

Section Two: DESIGN GUIDELINES

“We have a vision for delivering outdoor recreation opportunities close to home for all Americans: a network of Greenways, created by local action, linking private and public recreation areas in linear corridors of land and water. Greenways can bring access to the natural world to every American, and can eventually, if we act now with speed and with foresight, link our communities and our recreation areas together across the nation.”

PRESIDENT’S COMMISSION ON AMERICANS OUTDOORS, Americans and the Outdoors, 1987



Ludlam Trail at A.D. Barnes Park looking northeast, Trail Rest Area

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2.1 TRAIL DESIGN GUIDELINES

2.1.1 ELEMENTS OF TRAIL DESIGN:

Shared-use paths contain many design elements which can help enhance trail users’ experiences and impact the number of visitors. The trail elements listed below are addressed in the following plans, sections and images:

- **Corridor and trail widths (typical and at constraints):** Addressing trail width needs for various users and conditions along the Ludlam Trail.
- **Trail alignment relationship and distances to right-of-ways, adjacent land uses, structures, vegetation, amenities, lighting, signage, etc:** These elements help define the trail views and have one of the largest impacts on a trail user’s experience.
- **Trail corridor edge treatments:** Should secure the trail corridor yet allow adjacent neighbors to ‘take ownership’ of the trail, helping to provide a safe trail.
- **Trail intersections:** Consideration should be given to trail intersections which often face a high level of trail volume due to nearby points of destination or attraction. Parks, schools and shopping centers are a few points of destination to evaluate.
- **Trail access barrier treatments:** A safe barrier treatment should be used to provide a simple yet safe solution to trail users and prevent motorized vehicles or other non-permitted devices from entering the trail corridor.
- **Trail surface materials:** Specifying a durable yet safe trail surface that can be used by wheeled devices and encourages joggers and walkers to use the trail.
- **Trail furnishings and amenities:** Trail furnishings and amenities can significantly affect the enjoyment of trail users. While the design and use of trail furnishings and amenities varies across the United States, based on budget, taste, style, weather conditions, maintenance capabilities and other variables, the purpose of the furnishings and amenities is the same: to enhance the experience of the trail users.
- **Trail lighting:** Touching on safety and design, trail lighting must be considered for all crossings,

intersections, and other points of interest along the trail. Users must be able to identify any obstructions in the crosswalks and estimate safe timing while vehicles must be able to identify trail users at all crossings.

- **Trail relationship to parking lots within the right-of-way and adjacent to corridor:** Parking is typically not an appealing facility to provide within parks and greenways, however, minimum screening and direct access should be provided to encourage trail users to use existing parking facilities along the corridor and promote the trail itself.
- **Street crossing treatments:** Whether the crossing is at-grade, below-grade or above-grade, crossings should provide a safe means for trail users to navigate across roadways.
- **Relationship to transit service within right-of-way:** Transit stops should be considered at each crossing with an existing bus line. Bus shelters or at the minimum, space for bus shelters should be, planned for these points.
- **Vegetation:** Views, safety and trail security should be considered in the placement of shade trees, shrubs and groundcovers. The trail should have ample shading to promote year-round, daily use. Landscape should also be used as an identifying feature for crossings and points of interest.
- **Signage, wayfinding and surface markings:** The proper placement of signage and wayfinding can have a dramatic affect on a trail user’s experience. Signage and wayfinding can promote the trail’s history/nearby attractions, educate users on trail etiquette, and provide users with a sense of location/direction. See Appendix E for MUTCD Part 9; Traffic Control for Bicycle Facilities.
- **Typical components of trail rest area/bike stations:** Trail comfort stations should promote trail user needs and provide, at the least, shaded seating, trash receptacle and emergency phone access. Consideration will be give to the needs of each station.
- **Typical components of trailheads and distances between trailheads and rest areas:** Ludlam Trail will have one trailhead facility at A.D. Barnes Park which has a proposed visitor center, Eco-Hub, restrooms and parking.

2.1.2 STUDY AREAS:

Eight (8) study areas were identified along the Ludlam Trail corridor. The Location Map (previous page) identifies each study area and its contextual setting. The selection of each study place was made based on the following features:

1. TYPICAL ABOVE-GRADE CROSSING (West Flagler Street)

- Typical limited active rail (Alternative Plan 1)
- Typical above grade crossing (Alternative Plan 2)
- Typical connection to a municipal park (Robert King High Park, City of Miami)
- Typical incorporation of transit (bus stop)
- Typical active rail section
- Adjacent private driveways
- Unique crossing of arterial street (57,500 AADT, projected to be 70,300)
- Unique City of Miami location, (Gateway element only section along corridor within City of Miami)
- Potential incorporation of Bike Station / Comfort Station concept (Phase 2 without active rail)
- Non-residential zoning



West Flogler Street crossing looking north towards Tamiami (C-4) Canal

2. TYPICAL LOCAL STREET CROSSING (SW 16th Street)

- Typical local street crossing
- Deflecting traffic median, speeds reduced to 20 MPH
- Typical neighborhood connections
- Typical residential lots backing onto corridor
- Refuge Island in median
- Trail lighting



SW 16th St., typical local street crossing looking north

3. TYPICAL COLLECTOR/MINOR ARTERIAL STREET CROSSING (Coral Way / SW 40th St. Crossing)

- Typical collector/ minor arterial street crossing (35,000 ADT)
- Non-residential zoning
- Unique connection to Brothers to the Rescue Park.
- Show collector street with bike lanes
- Transit (Bus) connection
- Elementary school connection
- ‘Half’ traffic signal
- 12’+ refuge island



Coral Way, typical collector street crossing, looking north

4. TYPICAL PARK CONNECTION (A.D. Barnes Park)

- Typical rail trestle bridge crossing (utilize existing trestle)
- Typical neighborhood connection
- Typical trailhead (connect to A.D. Barnes Park Eco-Hub w/ restrooms & parking)
- Typical connection to County Park (A.D. Barnes Park)
- Typical trail rest area with shelter



A.D. Barnes Park connection, typical park connection, looking at Coral Gables (C-3) Canal

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5. TYPICAL ARTERIAL STREET CROSSING (Bird Road / SW 40th St. Crossing)

- Typical below grade arterial street crossing (70,000 AADT)
- Typical above-grade arterial street crossing (Alternative Plan 2)
- Tunnel with skylight
- Typical parking adjacent to corridor
- Typical leased property from corridor.
- Unique commercial area without active rail
- Non-residential zoning
- Alternative plan to include above-grade crossing with stair connection
- Transit connection (bus stops)



Bird Road, typical arterial street below-grade crossing, looking west

6. TYPICAL SCHOOL CONNECTION (South Miami Senior High School)

- Typical school connection
- Unique bus drop-off within corridor
- Typical neighborhood connection
- Typical parking adjacent to corridor
- Trail easement study area (50’ width easement)
- Typical seating area along trail



South Miami Senior High, typical school connection, looking east towards school facilities

7. TYPICAL NEIGHBORHOOD CONNECTION (SW 76th Street)

- Typical pedestrian/bike crossing
- Typical trail rest area with shelter
- Typical residential zoning
- Limited trail parking for neighborhood use
- Trail lighting
- Typical seating area along trail



SW 76th St., typical neighborhood connection, looking east across corridor

8. TYPICAL TRAIL JUNCTION (Snapper Creek / C-2 Canal Crossing)

- Typical new bridge (over Snapper Creek (C-2) Canal)
- Typical trail junction with future Snapper Creek Trail (shared crossing of canal)
- Unique transit center connection (with potential bike station/comfort station incorporation)
- Unique commercial center connection (Dadeland Mall).
- Trailhead with rest shelter
- Potential fishing platform along the Snapper Creek (C-2) Canal



SW 85th St. at SW 80th Ave., typical transit connection, looking south towards U.S. 1

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TYPICAL ABOVE-GRADE CROSSING PLAN

RAIL-WITH-TRAIL CONCEPT

WEST FLAGLER STREET CROSSING

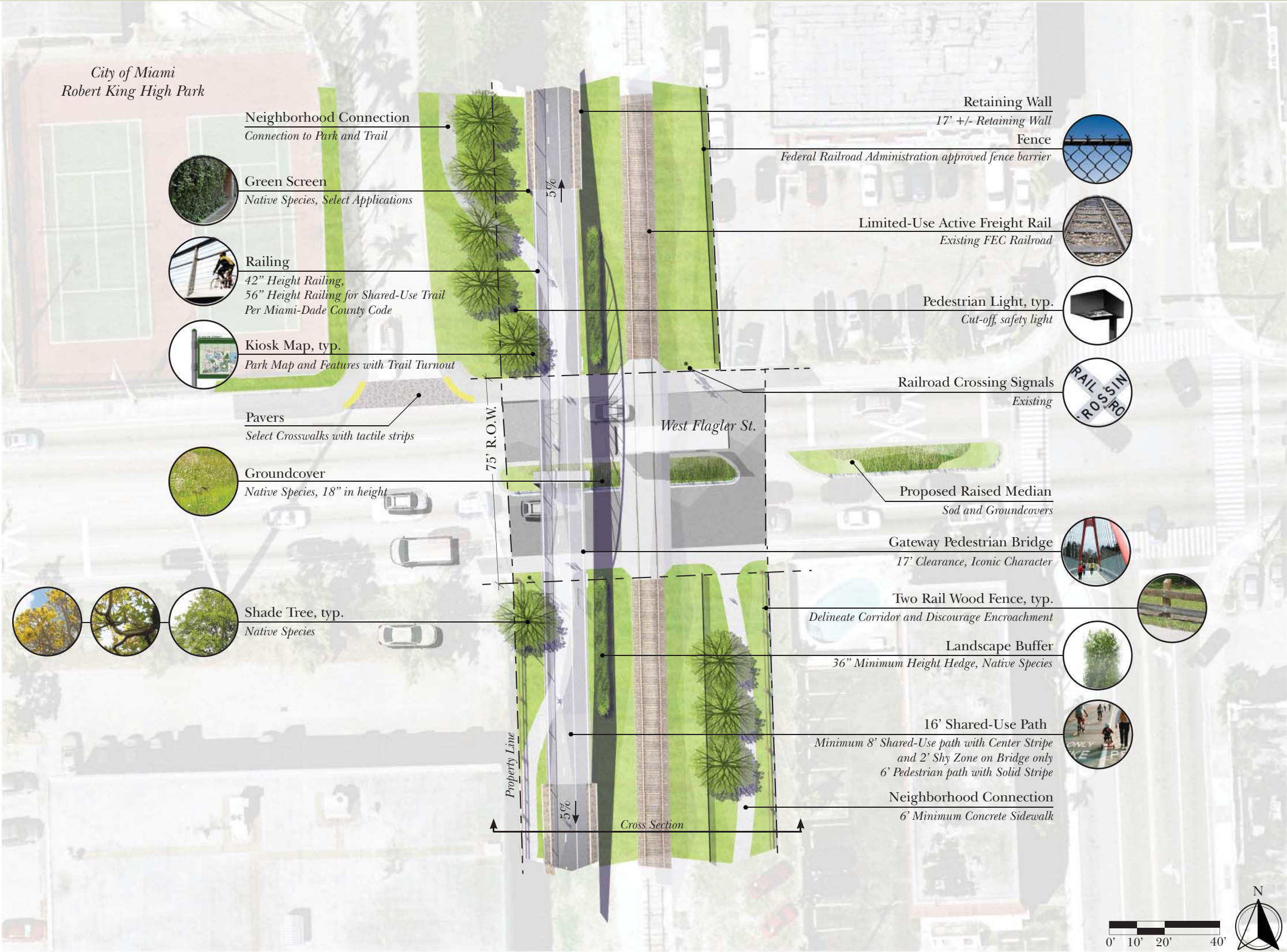
Flagler Street has served as the spine of Miami-Dade County for decades. As the baseline for all streets in Miami-Dade County, Flagler Street connects the Central Business District of Downtown Miami with the western suburbs of unincorporated Miami-Dade County. For this reason, Flagler serves as an arterial of bus transit with multiple routes and several stops within walking distance of the Ludlam Trail corridor.

This section that Ludlam Trail crosses is named West Flagler St. for its location west of Miami Avenue. The crossing is located adjacent to the City of Miami Robert King High Park. This study area highlights the use of above-grade crossing techniques to ensure a safe pedestrian friendly crossing of a major arterial road along with neighborhood connectivity which is diagrammed on Page 49.

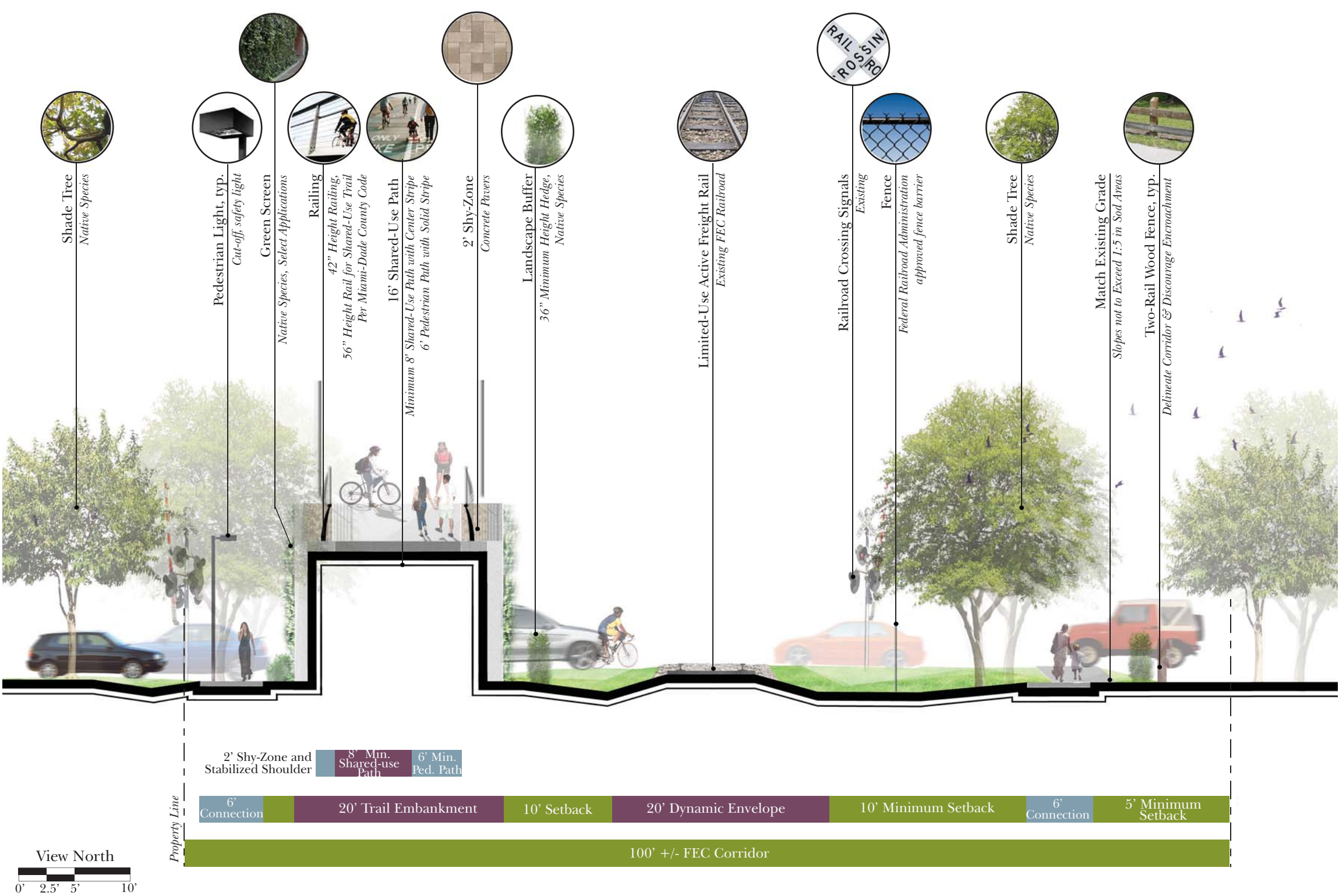
The Florida Department of Transportation 2008 AADT count showed an estimated 57,500 vehicles and a forecasted count of 70,300+ vehicles by 2017. High roadway volumes coupled with adjacent driveways and a close signalized intersection requires an above-grade crossing to ensure trail user safety.

Highlights of the plan include:

- Typical above-grade crossing of an arterial road
- Neighborhood and street sidewalk network connections
- Preservation of active freight rail corridor
- Non-residential zoning along trail corridor
- Opportunity to incorporate public artwork
- Connection to a municipal park
- Forms western gateway to the City of Miami
- Similar conditions at SW 8th St. (Tamiami Trail)



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TYPICAL ABOVE-GRADE CROSSING
CROSS-SECTION

RAIL-WITH-TRAIL CONCEPT

WEST FLAGLER STREET CROSSING

Addressing all pedestrian and cyclist safety concerns, this cross-section highlights the above-grade crossing techniques used at West Flagler Street. This concept maintains a limited-use active rail corridor with twenty (20) foot setbacks from centerline of railroad for maintenance use. Neighborhood connections are shown where applicable and safe setbacks from the limited-use active rail line can be maintained.

The gateway bridge should utilize an iconic bridge character to establish the Ludlam Trail corridor as a gateway feature for the City of Miami and for the western unincorporated areas of Miami-Dade County. The bridge should be designed with a minimum seventeen (17) foot clearance from roadway to bridge support. The bridge deck should contain two foot 'shy-zones' on the western sides of a fourteen (14) foot trail for cyclist comfort and should maintain a slope no greater than five (5) percent. A green-screen type product should be installed on the trail ramp retaining walls to provide for both increased visual appeal and environmental sustainability.



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TYPICAL ABOVE-GRADE CROSSING
PLAN

RAIL-TO-TRAIL CONCEPT

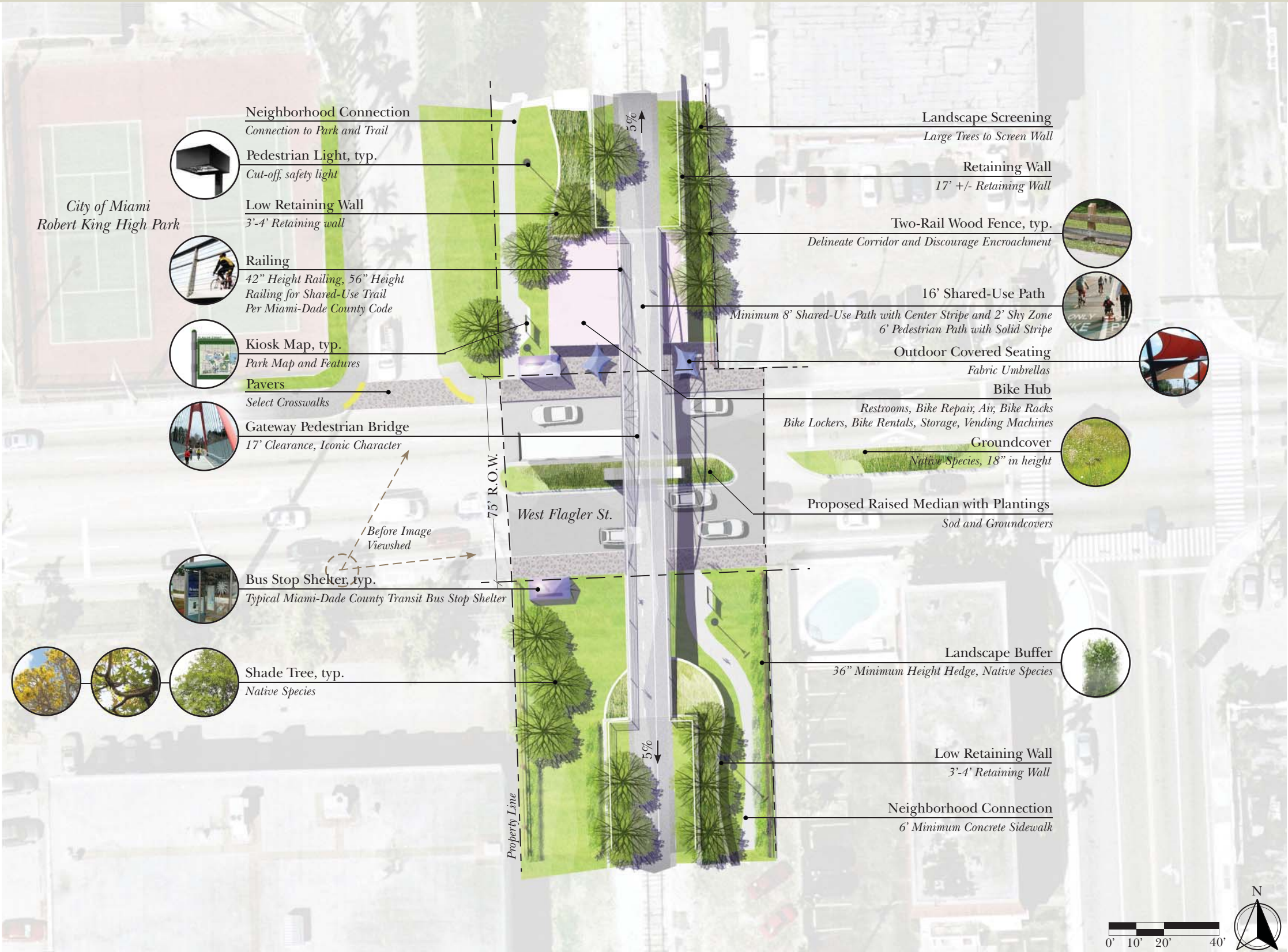
WEST FLAGLER STREET CROSSING

West Flagler Street serves several transit routes into Downtown Miami from western unincorporated areas of Miami-Dade County. Building upon the existing transit and the Miami-Dade County Parks and Open Space System Master Plan’s Great Streets Vision, the Ludlam Trail crossing at West Flagler Street has the opportunity to develop into a multi-modal transit hub.

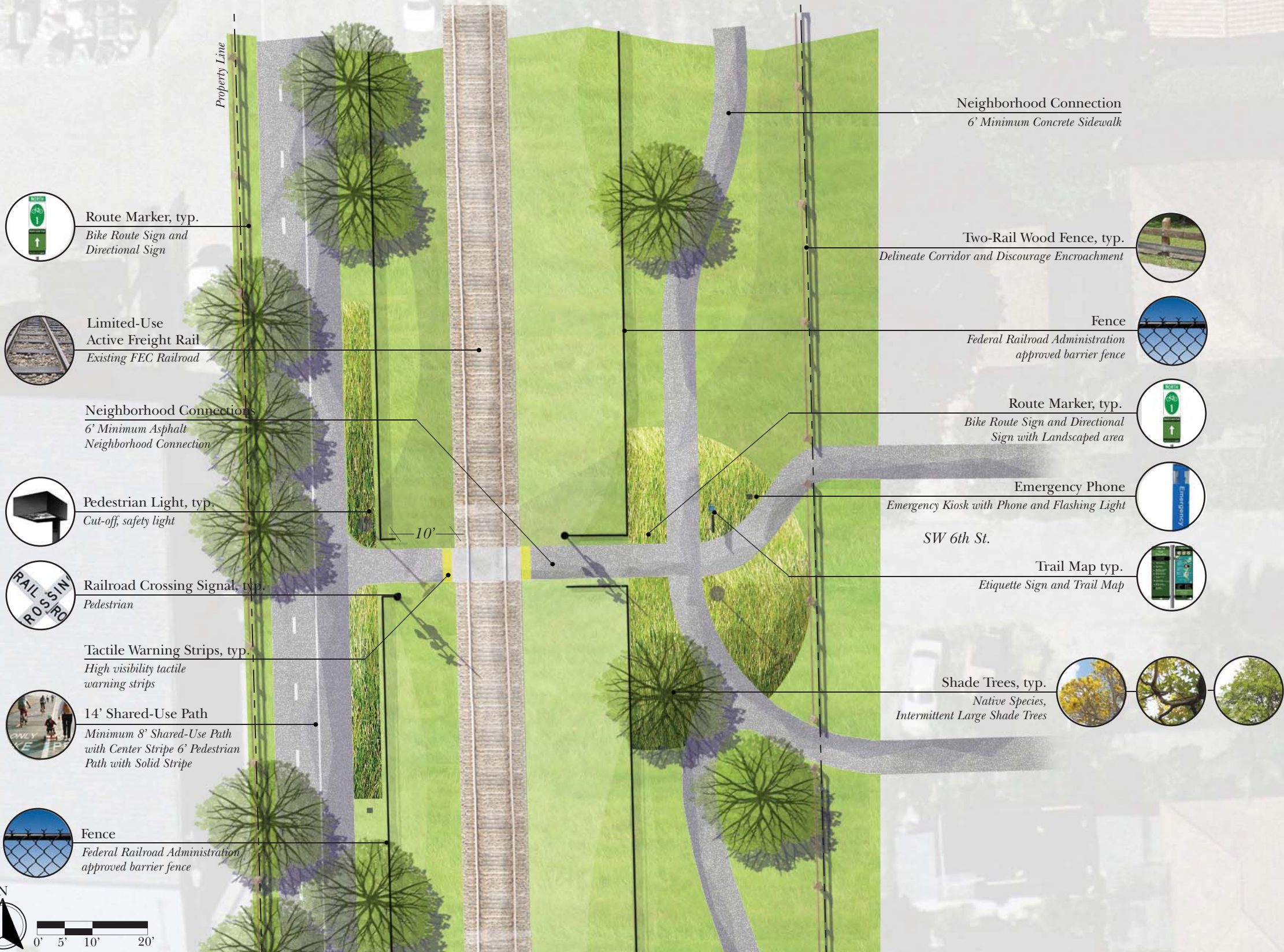
Offering direct access to transit through conveniently located bus shelters and neighborhood connections, the rail-to-trail concept utilizes the full trail corridor for user amenities. The highlight of user amenities is a bike hub with restrooms, a vending area, bike repair shop, air for bikes and personal locker space for transit users, along with outdoor seating and gathering space.

Highlights of the plan include:

- Typical above-grade crossing of an arterial road
- Neighborhood and street sidewalk network connections
- Utilization of full corridor width for trail user amenities
- Visually pleasing retaining wall system
- Outdoor seating space
- Opportunity to incorporate public artwork
- Connection to a municipal park
- Forms western gateway to City of Miami



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TYPICAL PEDESTRIAN MID-BLOCK RAILROAD CROSSING PLAN

SW 6TH AVE. RAILROAD CROSSING



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TYPICAL ABOVE-GRADE CROSSING

WEST FLAGLER STREET CROSSING

BEFORE IMAGE

This before images serves to document the existing conditions of the West Flagler Street crossing. Note the presence of the railroad traffic signal masts and barrier treatments to the north side of the roadway next to Robert King High Park.



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Ludlam Trail Above-Grade crossing at West Flagler Street looking northeast

TYPICAL ABOVE-GRADE CROSSING

WEST FLAGLER STREET CROSSING

AFTER IMAGE

RAIL-TO-TRAIL CONCEPT

This ‘after’ image highlights the impact of a gateway bridge feature across West Flagler Street to provide a safe route for trail users. An expanded concept bike hub is located on the north side of West Flagler Street with relocated bus shelters, outdoor seating, restroom facilities, bike racks, bike lockers, air, bike repair and rental, potential retail space, and will serve Robert King High Park with additional amenities and access.



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TYPICAL LOCAL STREET CROSSING
PLAN

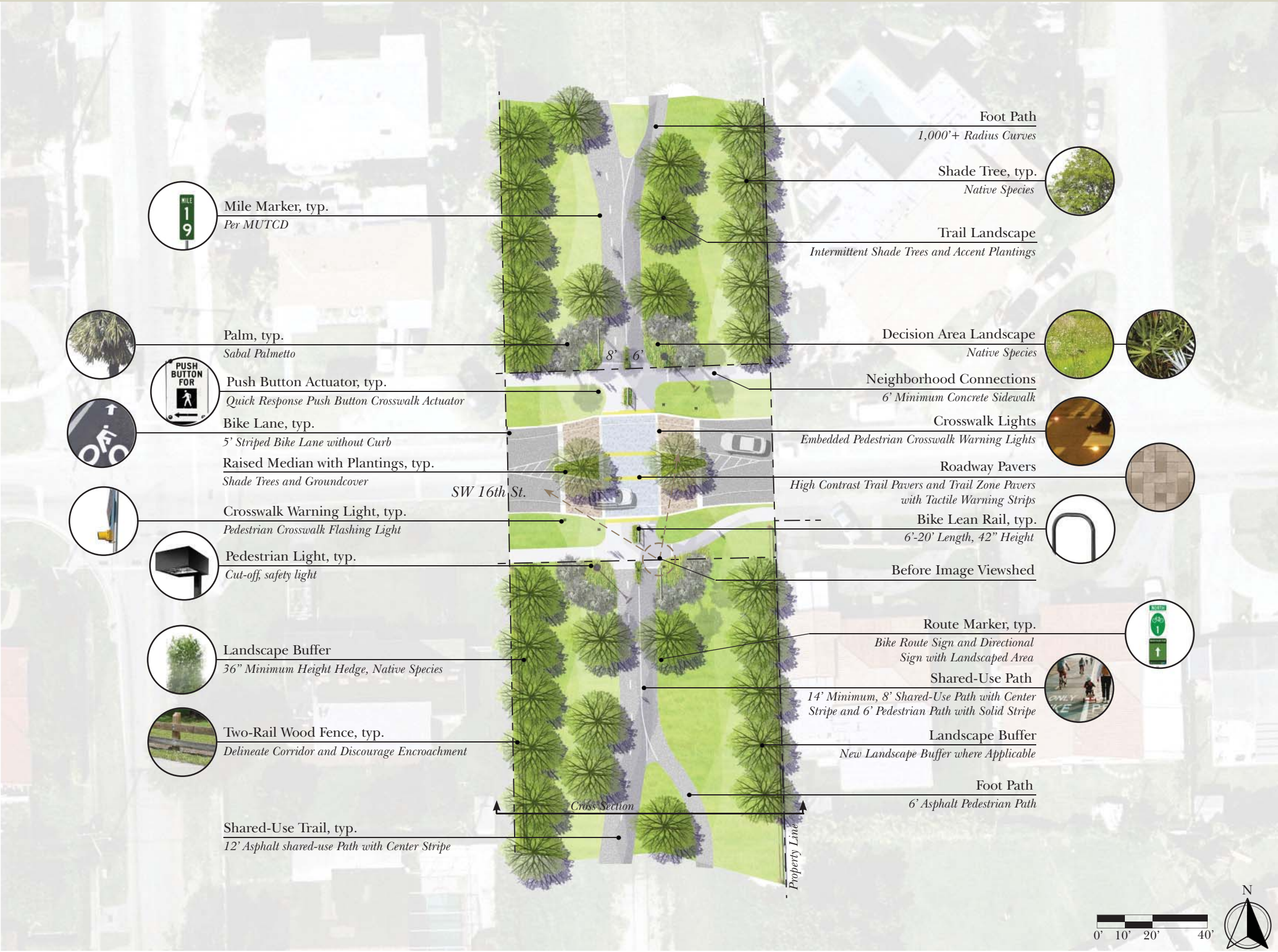
SW 16TH STREET CROSSING

SW 16th Street serves as an example of a local street crossing for Ludlam Trail, a condition that takes place in eight locations along the corridor. Through the incorporation of pedestrian and cyclist friendly safety techniques and design, these crossing points will be highly efficient in moving users and vehicles through what could be hazardous situations while still providing neighborhood connections through sidewalks and bike access.

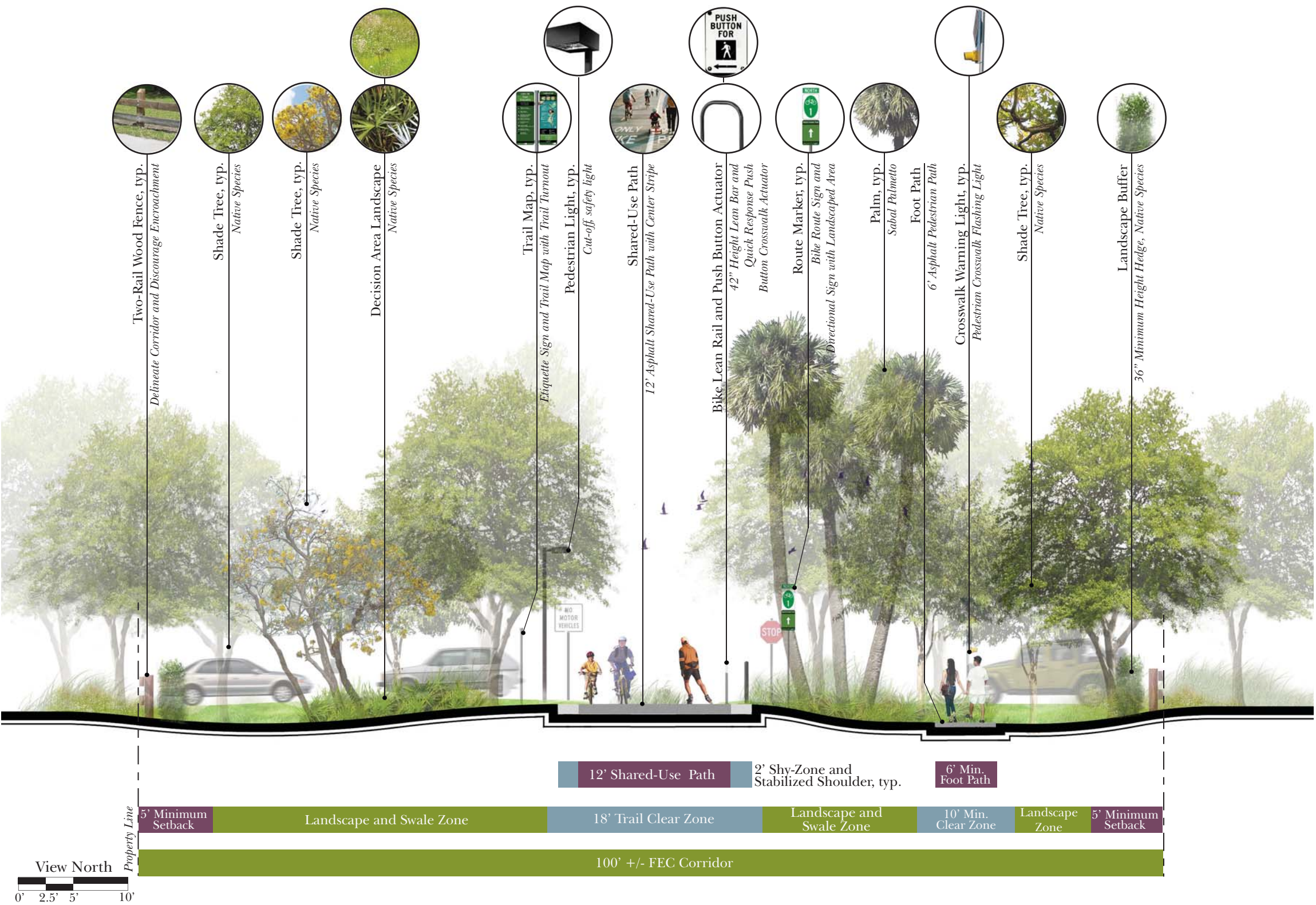
The local street crossing concept utilizes a decision making area in which each trail user decides a safe time to cross the street at his or her own pace. With quick response push button pedestrian crosswalk warning lights, the trail creates a safe pedestrian priority zone with high contract textured pavement for vehicle and trail user visibility.

Highlights of the plan include:

- Typical at-grade crossing of a local street
- Neighborhood and street sidewalk network connections
- Wide trail crosswalk zone for user comfort
- Incorporation of bike lanes on a local street
- Pedestrian crosswalk flashing warning lights
- Quick response push button pedestrian crosswalk actuators
- Similar conditions as SW 4th St., SW 12th St., SW 16th St., SW 21st St., SW 22nd St., North Waterway Drive, SW 60th St., and SW 64th St.



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**TYPICAL LOCAL STREET CROSSING
CROSS-SECTION**

SW 16TH STREET CROSSING

The SW 16th Street or local street crossing concept utilizes pedestrian and cyclist friendly elements such as a bike lean bar for all crossings and waiting points and clear site-lines, allowing users to see on-coming traffic and decide when it is safe to cross. Neighborhood connectivity is enhanced through the incorporation of sidewalks which tie into the trail.

Landscape characteristics of the local street crossing include the use of a pedestrian friendly refuge island with low groundcover to allow for vehicle and pedestrian visibility. Adjacent residences are screened from any intrusive elements with the use of a landscape buffer hedge and two (2) rail wood fencing. Trail users can rest in the shade under intermittent shade trees lining the entire trail length. In addition, decision making areas, or places where trail users must make a directional route decision, are highlighted by the use of Sabal palmettos and native shrubs and groundcovers.



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TYPICAL LOCAL STREET CROSSING

SW 16TH STREET CROSSING

BEFORE IMAGE

The ‘before’ image for the SW 16th Street crossing shows the existing condition of a typical two (2) lane local street at the Ludlam Trail corridor. No existing neighborhood sidewalk connections are present.



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Ludlam Trail at SW 16th Street looking north

TYPICAL LOCAL STREET CROSSING

SW 16TH STREET CROSSING

AFTER IMAGE

Highlighting the use of a flared median for trail user refuge, the image to the left demonstrates a safe pedestrian and cyclist friendly street crossing. Bike lean rails are located on each side of the crossing with a trail median to separate bicyclist traffic from pedestrians.



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TYPICAL COLLECTOR STREET CROSSING PLAN

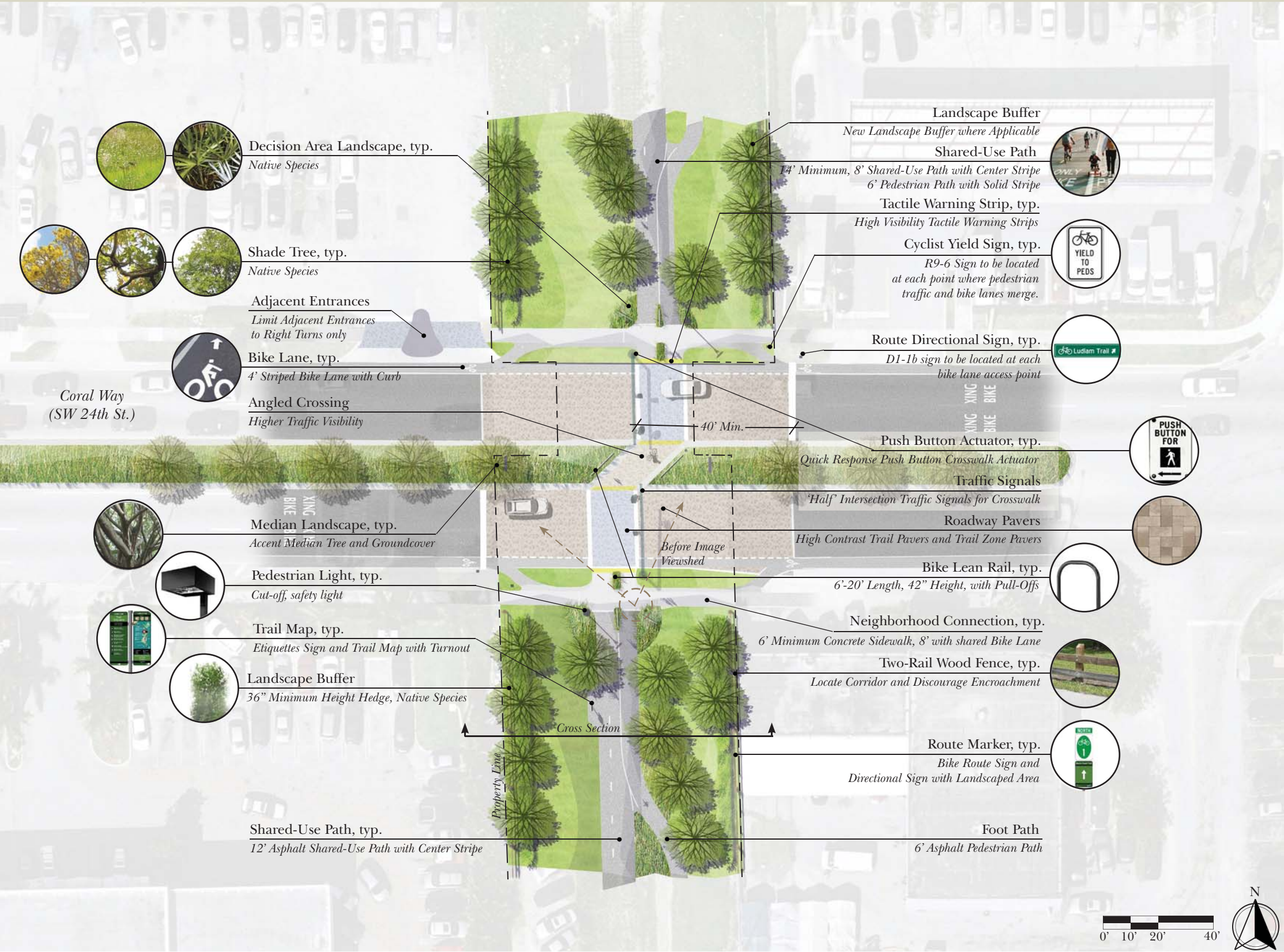
CORAL WAY (SW 24TH ST.) CROSSING

Starting in the Financial District and heading west through the City of Coral Gables, Coral Way, or SW 24th Street as it is known along the Ludlam Trail, has deep historical roots in the Miami-Dade Community. At Ludlam Trail crossing point, Coral Way no longer maintains the characteristic ficus and banyan trees in the median but still contains a four-lane divided roadway.

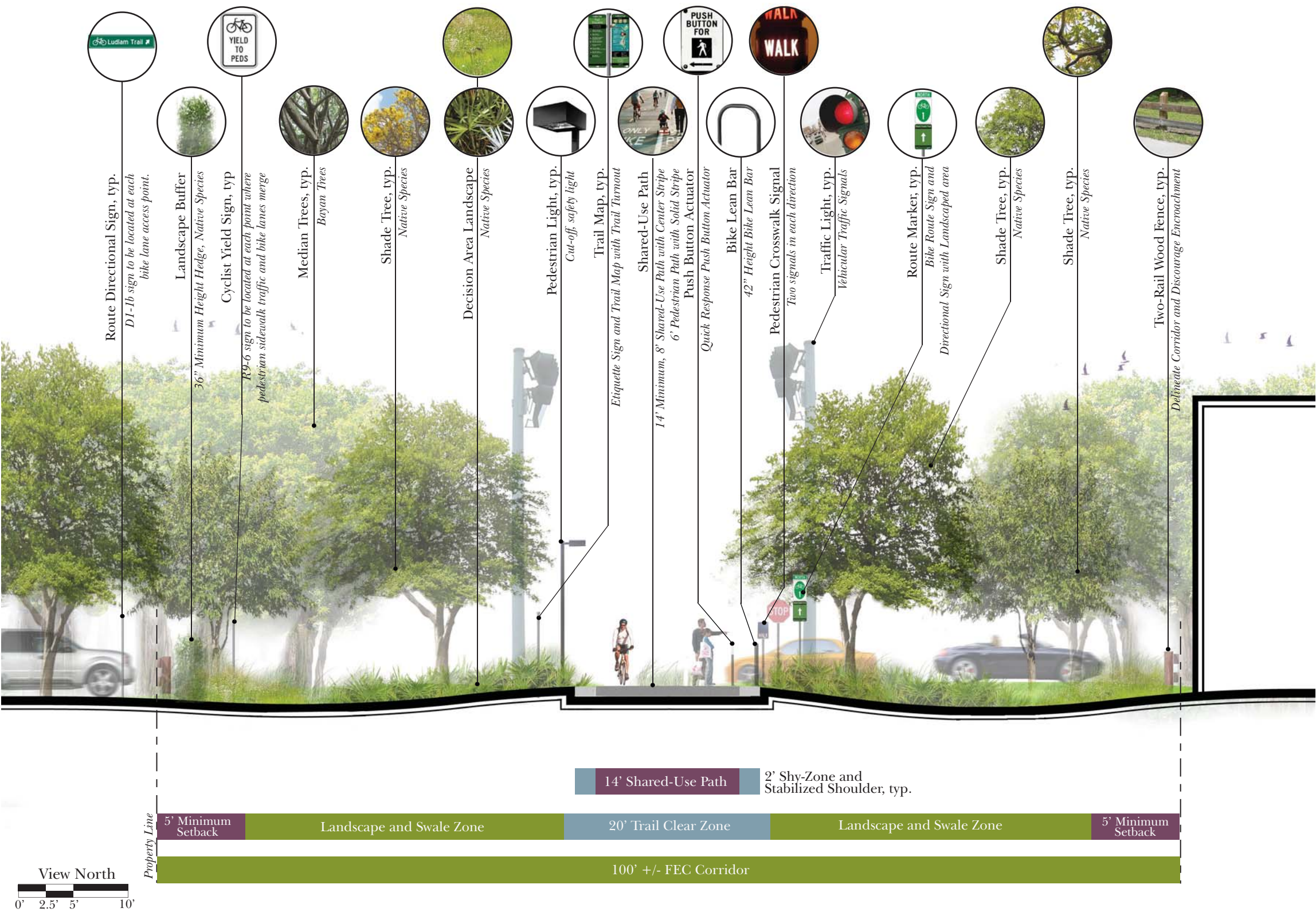
Building upon this historical aspect the at-grade crossing concept utilizes the median as a refuge island with ‘hot button’ pedestrian or cyclist activated actuators for traffic signals. Additional user safety elements include a divided decision making area for users to decide safe crossing times and an angled median crossing for maximum vehicle and user visibility.

Highlights of the plan include:

- Typical at-grade crossing of a collector or minor arterial street
- Neighborhood and street sidewalk network connections
- Wide trail crosswalk zone for user comfort
- Angled refuge island for maximum pedestrian visibility
- Incorporation of bike lanes on collector street
- Traffic signals for user activated push button
- Pedestrian crosswalk flashing warning lights
- Quick response push button pedestrian crosswalk actuators
- Embedded pedestrian crosswalk warning lights
- Similar conditions at SW 56 St. (Miller Drive) and SW 72nd St. (Sunset Drive)



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**TYPICAL CROSSING STREET
CROSSING
CROSS-SECTION**

CORAL WAY (SW 24TH ST.) CROSSING

The Coral Way or at-grade crossing concept utilizes a 'half' intersection with push button activated traffic lights with quick response for trail users. This cross section highlights the approach to the decision making area with a divided trail and signage to include directional signs, a trail map and a stop sign.

Adjacent commercial properties are screened with the use of a 36" minimum height hedge and a two-rail wood fence which will reestablish the corridor's property line and discourage future encroachment. Pedestrian lighting is shown for all decision making areas and crossings with low level poles and cut-off safety lighting. Between decision making areas the trail will be unlit through residential areas.



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TYPICAL COLLECTOR STREET
CROSSING

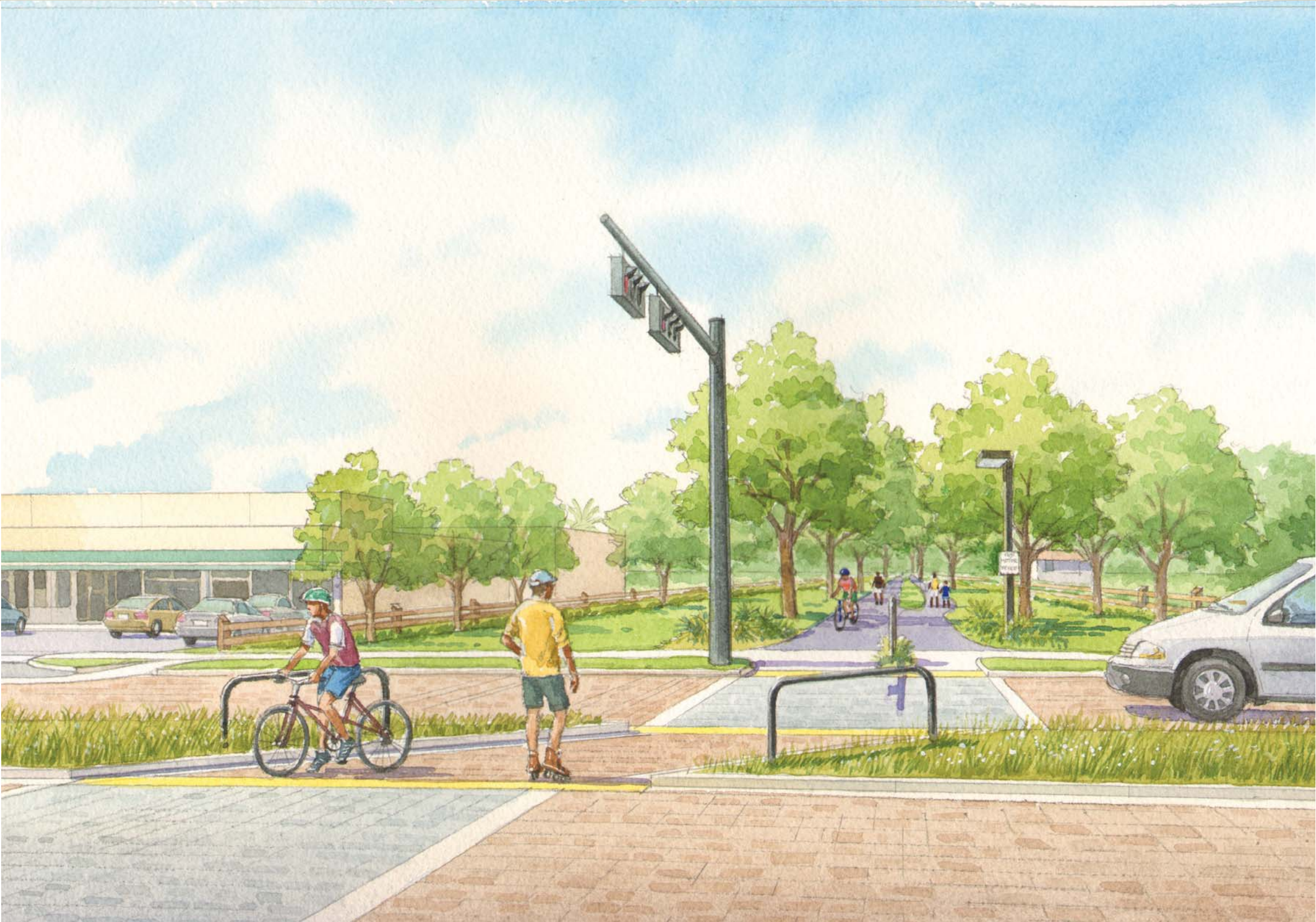
CORAL WAY (SW 24TH ST.) CROSSING

BEFORE IMAGE

Highlighting an area of the corridor where the track has been removed and historical sense of the roadway has been lost, this ‘before’ image of the Coral Way crossing of Ludlam Trail builds upon neighborhood connectivity and safe transportation alternatives.



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Ludlam Trail at Coral Way (SW 24th St.) looking north

**TYPICAL COLLECTOR STREET
CROSSING
AFTER IMAGE**

CORAL WAY (SW 24TH ST.) CROSSING

The guidelines shown for the Coral Way crossing provide a safe at-grade crossing for a heavily traveled historical roadway. The image highlights the use of a twelve (12) foot wide pedestrian refuge island with bike lean rails and quick response push button actuators along with the use of high contrast pavers which help to establish the corridor as a pedestrian priority zone.



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TYPICAL PARK CONNECTION PLAN

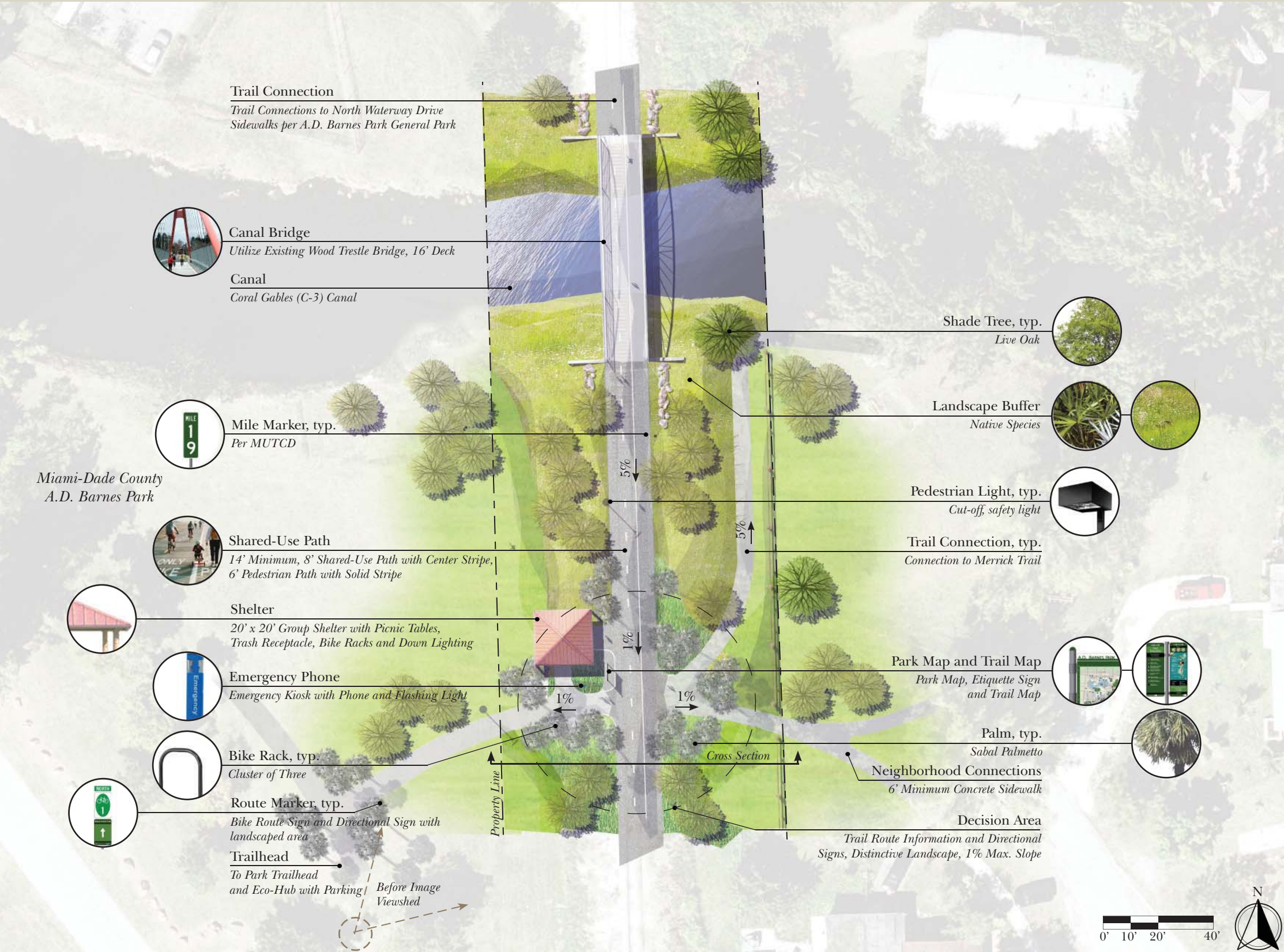
A.D. BARNES PARK CONNECTION

A.D. Barnes Park is an environmentally significant area of Miami-Dade County. Building upon a recently completed update to the park's general plan, the Ludlam Trail corridor is the crossing point for neighborhood connectivity to the eastern side of the park. In addition, a connection is planned for the Merrick Trail.

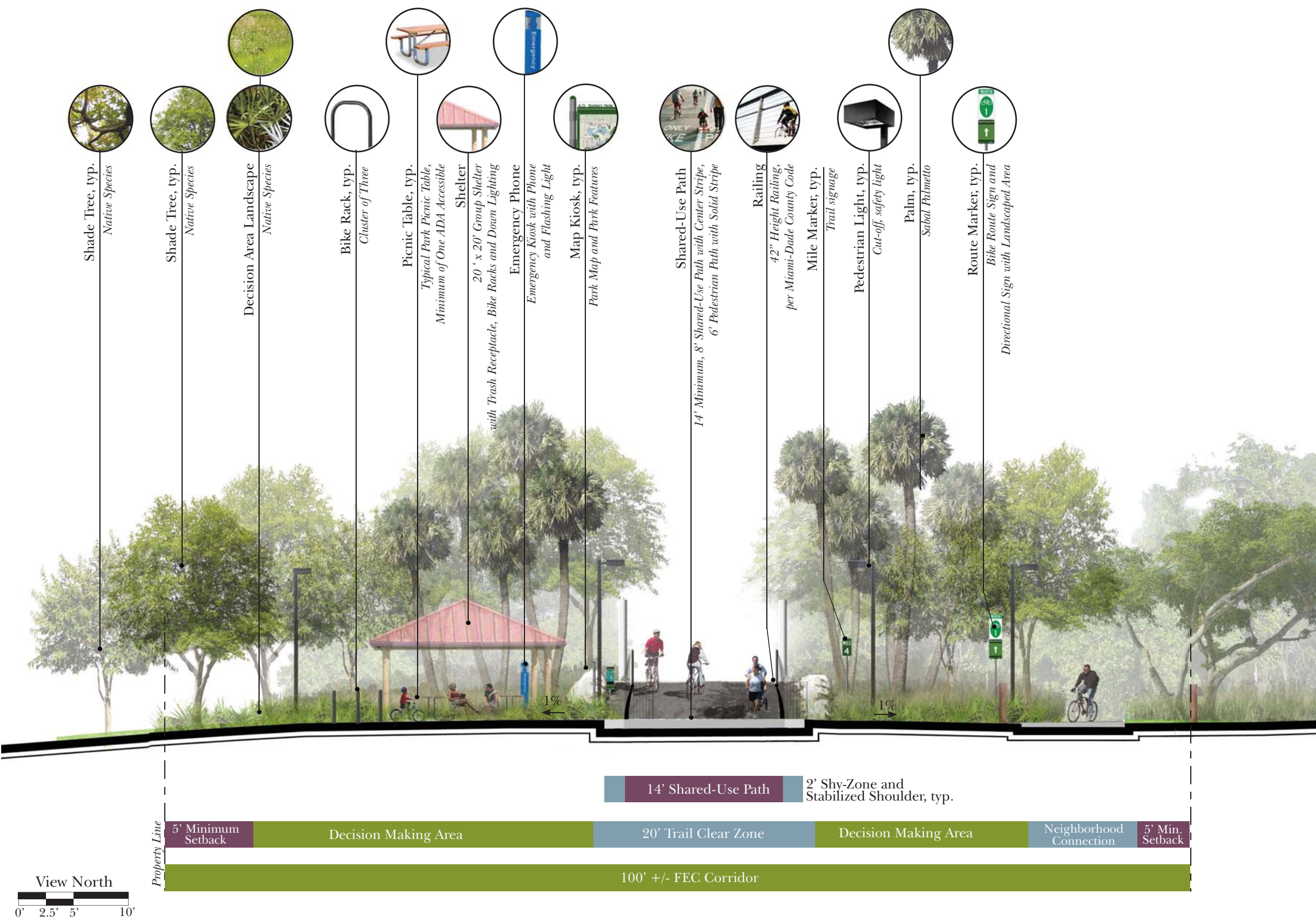
Trail users will have access to park amenities which will serve as trail amenities in the form of a trailhead/visitor center and Eco-Hub for the park with parking, restrooms, information and indoor programmable space, (see page 65). Access to the Coral Gables (C-3) Canal via a canoe and kayak launch and fishing piers is achieved through the development of a perimeter path for the park accessible by Ludlam Trail.

Highlights of the plan include:

- Typical existing bridge converted to trail use
- Extensive park connectivity
- Neighborhood and street sidewalk network connections
- Group shelter with picnic tables
- Connection to trail junction
- Decision making area with distinctive landscape and signage
- Similar conditions at City of Miami Robert King High Park



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**TYPICAL PARK CONNECTION
CROSS-SECTION**

A.D. BARNES PARK CONNECTION

Faced with a unique situation for a trail to fully engage a park and its amenities, Ludlam Trail will help establish neighborhood connectivity for the park and the park in return will provide parking and visitor opportunities for the trail. As a crossing point for a trail connection path and neighborhood connection points, Ludlam Trail will serve as a meeting point for neighborhoods all around the park.

Ludlam Trail will use an existing trestle railroad bridge for reuse as a sixteen (16) foot wide trail crossing. Character elements can be added to the bridge to give the corridor an identifying feature. With steep grading for the former rail line, this section of the corridor will rely on maximum trail grades of five (5) percent to provide a comfortable level of access to all users. Within the decision making area slopes should be no greater than one (1) percent.



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TYPICAL PARK CONNECTION

A.D. BARNES PARK CONNECTION

BEFORE IMAGE

The ‘before’ image to the right shows a view overlooking what will be a comfort station for the Ludlam Trail, along with vital park and neighborhood connections. An existing wood trestle bridge is shown in the background, crossing the Coral Gables (C-3) Canal.



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Ludlam Trail at A.D. Barnes Park Rest Area looking northeast

TYPICAL PARK CONNECTION

A.D. BARNES PARK CONNECTION

AFTER IMAGE

The A.D. Barnes Park connection ‘after’ image highlights the layout of a trail comfort station with covered seating, trail wayfinding, landscaping and an emergency phone. Landscape shown around the shade pavilion is typical of a decision making area with Sabal palmettos and native shrubs and groundcover.



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TYPICAL ARTERIAL STREET CROSSING
PLAN

BIRD ROAD (SW 40TH ST.) CROSSING

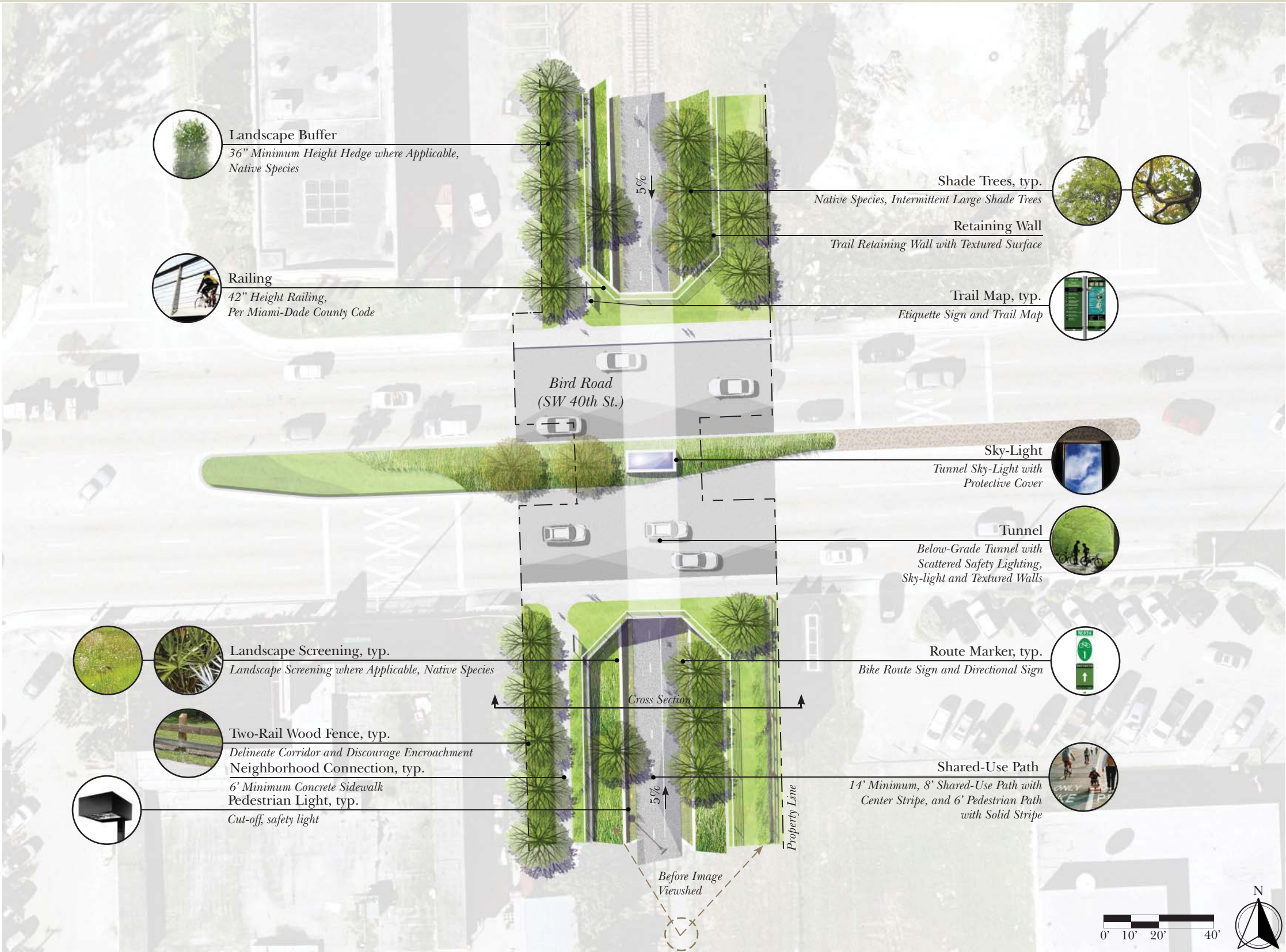
The Bird Road crossing is a unique opportunity to build upon the Miami-Dade County Parks and Open Space System Master Plan’s Great Greenways, Trails and Water Trail Vision and Great Streets Vision through the development of a safe road crossing and protection of Bird Road’s viewshed.

Located adjacent to A.D. Barnes Park, this crossing highlights the use of below-grade crossing techniques to ensure a safe pedestrian crossing of a major arterial road along with neighborhood connectivity.

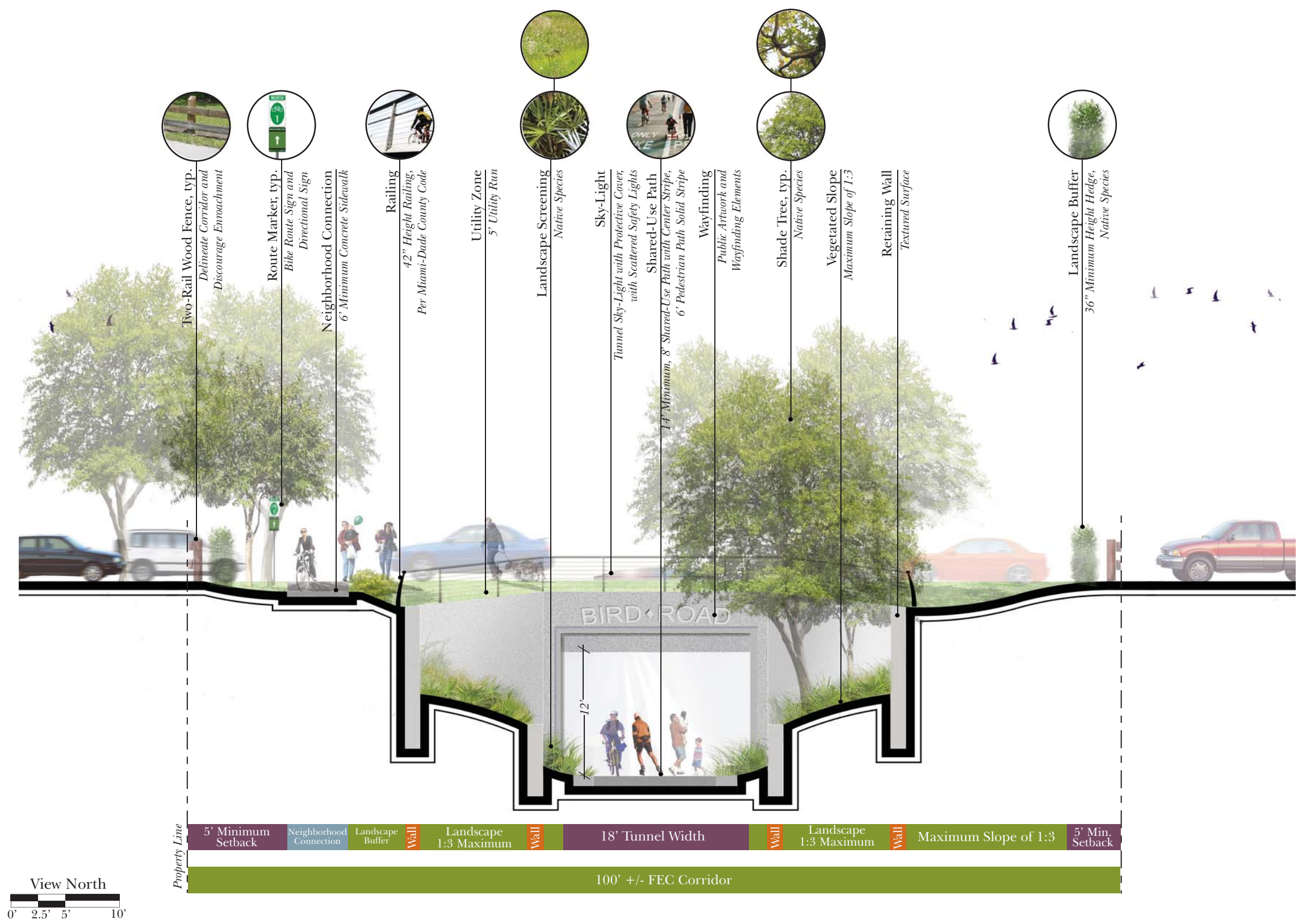
With a 2008 Florida Department of Transportation Annual Average Daily Traffic count of 68,000 vehicles and a forecasted count of 90,000+ vehicles by 2017, Bird Road is the busiest street Ludlam Trail crosses within the 7.4 mile corridor.

Highlights of the plan include:

- Typical below-grade crossing of an arterial road.
- Neighborhood and street sidewalk network connections.
- Non-residential zoning along trail corridor.
- Opportunity to incorporate public artwork.
- Protection of road viewshed.
- Limited visual impact on surrounding community.
- Wide vertical viewshed from trail for an open feel.
- Sky-light within median for maximum natural light.



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TYPICAL ARTERIAL STREET CROSSING
CROSS-SECTION

BIRD ROAD (SW 40TH ST.) CROSSING

A below-grade crossing can pose several challenges with user safety being the most important. For Ludlam Trail, a below-grade crossing is utilized to preserve Bird Road's viewshed and have limited impact on the surrounding community while still providing for a safe pedestrian crossing of a six (6) lane divide roadway. For users, a tunnel means a drop in elevation to below the horizon. This condition can make trail users uncomfortable, however, for Ludlam Trail, efforts were taken to develop a standard below-grade crossing that will provide a brightly lit tunnel with surrounding vegetation, artwork and an overall feeling of openness.

The tunnel opening should be a minimum of eighteen (18) feet wide to allow for a fourteen (14) foot trail and a two (2) foot shoulder. Trail widths should not be constricted at tunnels, as this condition makes users feel uncomfortable. The minimum height of the tunnel should be twelve (12) feet to allow for maximum user capabilities and comfort. High intensity lighting is shown throughout the tunnel and a sky-light is located in the roadway median to provide maximum natural lighting and improve tunnel visibility.

Grading along the tunnel approach should allow for open views to the horizon. Where applicable, walls should be set back from the trail a minimum of five (5) feet with three (3) to four (4) foot walls utilized adjacent to the trail. Higher walls, those above four (4) feet should be located a minimum of fifteen (15) feet from the trail edge to allow for landscape screening and grading.



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TYPICAL ARTERIAL STREET CROSSING PLAN

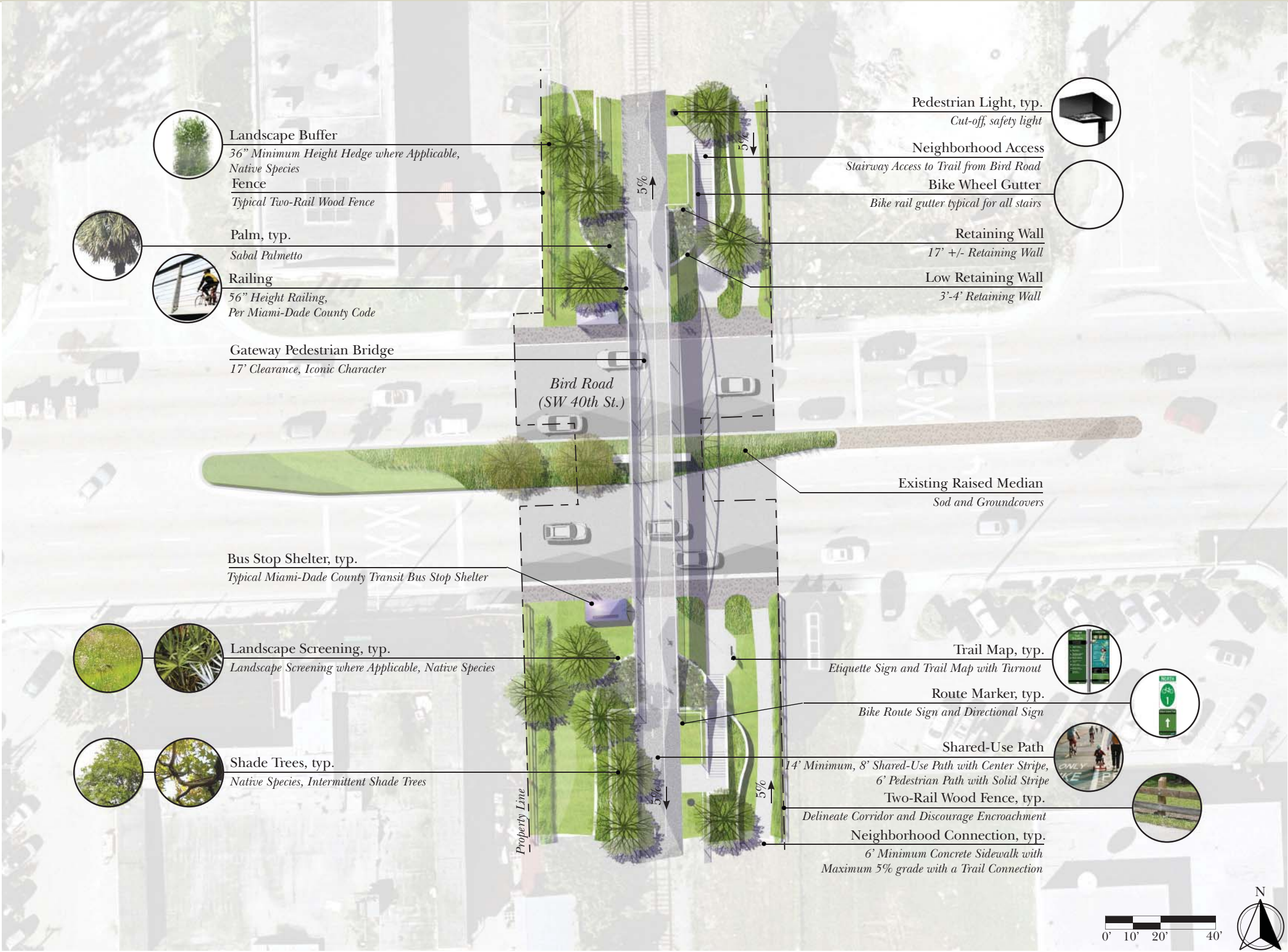
BIRD ROAD (SW 40TH ST.) CROSSING

With forecasted Annual Average Daily Traffic count of 90,000+ vehicles, the Bird Road highlights the need for a grade separated trail crossing to limit the potential impact to traffic flow. Near gridlock has been observed during morning commutes. Additional constraints such as a high water table and existing utilities, could underscore the potential need for an above-grade crossing.

Two (2) solutions are presented for Bird Road, both highlighting a specific principle. An above-grade crossing may be preferred due to an increased construction cost and the roadway impacts of a below-grade crossing. A below-grade crossing may be desired to preserve the roadway viewshed of nearby A.D. Barnes Park and nearby businesses.

Highlights of the plan include:

- Typical above-grade crossing of an arterial road.
- Neighborhood and street sidewalk network connections.
- Non-residential zoning along trail corridor.
- Aesthetically pleasing retaining wall system.
- Pedestrian connections at bridge.



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TYPICAL TRAILHEAD CONNECTION PLAN

A.D. BARNES PARK

Trailheads are integral parts of any trail system. Providing a visitor center, existing parking, restroom facilities, drop-off, shaded seating, and bike racks, the A.D. Barnes Park trailhead serves both the park and trail with amenities, maximizing benefits. With one (1) centrally located trailhead, Ludlam Trail will rely on strong connections to municipal and county parks for amenities and parking.



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TYPICAL ARTERIAL STREET CROSSING

BIRD ROAD (SW 40TH ST.) CROSSING

BEFORE IMAGE

Maximum potential lays within the ‘before’ image of the Bird Road crossing to the right. Potential to spark redevelopment of the Bird Road corridor with transit oriented housing and businesses are matched with opportunities to provide a safe crossing of the six (6) lane road.



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Ludlam Trail Below-Grade Crossing at Bird Road (SW 40th St.) looking north

TYPICAL ARTERIAL STREET CROSSING

BIRD ROAD (SW 40TH ST.) CROSSING

AFTER IMAGE

The Bird Road 'after' image shows what a below-grade crossing of the highly trafficked roadway may look like from the trail. Emphasis is given to planning a safe yet comfort tunnel which provides an open feel for trail users with 'stepped' retaining walls and a balanced landscape of native shrubs, groundcovers and shade trees intended not to overwhelm trail users as they approach the tunnel.



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TYPICAL SCHOOL CONNECTION
PLAN

SOUTH MIAMI SENIOR HIGH CONNECTION

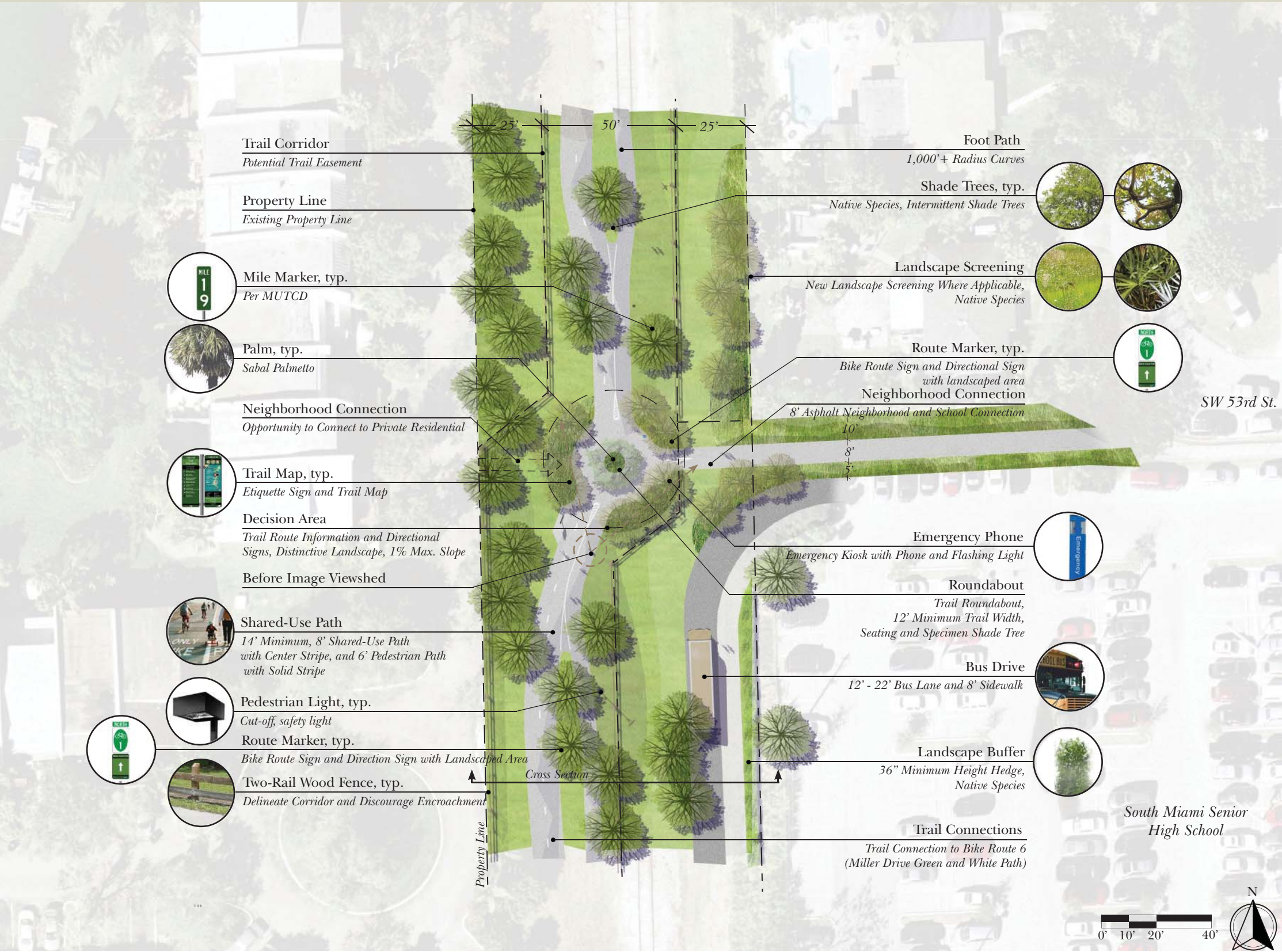
There are five (5) schools located within a quarter mile of the Ludlam Trail corridor, including one (1) high school and one (1) middle school. Many of these students will depend on Ludlam Trail to provide a safe route to school each morning. Efforts have been taken to ensure a safe connection to each school and this includes the use of trail signage, neighborhood connection sidewalks and separation of motorized traffic from trail users.

South Miami Senior High currently relies on neighborhood streets for bus loading. This school connection concept utilizes a bus lane which would be connected at Miller Drive to the south and connect to the school's existing parking and drop-off lot. A sidewalk would be located along this bus lane to provide ample student loading and unloading space for buses.

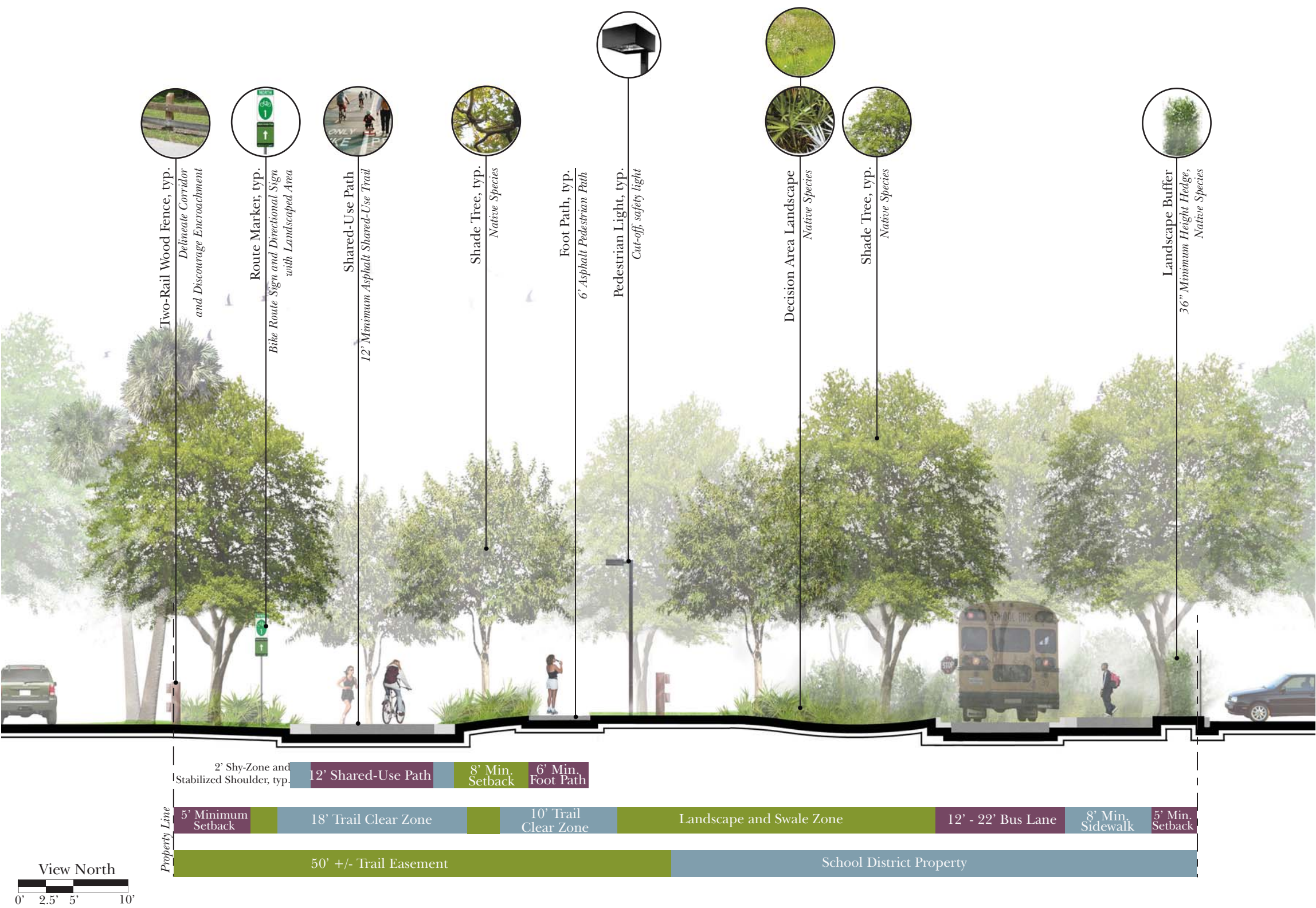
The corridor plan shows a possible solution to trail design if easements were utilized. A fifty (50) foot trail easement would be planned, allowing private ownership of the corridor property.

Highlights of the plan include:

- Typical school connection route
- Neighborhood, street and school sidewalk network connections
- Typical trail roundabout
- Trail seating opportunity
- A safe school bus lane with sidewalk
- Potential connection opportunities to private residential development
- Similar conditions at South Miami Elementary School



Section Two **DESIGN GUIDELINES**



**TYPICAL SCHOOL CONNECTION
CROSS-SECTION**

SOUTH MIAMI SENIOR HIGH CONNECTION

Connections to schools are vital parts of a functioning trail system. The Ludlam Trail corridor presents five (5) opportunities to develop connections to schools, with three being immediately adjacent to the corridor. Where possible, school connections should also be neighborhood connection points to provide maximum usage.

With higher levels of pedestrian and bicycle traffic expected around schools, any school connection should intersect Ludlam Trail at a roundabout. A trail roundabout allows for smooth decision making movements and lessens the conflict opportunities between trail users. Each roundabout can become a focal point for the surrounding neighborhood with the use of specimen trees and visually distinctive landscape.



Section Two **DESIGN GUIDELINES**

TYPICAL SCHOOL CONNECTION

SOUTH MIAMI SENIOR HIGH CONNECTION

BEFORE IMAGE

The 'before' image to the right offers a view of existing conditions of the Ludlam corridor at South Miami Senior High School. The corridor in this area is currently free of encroachment and has limited existing vegetation within the corridor property.



Section Two **DESIGN GUIDELINES**



TYPICAL SCHOOL CONNECTION

SOUTH MIAMI SENIOR HIGH CONNECTION

AFTER IMAGE

The South Miami Senior High School connection 'after' image to the left shows the layout of a 'trail roundabout' with an eight (8) foot sidewalk connection to the school. Students and other trail users will be able to safely travel to school via the Ludlam Trail.



Section Two **DESIGN GUIDELINES**

TYPICAL NEIGHBORHOOD CONNECTION
PLAN

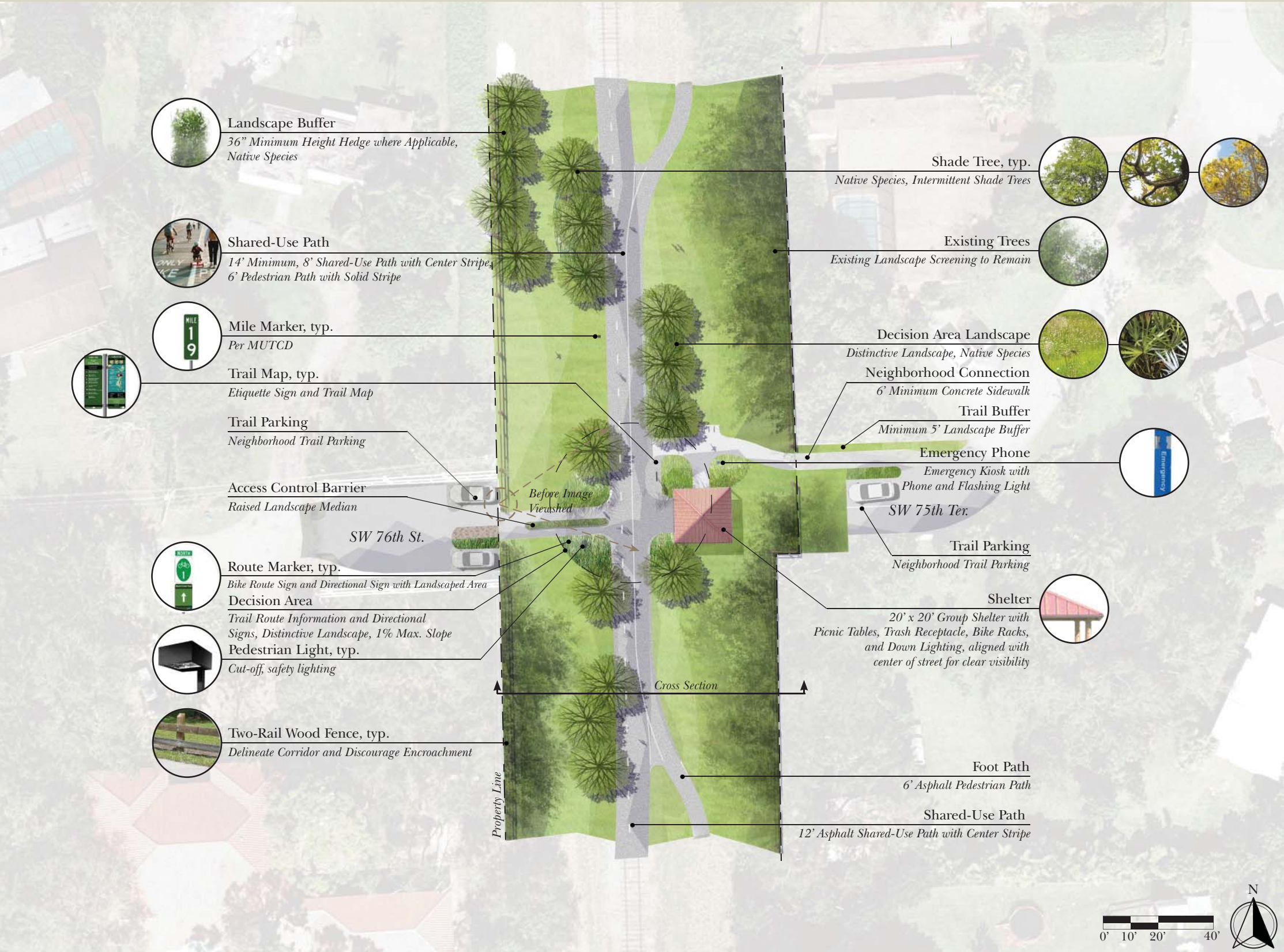
SOUTHWEST 76TH STREET CONNECTION

Neighborhood connectivity is a critical element of the standards and guidelines for Ludlam Trail. With twelve (12) opportunities over the length of the corridor, Ludlam Trail seeks to expand beyond the corridor and into neighborhoods to provide maximum user accessibility.

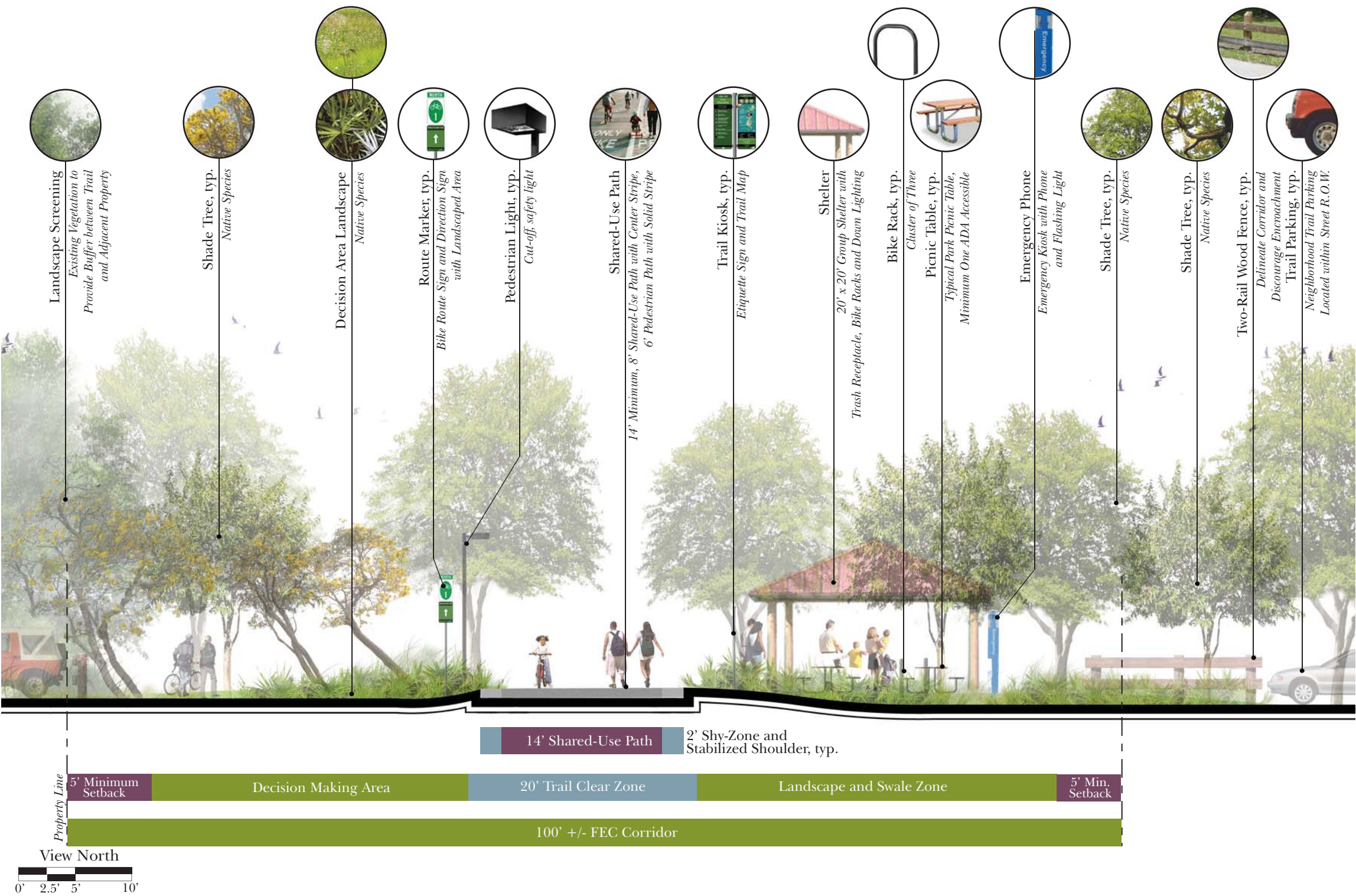
The typical neighborhood connection concept develops the trail into a true neighborhood meeting place with a rest area consisting of a group shelter, site furnishings, user safety elements and limited trail parking. Trail parking will utilize the existing street right-of-ways and in select instances, provide opportunities to patrol the corridor with clear visibility. Rest areas are recommended throughout the Ludlam Trail corridor every one (1) to two (2) miles.

Highlights of the plan include:

- Typical neighborhood connection
- Neighborhood and street sidewalk network connections
- Group shelter with site furnishings
- Trail seating opportunity
- Neighborhood meeting location and possible pavilion rental
- Income opportunity for operation of trail
- Opportunity to patrol trail corridor from vehicle turn-around
- Similar conditions at SW 6th St., SW 19th St., SW 23rd St., South Waterway Drive, SW 44th St., SW 48th St., SW 62nd St., SW 66th St., SW 68th St., SW 74nd St., SW 76th St., and SW 78th St.



Section Two **DESIGN GUIDELINES**



**TYPICAL NEIGHBORHOOD CONNECTION
CROSS-SECTION**

SOUTHWEST 76TH STREET CONNECTION

Neighborhood access routes should be located a minimum of five (5) feet from any private residences with a landscaped buffer. A two-rail wood fence may be used to define the trail corridor and discourage encroachment onto private property.

Where applicable, existing vegetation within and adjacent to the trail corridor should be preserved for buffering and screening for private residences and businesses. Intermittent landscape screening and buffers may need to be installed to ensure a consistent level of privacy for adjacent residents.

Section Two **DESIGN GUIDELINES**

TYPICAL NEIGHBORHOOD CONNECTION

SOUTHWEST 76TH STREET CONNECTION

BEFORE IMAGE

The existing conditions photo to the left portrays a typical view from a neighborhood connection point along the Ludlam Trail. Such access points should consist of a minimum forty (40) foot right-of-way adjacent to the trail corridor to allow a six (6) foot sidewalk, landscaping and potential limited parking in a safe and accessible manner.



Section Two **DESIGN GUIDELINES**



Ludlam Trail at SW 76th Street looking east

TYPICAL NEIGHBORHOOD CONNECTION

SOUTHWEST 76TH STREET CONNECTION

AFTER IMAGE

The SW 76th Street neighborhood connection ‘after’ image to the left shows the layout of a ‘rest area’ with covered seating, trash receptacle, multiple access points and emergency phone. Low level pedestrian lighting is shown and is recommended only at decision making areas such as roadway crossings, trailheads or rest areas.



Section Two **DESIGN GUIDELINES**

TYPICAL TRAIL JUNCTION
PLAN

SNAPPER CREEK (C-2) CANAL CROSSING

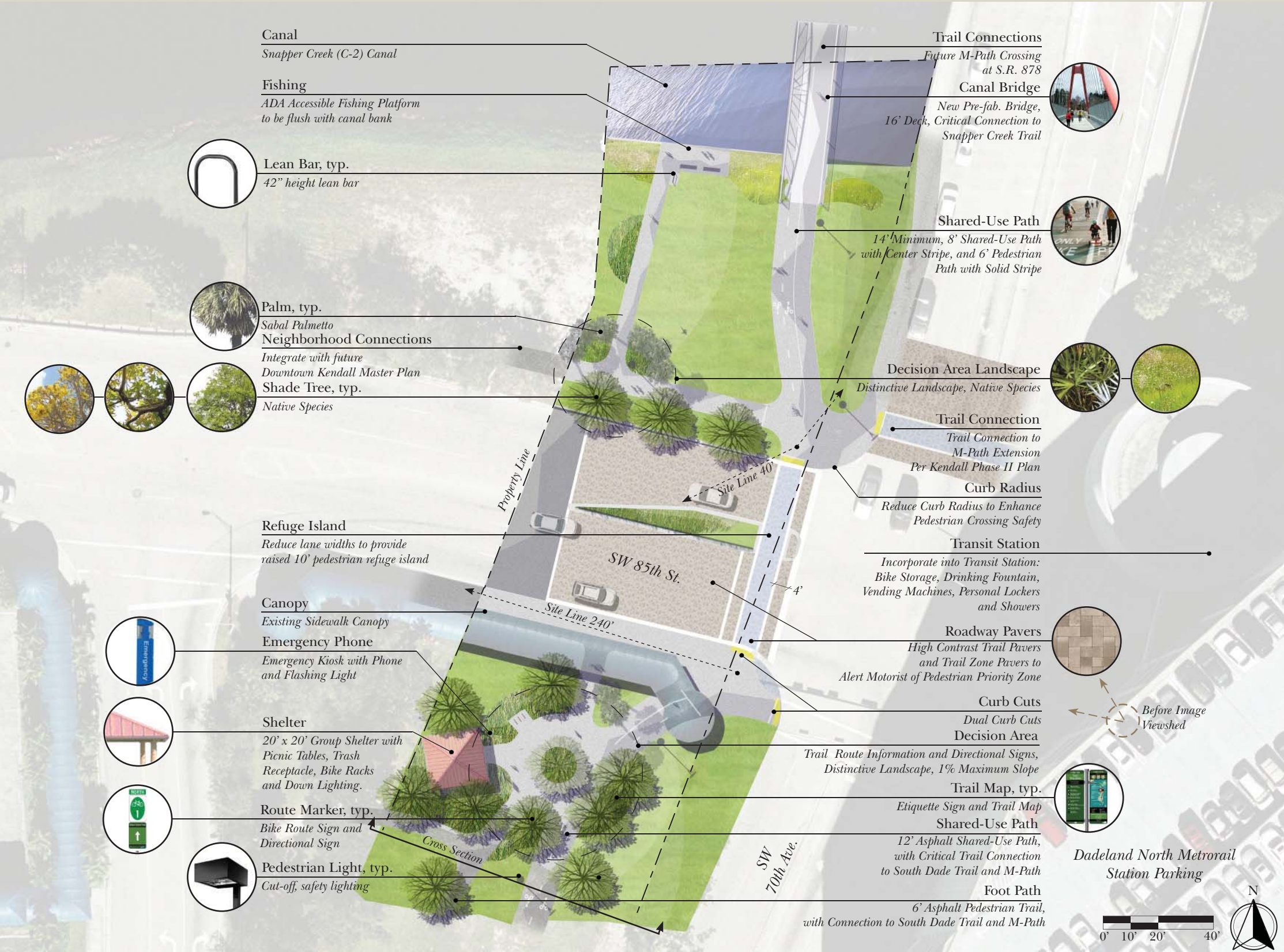
The Ludlam Trail has the opportunity to connect with five or more trails and greenways. This typical trail junction concept highlights Ludlam Trail’s connection and pairing with the future Snapper Creek Trail and M-Path Extension Trail. The Ludlam Trail would meet the Snapper Creek Trail on the north side of the Snapper Creek Canal and together cross the canal on a new trestle style prefabricated bridge. Once on the south side of the canal, Ludlam Trail meets the M-Path Extension Trail before crossing SW 85th St. at a signalized intersection. The M-Path Trail would then cross SW 70th Ave. and continue east.

Trail parking would utilize existing parking at the Dadeland Mall and the Dadeland North Metrorail station parking garage. Trail user amenities should be added to the station’s parking garage such as; bike storage and personal lockers, restrooms and showers, drinking fountains and a vending area.

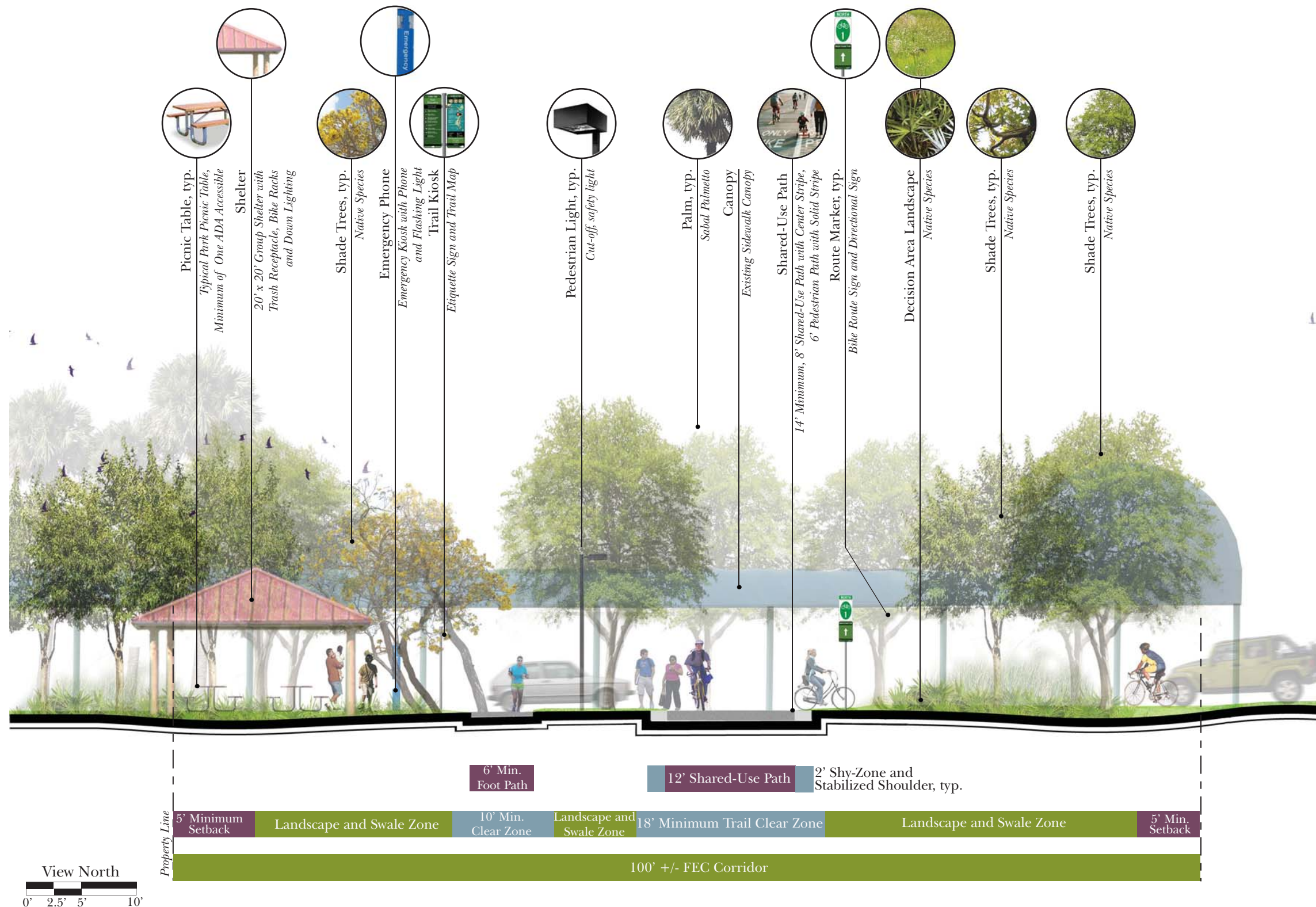
With direct access to the Snapper Creek (C-2) Canal, the Ludlam Trail has the opportunity to offer recreation elements within the corridor such as fishing. Opportunities should be developed to provide equitable recreation programming per the Miami-Dade County Parks and Open Space System Master Plan.

Highlights of the plan include:

- Typical trail junction
- Street sidewalk network connections
- Group shelter with site furnishings
- Trail seating opportunity
- Neighborhood meeting location and possible rental income for operation of trail
- Transit connection via Dadeland North Metrorail Station
- Opportunity for bike-hub within station parking garage
- Similar conditions at SW 80th St. and SW 81st St.



Section Two DESIGN GUIDELINES



TYPICAL TRAIL JUNCTION CROSS-SECTION

SNAPPER CREEK (C-2) CANAL CROSSING

Ludlam Trail, per the direction of the Downtown Kendall Master Plan, utilizes the original FEC Railroad corridor for greenway development and connectivity. Existing elements such as a covered walkway canopy should remain for patrons of the Dadeland Mall and the Dadeland North Metrorail station.

Section Two **DESIGN GUIDELINES**

TYPICAL TRAIL JUNCTION

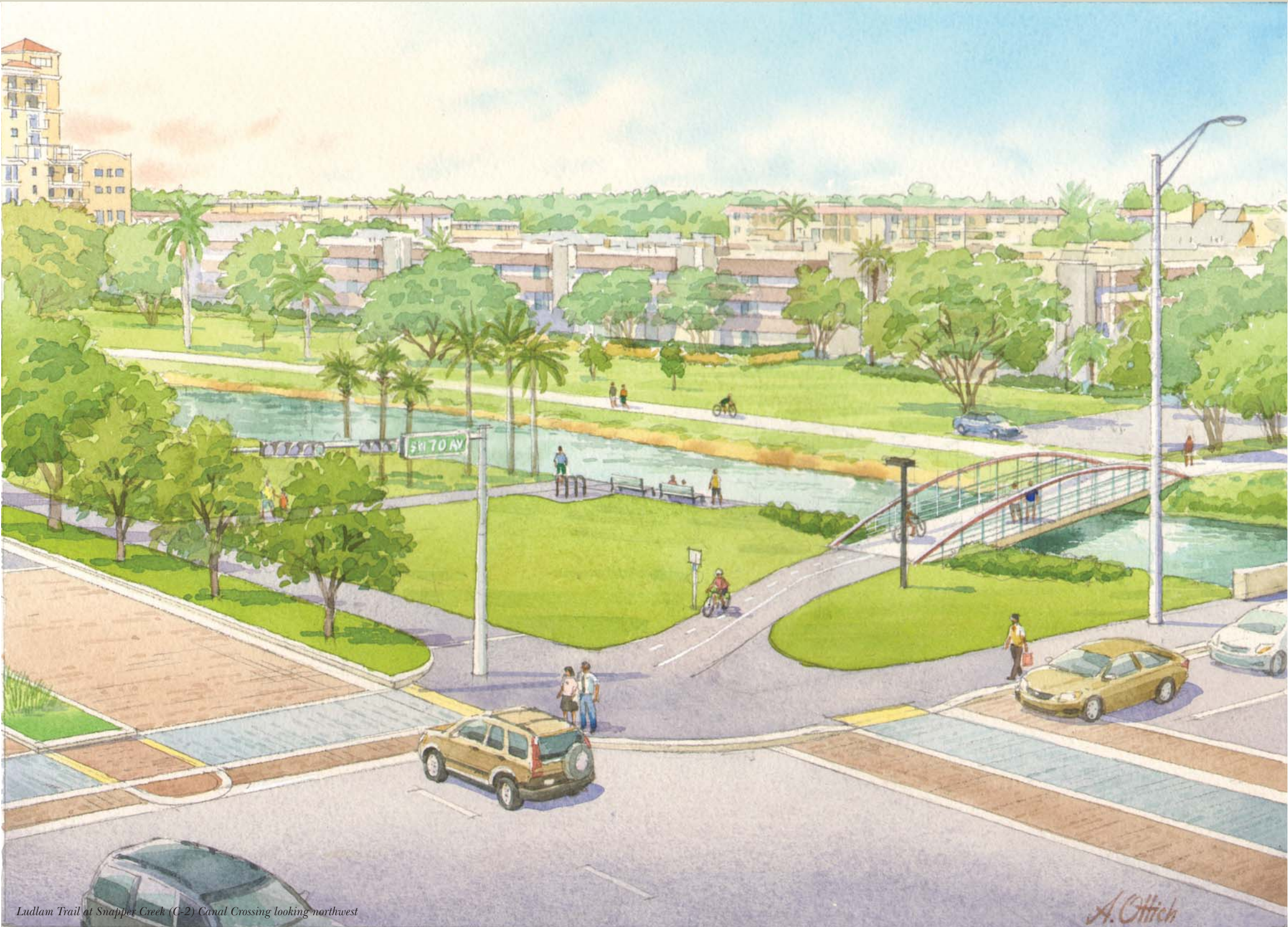
SNAPPER CREEK (C-2) CANAL CROSSING

BEFORE IMAGE

The Snapper Creek (C-2) Canal is the only canal crossing along the Ludlam Trail corridor without an existing bridge. Any bridge planned for the canal should be developed in respect to the style and look of the Tamiami (C-4) Canal and Coral Gables (C-3) Canal bridges.



Section Two **DESIGN GUIDELINES**



Ludlam Trail at Snapper Creek (C-2) Canal Crossing looking northwest

TYPICAL TRAIL JUNCTION

SNAPPER CREEK (C-2) CANAL CROSSING

AFTER IMAGE

This 'after' image of the Snapper Creek (C-2) Canal crossing identifies a new bridge styled after existing bridges along the corridor. The images also shows a fishing platform along the canal with ADA accessible opportunities to provide fishing. Other image highlights include traffic calming techniques and guidelines for intersection crossing such as reduced radii at corners, raised landscape medians, pedestrian refuge islands and high contrasting pavers to identify pedestrian priority zones.

