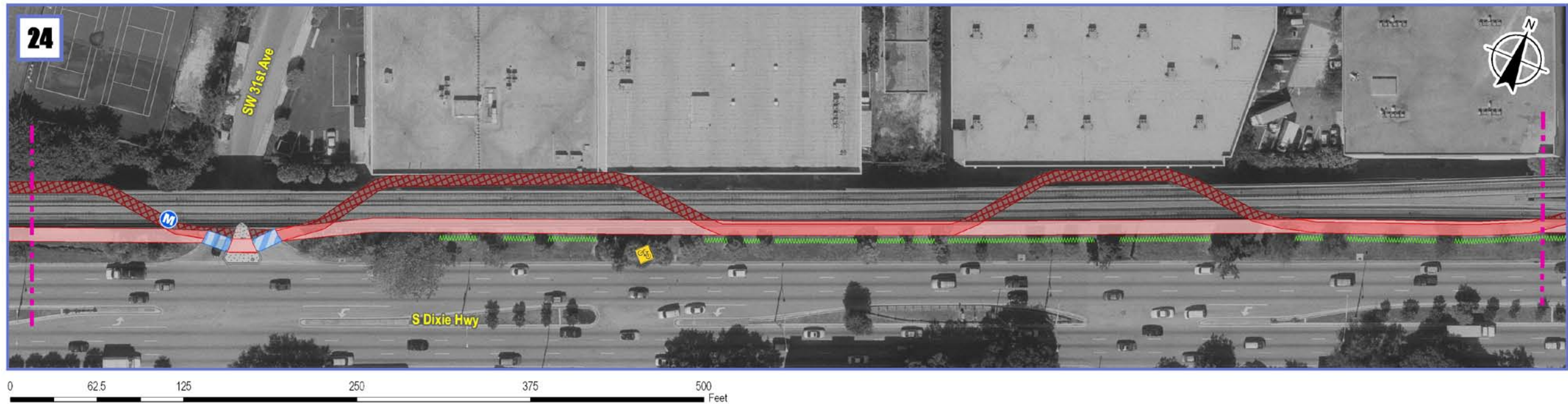
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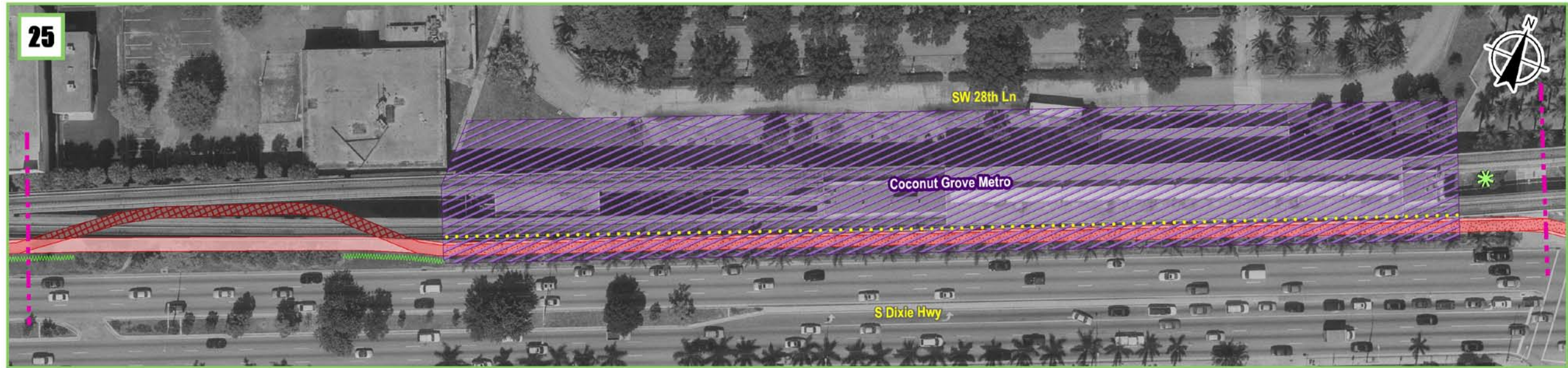
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	Crosswalk		Directional Sign		Wayfinding Sign		Lighting
	Sidewalk		Emergency Call Box		Low Landscaped Buffer		Pavement Markings
	Secondary Path		Removable Bollards		Safety Fencing		Stop Bar
					New Path		New Curb
					Remove Path		Low Landscaping
					Colored Crosswalk		Bike-Ped Bridge
					Raised Colored Crosswalk		Plaza Improvements





SEE SHEET 23

SEE SHEET 25

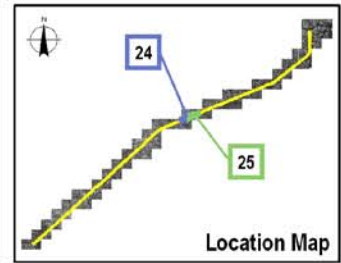


SEE SHEET 24

SEE SHEET 26

Legend

Existing Conditions		Master Plan Improvements					
	Paved path		Advance Warning Sign		Pedestrian Signal		Remove Path
	Crosswalk		Directional Sign		Wayfinding Sign		New Path
	Sidewalk		Emergency Call Box		Low Landscaped Buffer		Colored Crosswalk
	Secondary Path		Removable Bollards		Lighting		Raised Colored Crosswalk
			Safety Fencing		Pavement Markings		Low Landscaping
			Stop Bar		Stop Bar		Bike-Ped Bridge
							Plaza Improvements

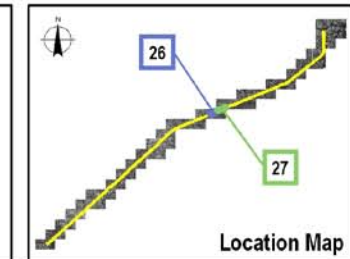


Metrorail M-Path Master Plan



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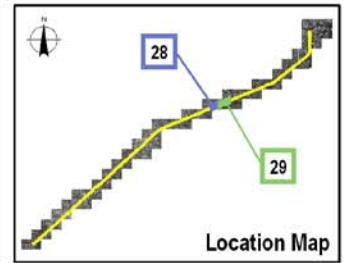
Existing Conditions		Master Plan Improvements											
	Paved path		Advance Warning Sign		Pedestrian Signal		Removable Bollards		Lighting		New Path		New Curb
	Crosswalk		Directional Sign		Wayfinding Sign		Low Landscaped Buffer		Pavement Markings		Remove Path		Low Landscaping
	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Raised Colored Crosswalk		Colored Crosswalk		Bike-Ped Bridge
	Secondary Path										Plaza Improvements		



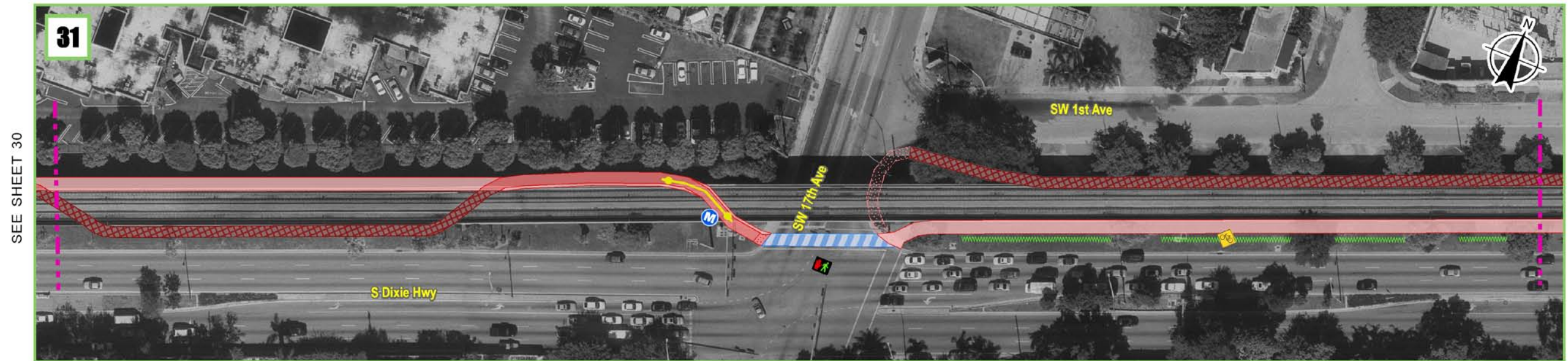


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Existing Conditions		Master Plan Improvements			
	Paved path		Advance Warning Sign		Pedestrian Signal
	Crosswalk		Directional Sign		Wayfinding Sign
	Sidewalk		Emergency Call Box		Removable Bollards
	Secondary Path		Low Landscaped Buffer		Lighting
			Safety Fencing		Pavement Markings
			Stop Bar		New Path
			Colored Crosswalk		Remove Path
			Raised Colored Crosswalk		Low Landscaping
			Bike-Ped Bridge		Plaza Improvements

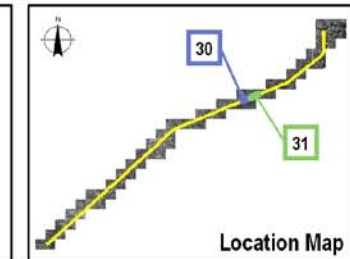


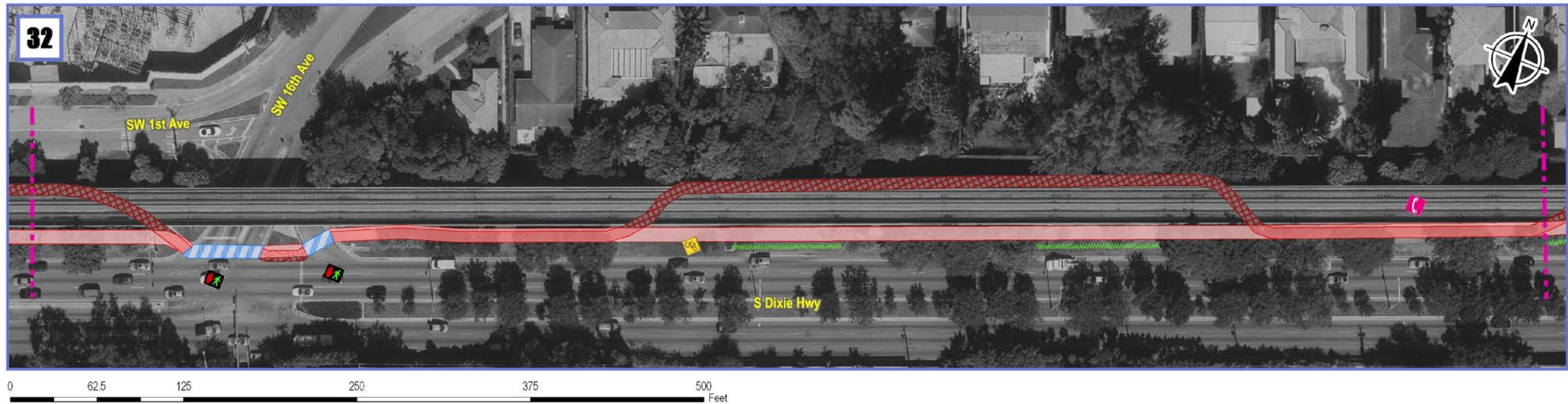
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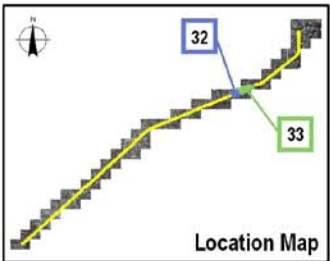
Existing Conditions		Master Plan Improvements					
	Paved path		Advance Warning Sign		Pedestrian Signal		New Path
	Crosswalk		Directional Sign		Wayfinding Sign		Remove Path
	Sidewalk		Emergency Call Box		Low Landscaped Buffer		Colored Crosswalk
	Secondary Path		Removable Bollards		Lighting		Raised Colored Crosswalk
			Safety Fencing		Pavement Markings		New Curb
			Stop Bar		Stop Bar		Low Landscaping
							Bike-Ped Bridge
							Plaza Improvements



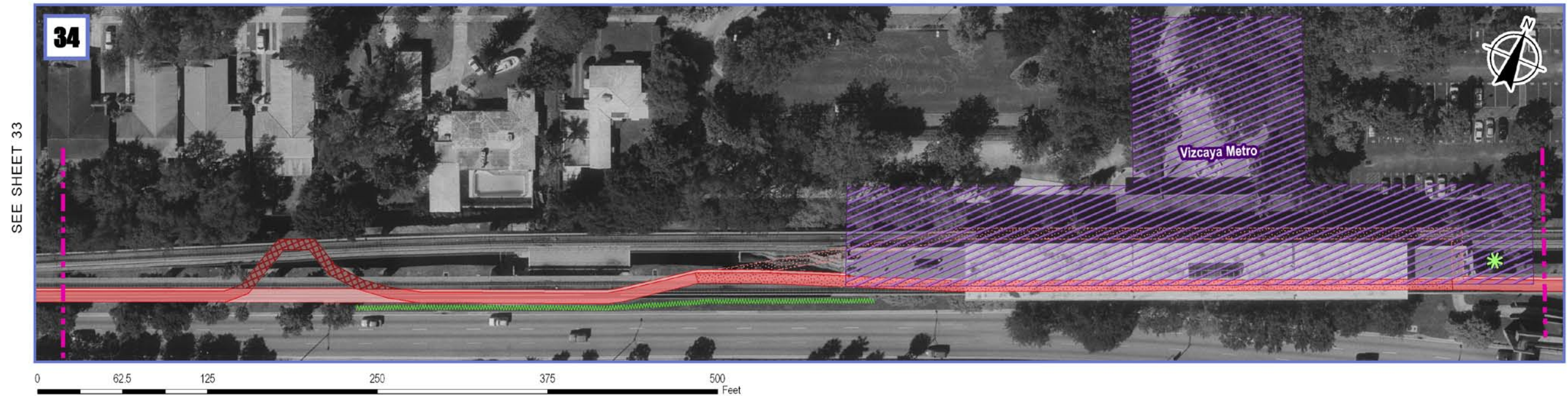


Legend

Existing Conditions		Master Plan Improvements					
	Paved path		Advance Warning Sign		Pedestrian Signal		Remove Path
	Crosswalk		Directional Sign		Wayfinding Sign		New Path
	Sidewalk		Emergency Call Box		Low Landscaped Buffer		Colored Crosswalk
	Secondary Path		Removable Bollards		Lighting		Raised Colored Crosswalk
			Safety Fencing		Pavement Markings		Low Landscaping
			Stop Bar		New Path		Bike-Ped Bridge
					New Path		Plaza Improvements

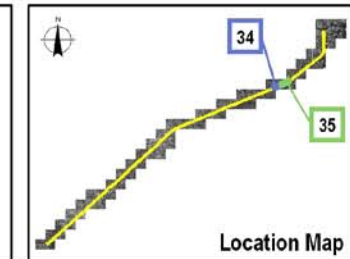


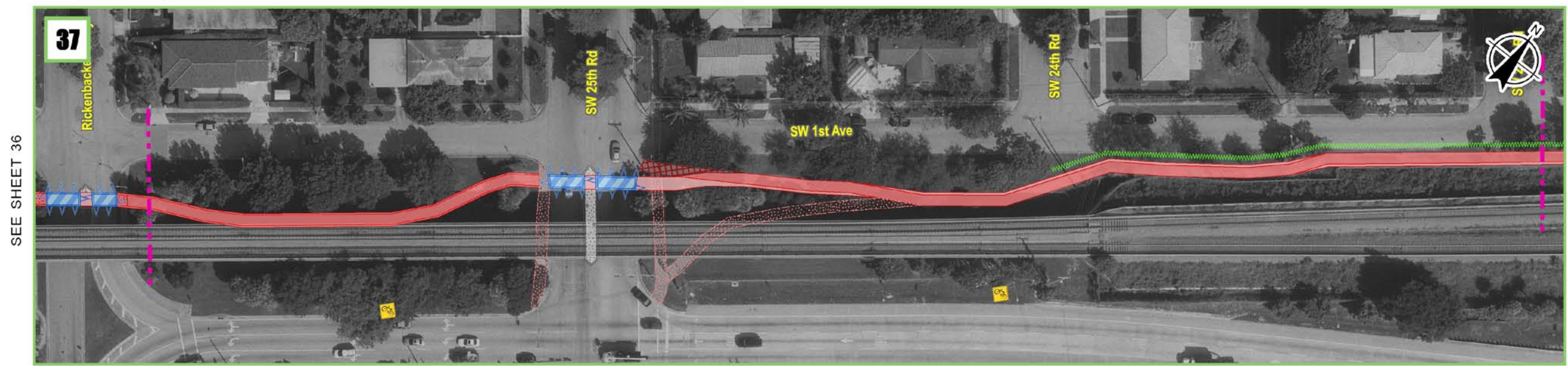
Metrorail M-Path Master Plan



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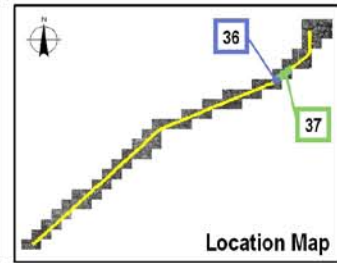
Existing Conditions		Master Plan Improvements											
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	Crosswalk		Directional Sign		Wayfinding Sign		Low Landscaped Buffer		Pavement Markings		Remove Path		Low Landscaping
	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Colored Crosswalk		Raised Colored Crosswalk		Bike-Ped Bridge
	Secondary Path								Stop Bar		Raised Colored Crosswalk		Plaza Improvements

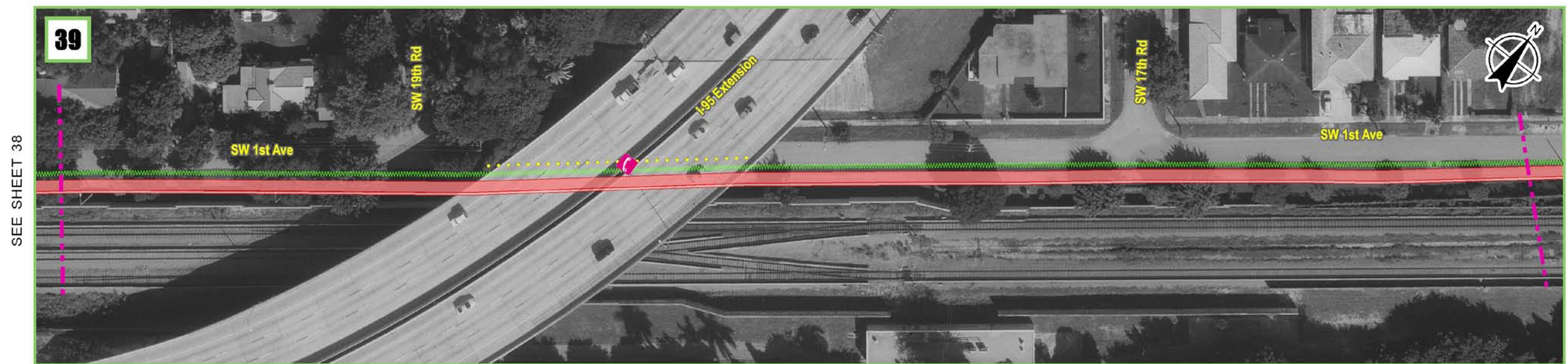
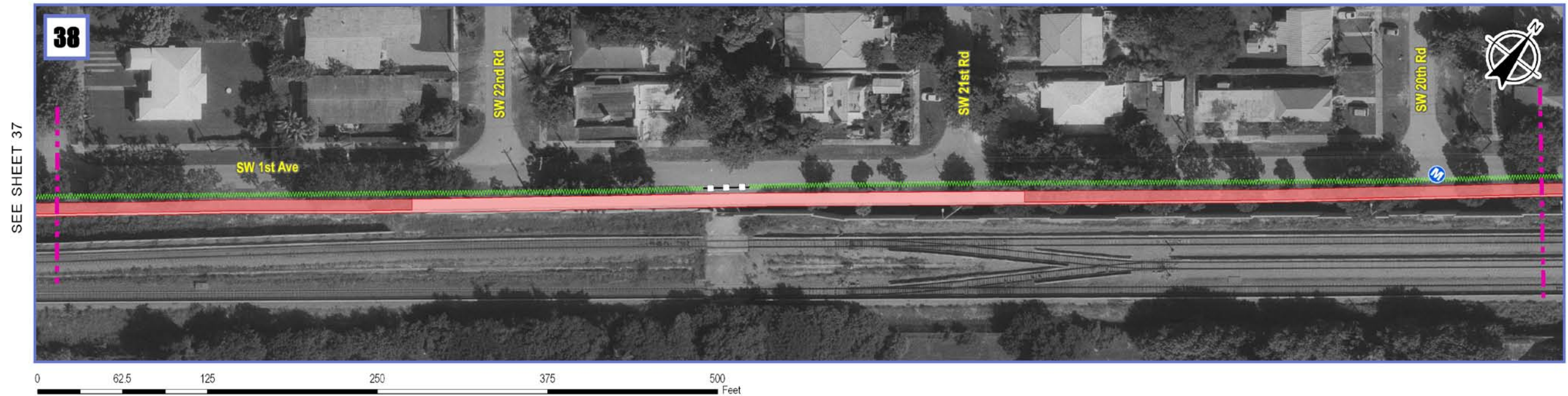




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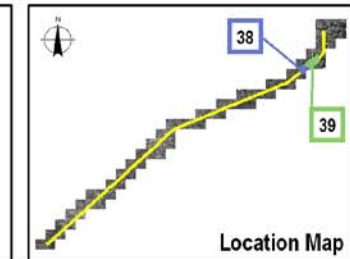
Existing Conditions		Master Plan Improvements											
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	Crosswalk		Directional Sign		Wayfinding Sign		Low Landscaped Buffer		Pavement Markings		Remove Path		Low Landscaping
	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Colored Crosswalk		Raised Colored Crosswalk		Bike-Ped Bridge
	Secondary Path										Plaza Improvements		

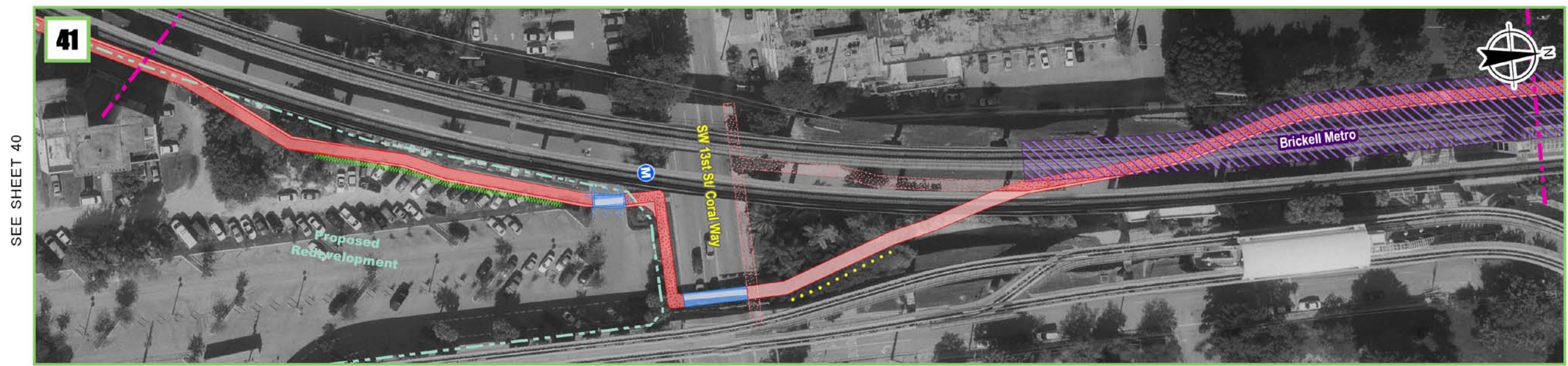
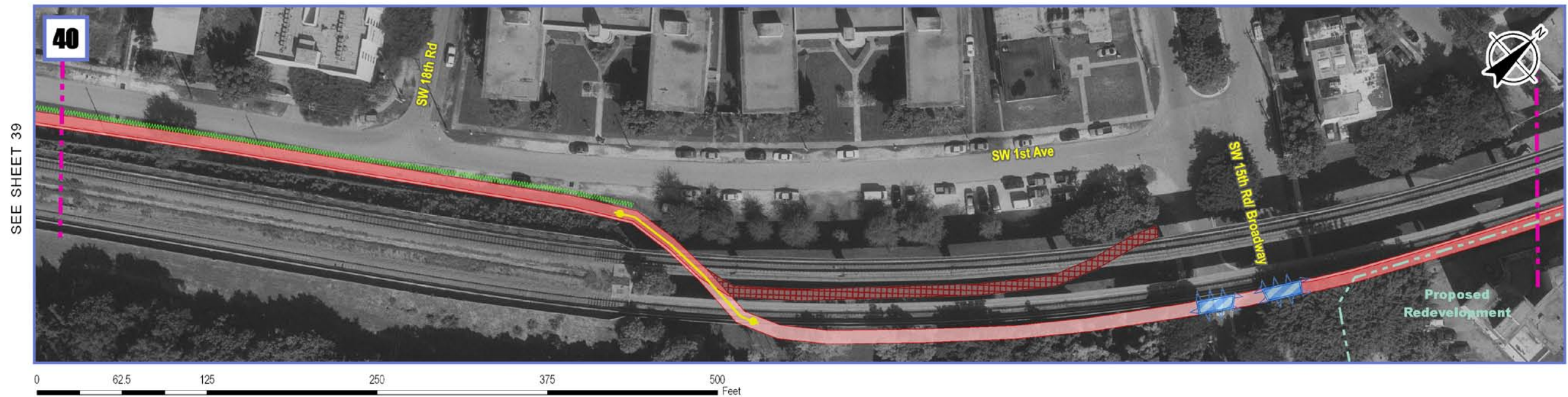




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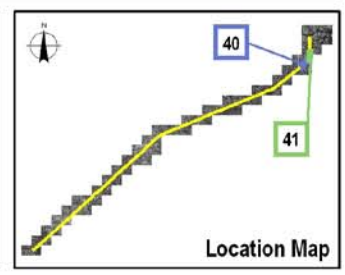
Existing Conditions		Master Plan Improvements											
	Paved path		Advance Warning Sign		Pedestrian Signal		Removable Bollards		Lighting		New Path		New Curb
	Crosswalk		Directional Sign		Wayfinding Sign		Low Landscaped Buffer		Pavement Markings		Remove Path		Low Landscaping
	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Raised Colored Crosswalk		Colored Crosswalk		Bike-Ped Bridge
	Secondary Path								Plaza Improvements				



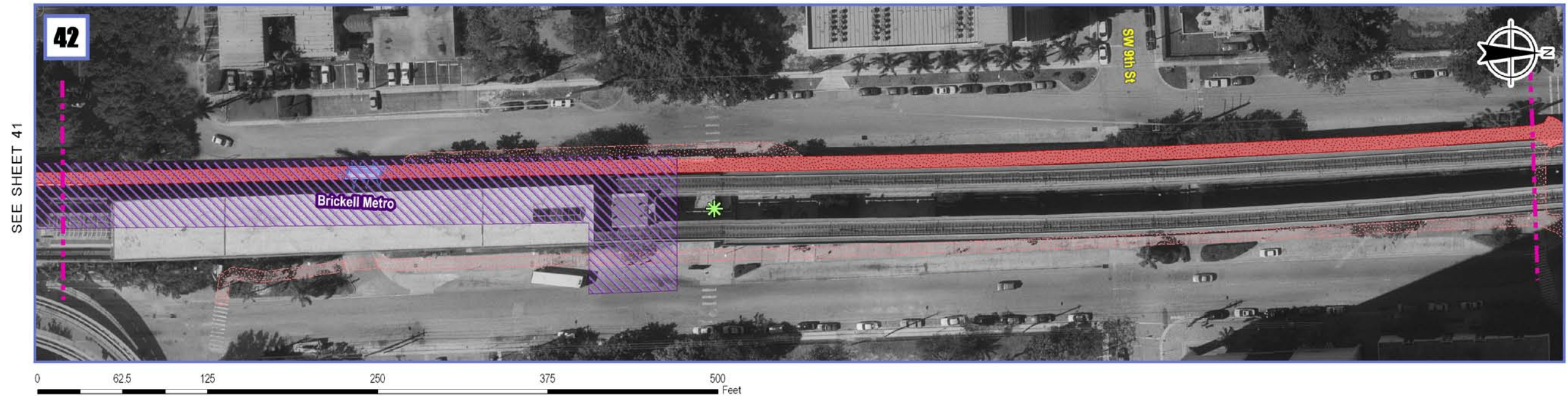


Legend

Existing Conditions		Master Plan Improvements											
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	Crosswalk		Directional Sign		Wayfinding Sign		Low Landscaped Buffer		Pavement Markings		Remove Path		Low Landscaping
	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Colored Crosswalk		Raised Colored Crosswalk		Bike-Ped Bridge
	Secondary Path								Plaza Improvements				

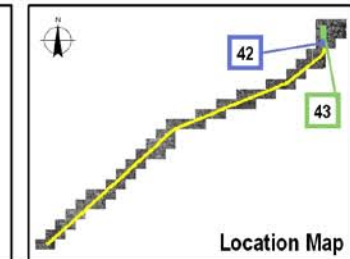


Metrorail M-Path Master Plan



Legend

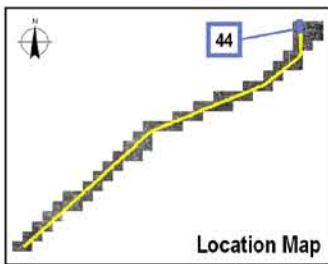
Existing Conditions		Master Plan Improvements											
	Paved path		Advance Warning Sign		Pedestrian Signal		Removable Bollards		Lighting		New Path		New Curb
	Crosswalk		Directional Sign		Wayfinding Sign		Low Landscaped Buffer		Pavement Markings		Remove Path		Low Landscaping
	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Colored Crosswalk		Raised Colored Crosswalk		Bike-Ped Bridge
	Secondary Path										Plaza Improvements		





Legend

Existing Conditions		Master Plan Improvements											
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	Sidewalk		Emergency Call Box		Safety Fencing		Stop Bar		Colored Crosswalk		Raised Colored Crosswalk		Bike-Ped Bridge
	Secondary Path										Plaza Improvements		



Prepared for



Prepared by



Kimley-Horn and Associates, Inc.