

MEMORANDUM

TMSC
Agenda Item No. 2D

TO: Honorable Chairman Jean Monestime
and Members, Board of County Commissioners

DATE: June 15, 2016

FROM: Abigail Price-Williams
County Attorney

SUBJECT: Resolution expressing support for the design and planning concepts set forth in The Underline Framework Plan, subject to further review before implementation; directing the County Mayor to negotiate any agreements necessary for the development and implementation of the concepts contained within The Underline Framework Plan in the determination of the County Mayor, all such agreements subject to subsequent Board approval; and identifying The Underline as a mobility and transportation solution

The accompanying resolution was prepared and placed on the agenda at the request of Prime Sponsor Commissioner Jose "Pepe" Diaz.



Abigail Price-Williams
County Attorney

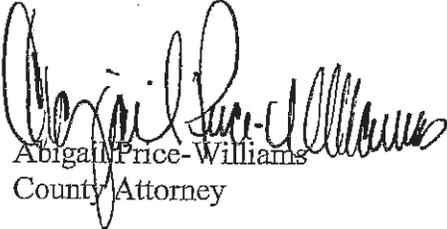
APW/smm



MEMORANDUM
(Revised)

TO: Honorable Chairman Jean Monestime
and Members, Board of County Commissioners

DATE: July 6, 2016

FROM: 
Abigail Price-Williams
County Attorney

SUBJECT: Agenda Item No.

Please note any items checked.

- "3-Day Rule" for committees applicable if raised
- 6 weeks required between first reading and public hearing
- 4 weeks notification to municipal officials required prior to public hearing
- Decreases revenues or increases expenditures without balancing budget
- Budget required
- Statement of fiscal impact required
- Statement of social equity required
- Ordinance creating a new board requires detailed County Mayor's report for public hearing
- No committee review
- Applicable legislation requires more than a majority vote (i.e., 2/3's _____, 3/5's _____, unanimous _____) to approve
- Current information regarding funding source, index code and available balance, and available capacity (if debt is contemplated) required

Approved _____ Mayor

Agenda Item No.

Veto _____

7-6-16

Override _____

RESOLUTION NO. _____

RESOLUTION EXPRESSING SUPPORT FOR THE DESIGN AND PLANNING CONCEPTS SET FORTH IN THE UNDERLINE FRAMEWORK PLAN, SUBJECT TO FURTHER REVIEW BEFORE IMPLEMENTATION; DIRECTING THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE TO NEGOTIATE ANY AGREEMENTS NECESSARY FOR THE DEVELOPMENT AND IMPLEMENTATION OF THE CONCEPTS CONTAINED WITHIN THE UNDERLINE FRAMEWORK PLAN IN THE DETERMINATION OF THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE, ALL SUCH AGREEMENTS SUBJECT TO SUBSEQUENT BOARD APPROVAL; AND IDENTIFYING THE UNDERLINE AS A MOBILITY AND TRANSPORTATION SOLUTION

WHEREAS, in 2015, James Corner Field Operations was selected by Friends of The Underline to prepare a conceptual framework and design document for the project commonly known as "The Underline"; and

WHEREAS, in 2016, after receiving and incorporating input from officials within the County's Departments of Transportation and Public Works and Parks, Recreation and Open Spaces Department, James Corner Field Operations completed a conceptual framework and design document titled "The Underline Framework Plan and Demonstration Projects" ("The Underline Framework Plan"), which is attached hereto as Exhibit A; and

WHEREAS, The Underline Framework Plan contemplates improvements to an existing ten-mile transit mobility corridor running underneath the Metrorail right-of-way from the Miami River north of the Brickell Metrorail Station to the Dadeland South Metrorail Station; and

WHEREAS, as the largest multi-modal transportation connector in the County, the Underline connects eight Metrorail transit stations and provides enhanced access to all County residents to public transit; and

WHEREAS, The Underline Framework Plan sets forth a plan for construction and improvement of the lands underneath the Metrorail right-of-way that will be primarily used to improve transportation and access to the County's transit system, including by reducing vehicular traffic and average vehicle delay, increasing ridership of the Metrorail and the desirability of mass transit, and providing an accessible and safe transportation alternative with dedicated paths for pedestrians and cyclists; and

WHEREAS, it is anticipated that The Underline Framework Plan, if fully implemented, would result in the creation of new recreational opportunities on over 100 acres of open space incidental to The Underline's primary purpose of improving transportation and access to the County's transit system; and

WHEREAS, on April 1, 2016, the Federal Transit Administration informed the County that, "[b]ased on a preliminary review of [The Underline] concept, [T]he Underline appears to bring together bicycle and pedestrian uses in a positive synergistic way on underutilized land beneath Miami's Metrorail system"; and

WHEREAS, it is anticipated that The Underline Framework Plan, if fully implemented, will result in economic development abutting the ten-mile span of The Underline, which serves on average 400,000 residents within a ten-minute walk at any given point of The Underline, benefitting the County, the Cities of Miami, Coral Gables, and South Miami, and their residents by increasing economic activity, adjacent property values, and tax receipts; and

WHEREAS, it is further anticipated that The Underline Framework Plan, if fully implemented, would result in the creation of a civic space and thoroughfare that will encourage significant economic development abutting the ten-mile span of The Underline,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that:

Section 1. The Board adopts the foregoing recitals as true and correct and incorporates them herein.

Section 2. The Board expresses its support for the design and planning concepts set forth in The Underline Framework Plan, provided that before the development and implementation of the design and planning concepts in The Underline Framework Plan the specific design and planning elements of the plan shall be subject to further County review and approvals through the regular processes utilized for the planning and development of County facilities.

Section 3. The County Mayor or County Mayor's designee is further directed to negotiate any agreements necessary, in the determination of the County Mayor or County Mayor's designee, for the development and implementation of the concepts contained in The Underline Framework Plan, which agreements shall be subject to the subsequent approval of the Board.

Section 4. The Board identifies The Underline as a mobility and transportation solution that has a substantial possibility of improving transportation and access to the County's transit system and, if fully implemented, would result in the creation of recreational opportunities on over 100 acres of open space incidental to the primary purpose of improving transit.

The Prime Sponsor of the foregoing resolution is Commissioner Jose "Pepe" Diaz. It was offered by Commissioner _____, who moved its adoption. The motion was seconded by Commissioner _____ and upon being put to a vote, the vote was as follows:

Jean Monestime, Chairman	
Esteban L. Bovo, Jr., Vice Chairman	
Bruno A. Barreiro	Daniella Levine Cava
Jose "Pepe" Diaz	Audrey M. Edmonson
Sally A. Heyman	Barbara J. Jordan
Dennis C. Moss	Rebeca Sosa
Sen. Javier D. Souto	Xavier L. Suarez
Juan C. Zapata	

The Chairperson thereupon declared the resolution duly passed and adopted this 7th day of July, 2016. This resolution shall become effective upon the earlier of (1) 10 days after the date of its adoption unless vetoed by the County Mayor, and if vetoed, shall become effective only upon an override by this Board, or (2) approval by the County Mayor of this Resolution and the filing of this approval with the Clerk of the Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK

By: _____
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency.

MAG

Miguel A. Gonzalez

THE UNDERLINE FRAMEWORK PLAN AND DEMONSTRATION PROJECTS

DECEMBER 18TH 2015

PREPARED BY:
JAMES
CORNER
FIELD
OPERATIONS

IN COLLABORATION WITH:
KIMLEY-HORN
HR&A ADVISORS
HIGHLIGHTING
PENTAGRAM
STUART-LYNN COMPANY
FAIRCHILD TROPICAL BOTANIC GARDEN

PREPARED FOR:

Friends of the Underline, in partnership with:
Miami-Dade County Parks
Recreation and Open Spaces Department
Miami-Dade Transit Department

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PREPARED FOR:



Friends of the Underline, in partnership with:
Miami-Dade County Parks
Recreation and Open Spaces Department
Miami-Dade Transit Department

ACKNOWLEDGEMENTS:

Special thanks to:

Maria Nardi of Miami-Dade Parks for her commitment to excellence, design vision, professional guidance and steadfast dedication to The Underline Master Plan and the project's ultimate implementation.

Meg Daly, Founder of Friends of The Underline for her relentless pledge to making The Underline a reality.

The University of Miami School of Architecture for committing three design studios to study The Underline's future potential, and in particular Rocco Ceo's Spring 2014 studio that excited and mobilized the community.

Miami Dade County

Miami-Dade County Mayor Carlos Gimenez

Miami-Dade County Board of County Commissioners

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 Vice Chairman Estaban Boyo, Jr.
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 Commissioner Daniella Levine-Cava
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 Commissioner Josh Liebman
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Master Plan Funders

The City of Miami
 The City of Coral Gables
 The City of South Miami
 The John S. and James L. Knight Foundation
 The Miami Foundation
 The Mitchell Wolfson Foundation
 The Health Foundation of South Florida

In Kind Donations

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 Hogan Lovells
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 Boston Consulting Group
 Fairchild Tropical Botanic Garden
 rbb Communications
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 SoMI Magazine
 Vizcaya Museum & Gardens
 Miami Aerial
 Trimble
 True Tree Service

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 and The Underline Director of Planning, Design, and Construction
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 Harold Desdunes, District Director of
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 Zak Lata

Aleah Yassin

Tomas Marfinelli

Omar Merfin

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Chris Tavella

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 Barbara Beaudry, Volunteer
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 Chris Brimo, City of Miami
 Brett Bibeau, Miami River Greenway/Commission
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 Jake Brillhart, UM School of Architecture
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Joel Hoffman, Vizcaya Museum & Gardens
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 David Weda, FPL
 Ian Wogan, Volunteer

Wendy Wolf, Vizcaya Museum & Gardens
 Louis Wolfson, Pinnacle Housing
 Collin Worth, City of Miami
 Bernard Zyscovich

To request materials in an accessible format, please contact
 Miami-Dade County Parks Recreation and Open Spaces
 Disability Services Section at (305) 755-7848

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A NATIVE HABITAT CORRIDOR INSPIRED BY THE SOUTH FLORIDA AND MIAMI REGION

ATLANTIC OCEAN

GULF OF MEXICO

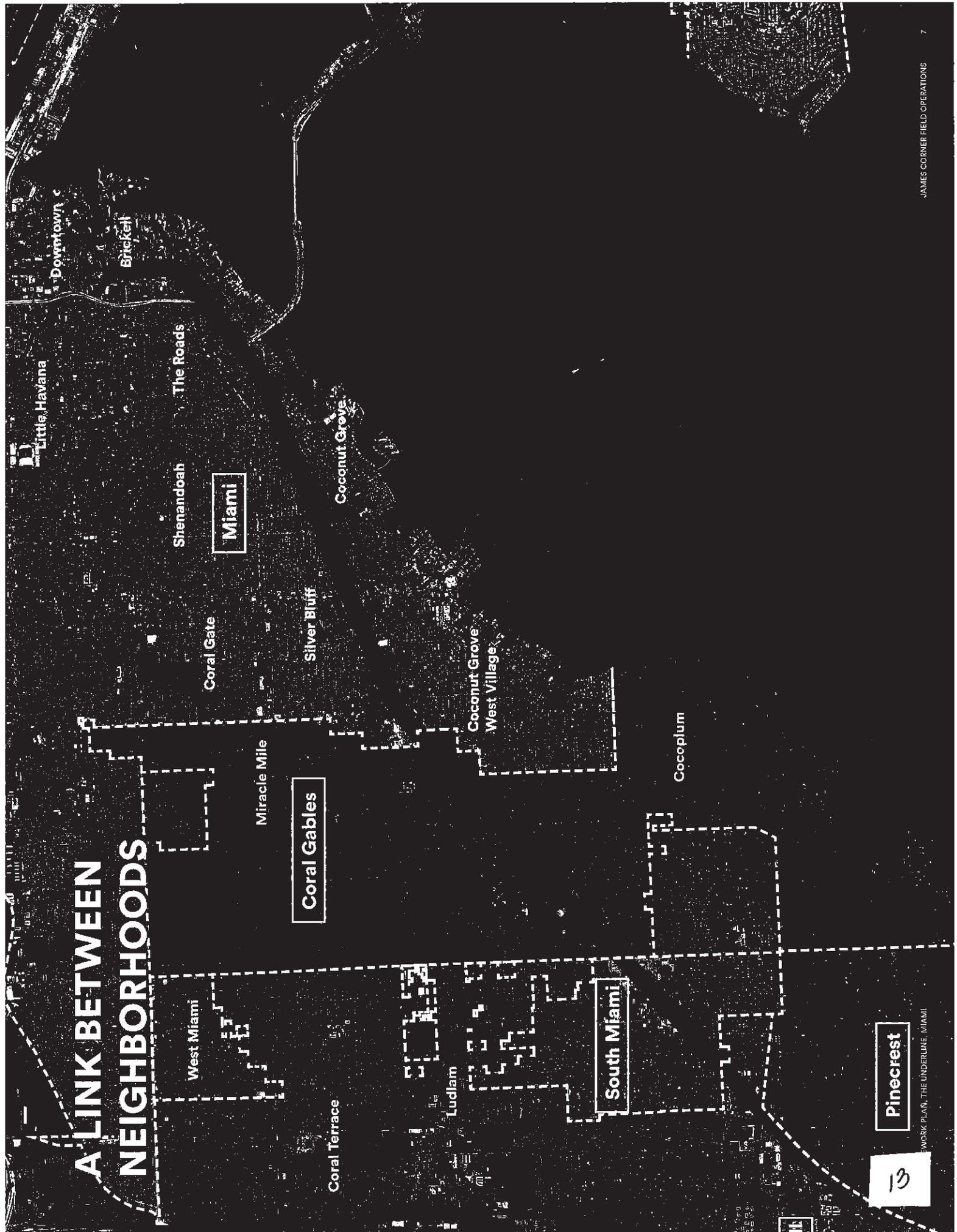


THE UNDERLINE

MIAMI-DADE REGION



A LINK BETWEEN NEIGHBORHOODS



Pinecrest

WORK PLAN, THE UNDERLINE, MIAMI

13

AN ALTERNATE MODE OF TRANSPORT

Brickell Station

Vizcaya Station

Coconut Grove Station

Douglas Road Station

University Station

South Miami Station

Dadeland North Station

Dadeland South Station

114



AN ECONOMIC GENERATOR

Brickell Station

Vizcaya Station

Coconut Grove Station

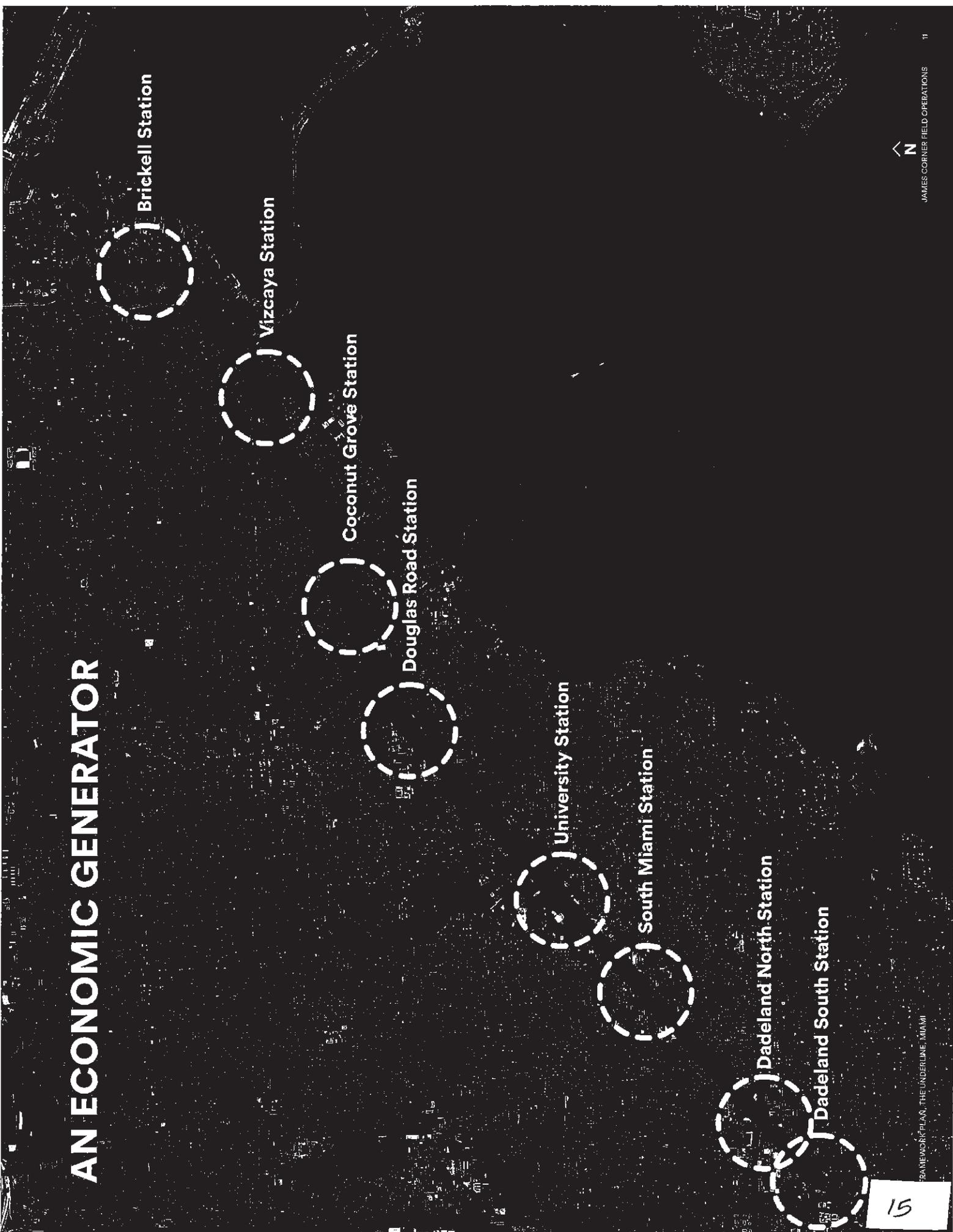
Douglas Road Station

University Station

South Miami Station

Dadeland North Station

Dadeland South Station



EXECUTIVE SUMMARY:

MIAMI'S SIGNATURE LINEAR PARK, URBAN TRAIL, & LIVING ART DESTINATION

The Underline will transform the land below the southern half of Miami's Metrorail into a 10-mile signature linear park, urban trail, and living art destination that is inspired by the Miami area, well-connected to transit, promoting a healthy lifestyle, and a gateway to the adjacent communities.

INSPIRED BY THE MIAMI AREA
The Framework plan aims to create an exceptional open space rooted in and inspired by Miami that improves functionality for its existing users — commuters, cyclists, runners and pedestrians — while maximizing its potential to foster new types of programming and uses for additional user groups, such as residents, nature and park lovers, art enthusiasts, environmentalists, entrepreneurs, and families.

URBAN TRAIL
First and foremost, The Underline is a transportation solution. As a continuous multimodal corridor, The Underline will be the primary bicycle and pedestrian connection from the southern neighborhoods and cities to downtown Miami and other destinations. It will also be a link between neighborhoods and the central spine in a regional network of existing and proposed trails.

LINEAR PARK
In addition to being an urban trail and multimodal corridor, The Underline will be a linear park.

It is part of the Miami Dade County Parks and Public Space Master Plan adopted by the Board of County Commissioners in 2008 and incorporated into the comprehensive development master plan in 2009.

From New York City's High Line to Atlanta's Beltline, linear parks have a proven track record of creating value. As a well-connected and unique site along a transit corridor, The Underline presents an extraordinary opportunity to generate a significant amount of economic development in the region by increasing property values along the corridor and thus stimulating new and unique developments that can reinforce The Underline's vision as a new sector of the region.

The Underline will also encourage a healthier lifestyle. Over half of Miami residents don't exercise the recommended 20-30 minutes per day. Providing an option to walk and bike as an alternative to driving will increase our community's mobility and activity levels. Plus the numerous proposed recreation features, from the walking/running and biking trails, basketball courts, soccer fields, outdoor gyms, and related programming will attract residents and tourists alike to enjoy an active lifestyle, a proven prescription to defending against chronic diseases and enhancing longevity.

With a generous width ranging from 70 to 170 feet, the corridor offers an opportunity to create a signature linear park influenced by its inherent attributes - the unique space created by the distinctive overhead structure of the Metrorail viaduct, the large amount of adjacent undeveloped land, and the relationship to existing neighborhoods, institutions, parks, canals, creeks and the Miami River.

WELL-CONNECTED TO TRANSIT
Primarily running underneath the Metrorail line and parallel to US-1, The Underline's privileged location allows it to be a transportation solution for the larger Miami Dade region. Capitalizing on its 10-mile length and connection to eight transit stations, the Framework Plan looks to develop a linked corridor that can present an attractive alternative to car-based commuting by promoting public transportation via Metrorail, strengthening linkages to local bus and trolley transportation routes, and creating a safe, off-road biking corridor within a natural and beautiful setting.

The Underline will encourage residents to get out of their cars and walk, bike, and take mass transit as an alternative to driving.

GATEWAY TO COMMUNITIES
The Underline will serve as a gateway to the adjacent communities, by improving physical access from north to south, as well as across US-1 / South Dixie Highway, and by tapping into the unique identities of each adjoining neighborhood by providing distinctive places for programs relevant to each community.

Our mission is to create a signature linear park, urban trail, and living art destination. Inspired by South Florida and the Miami region, The Underline will become an alternative mode of transportation; a significant social and civic spine for the area; a linear experience of inviting spaces that foster community, enhance value, accommodate recreation, facilitate connectivity and improve social exchange, and activate residents to a healthier lifestyle. We envision a unique and sustainable corridor that supports mobility, community, recreation, public life, and inspires innovation in open space, transportation, planning, and redevelopment.

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STAKEHOLDER GROUP MEETINGS

Since we began developing the Framework Plan for The Underline in April of 2015, there have been numerous stakeholder meetings with project constituents including municipal agencies, county agencies, mayors and private citizen-led groups.

These meetings will continue throughout the next phases of design to gather feedback and ensure coordination with all other city initiatives.

ON GOING MEETINGS:

- CITY OF MIAMI PARKS DEPARTMENT
- CITY OF MIAMI PLANNING & ZONING (LAND USE, ZONING)
- CITY OF MIAMI PUBLIC WORKS/BIKE PED COORDINATOR
- CITY OF SOUTH MIAMI
- CITY OF CORAL GABLES PLANNING & ZONING
- CITY OF CORAL GABLES PUBLIC WORKS/PARKING DEPARTMENT
- MIAMI DADE ART IN PUBLIC PLACES
- MIAMI DADE COUNTY PARKS, RECREATION AND OPEN SPACES DEPARTMENT
- MIAMI DADE COUNTY TRANSIT/PUBLIC WORKS
- FLORIDA POWER AND LIGHT COMPANY
- MIAMI RIVER GREENWAY AND MIAMI RIVER COMMISSION
- SOUTH MIAMI HOSPITAL
- UNIVERSITY OF MIAMI BUILDING AND GROUNDS PLANNING DEPARTMENT
- MAYOR REGALADO
- MAYOR GIMENEZ
- FLORIDA DEPARTMENT OF TRANSPORTATION
- METROPOLITAN PLANNING ORGANIZATION

UPCOMING MEETINGS:

- FEDERAL TRANSIT ADMINISTRATION



FRAMEWORK PLAN, THE UNDERLINE, MIAMI

PUBLIC ENGAGEMENT

Over the past months, we have gathered feedback in various formats including two series of public meetings. The first series occurred in April and included three public meetings where participants were encouraged to provide feedback using interactive boards. The second series included two meetings at the end of June where in-progress design work was presented and participants were given the opportunity to ask questions to the design and client team.

In addition to the meetings, two types of surveys have been completed. The first survey, taken by over 600 participants both on-line and over the course of various events, solicited feedback on a range of topics including uses, themes and overall vision and aspirations for the Underline as well as the potential for future transit oriented development along the corridor. A second survey was distributed during the June public meetings and was available on-line. This survey focused on soliciting the public's feedback on the in-progress design work presented during these meetings. The next few pages summarize the results of these surveys.

A similar set of meetings will take place in the fall to present the final Framework Plan.



PUBLIC ENGAGEMENT PUBLIC MEETINGS #1: 16-18 APRIL 2015

The first series of open public meetings to discuss aspirations for the Underline were held April 16-18, 2015. The first meeting, held on April 16th at the University of Miami, focused on the area from Coral Gables to Dadeland South, including South Miami. The second meeting, held on April 17th at the Miami Dade County Public Library, focused on the Brickell area. The third and final meeting was held on April 18th at the Vizcaya Garage to gather feedback from areas including Vizcaya, Shennandoah, the Roads, Silver Bluff, Coconut Grove, and Coconut Grove Village West.

These three meetings documented the participants' thoughts on what they most wanted to do and see on the future Underline by allowing them to physically mark their priorities and document their wishes on printed maps and boards, designed to represent various key aspects and aspirations for the project.

These public meetings provided us with a clear understanding of the program and thematic priorities of each segment of The Underline, and the surrounding neighborhoods. This information was the basis for our character zones, discussed in Chapter 3. Below is a sample of the materials produced; for more in-depth information on the first public meetings, refer to the task 1A Site Analysis and Key Strategies book, delivered May 2015.



THEMES

What would most attract you to The Underline?

U

Festivals + Events 	Ecology + Natural Habitats 	Art + Culture 	Health + Fitness 	Strolling + Picnicking 	Green Technologies + Sustainable Initiatives 	Shops + Restaurants

Dot Key:

- Meeting #1- Coral Gables, South Miami to Dadeland S. Station
- Meeting #2- Brickell area
- Meeting #3- Vizcaya, Coconut Grove, Douglas Station Areas

- ### Top Themes per Meeting:
- Meeting #1
 - 1) Art + Culture
 - 2) Ecology + Natural Habitats
 - 3) Health + Fitness
 - Meeting #2
 - 1) Ecology + Natural Habitats
 - 2) Art + Culture
 - 3) Green Technologies + Sustainable Initiatives
 - Meeting #3
 - 1) Ecology + Natural Habitats
 - 2) Green Technologies + Sustainable Initiatives
 - 3) Art + Culture

USES

How would you use The Underline?

U

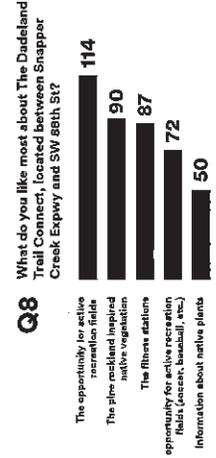
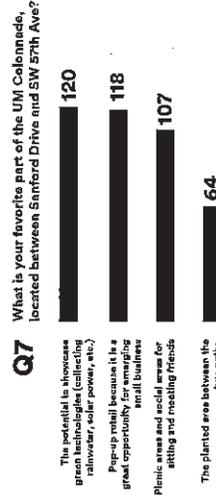
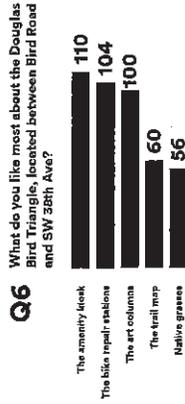
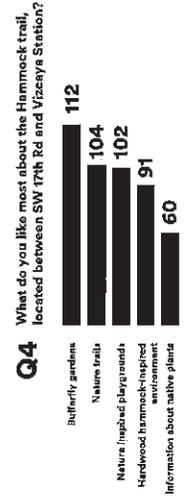
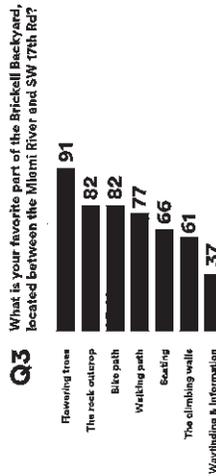
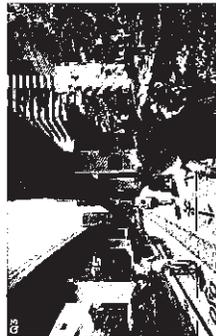
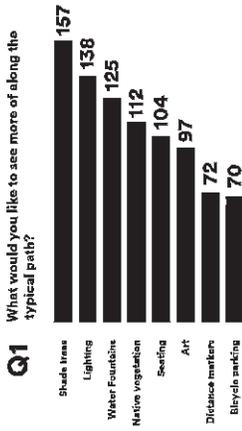
Run Cycle 	Dog Walk 	Access the Metrorail 	Commute by Bike 	Outdoor Fitness 	Appreciate Art 	Other Use

Top Uses per Meeting:

- Meeting #1
 - 1) Commute by Bike
 - 2) Enjoy Nature
 - 3) Leisurely Bike Ride
- Meeting #2
 - 1) Enjoy Nature
 - 2) Restaurants + Cafes
 - 3) Appreciate Art
- Meeting #3
 - 1) Leisurely Bike Ride
 - 2) Commute by Bike
 - 3) Access the Metrorail

PUBLIC ENGAGEMENT PUBLIC MEETINGS #2: 23 & 25 JUNE 2015

In-progress designs were presented to the public for their feedback, during two public meetings. Surveys were distributed during the public meetings, and the same surveys were available online from June 23 - August 1. This feedback is summarized below.



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FRAMEWORK PLAN:

SEVEN STRATEGIES ORGANIZED ON THREE KEY LAYERS

There are three main components that will unite the 10 miles of the Underline and establish its core character: the Paths + Intersections, Planting + Habitat, and the Character Zones. Throughout each of these three layers, seven core strategies will guide our design:

- 1 Create a multimodal corridor with designated paths
- 2 Establish a green corridor based on historic native communities
- 3 Locate programmatic nodes (Neighborhood open space amenities)
- 4 Improve intersections
- 5 Connect to the larger trail network
- 6 Develop guidelines for transit-oriented development
- 7 Use The Underline as a framework for art curated through Miami-Dade County Art in Public Places



DEMONSTRATION PROJECTS:

THE BRICKELL BACKYARD

THE UM COLONNADE

The primary design components and elements established on the Framework Plan are further developed on two sites: The Brickell Backyard, extending from the Miami River to SW 17th Road and the UM Colonnade, located between Stanford Drive and SW 57th Avenue.



CHAPTER 2

FRAMEWORK PLAN

- 2.1 PATHS & INTERSECTIONS
- 2.2 PLANTING & HABITAT
- 2.3 CHARACTER ZONES
- 2.4 DESIGN ELEMENTS
- 2.5 REAL ESTATE STRATEGY

2.1 PATHS & INTERSECTIONS

The core use of The Underline is as an off-road, dedicated bicycle and pedestrian facility. The essential components of the facility are the bicycle and pedestrian paths, and the intersections, where the paths cross vehicular traffic. The key criteria for the design of these components are safety and the ability to accommodate varying levels of use. This chapter outlines the dimensional and geometric parameters that guide the design of the paths and intersections, along with relevant site constraints.

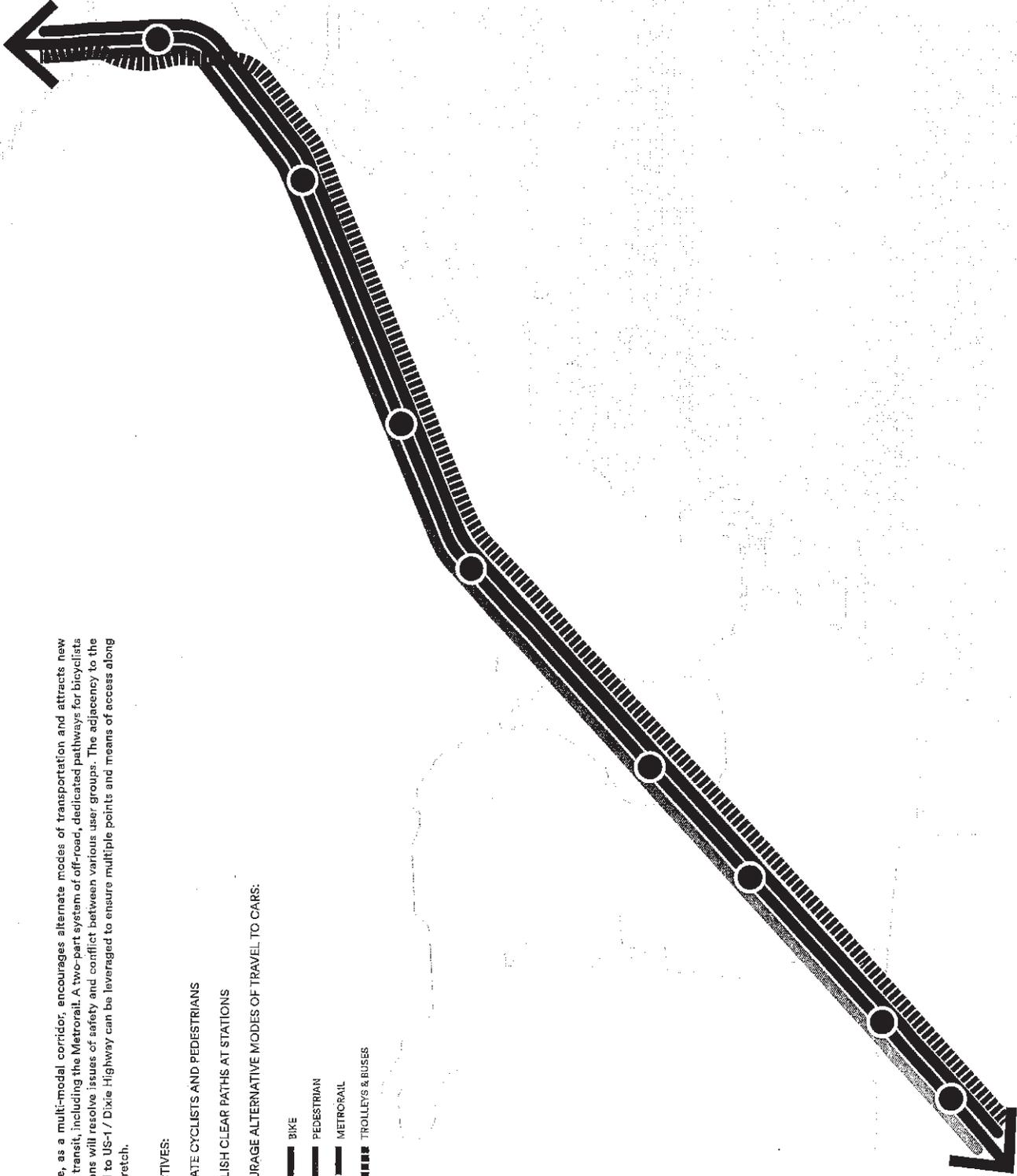
A MULTI-MODAL CORRIDOR WITH DEDICATED PATHS AN ACCESSIBLE & SAFE TRANSPORTATION ALTERNATIVE

The Underline, as a multi-modal corridor, encourages alternate modes of transportation and attracts new users to mass transit, including the Metrorail. A two-part system of off-road, dedicated pathways for bicyclists and pedestrians will resolve issues of safety and conflict between various user groups. The adjacency to the Metrorail and to US-1 / Dixie Highway can be leveraged to ensure multiple points and means of access along the 10 mile stretch.

MAIN OBJECTIVES:

- SEPARATE CYCLISTS AND PEDESTRIANS
- ESTABLISH CLEAR PATHS AT STATIONS
- ENCOURAGE ALTERNATIVE MODES OF TRAVEL TO CARS:

- BIKE
- PEDESTRIAN
- METRO RAIL
- TROLLEYS & BUSES



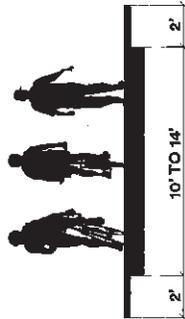
NOT TO SCALE

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TYPES OF BICYCLE FACILITIES DESIGN CRITERIA FOR THE UNDERLINE

It is necessary to understand the type of facility. The Underline will be, in order to determine optimum dimensions for the bicycle and pedestrian paths. The majority of design criteria and standards, both national and international, primarily address the design of on-street, shared or separated bicycle lanes. As a facility that will primarily be off-street, with dedicated paths, the design of The Underline paths can be more flexible, responding to criteria of ridership, site and context.

CRITERIA FOR OFF-ROAD SHARED USE PATHS*

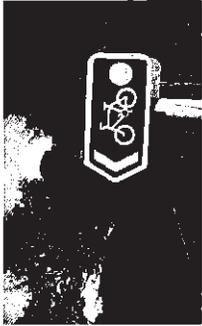


- 10 FEET = MINIMUM WIDTH
- 10 TO 14 FOOT WIDTH IS TYPICAL
- WIDER PATH ACCOMMODATES HIGHER VOLUMES OR MORE VARIED USER GROUPS

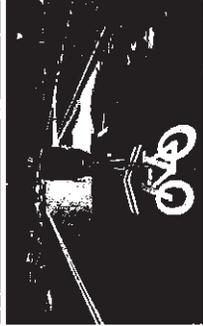
CRITERIA FOR BICYCLE LAINE WIDTH*



TYPES OF BICYCLE FACILITIES



SIGNED ROUTES (NO PAVEMENT MARKINGS)
a roadway designated as a preferred route for bicycles



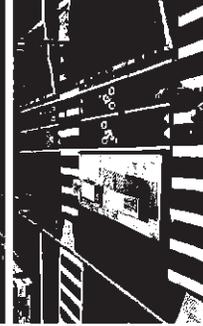
SHARED LANE MARKINGS
a shared roadway with pavement markings providing wayfinding guidance to bicyclists and alerting drivers that bicyclists are likely to be operating in mixed traffic



ON-STREET BIKE LANES
an on-road bicycle facility designated by striping, signing and pavement markings



ON-STREET BUFFERED BIKE LANES
bike lanes with a painted buffer. Increase lateral separation between bicyclists and motor vehicles



SEPARATED BIKE LANES
a separated bike lane is an exclusive facility for bicyclists that is located within or directly adjacent to the roadway and that is physically separated from motor vehicle traffic with a vertical element



CURRENT MPATH OFF STREET TRAILS
bicycle facilities physically separated from traffic, but intended for shared use by a variety of groups, including pedestrians, bicyclists and joggers.

SOURCE: TYPES OF BICYCLE FACILITIES, SEPARATED BIKE LANE PLANNING AND DESIGN GUIDE, MAY 2015, USDOT FHWA

* SEE CHAPTER 15: DESIGN OF SHARED USE PATHS, THE GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES, 2023, FOURTH EDITION BY AASHTO

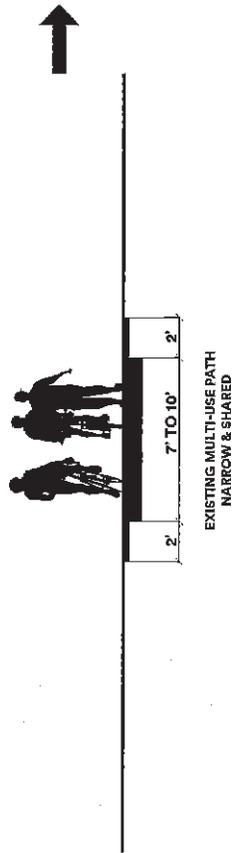
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PATH DIMENSIONS PROPOSED OFF-ROAD DEDICATED PATHS

The Underline will have an off-road, dedicated bicycle path (10 foot minimum width) and pedestrian path (8 foot minimum width). For most of their length, the paths are physically separated. When the paths are adjacent to each other, they will be clearly demarcated and separated through shoulders or margins. The width of the paths will increase to accommodate contextual needs, like high-traffic at stations and entrances.

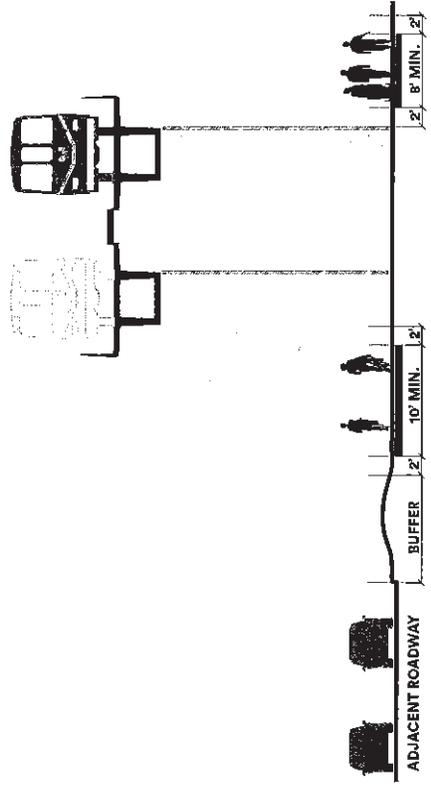
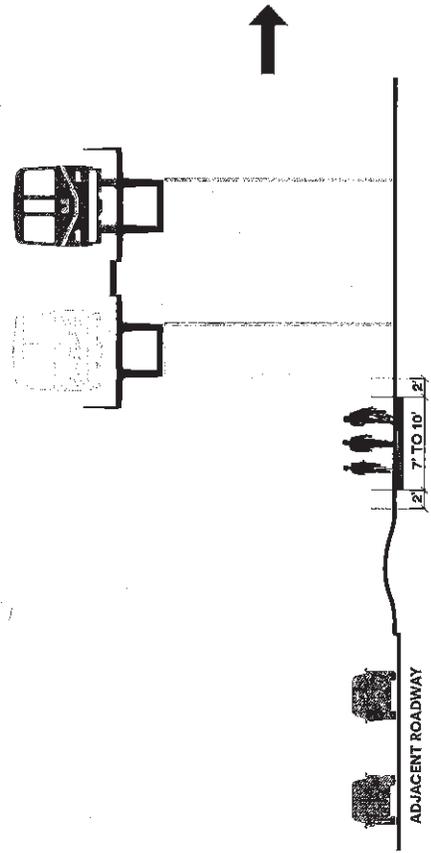
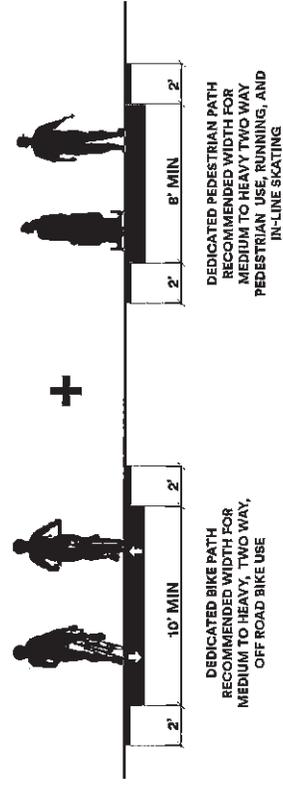
See chapter 2.4: Design Elements for detailed information on proposed path materials and pavement markings.

CURRENT / SHARED PATH PAVED WIDTH = 7' TO 10'



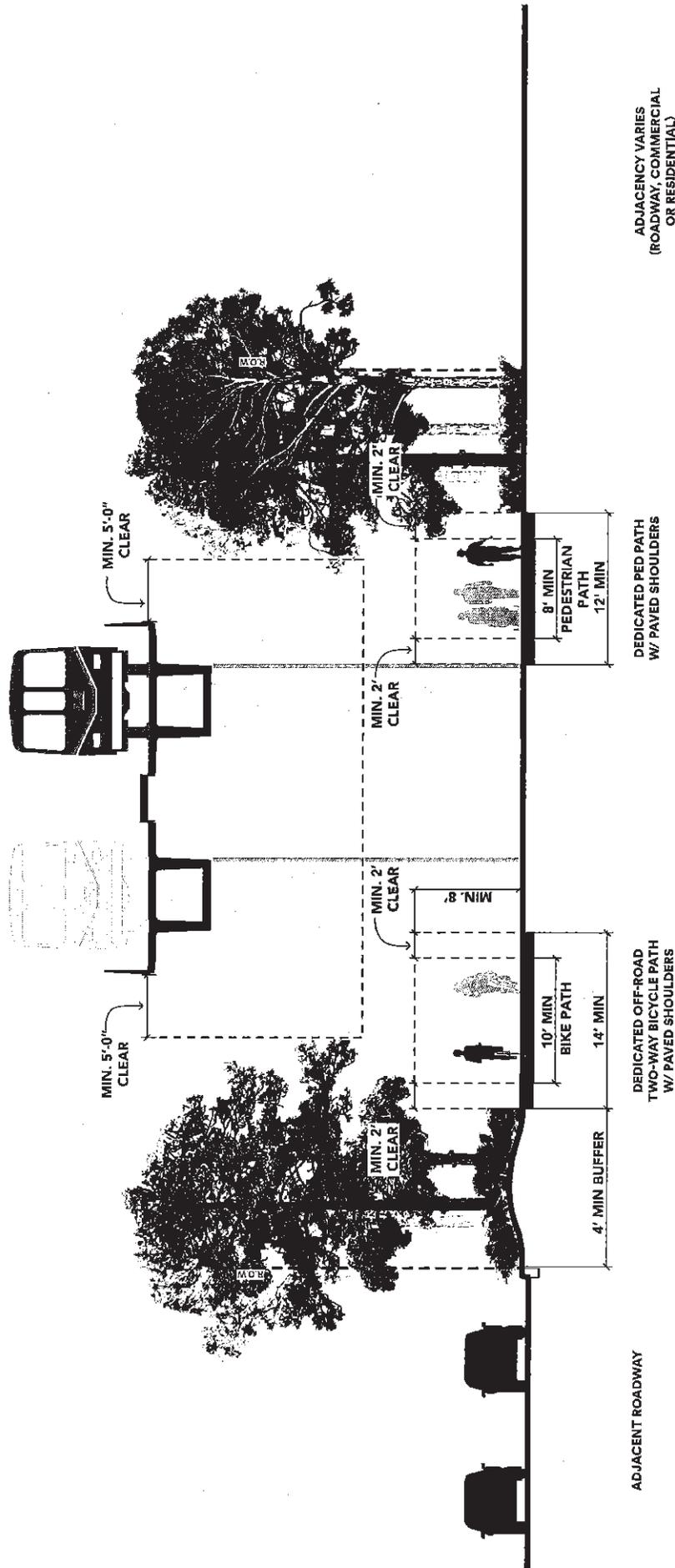
PROPOSED/ DEDICATED PATHS

MIN TOTAL PAVED WIDTH = 18'
(AT LEAST 4' TO 8' WIDER THAN RECOMMENDED WIDTH FOR SHARED USE PATHS BY AASHTO*)



* SEE CHAPTER 8: DESIGN OF SHARED USE PATHS, THE GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES, 2021, FOURTH EDITION BY AASHTO

**PATH DIMENSIONS
TYPICAL CROSS SECTION**



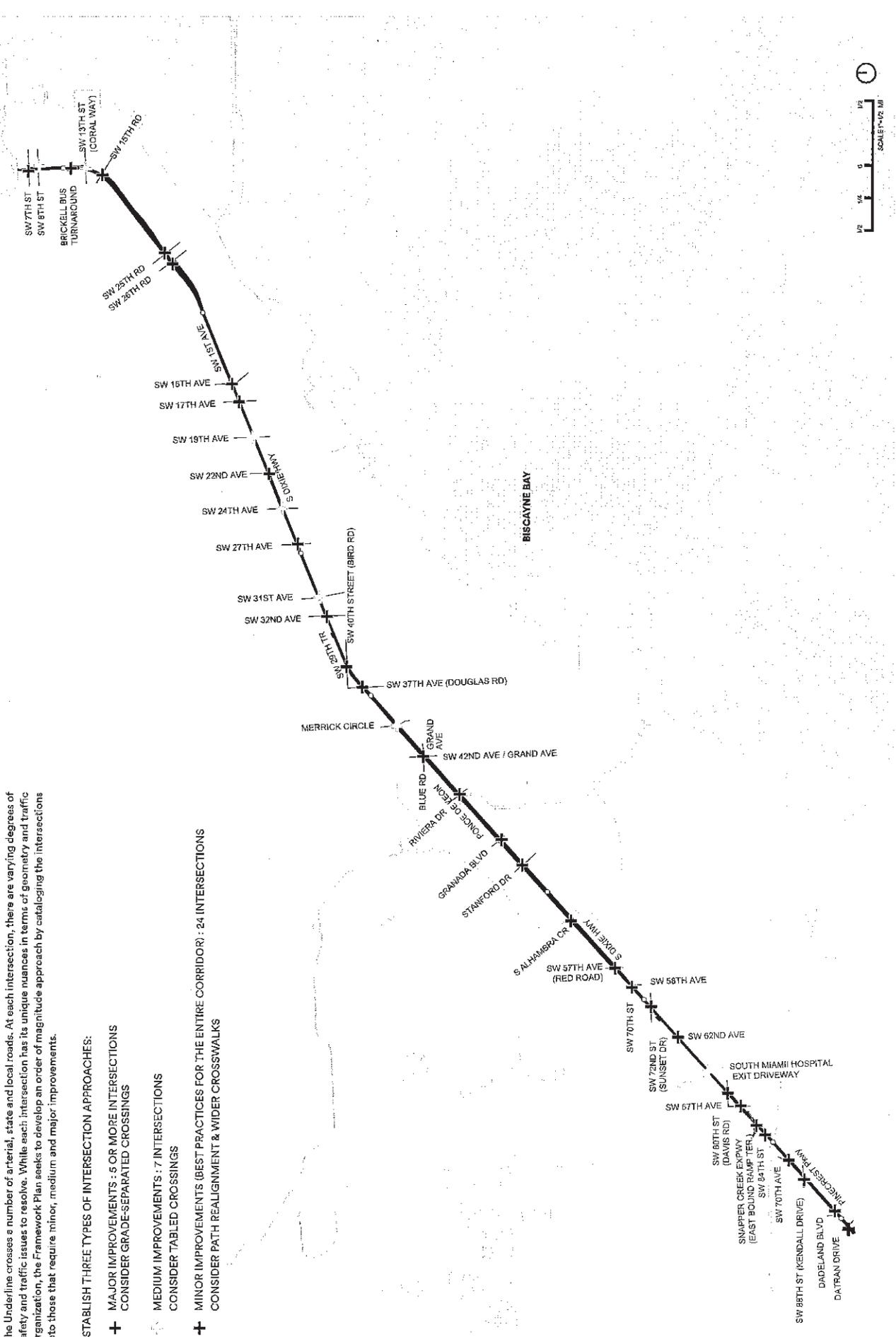
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INTERSECTIONS CATEGORIES OF IMPROVEMENTS

The Underline crosses a number of arterial, state and local roads. At each intersection, there are varying degrees of safety and traffic issues to resolve. While each intersection has its unique nuances in terms of geometry and traffic organization, the Framework Plan seeks to develop an order of magnitude approach by cataloging the intersections into those that require minor, medium and major improvements.

ESTABLISH THREE TYPES OF INTERSECTION APPROACHES:

- + MAJOR IMPROVEMENTS : 5 OR MORE INTERSECTIONS
CONSIDER GRADE-SEPARATED CROSSINGS
- ☆ MEDIUM IMPROVEMENTS : 7 INTERSECTIONS
CONSIDER TABLED CROSSINGS
- + MINOR IMPROVEMENTS (BEST PRACTICES FOR THE ENTIRE CORRIDOR) : 24 INTERSECTIONS
CONSIDER PATH REALIGNMENT & WIDER CROSSWALKS



INTERSECTIONS MINOR IMPROVEMENTS : PATH REALIGNMENT & WIDER CROSSWALKS

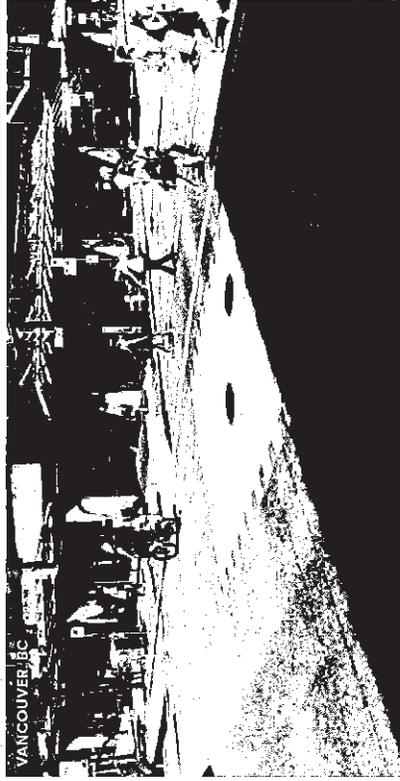
RECOMMENDATIONS FOR MINOR INTERSECTION IMPROVEMENTS INCLUDE:

- 1 Re-align path approach to improve visibility and orientation
- 2 Provide early indicators for approaching path users
 - Pavement marking and/or material changes
 - Gradual grading to meet roadway at-grade
- 3 Provide a minimum of 6 feet of buffer space between U.S. 1 travel lane and crossing
- 4 Widen crosswalks and curb openings to 18 feet in width:
 - Bicycle crossing space 10 feet in width
 - Pedestrian crossing space 8 feet in width
 - Flush curb openings
- 5 Consider no-turn-on-red for cross-street right-turn movement
 - May be required due to sight distance calculations of widened crossings
 - Dynamic no-turn-on-red during peak travel times could be considered for the highest volume right-turn movements
- 6 Provide leading pedestrian interval (LPI) for Underline crossing

THERE ARE A TOTAL OF 24 INTERSECTIONS WHERE MINOR IMPROVEMENTS ARE RECOMMENDED. THESE INCLUDE:

Datran Drive	Granada Boulevard
Dedeland Boulevard	Riviera Drive
SW 70th Avenue	SW 32nd Avenue
SW 84th Street	SW 27th Avenue
Snapper Creek Expressway (eastbound ramp terminus)	SW 22nd Avenue
SW 67th Avenue (Ludlam Road)	SW 17th Avenue
SW 60th Street (Davis Road)	SW 16th Avenue
SW 62nd Avenue	SW 26th Road
SW 72nd Street (Sunset Drive)	SW 25th Road
SW 70th Street	SW 18th Road (Broadway)
Alhambra Circle	Brickell bus turnaround driveway
Stanford Drive	SW 7th Street.

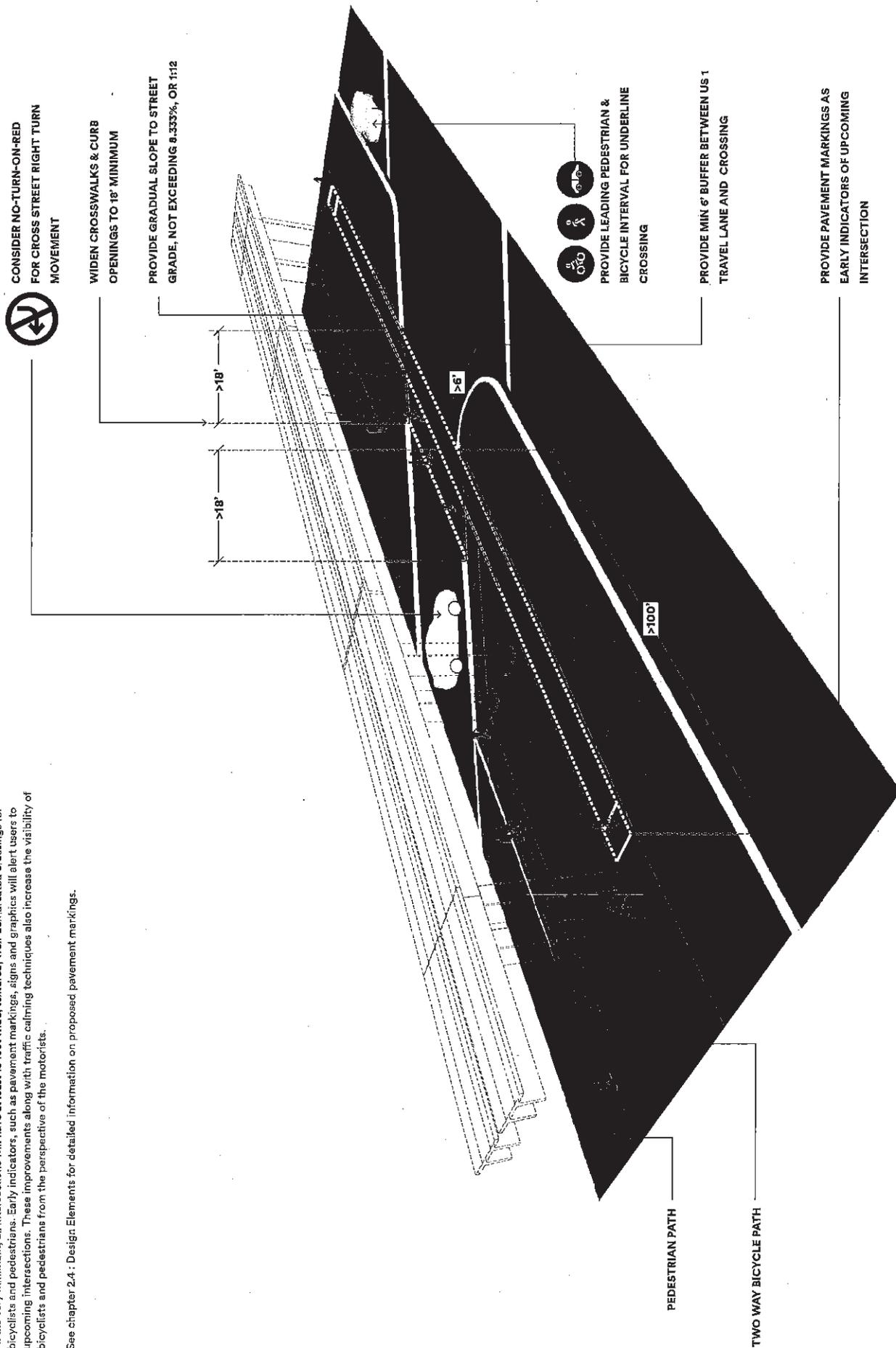
See chapter 2.4 : Design Elements for detailed information on proposed pavement markings.
See appendix chapter 4.2 for detailed recommendations for each intersection along the corridor.



INTERSECTIONS MINOR IMPROVEMENTS : PATH REALIGNMENT & WIDER CROSSWALKS

At the very minimum, all intersections will have at least 18 foot wide, textured, well-demarcated crossings for bicyclists and pedestrians. Early indicators, such as pavement markings, signs and graphics will alert users to upcoming intersections. These improvements along with traffic calming techniques also increase the visibility of bicyclists and pedestrians from the perspective of the motorists.

See chapter 2.4 : Design Elements for detailed information on proposed pavement markings.



INTERSECTIONS MEDIUM IMPROVEMENTS: TABLED CROSSINGS

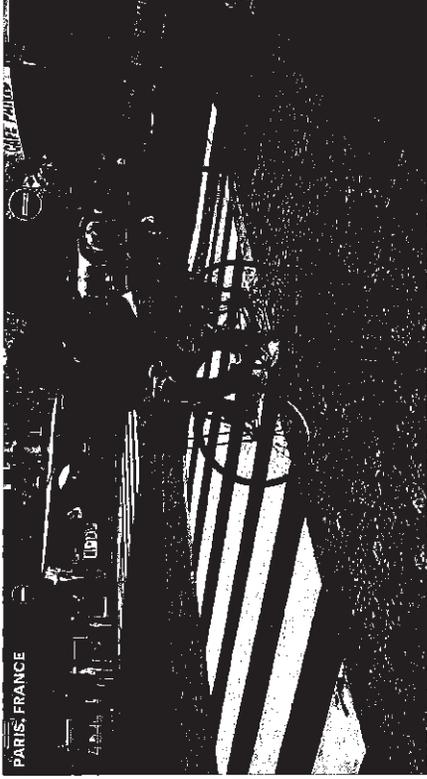
RECOMMENDATIONS FOR MEDIUM INTERSECTION IMPROVEMENTS INCLUDE:

- ① Maintain straight approach path alignment across the intersection
- ② Provide early indicators for approaching path users
 - Pavement marking and/or material changes
- ③ Provide tabled crossing or lift grade of roadway to provide smooth crossing
 - Ramp to tabled crossing encourages motorists to drive slowly with care and notifies motorists of the crossing
- ④ Widen crosswalks and curb openings to 18 feet in width (minimum)
 - Bicycle crossing space 10 feet in width
 - Pedestrian crossing space 8 feet in width
 - Flush curb openings
 - Consider wider crossings where appropriate

THERE ARE A TOTAL OF 7 INTERSECTIONS WHERE MEDIUM IMPROVEMENTS ARE RECOMMENDED. THESE INCLUDE:

South Miami Hospital exit driveway
Merrick Circle
SW 31st Avenue
SW 24th Avenue
SW 19th Avenue
SW 13th Street (Coral Way)
SW 8th Street (Calle Ocho)

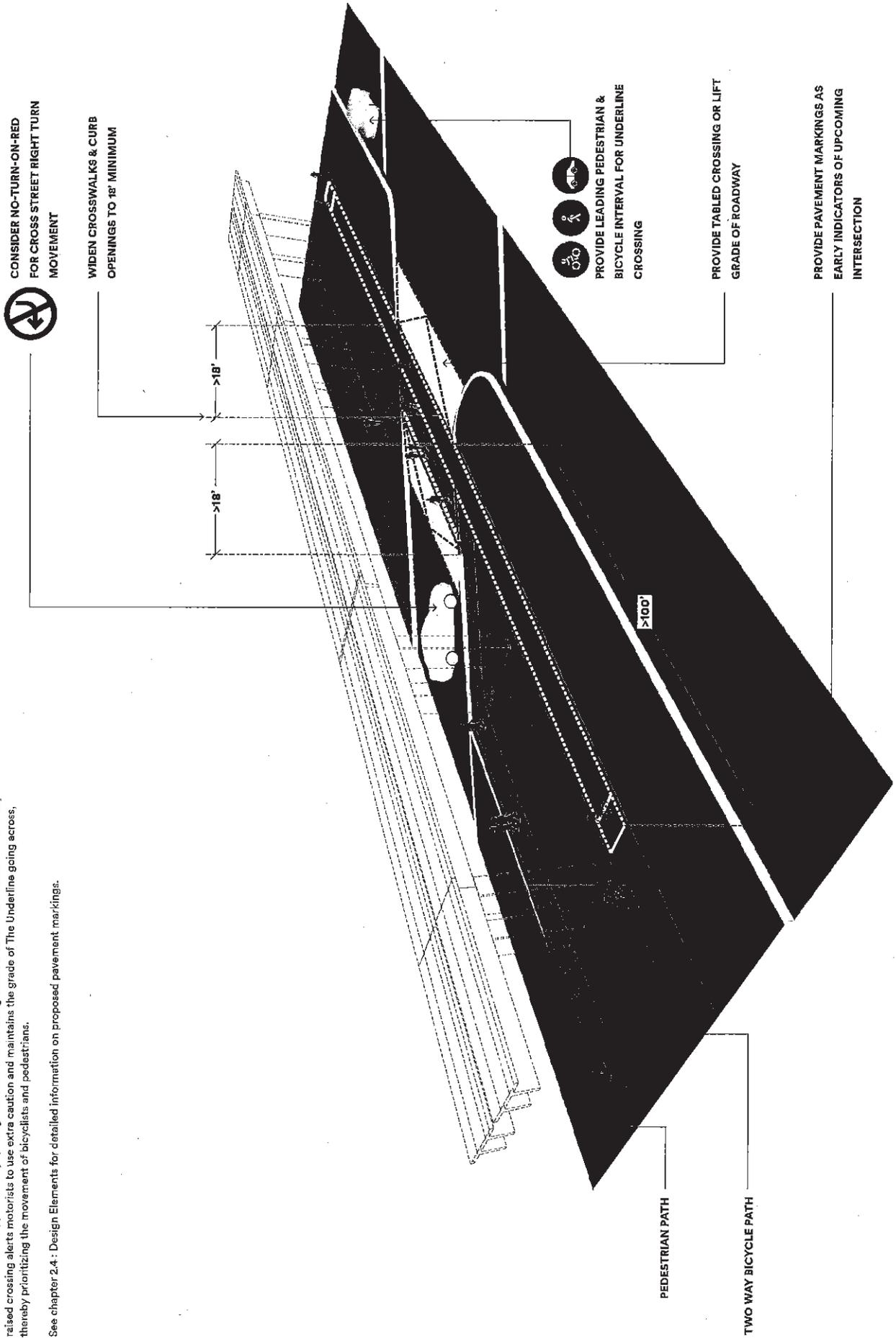
See chapter 2.4 : Design Elements for detailed information on proposed pavement markings.
See appendix chapter 4.2 for detailed recommendations for each intersection along the corridor.



INTERSECTIONS MEDIUM IMPROVEMENTS: TABLED CROSSINGS

Select intersections (approximately 7) along The Underline are being considered for this treatment. The wide, raised crossing alerts motorists to use extra caution and maintains the grade of The Underline going across, thereby prioritizing the movement of bicyclists and pedestrians.

See chapter 2.4 : Design Elements for detailed information on proposed pavement markings.



INTERSECTIONS MAJOR IMPROVEMENTS: GRADE-SEPARATED CROSSINGS

RECOMMENDATIONS FOR MAJOR INTERSECTION IMPROVEMENTS INCLUDE:

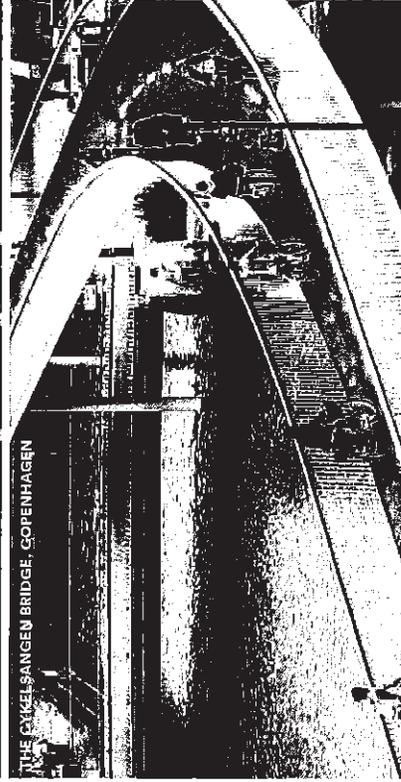
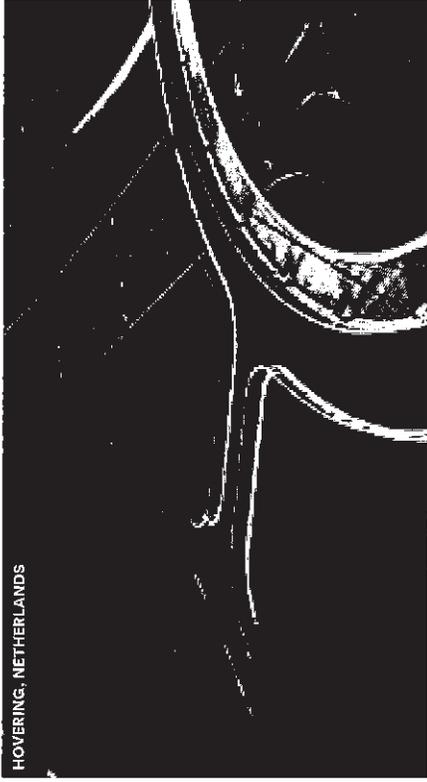
- 1 Consider grade-separated crossing at highest volume intersections and/or crossings with unavoidable constraints
 - Elevated/bridge crossings will be accompanied by at-grade solutions
- 2 Explore strategies for significant path re-alignment associated with tactical opportunities

THERE ARE A MINIMUM OF 5 INTERSECTIONS WHERE MAJOR IMPROVEMENTS ARE RECOMMENDED. THESE INCLUDE BUT ARE NOT LIMITED TO:

1. SW 88th Street (Kendall Drive)
2. SW 57th Avenue (Red Road)
3. SW 42nd Avenue/Grand Avenue
4. SW 37th Avenue (Douglas Road)
5. SW 40th Street (Bird Road)

Furthermore, there are existing pedestrian bridges adjacent to The Underline that may be considered as opportunities for partnered aesthetic improvement, such as the bridge to Vizcaya Museum and Gardens.

See Chapter 2.4 - Design Elements for detailed information on proposed pavement markings.
See Appendix Chapter 4.2 for detailed recommendations for each intersection along the corridor.

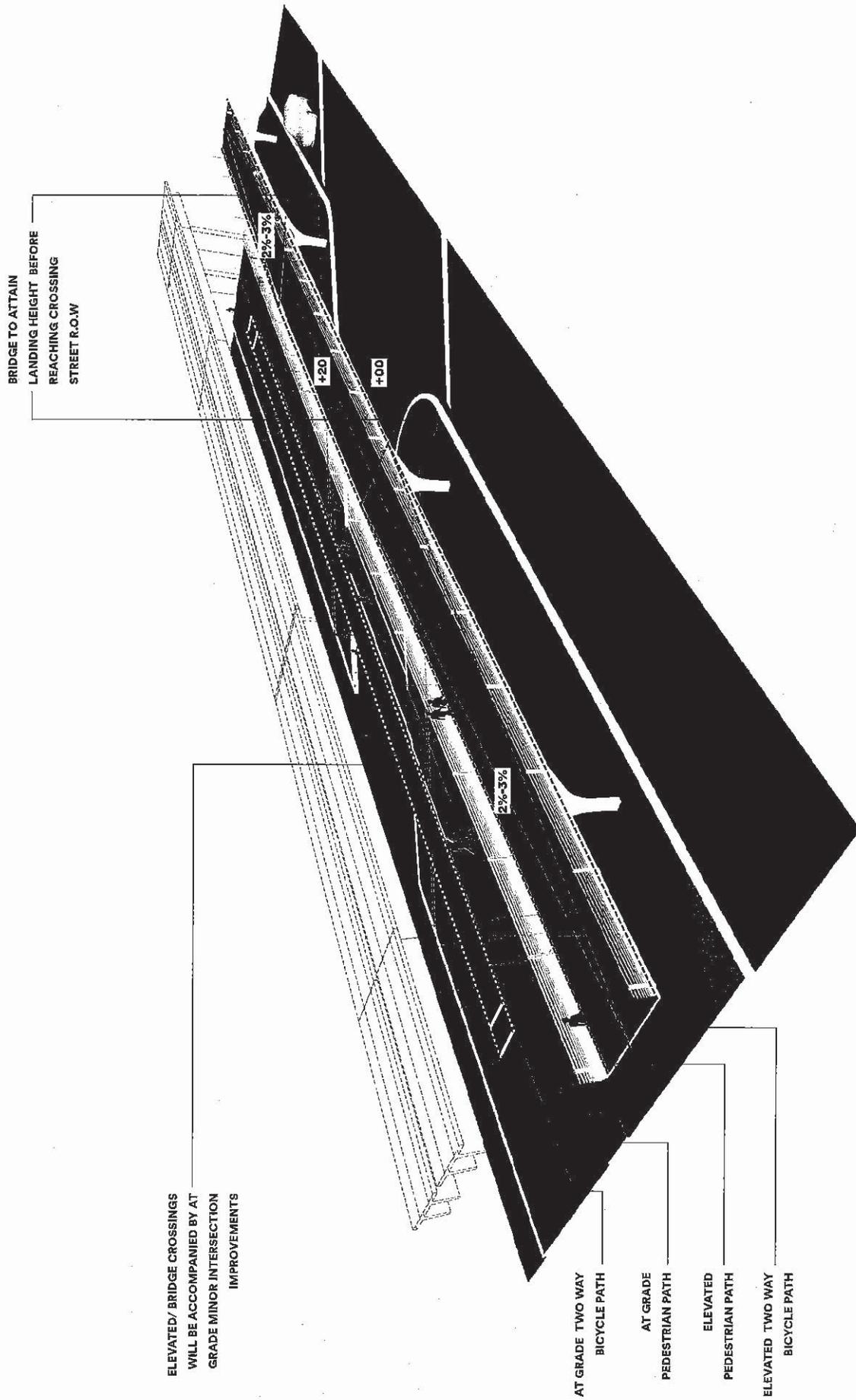


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INTERSECTIONS MAJOR IMPROVEMENTS : GRADE SEPARATED CROSSINGS

The Underline bridges will be designed to avoid switchbacks and to have slopes of 2%-3%, ideal both from the perspective of ascent and descent. The bridge structure will maintain a minimum distance of 10' from the adjacent Metrorail structure.

See chapter 3.2 : University Colonnade Demonstration Project for conceptual design of the proposed bridge at SW 57th Avenue (Red Road)



ELEVATED/ BRIDGE CROSSINGS
WILL BE ACCOMPANIED BY AT
GRADE MINOR INTERSECTION
IMPROVEMENTS

BRIDGE TO ATTAIN
LANDING HEIGHT BEFORE
REACHING CROSSING
STREET R.O.W

AT GRADE TWO WAY
BICYCLE PATH

AT GRADE
PEDESTRIAN PATH

ELEVATED
PEDESTRIAN PATH

ELEVATED TWO WAY
BICYCLE PATH

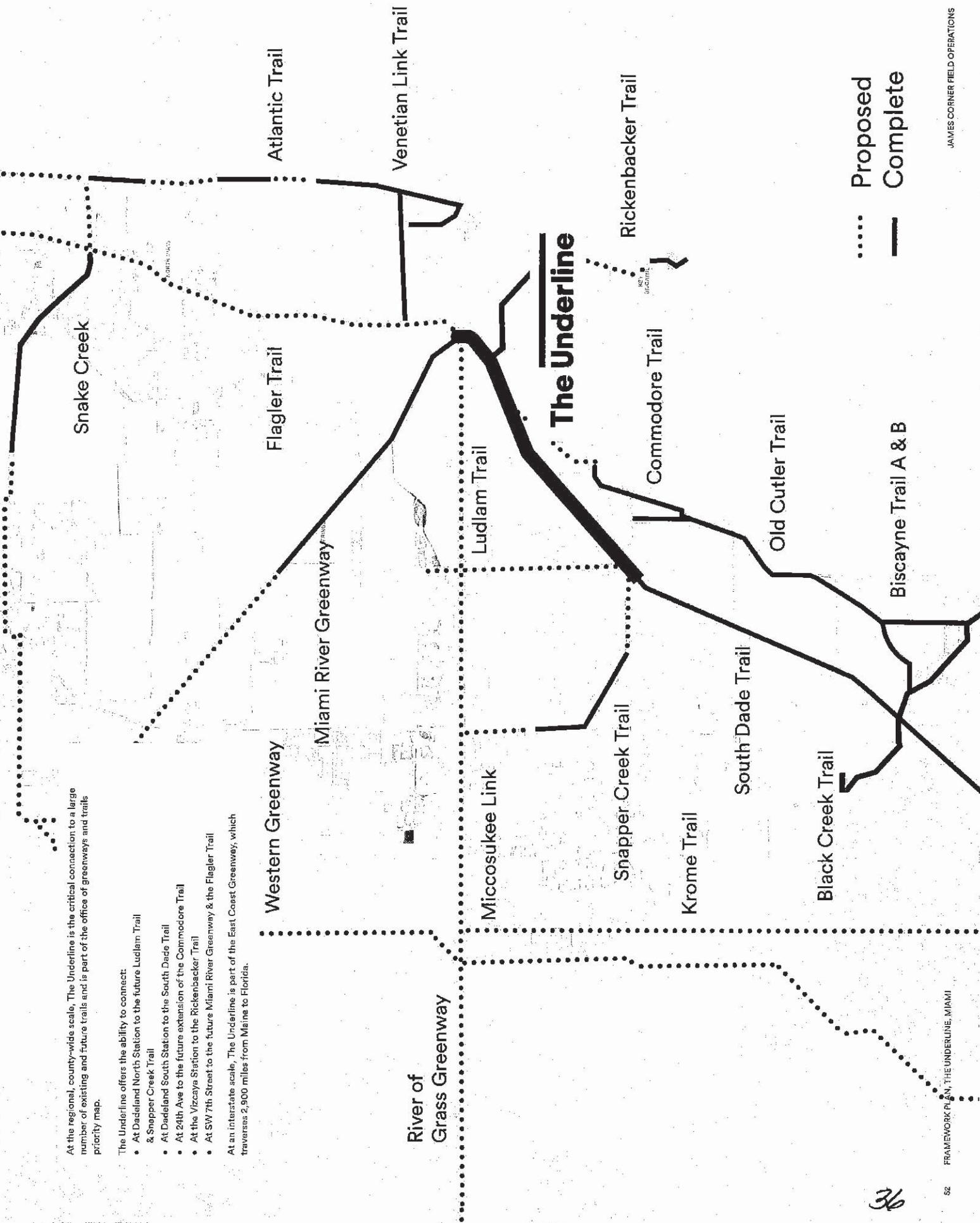
35

At the regional, county-wide scale, The Underline is the critical connection to a large number of existing and future trails and is part of the office of greenways and trails priority map.

The Underline offers the ability to connect:

- At Dadeland North Station to the future Ludlam Trail & Snapper Creek Trail
- At Dadeland South Station to the South Dade Trail
- At 24th Ave to the future extension of the Commodore Trail
- At the Vizcaya Station to the Rickenbacker Trail
- At SW 7th Street to the future Miami River Greenway & the Flagler Trail

At an interstate scale, The Underline is part of the East Coast Greenway, which traverses 2,900 miles from Maine to Florida.



..... Proposed
 — Complete

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2.2 PLANTING & HABITAT

The planting palette is inspired by historic plant communities that once dominated the area – hardwood hammock and pine rocklands. These historic plant communities play a large role in anchoring the Underline, giving it a feel that is unique and specific to its location in South Florida and on the Miami Rock Ridge. Our aim is to focus on plants that are native to the Miami Rock Ridge, which are well-suited to the soils and climate, and which will provide habitat for many pollinators and butterflies that depend on native plants. This is not a restoration, but rather an approach that seeks to understand the species and relationships of native plant communities, and use those as a basis for a planting scheme that is distinctive, functional, engaging, and surprising.

Development of the planting palette is through a collaboration with Fairchild Tropical Botanic Garden.

HISTORICAL PLANT COMMUNITIES PRE-1825

The planting palette will respond to a deep understanding that many Miami area residents have about their city's roots. The Underline corridor is a place where residents are very aware of their topography in relation to the surrounding area, their location on the Miami Rock Ridge, the oolite bedrock beneath them, and the native plant communities that used to be so prevalent before development.

The planting is based on the historical plant communities that once dominated the area. These communities were home to many plant and wildlife species that are now struggling to find habitat and will benefit from reintroduction of historic native species.



LEGEND

- HAMMOCK - CABBAGE PALMETTO, LIVE OAK, AND SUBTROPICAL PLANTS
- PINE SODALANDS - SLASH PINE, SAW PALMETTO, CABBAGE PALMETTO
- PINE OCKLANDS - SLASH PINE, SAW PALMETTO, SCRUB OAK
- SAWGRASS, MYRTLE, GROUNDSEL BUSH, AND PRIMROSE WILLOW
- SAWGRASS, SHRUBS, AND GRASSES
- OTHER

PLANTING ENVIRONMENT TYPES

PINE ROCKLAND



HARDWOOD HAMMOCK



WET PRAIRIE AND FRESHWATER MARSH



BUTTERFLY GARDENS

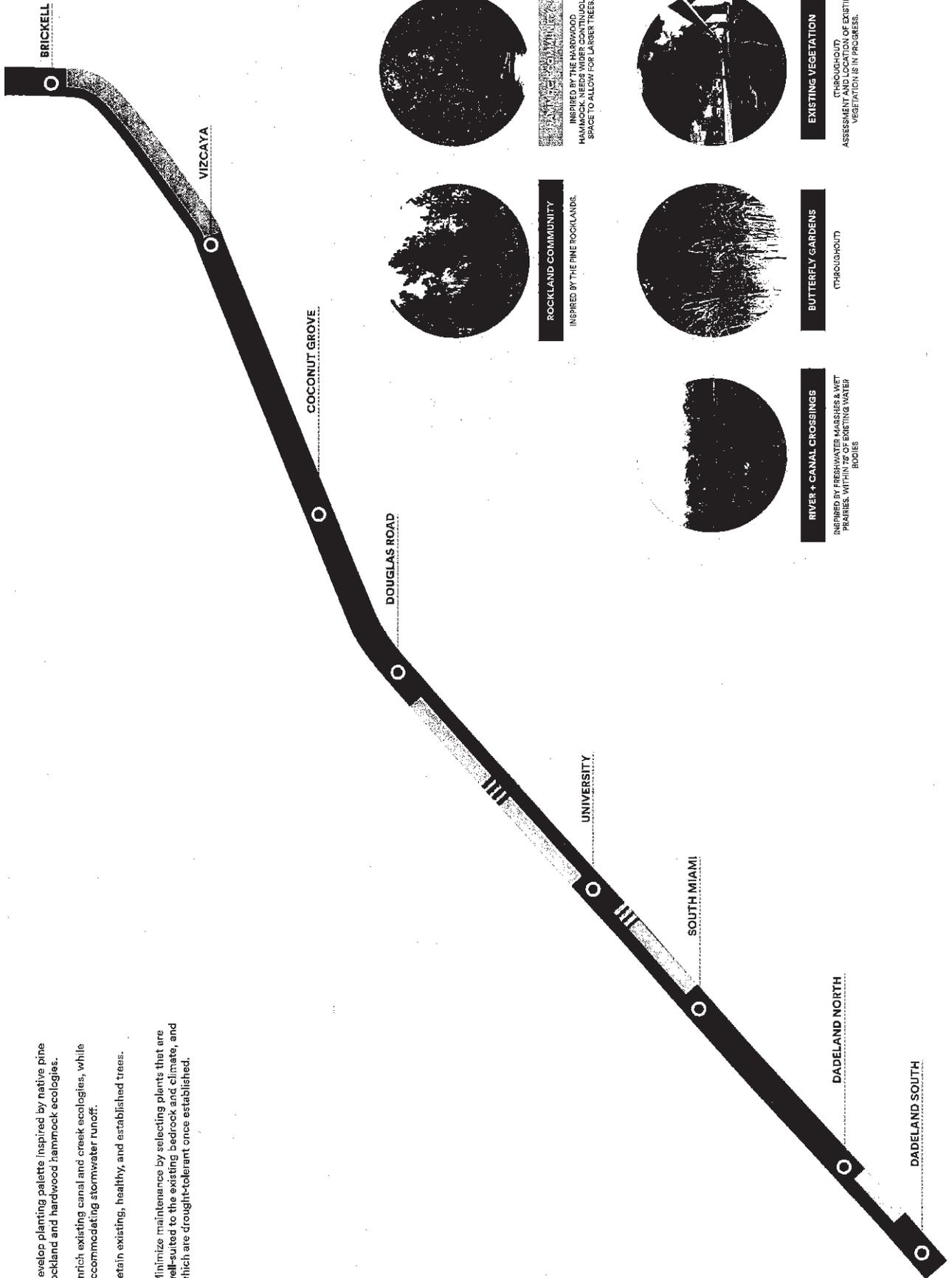


EXISTING VEGETATION



OVERALL PLANTING STRATEGIES
CREATE A CONTINUOUS GREEN CORRIDOR

- 1 Develop planting palette inspired by native pine rockland and hardwood hammock ecologies.
- 2 Enrich existing canal and creek ecologies, while accommodating stormwater runoff.
- 3 Retain existing, healthy, and established trees.
- 4 Minimize maintenance by selecting plants that are well-suited to the existing bedrock and climate, and which are drought-tolerant once established.



BRICKELL

VIZCAYA

COCONUT GROVE

DOUGLAS ROAD

UNIVERSITY

SOUTH MIAMI

DADELAND NORTH

DADELAND SOUTH



ROCKLAND COMMUNITY
 INSPIRED BY THE FINE ROCKLANDS



INSPIRED BY THE HARDWOOD HAMMOCK
 NEEDS WIDER CONTINUOUS SPACE TO ALLOW FOR LARGER TREES.



EXISTING VEGETATION
 THROUGHOUT
 ASSESSMENT OF EXISTING VEGETATION IS IN PROGRESS.



BUTTERFLY GARDENS
 THROUGHOUT



RIVER + CANAL CROSSINGS
 INSPIRED BY FRESHWATER MARSHES & WET PRAIRIES WITH EXISTING WATER BODIES

OVERALL PLANTING STRATEGIES LIMIT HIGH-MAINTENANCE PLANTING TO SELECT AREAS

The 10-mile length of the Underline presents both challenges and opportunities for maintenance. The level of maintenance required for any point along the Underline can be thought of in the following three categories.

TYPICAL UNDERLINE (low-maintenance)

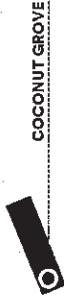
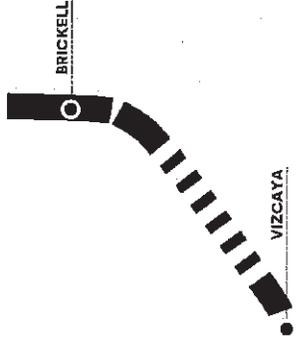
The typical stretch of the Underline will feature a native-based planting palette, in order to limit the amount of maintenance that is required throughout the entire project. For the first year, these areas will need consistent watering and care. However, once the plants are established, they should be drought-resistant and will require no irrigation. The natural form of these native plants will guide their placement, limiting the amount of maintenance required for pruning, mowing, etc. This represents roughly 80% of the Underline.

PROGRAMMED ZONES (medium-maintenance)

Interspersed throughout the corridor will be areas of more intense activity, as outlined in Chapter 3: Character Zones. These more intensely programmed areas may include more heavily planted areas, such as gardens, small parks, and plazas, and as a whole they will have a slightly higher level of maintenance than the typical Underline segment, similar to the level required for traditional parks and gardens. This represents roughly 15% of the Underline.

FEATURE GARDENS (high-maintenance)

One of the greatest opportunities of the Underline is that people will be able to enjoy substantial swaths of native flora and fauna right in their own neighborhood, throughout the seasons. However, there are many species in the pine rocklands and hardwood hammocks that are either not commonly found, are host plants to endangered butterflies, or are otherwise more sensitive. These plants require a bit more specialized and hands-on care than the plants that are part of the Typical Underline areas, as well as irrigation, and so are gathered into smaller gardens found occasionally throughout the Underline. This represents roughly 5% of the Underline.



BISCAYNE BAY

80%

Native-based planting that is low-maintenance and drought-resistant, once established.

15%

Planting that includes gardens, specimens, and high-activity zones, which may require more care, as well as some irrigation.

5%

Specialty planting and feature gardens.

4

ROCKLAND COMMUNITY CANOPY INSPIRED BY THE PINE ROCKLANDS

The pine rocklands canopy is dominated by the South Florida slash pine (*Pinus elliotii* var. *densa*) and cabbage palm (*Sabal palmetto*), both of which thrive on the rocky limestone soils of the Miami Rock Ridge. We have expanded the canopy palette to include more species that offer shade and are proven to grow well in an urban context, such as paradise tree (*Simarouba glauca*) and wild-tamarind (*Lysiloma latisiliquum*). Below are some selected canopy species; for more see the expanded list on the following pages.

TYPICAL CANOPY SPECIES



Pinus elliotii var. *densa*
South Florida slash pine

Lysiloma latisiliquum
wild tamarind

Sabal palmetto
cabbage palm

Simarouba glauca | paradise tree



Lysiloma latisiliquum | wild tamarind



Sabal palmetto | cabbage palm



Pinus elliotii var. *densa* | South Florida slash pine

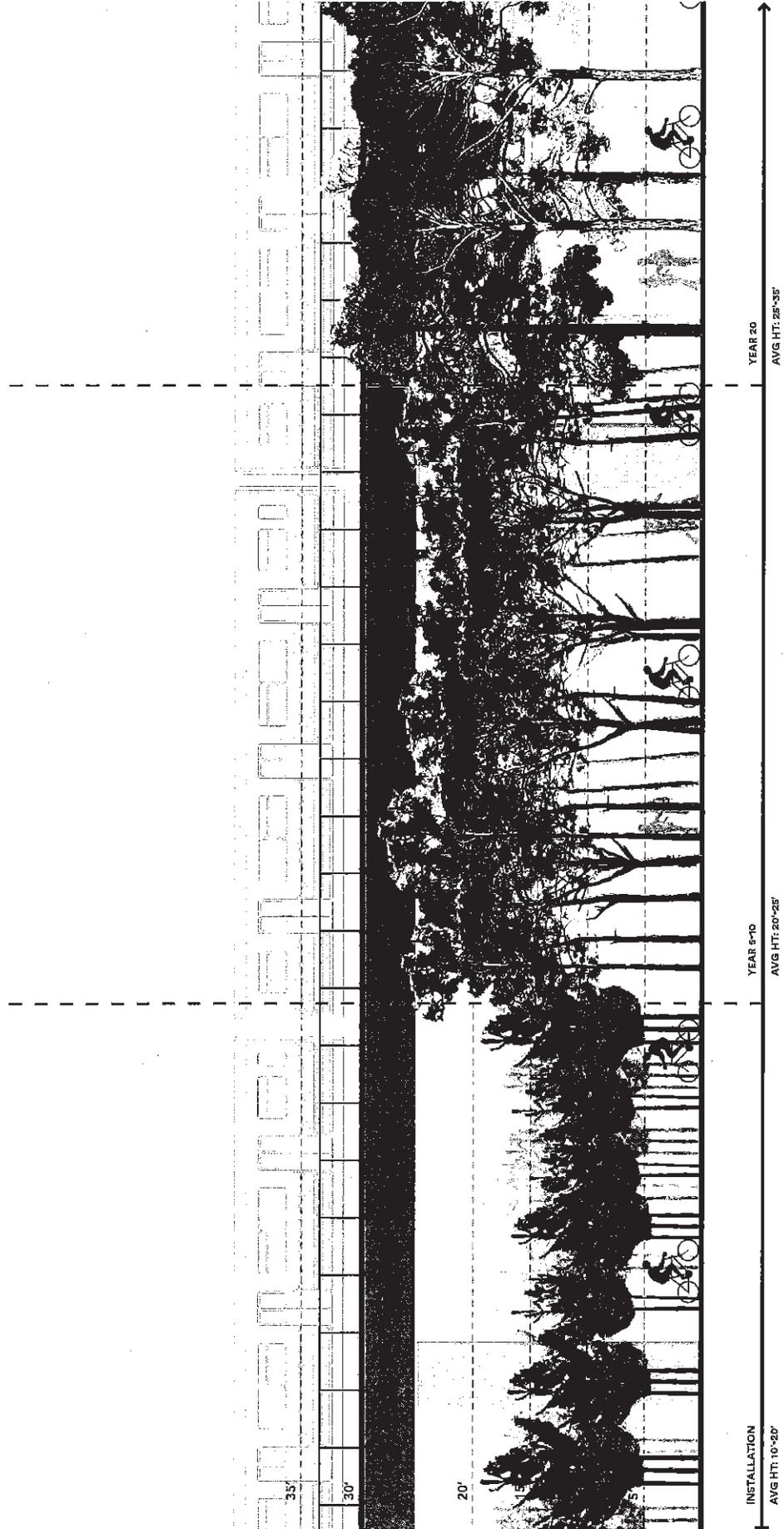


Note: Trees are shown at mature size (20 years)

FRAMEWORK PLAN, THE UNDERLINE, MIAMI

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**ROCKLAND COMMUNITY CANOPY
GROWTH THROUGH TIME**



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ROCKLAND COMMUNITY UNDERSTORY INSPIRED BY THE PINE ROCKLANDS

The pine rocklands has a minimal shrub layer and a diverse herbaceous layer, comprised of palms, grasses, and woody shrubs. Many of these species provide habitat and food for butterflies. Our approach to this pine rockland-inspired understory is to mix some key species, such as saw palmetto (*Serenoa repens*) with softer grasses, keeping the understory low in order to preserve view corridors, and creating a more natural look than many current public parks. Shrubs are included for areas of The Underline that require screening. Below are some selected understory species; for more see the expanded list on the following pages.

TYPICAL UNDERSTORY SPECIES

10'

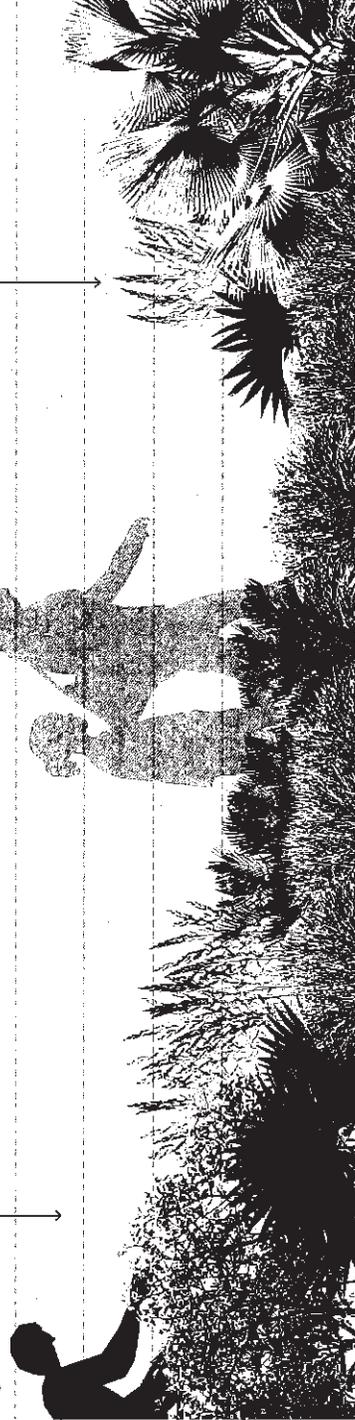
Koanophylon villosum
shrub eupatorium



Sorghastrum secundum
lopsided Indiangrass



5'



Serenoa repens
saw palmetto

Tripsacum floridanum
Florida gamagrass

Zamia integrifolia
coontie

Coccothrinax argentea
silver palm

Coccothrinax argentea | silver palm



Koanophylon villosum | shrub eupatorium



Serenoa repens | saw palmetto



Zamia integrifolia | coontie



Sorghastrum secundum | lopsided Indiangrass



Tripsacum floridanum | Florida gamagrass



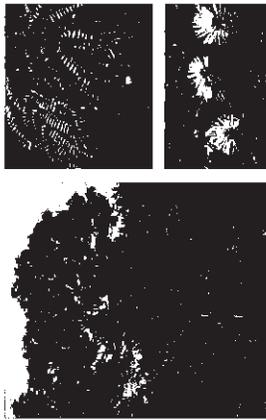
44

ROCKLAND COMMUNITY EXPANDED SPECIES LIST

Following are working lists of plant species for the Rockland community. These species were selected in collaboration with Fairchild Tropical Botanic Gardens, with a focus on species that will grow well, are native to the area, will provide habitat and food for birds, and which are drought-tolerant once established, resulting in minimal maintenance. The palette will continue to be refined and evolve as the design moves forward.

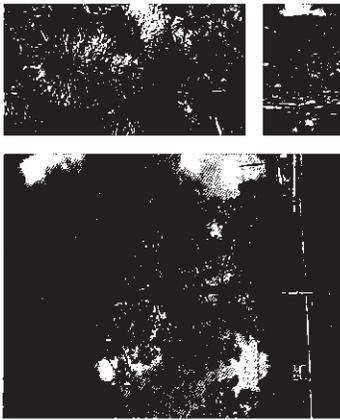
Primary canopy

Lysiloma latissiliquum | wild tamarind



Type: tree
 Height: 30-50', up to 70 feet
 Spread: 30-50'
 Soil: moist, well-drained limestone soils
 Sun: full
 Bloom: spring to fall
 Foliage: evergreen
 Notes: Often found in rockland hammocks, excellent shade tree. Fast-growing. Fragrant blooms are greenish-white. Not tolerant of salt wind or water. Larval host plant and nectar source for several butterflies.

Pinus elliottii var. *densa* | South Florida slash pine



Type: tree
 Height: 90-30'
 Spread: limestone substrate
 Soil: full
 Sun: evergreen
 Bloom: Primary canopy tree of the pine rocklands; needles usually 8-10" long; thrives with seasonal fire in early October, every 3-7 years. The South Florida slash pine has a grass stage seedling, during which it resembles a clump of grass while it grows a large tap root and stores carbohydrates for energy. After 2-5 years, the young pine bolts upward, as much as 5-6 ft in the first year. Widely grown in plantations for wood pulp and construction. The wood has a high resin content, making it resistant to rot. Self-pruning of lower limbs. Drought tolerant once established. Does not grow well in fill. Miami-Dade county has had success with planting small tublings in natural areas, but these are places where the substrate is intact and mycorrhizal fungus is present.

Sabal palmetto | cabbage palm



Type: palm
 Height: 50-65'
 Spread: 12-18'
 Soil: all
 Sun: partial to full
 Bloom: evergreen
 Foliage: Fan palm; leaves 5-6.5 ft long and leaflets 2-2.5 ft long. Trunk up to 2 ft in diameter; distinctive stems are left when leaves fall off, called bootjacks. These diminish over time, leaving taller palms with smooth trunks. Tolerant of salt breezes and brackish flooding but not saltwater flooding; drought tolerant once established. Occurs in coastal communities, including pine rocklands.

Simarouba glauca | paradise tree



Type: tree
 Height: 30-50'
 Spread: up to 30'
 Soil: moist but well-drained
 Sun: full
 Bloom: winter to spring
 Foliage: evergreen
 Notes: Resistant to hurricanes, drops smaller branches. Roots can rise to surface on mature trees, leading to cracked pavement. Does not tolerate frost. Found in coastal hammocks. Oil is used baking in Central America and India. Slow to moderate growth. Tolerant of salt winds but not water. Drought tolerant once established. New growth is reddish.

Additional canopy

Alvaradoa amorphoides | Mexican alvaradoa

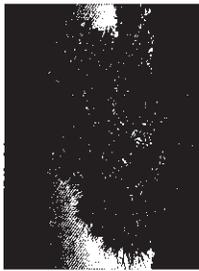
Quercus pumila | running oak

Sideroxylon salicifolium | willow-bustic

ROCKLAND COMMUNITY EXPANDED SPECIES LIST

Primary shrubs and small trees

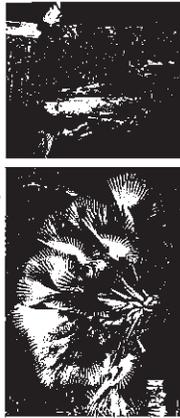
Acacia farnesiana | sweet acacia



Type: tree
Height: 15'-20'
Spread: 15'-20'
Soil: -
Sun: full to partial
Bloom: Jan-Apr
Foliage: deciduous
Notes: -

Native to FL and southern US, but grown extensively in Europe for the flowers, which produce castore, an essential oil used for perfume. Nectar plant for the red-banded hairstreak butterfly. Seeds contain an alkaloid that is toxic. Many other practical uses, from tanning to pottery, mending to toothbrushes. Thorns. Often multi-stemmed. Foliage is bipinnately compound and fine, giving dappled shade. Found in dry sandy pinehills and hammocks.

Coccothrinax argentata | silver palm



Type: palm
Height: 8-8', rarely up to 20'
Spread: 0 ft
Soil: all
Sun: partial to full
Bloom: fragrant
Foliage: evergreen
Notes: -

Often found with saw palmetto. Slow-growing at 4.7 inches per year. Fan palm with blades 18-36 in long, with a 6-in wide vertical trunk. Trunk is usually smooth but sometimes latched. Leaves are silver underneath and dark blue-green on top. Drought tolerant once established.

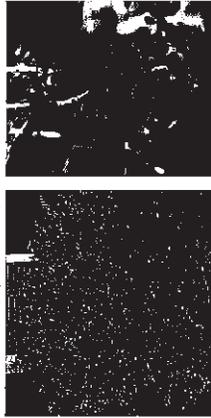
Crossopetalum rhiacoma | wild cherry



Type: shrub
Height: 8-24'
Spread: -
Soil: sandy limestone substrate
Sun: full to partial
Bloom: season or month
Foliage: evergreen
Notes: -

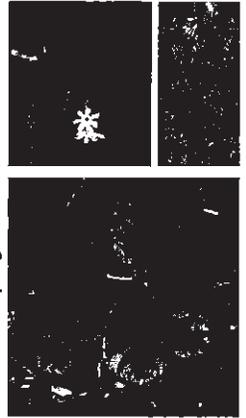
Found in pine woodlands and rockland hammocks. Gray bark. Drought tolerant once established. Showy red fruits.

Forstiera segregata | Florida privet



Type: shrub
Height: 8-18'
Spread: 5-10'
Soil: -
Sun: partial sun
Bloom: evergreen
Foliage: densely foliated with fine, dark green, glossy leaves. Attracts butterflies. Tolerant of flooding, even salt water. Good hedge plant.

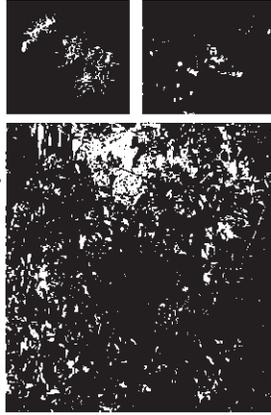
Guettarda scabra | rough velvetseed



Type: shrub to small tree
Height: 6-20', rarely up to 30'
Spread: taller than wide
Soil: moist but well-drained
Sun: full
Bloom: yearlong, peak winter-spring
Foliage: evergreen
Notes: -

Found in pine rocklands and hammocks. Red berries. Tolerant of moderate drought once established. Not tolerant of salt wind or water. Hardwood.

Koempfya villosa | shrub eupatorium



Type: shrub
Height: 4-6'
Spread: 4-6'
Soil: arid
Sun: full
Bloom: yearlong
Foliage: deciduous
Notes: -

Pale pink to white blooms, do not overwater or let dry out. Attracts stink, sulphur, skipper and other kinds of butterflies.

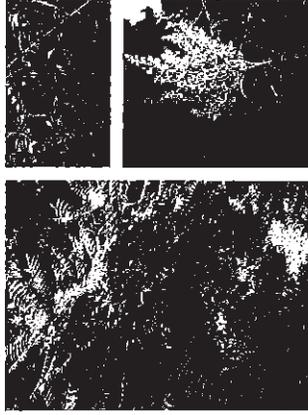
Myrica cerifera | wax myrtle



Type: shrub
Height: 8-25' high, rarely up to 35'
Spread: -
Soil: -
Sun: full to partial
Bloom: -
Foliage: evergreen
Notes: -

Multistemmed. Leaves are aromatic when crushed. Can be found in swamps or upland dry communities. Berries attract birds. Larval host to butterflies.

Rhus copallinum | southern sumac, winged sumac



Type: shrub
Height: 10-20'
Spread: 10-20'
Soil: full
Sun: spring to summer
Bloom: deciduous
Notes: -

Fast-growing. Found in pinehills. Can spread by suckers. Larval host and nectar plant for butterflies. Good fall color. Shiny leaves. Fruit is prominent and can be eaten or turned into a lemonade-like drink. Drought tolerant once established.

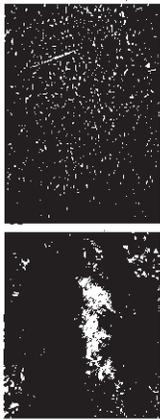
Additional shrub

- Croton linearis* | pineland croton
- Guettarda scabra* | rough velvetseed
- Vaccinium myrsinites* | shiny blueberry

ROCKLAND COMMUNITY EXPANDED SPECIES LIST

Primary herbaceous + groundcover

Eragrostis Elliottii | Elliott's lovegrass



Type: grass
Height: 6-18 inches
Spread: moist to wet
Soil: full
Sun: summer-fall
Bloom: deciduous
Foliage: Tolerant of salt wind but not water. Drought tolerant once established. Can be grown from seed. Birds eat seeds. Found in pinehlands, prairies, and short hydroperiod wetlands.

Mimosa strigillosa | sunshine mimosa



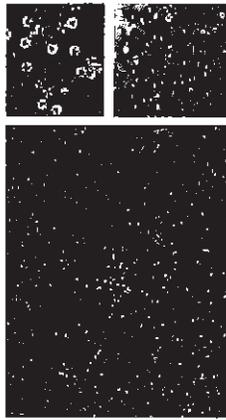
Type: perennial
Height: 1 inch, 3 inches in flower
Spread: moist to dry
Soil: full
Sun: spring to summer
Bloom: evergreen
Foliage: Fast-growing. Larval host plant for little yellow butterflies. Low salt tolerance. Turf replacement - can be mowed to 4". Flowers are spherical with purple-pink stamens, tipped with yellow. Can be found in pinehlands and streambanks.

Passiflora suberosa | corky stem passionflower



Type: vine
Height: 6 inches
Spread: moist but well-drained limestone soils
Soil: full sun to light shade
Sun: continuous
Bloom: deciduous
Foliage: A fast-growing, low-climbing vine, found in pinehlands and moist prairies. Larval host plant for the Gulf fritillary (*Agraulis vanillae*), Julia (*Dryas julia*), and Zebra langwing (*Heliconia charitoides*) butterflies.

Phyla nodiflora | frogfruit



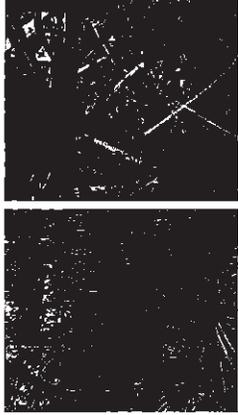
Type: perennial
Height: 1-3 inches, 6 inches in flower
Spread: creeping
Soil: full
Sun: continuous
Bloom: evergreen
Foliage: Found in wet prairies and moist disturbed areas; not tolerant of salt water inundation. Larval host plant and nectar source for many butterflies. Can be used as a turf substitute in low-traffic areas. Can be mown.

Schizanthium gracile | wire bluestem



Type: grass
Height: 6-18"
Spread: limestone substrate
Soil: full
Sun: deciduous
Bloom: Difficult to find in cultivation. Native to pine rockhlands.
Foliage: Feathery racemes.

Serenoa repens | saw palmetto



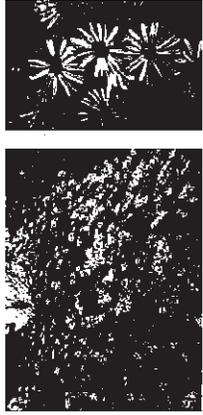
Type: palm
Height: 2-3', rarely up to 9'
Spread: 4-6'
Soil: asdf
Sun: full to partial
Bloom: evergreen
Foliage: Significant understory component of the pine rockhlands and hardwood hammocks. Palmate leaves are 2-3ft across and green to bluish green, and often are close to the ground. Occasionally the stem emerges and can lift the leaves up 4-9 feet. In the wild, they often grow in clumps up to 20 ft in diameter. Drought tolerant once established. Leaf stems are sharply saw-toothed. Fruit is often used to prevent prostate cancer and UTI.

Sorghastrum secundum | lopsided Indiangrass



Type: grass
Height: 2-5', 6' in flower
Spread: 2-3'
Soil: moist but well-drained
Sun: full
Bloom: summer-fall
Foliage: evergreen/deciduous
Notes: Host plant to butterfly larvae. Drought-tolerant once established. Not tolerant of salt wind or water. Bloom lasts about 2-3 weeks. Does well in high pine shade.

Symphoricarum dumosum | rice button aster



Type: perennial
Height: 2-4'
Spread: moist but well-drained limestone soils
Soil: full
Sun: spring to fall
Bloom: deciduous
Foliage: Moderate to fast growth rate. Native to pinehlands and prairies, can range far north to the Great Lakes. Can tolerate some wetness. Showy flowers are white to blue. Larval host plant for butterflies.

Tripsacum floridanum | Florida gamagrass, dwarf fakahatchee



Type: grass
Height: 2-3'
Spread: 2-3'
Soil: sand, lime rock
Sun: full to partial
Bloom: yearlong
Foliage: evergreen
Notes: Rhizomatous, clumping grass, native to pine rockhlands and marl prairies. Drought-tolerant once established. Not tolerant of salt wind or water.

Zamia integrifolia | coontie



Type: cycad
Height: 1-4'
Spread: 1-4'
Soil: full to partial
Sun: evergreen
Bloom: Found in pine rockhlands and hammocks. Slow-growing. Drought tolerant once established. Tap root. Stem is below surface. Not tolerant of salt water, but moderately tolerant of salt spray. Starchy tuber is poisonous unless properly prepared; it is traditionally used for flour, leading to the other common name of Florida arrowroot. Larval host plant for the atlas butterfly.

Additional herbaceous + groundcover

- Andropogon tracyi* | Tracy's bluestem
- Chaetalia albicans* | pinehland daisy
- Cirsium horridulum* | thistle
- Crotalaria rotundifolia* | rabbit-bells

- Heliotropium polyphyllum* | pinehland heliotrope
- Psychotria ligustrifolia* | Bahamian wild coffee
- Schizanthium sanguineum* | crimson bluestem

HAMMOCK COMMUNITY CANOPY INSPIRED BY THE TROPICAL HARDWOOD HAMMOCK

Adjacent to The Underline at SW 15th Road is Simpson Park Hammock, one of the last remaining remnants of the Brickell Hammock, which once covered much of the northern portion of The Underline. As the name indicates, tropical hardwood hammocks have a varied canopy of hardwood tropical trees, which range in size. The Hammock community will occur in portions of The Underline where the corridor is wide enough to give these trees room to grow.

TYPICAL CANOPY SPECIES



Coccoloba diversifolia
pigeon-plum

Lysiloma latisiliquum
wild tamarind

Eugenia axillaris
white stopper

Eugenia foetida
Simpson's stopper

Quercus virginiana
southern live oak

Quercus virginiana | southern live oak

Coccoloba diversifolia | pigeon-plum

Eugenia axillaris | white stopper

Eugenia foetida | Simpson's stopper

Krugiodendron ferreum | black ironwood

Lysiloma latisiliquum | wild tamarind

Note: Trees are shown at mature size (20 years)

HAMMOCK COMMUNITY UNDERSTORY INSPIRED BY THE TROPICAL HARDWOOD HAMMOCK

In nature, hardwood hammocks can have a dense and diverse shrub layer, leading to low visibility. We have selected an understory palette that remains relevant to the hammock, but which is lower-growing. This preserves views and enhances safety, while still creating a lush, woodland setting. A lower understory also allows visitors to appreciate the graceful branching habit of many of the canopy species, which give the Hammock community a very different atmosphere than the Rockland community.

TYPICAL UNDERSTORY SPECIES

10'

5'

Chrysobalanus icaco | cocoplum



Zamia integrifolia | coontie



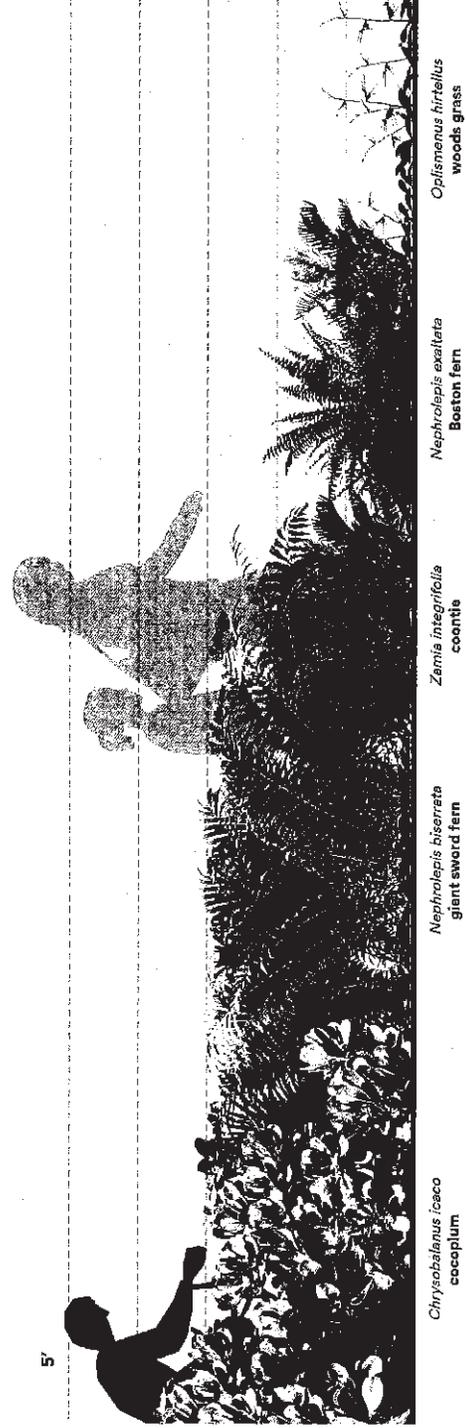
Nephrolepis exaltata | Boston fern



Nephrolepis biserrata | giant sword fern



Opismenus hirtellus | woods grass



Chrysobalanus icaco
cocoplum

Nephrolepis biserrata
giant sword fern

Zamia integrifolia
coontie

Nephrolepis exaltata
Boston fern

Opismenus hirtellus
woods grass

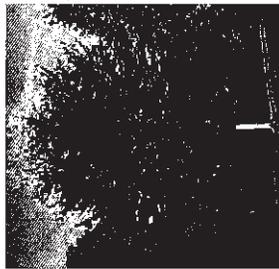
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HAMMOCK COMMUNITY EXPANDED SPECIES LIST

Following are working lists of plant species for the Hammock community. These species were selected in collaboration with Fairchild Tropical Botanic Gardens with a focus on species that will grow well, are native to the area, will provide habitat and food for birds, and which are drought-tolerant once established, resulting in minimal maintenance. The palettes will continue to be refined and evolve as the design moves forward.

Primary canopy

Acer rubrum | red maple



Type: tree
Height: 30-60'
Spread: -
Soil: wet to moist
Sun: full to partial
Bloom: winter to early spring
Foliage: deciduous
Notes: Moderate to fast growth. Found in freshwater swamps; not salt-tolerant. Flowers are red and semi-showy. Fall color ranging from yellow to red. Sap used to make maple syrup, wood used for furniture.

Chrysolepis icaco Red Tip or Green Tip | coccoloba | Red Tip or Green Tip



Type: shrub
Height: 12-15', up to 30'
Spread: -
Soil: moist
Sun: full sun to light shade
Bloom: continuous
Foliage: evergreen
Notes: These two naturally-occurring varieties grow taller and can be pruned into trees. Edible dark purple fruit. Thick, glossy leaves. Many traditional medicinal uses. Moderate to fast-growing.

Celtis laevigata | hackberry



Type: tree
Height: 30-60'
Spread: 30-60'
Soil: full sun to light shade
Sun: full sun to light shade
Bloom: Feb-Apr
Foliage: deciduous
Notes: Fruit is attractive to birds; tree is a larval host to several butterflies. Moderate to fast growth. Bark is light grey with corky patches. Found in hammocks.

Coccoloba diversifolia | pigeon-plum



Type: tree
Height: 15-20', up to 30'
Spread: 20-30'
Soil: moist and well-drained
Sun: full to partial
Bloom: early summer
Foliage: evergreen/deciduous
Notes: often multi-stemmed but can be pruned into single-stem street trees, shiny dark green leaves drop in March and regrow quickly as bright red; dense rounded crown, moderates growth rate, fruit attracts birds

Eugenia axillaris | white stopper



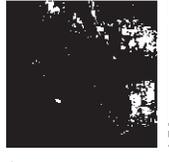
Type: shrub
Height: 10-30', up to 30'
Spread: -
Soil: well-drained
Sun: full to partial
Bloom: year-long, peak in summer
Foliage: evergreen
Notes: Fragrant blossoms, new growth is red, attractive to birds and butterflies; Drought-tolerant once established, tolerant of salt winds but not salt water.

Eugenia confusa | redberry stopper



Type: tree
Height: 15-25', up to 45'
Spread: 10-20'
Soil: moist but well-drained limestone soil
Sun: full to light shade
Bloom: continuous, peak spring to summer
Foliage: evergreen/deciduous
Notes: Slow to very slow-growing tree, found in very old hammocks. Not common in the wild, endangered in the state of Florida. White flowers are semi-showy, red berries provide food for birds. Multi-stemmed or can be trained to a single trunk.

Eugenia fontana | Spanish stopper



Type: tree
Height: 8-15'
Spread: 6-10'
Soil: limestone substrate
Sun: full sun to light shade
Bloom: continuous, especially summer
Foliage: evergreen
Notes: Slow to moderate growth. Semi-showy, fragrant, white flowers lead to black or brown berries, which attract birds. Found in hammocks and hammock edges.

HAMMOCK COMMUNITY EXPANDED SPECIES LIST

Primary canopy (contd.)

Lysiloma latifolium | wild tamarind



Type:
Height:
Spread:
Soil:
Sun:
Bloom:
Foliage:
Notes:

tree
20-50', up to 70 feet
30-50'
moist, well-drained limestone soils
full
spring to fall
evergreen
Often found in rockland hammocks, excellent elixir tree. Fast-growing. Fragrant blooms are greenish-white. Not tolerant of salt wind or water. Larval host plant and nectar source for several butterflies.



Krugiodendron ferreum | Black ironwood



Type:
Height:
Spread:
Soil:
Sun:
Bloom:
Foliage:
Notes:

tree
20-30'
taller than broad
well-drained
full
yearlong, peak late spring to summer
evergreen
Minimal maintenance, drought tolerance once established. Susceptible to sooty mold if irrigated or during the wet season. Hardwood. Found in hammocks. Bright green, glossy leaves. Attractive to pollinators. Moderately tolerant of salt wind but not salt water. Slow to very slow-growing. Wood is the most dense of any native South Florida tree, will sink in water.



Myrcianthes fragrans | Simpson's stopper

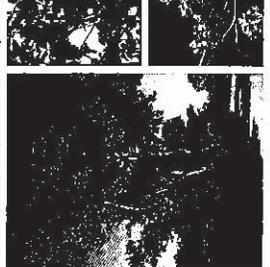


Type:
Height:
Spread:
Soil:
Sun:
Bloom:
Foliage:
Notes:

tree
10-20', up to 40'
7-8'
moist but well-drained
full
yearlong, peak late spring to summer
evergreen
Moderate to slow-growing. Bark is smooth and gray to light reddish-brown. Can tolerate moderate salt spray but not salt water. Can tolerate occasional inundation. Found in hammocks and hammock edges. Flowers are fragrant, attractive to birds and pollinators. Hurricane-resistant.



Piscidia piscipula | Jamaican dogwood

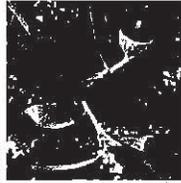


Type:
Height:
Spread:
Soil:
Sun:
Bloom:
Foliage:
Notes:

tree
25-35', can be up to 50'
20-30'
partial
Spring
deciduous
Moderate to fast-growing tree, native to coastal hammocks. Drought tolerant once established. Moderately tolerant of occasional salt wind and water. Larval host for several butterflies. White to pink flowers are brief but showy. Traditionally used for medicinal and hunting purposes, as well as for boat-building and agriculture; is poisonous to fish. Drought-tolerant.



Quercus virginiana | southern live oak



Type:
Height:
Spread:
Soil:
Sun:
Bloom:
Foliage:
Notes:

tree
25-50'
40-80'
full to partial
spring
deciduous
Susceptible to fire. May appear evergreen due to coordinated leaf loss and new leaf buds. Habitat for several epiphytes. Distinctive arching branching and habit. Potential for specimen tree.

Rapanea punctata | myrsine



Type:
Height:
Spread:
Soil:
Sun:
Bloom:
Foliage:
Notes:

shrub to small tree
10-15'
3-5'
moist
full
evergreen
Small berries attract wildlife, thick glossy leaves, narrow/columar habit, will tolerate salt winds but not salt water, tolerant of short drought once established

Simarouba glauca | paradise tree



Type:
Height:
Spread:
Soil:
Sun:
Bloom:
Foliage:
Notes:

tree
30-50'
up to 30'
moist but well-drained
full
winter to spring
resistant to hurricanes, drops smaller branches. Roots can rise up to 60 feet on steep slopes leading to crown rot. Does not tolerate frost. Found in coastal hammocks. Oil used in Central America and India. Slow to moderate growth. Tolerant of salt winds but not water. Drought tolerant once established. New growth is reddish.

Additional canopy

Calyptanthes patens | spicewood
Chrysophyllum oliviforme | satineaf
Conocarpus erecta | buttonwood
Excothea paniculata | inkwood
Ficus citrifolia | short-leaf fig

Guzmania monostachya | strap-leaved guzmania
Ilex krugiana | Krug's holly
Coccoloba coreacea | lancewood
Prunus myrtilloides | West Indian cherry
Sideroxylon foetidissimum | wild maestic
Swietenia mahagoni | West Indian mahogany

HAMMOCK COMMUNITY EXPANDED SPECIES LIST

Primary shrub

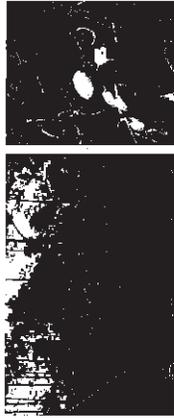
Ardisia escallonioides | marlberry



Type: shrub
Height: 8-15'
Spread: 3-6'
Soil: moist
Sun: full to partial
Bloom: yearlong, fall peak
Foliage: evergreen
Notes: native to hammocks, though *A. crenata* and *A. elliptica* are invasive; fragrant flowers, tolerant of salt wind but not salt water, food and cover for wildlife.



Chrysobalanus icaco 'Horizontal' | coco-plum 'Horizontal'



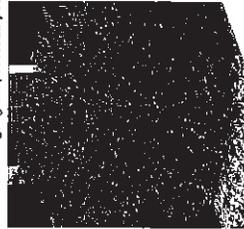
Type: shrub
Height: 3-5'
Spread: spreading
Soil: -
Sun: late spring
Bloom: evergreen
Foliage: 'Horizontal' is the coastal form, and is salt tolerant. Edible fruit. Thick, glossy leaves.
Notes: Can be trained as a hedge. Many traditional medicinal uses. Fruits are white to pale purple. Moderate to fast-growing.

Coccoloba uvifera | sea grape



Type: shrub
Height: 6-8'
Spread: spreading
Soil: -
Sun: full
Bloom: spring to summer
Foliage: semi-evergreen
Notes: Leaves are large, round, and thick, and become bright red just before falling off. New leaves emerge soon after. Found in coastal hammocks. Nectar source for several butterflies. Can spread into large stands, with complex branching. Fruit can be used for jelly. Can be pruned.

Forestiera selegata | Florida privet



Type: shrub
Height: 8-15'
Spread: 5-10'
Soil: -
Sun: partial sun
Bloom: evergreen
Foliage: Densely foliated with fine, dark green, glossy leaves. Attracts butterflies. Tolerant of flooding, even salt water. Good hedge plant.

Psidium longipes | long-stalked stopper



Type: shrub
Height: 12'
Spread: -
Soil: -
Sun: full to partial
Bloom: spring and summer
Foliage: evergreen
Notes: Thin, flaking bark and a twisting trunk, flowers and berries on long stalks.



Additional shrub

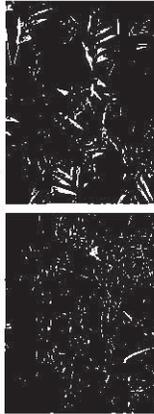
Bourreria cassinitolia | pineland strongback

Eugenia rhombos | red stopper

HAMMOCK COMMUNITY EXPANDED SPECIES LIST

Primary herbaceous + groundcover

Lasiacis divaricata | Bamboo grass, smallcane



Type: grass
Height: 6-12"
Spread: 3-4'
Soil: full to partial
Sun: evergreen
Bloom: May be hard to find in cultivation.
Notes:

Nephtrolepis biserrata | Giant swordfern



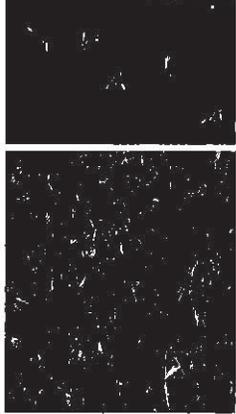
Type: fern
Height: 3-4'
Spread: 3-5'
Soil: moist and well-drained
Sun: partial to full shade
Bloom: evergreen
Notes: Fronds up to 7' long. Beware substituting it for common non-native invasive swordferns that may be sold as "Florida-friendly."

Nephtrolepis exaltata | Boston fern / sword fern



Type: fern
Height: 2-5'
Spread: 2'
Soil: partial to full shade
Sun: N/A
Bloom: evergreen
Notes: Can spread aggressively by underground runners in moist, shaded areas. Common Florida fern. Can be invasive and take over the understory of natural habitats. Probably the easiest fern to use to form a continuous feinting ground cover layer in central Florida. Beware substituting it for common non-native invasive swordferns that may be sold as "Florida-friendly."

Opismenus hirtellus | woods grass



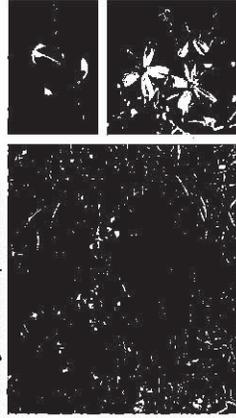
Type: grass
Height: 4 inches
Spread: spreading
Soil: to heavy shade
Sun: dominant in winter
Bloom: deciduous
Notes: Also known as brittle basketgrass, a low-growing, trailing grass is not visible in winter/early spring. Short-lived. Not salt tolerant. The exotic subspecies *Opismenus hirtellus* var. *undulatifolius* is highly invasive. Larval host for Carolina satyr (*Hermaugolychia cossibus*) butterflies.

Peperomia obtusifolia | Florida peperomia, baby rubber plant



Type: shrub/vine
Height: 6-8 inches
Spread: spreading
Soil: moist
Sun: partial
Bloom: continuous
Notes: evergreen
Not tolerant of salt. Best in high humidity. Blooms are 5" long white spikes.

Plumbago scandens | doctorbush



Type: perennial
Height: 1-3'
Spread: 3-4'
Soil: dry
Sun: partial to shade
Bloom: spring to fall
Notes: evergreen
Tiny white blooms. Poisonous to humans, attractive to butterflies - host plant to the Cassius blue butterfly. Will spread and climb. Seeds stick to fur and clothes. Found in shady hammocks.

Psychotria ligustrifolia | Bahamian wild coffee



Type: perennial
Height: 3-4'
Spread: 3-4'
Soil: -
Sun: partial
Bloom: continuous, peak in spring to summer
Notes: evergreen/deciduous
Fruit is a red, fleshy, berry-like structure. Less leggy than shiny-leaf wild coffee (*Psychotria ligustrifolia*). Flowers and berries are attractive to butterflies and birds. Endangered in Florida.

Thelypteris kunthii | woods fern



Type: fern
Height: 2.5-3', up to 5'
Spread: 3-4'
Soil: moist but well-drained
Sun: partial to full shade
Bloom: -
Notes: semi-evergreen
May be hard to find in cultivation, needs irrigation in dry season, foliage gets a bronze cast as winter approaches.

Zamia integrifolia | coontie



Type: cycad
Height: 1-4'
Spread: 1-4'
Soil: full to partial
Sun: evergreen
Notes: Found in pine rocklands and hammocks. Slow-growing. Drought tolerant once established. Tap root. Stems below surface. Not tolerant of salt water, but moderately tolerant of salt. Starchy tuber is poisonous unless properly prepared; it is traditionally used for flour, leading to the other common name of Florida arrowroot. Larval host plant for the atala butterfly.

Additional herbaceous + groundcover

Oncidium floridanum | Florida oncidium

RIVER + CANAL CROSSINGS COMMUNITY INSPIRED BY WET PRAIRIES + FRESHWATER MARSHES

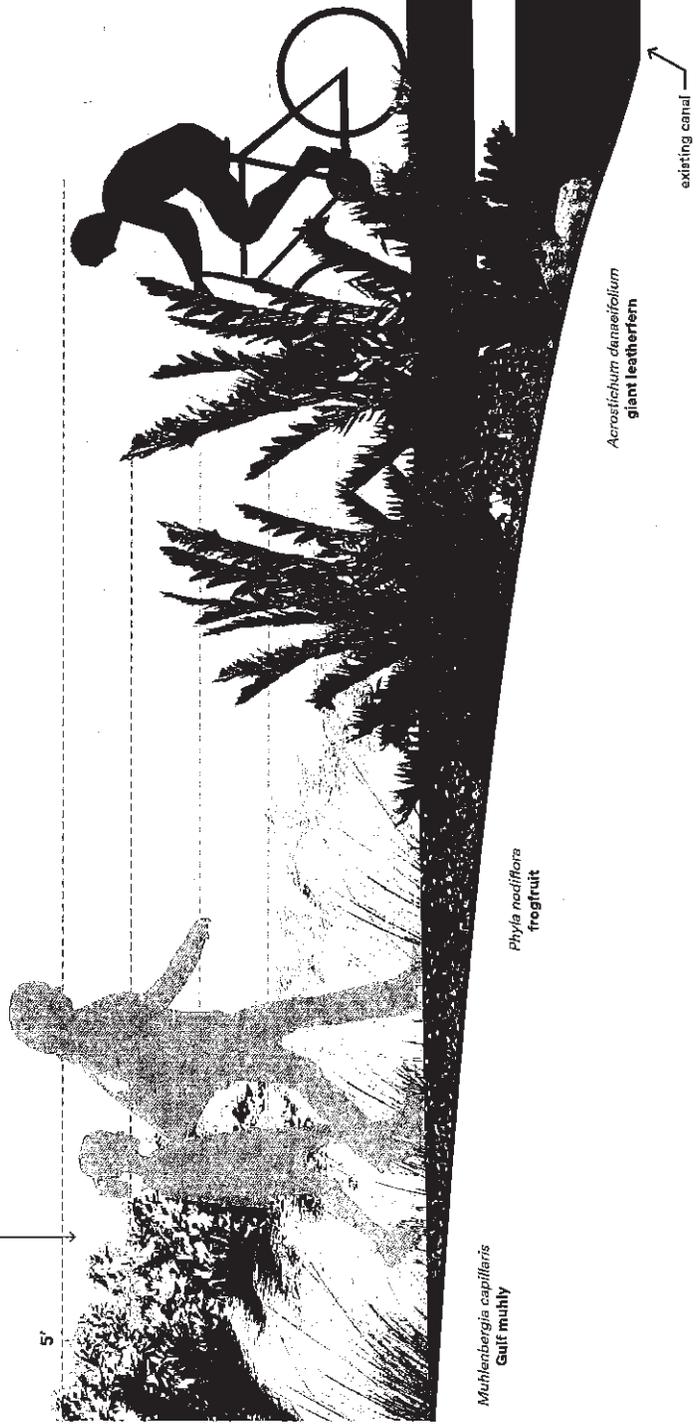
There are several places where the Underline crosses existing canals, and at the north, it nearly touches the Miami River. In these instances, the planting needs to be able to accommodate stormwater runoff and the possibility of rising canal levels and saltwater. Our species for these areas are inspired by both wet prairies and freshwater marshes, depending on what type of water conditions are present. When the canal crossing borders the Hammock community, the plant species may also be influenced by coastal hammock species. Below are a few selected species; an expanded species list is on the following pages, and this palette will continue to be refined as the design moves forward.

TYPICAL UNDERSTORY SPECIES

10'

Baccharis halimifolia
groundsel tree

5'



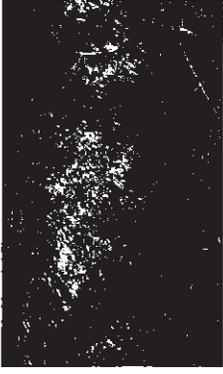
Muhlenbergia capillaris
Gulf muhly

Phyla nodiflora
frogfruit

Acrostichum danaeifolium
giant leather fern

existing canal

Muhlenbergia capillaris | Gulf muhly



Salix caroliniana | coastal plain willow



Baccharis halimifolia | groundsel tree



Acrostichum danaeifolium | giant leather fern



Phyla nodiflora | frogfruit



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RIVER + CANAL CROSSINGS COMMUNITY EXPANDED SPECIES LIST

Primary canopy

Acer rubrum | red maple



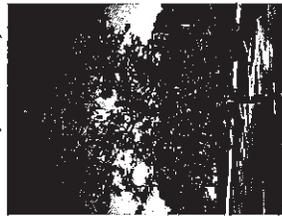
Type: tree
Height: 20-40'
Spread: full to partial
Soil: wet to moist
Sun: full to partial
Bloom: winter to early spring
Foliage: deciduous
Notes: Moderates to fast growth. Found in freshwater swamps and swamp prairies; not salt-tolerant. Flowers are red and semi-showy. Fall color ranging from yellow to red. Sap used to make maple syrup, wood used for furniture. Grows smaller in South Florida than in USDA zones 9 and farther north, with less fall color.

Ammonia glabra | pond apple



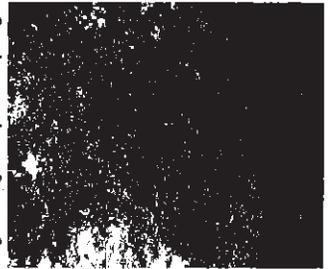
Type: tree
Height: 20-30'
Spread: 12-15'
Soil: wet
Sun: full
Bloom: mid spring to early summer
Foliage: evergreen
Notes: Fruit is sticky and continuous. Invasive in the Pacific Islands. Freshwater swamps, annual grower. Fruit is soft, but seeds are not edible and can be poisonous.

Ilex cassine | dahoon holly



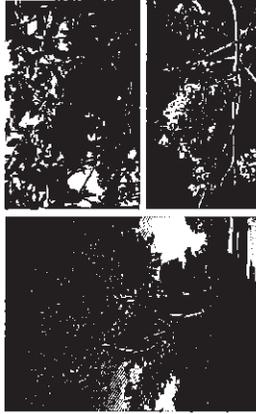
Type: tree
Height: 20-30'
Spread: 8-15'
Soil: moist to wet
Sun: partial shade
Bloom: April, May
Foliage: evergreen
Notes: Red fruit often used in Christmas decorations. Found in wet woods, marsh margins, cypress ponds. Slow-growing.

Magnolia virginiana | sweetbay magnolia



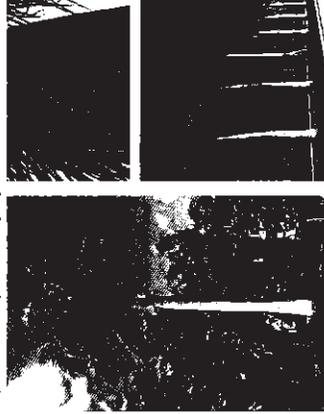
Type: tree
Height: 15-35', up to 50'
Spread: 15-35'
Soil: medium to wet
Sun: full to partial
Bloom: April-July
Foliage: evergreen to semi-evergreen
Notes: Showy, fragrant flowers are creamy and white. Leaves are shiny green. Can be multi-stemmed. Can tolerate wetness and is often used in rain gardens. Bright-red fruits are showy and mature in the fall. Larval host for the Sweetbay silkmoth (*Chilosaemia securifera*).

Piscidia piscipula | Jamaican dogwood



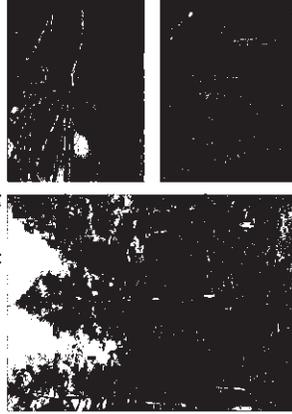
Type: tree
Height: 25-35', can be up to 80'
Spread: 20-30'
Soil: partial
Sun: spring
Bloom: deciduous
Foliage: drought-tolerant
Notes: Moderate to fast-growing tree, native to coastal hammocks. Drought tolerant once established. Moderately tolerant of occasional salt wind and water. Larval host for several butterflies. White to pink flowers are brief but showy. Traditionally used for medicinal and hunting purposes, as well as for boat-building and agriculture. Is poisonous to fish. Drought-tolerant.

Roystonea elata | Florida royal palm



Type: palm
Height: 40-60', up to 100'
Spread: 15-20'
Soil: wet
Sun: full
Bloom: continuous, peak mid-summer
Foliage: evergreen
Notes: Native to cypress swamps. Symmetrical with smoothly sculpted trunk. Very similar to Caribbean royal palm (*R. regia*), except the leaves are lighter with R. elata. Often considered interchangeable. Fronds up to 8ft. long, and can be very dangerous if they fall on someone.

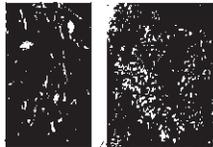
Taxodium ascendens | pond cypress



Type: tree
Height: 30-70'
Spread: 15-20'
Soil: medium to wet
Sun: full
Bloom: deciduous
Foliage: Similar in form to the common bald cypress, though smaller and more often found on pond edges, as opposed to in the water. Can grow on dry sites as well.

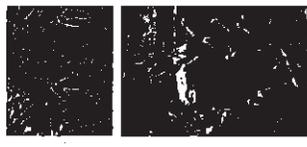
Primary shrub

Baccharis halimifolia | groundsel tree



Type: shrub
Height: 5-10'
Spread: 3-7'
Soil: moist to wet
Sun: full
Bloom: fall to winter
Foliage: evergreen
Notes: Spreads readily from seed. Fast to moderate growth rate. Found around moist forest edges and thickets. Flowers are showy, white, and fragrant. May be a nectar source for monarch butterflies. Tolerant of salt wind; moderately tolerant of occasional salt water.

Salix caroliniana | Coastal Plain willow



Type: shrub to small tree
Height: 15-30'
Spread: 20-35'
Soil: moist to wet
Sun: full to partial
Bloom: spring
Foliage: deciduous
Notes: Fast-growing. Found in wet thickets and swamps. Tolerates moderate salt wind but not salt water.

Sambucus nigra spp. *canadensis* | elderberry



Type: shrub
Height: 4-12'
Spread: 4-12'
Soil: medium to wet
Sun: full to partial
Bloom: May-July
Foliage: deciduous
Notes: Fragrant white flowers and dark berries are attractive to wildlife and butterflies. Short-lived, but roots produce new shoots. Responds well to wet areas. Widespread; native to eastern United States. Can be pruned into a tree form.

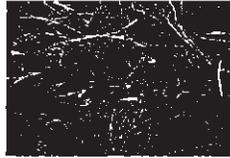
Additional shrub

Peperomia polystachya | swamp bay



Primary herbaceous + groundcover

Acrostichum daniae/folium | giant leather fern



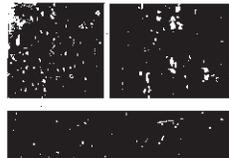
Type: fern
Height: 6-12'
Spread: 5-10'
Soil: moist to wet
Sun: full to partial
Bloom: -
Foliage: evergreen
Notes: Often found in hammock sinkholes, freshwater marshes, and canal and pond margins. Salt tolerant. Often form thickets.

Muhlenbergia capillaris | Gulf muhly, hairawn muhly



Type: grass
Height: 1-3'
Spread: -
Soil: moist but well-drained
Sun: full
Bloom: October
Foliage: deciduous
Notes: Many pink/purple inflorescence. It can occur as an isolated plant in areas where it is the only grass. Gulf muhly grass occurs in wet prairies, swamps, and the edges of marshes, and also in well-drained upland pine forests. It is frequently found near the coast in intradune swales. Established plants do not need additional water.

Phyla nodiflora | frogfruit



Type: perennial
Height: 1-3 inches, 6 inches in flower
Spread: creeping
Soil: -
Sun: full
Bloom: continuous
Foliage: evergreen
Notes: Found in wet prairies and moist disturbed areas; not tolerant of salt water inundation. Larval host plant and nectar source for many butterflies. Can be used as a turf substitute in low-traffic areas. Can be mown.

BUTTERFLY GARDENS

Many of the Rockland community species provide habitat and food for butterflies, so there will be food and habitat for butterflies throughout the corridor. However, there will also be areas for more intensive gardens that are specifically focused on butterfly habitat. These gardens will be primarily based on the pine rocklands, as the pine rocklands are home to several plants which are either the sole host or nectar source for certain endangered butterfly species. For example, the pineland croton (*Croton linearis*) is the sole host plant to two endangered species: the Bartram's scrub-hairstreak (*Strymon acis bartrami*) and the Florida leafwing (*Anaea troglodyta floridae*).

Many other butterflies live in or migrate through Southeast Florida, feeding on the native milkweeds like butterflyweed (*Asclepias tuberosa*) and longleaf milkweed (*Asclepias longifolia*). The butterfly gardens will also include these plants, as well as others that support many different butterflies.

TYPICAL UNDERSTORY SPECIES

10'

Croton linearis
pineland croton
(LARVAL HOST +
NECTAR SOURCE)

Liatrix gracilis
slender blazing-star
(NECTAR SOURCE)

5'

Zamia integrifolia
coontie
(LARVAL HOST)

Sorhastrum secundum
lopsided Indiangrass
(LARVAL HOST)

Asclepias viridis
green milkweed
(LARVAL HOST +
NECTAR SOURCE)

Serenoa repens
saw palmetto
(LARVAL HOST)

Zamia integrifolia | coontie



Croton linearis | pineland croton



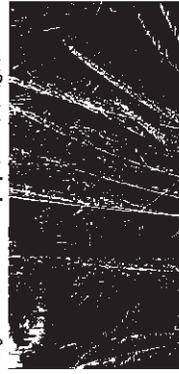
Serenoa repens | saw palmetto



Asclepias viridis | green milkweed



Sorhastrum secundum | lopsided Indiangrass



Liatrix gracilis | liatrix gracilis



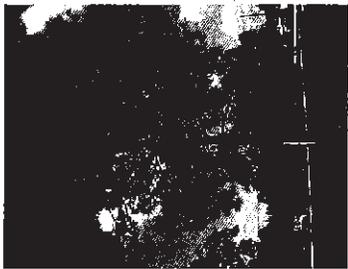
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BUTTERFLY GARDENS EXPANDED SPECIES LIST

Following are working lists of plant species for the butterfly gardens. These species were selected in collaboration with Fairchild Botanic Gardens with a focus on species that will grow well, are native to the area, will provide habitat and food for butterflies, and which are drought-tolerant once established, resulting in minimal maintenance. Many of them are native to the pine rocklands community. The list will continue to be refined and evolve as the design moves forward.

Primary canopy

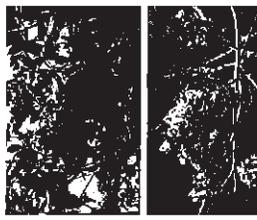
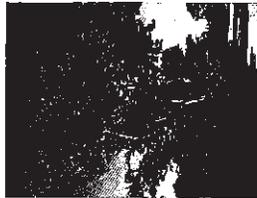
Pinus elliptica var. *densa* | South Florida slash pine



Type: tree
Height: 30-55'
Spread: 20-30'
Soil: limestone substrate
Sun: full
Bloom: evergreen
Foliage: Primary canopy tree of the pine rocklands, needles usually 8-12in long. Thrives with seasonal fire in early October every 3-7 years. The South Florida slash pine has a grass stage seedling, during which it resembles a clump of grass while it grows a large tap root and stores carbohydrates for energy. After 2-5 years, the young pine bolts upward, as much as 3-5 ft in the first year. Widely grown in plantations for wood pulp and construction. The wood has a high resin content, making it resistant to rot. Self-pruning of lower limbs. Drought tolerant once established. Does not grow well in fill. Miami-Dade county has had success with planting small cuttings in natural areas, but these are places where the substrate is intact and mycorrhizal fungus is present.

Type: tree
Height: 30-55'
Spread: 20-30'
Soil: limestone substrate
Sun: full
Bloom: evergreen
Foliage: Primary canopy tree of the pine rocklands, needles usually 8-12in long. Thrives with seasonal fire in early October every 3-7 years. The South Florida slash pine has a grass stage seedling, during which it resembles a clump of grass while it grows a large tap root and stores carbohydrates for energy. After 2-5 years, the young pine bolts upward, as much as 3-5 ft in the first year. Widely grown in plantations for wood pulp and construction. The wood has a high resin content, making it resistant to rot. Self-pruning of lower limbs. Drought tolerant once established. Does not grow well in fill. Miami-Dade county has had success with planting small cuttings in natural areas, but these are places where the substrate is intact and mycorrhizal fungus is present.

Piscidia piscipulus | Jamaican dogwood

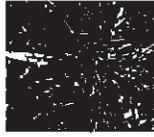


Type: tree
Height: 25-35', can be up to 50'
Spread: 20-30'
Soil: partial
Sun: spring
Bloom: deciduous
Foliage: Drought tolerant once established. Moderately tolerant of ocean salt wind and water. Larval host for several species. White to pink flowers are larger but showy. Traditionally used medicinally and for tanning purposes, as well as for boat building and agriculture. Is poisonous to fish. Drought-tolerant.

Type: tree
Height: 25-35', can be up to 50'
Spread: 20-30'
Soil: partial
Sun: spring
Bloom: deciduous
Foliage: Drought tolerant once established. Moderately tolerant of ocean salt wind and water. Larval host for several species. White to pink flowers are larger but showy. Traditionally used medicinally and for tanning purposes, as well as for boat building and agriculture. Is poisonous to fish. Drought-tolerant.

Primary shrub

Croton linearis | pinelands croton



Type: perennial
Height: 1-2'
Spread: 1-2'
Soil: sandy
Sun: full to partial
Bloom: year-round, white
Foliage: evergreen
Notes: Native to the pine rocklands, the pinelands croton is the only heat plant to the federally-listed Florida leaf-wing and Bortome scrub hairstreak butterflies, as well as a nectar source for other butterflies. Spines 18-36 in apart. Green leaves are leathery with a silvery underside.

Type: perennial
Height: 1-2'
Spread: 1-2'
Soil: sandy
Sun: full to partial
Bloom: year-round, white
Foliage: evergreen
Notes: Native to the pine rocklands, the pinelands croton is the only heat plant to the federally-listed Florida leaf-wing and Bortome scrub hairstreak butterflies, as well as a nectar source for other butterflies. Spines 18-36 in apart. Green leaves are leathery with a silvery underside.

Myrica cerifera | wax myrtle



Type: shrub
Height: 8-15' high, up to 35'
Spread: 8-15'
Soil: varied
Sun: full to partial
Bloom: evergreen
Foliage: Multistemmed. Leaves are aromatic when crushed. Can be found in swamps or upland dry communities. Berries attract birds. Larval host to butterflies.

Type: shrub
Height: 8-15' high, up to 35'
Spread: 8-15'
Soil: varied
Sun: full to partial
Bloom: evergreen
Foliage: Multistemmed. Leaves are aromatic when crushed. Can be found in swamps or upland dry communities. Berries attract birds. Larval host to butterflies.

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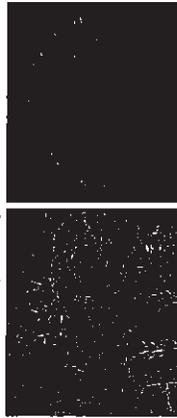
Primary herbaceous + groundcover

Andropogon longiberbis | hairy bluestem



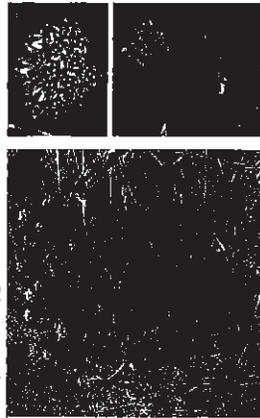
Type: grass
Height: 2-4'
Spread: 1-2'
Soil: moist but well-drained
Sun: full
Bloom: mid-summer to early fall
Foliage: deciduous
Notes: drought-tolerant, native to pine rocklands. Possible larval host plant for Delaware skipper (*Anatrytone logan*), Georgia satyr (*Neonympha erodes*), nearctic skipper (*Nastis neamathis*), swarthy skipper (*Nastis themister*) and twin-spot skipper (*Oligoria maculata*) butterflies. Moderate tolerance of salt winds but not salt water. Grows quickly from seed.

Asclepias tuberosa | butterflyweed



Type: perennial
Height: 1-2'
Spread: 1'
Soil: full
Sun: continuous
Bloom: deciduous
Foliage: Host plant or nectar source for several butterflies, specifically monarchs. Deep taproot, does not transplant well.

Asclepias viridis | green milkweed



Type: perennial
Height: 1-3'
Spread: 2-3'
Soil: moist to dry
Sun: full
Bloom: May-August
Foliage: deciduous
Notes: Up to 10 stems. Glabrous foliage has a coarse texture. Taproot. Low toxicity, attracts butterflies, host plant to Monarchs. Usually found in dry areas and prairies. Drought-tolerant.

Mimosa strigillosa | sunshine mimosa



Type: perennial
Height: 1 inch, 3 inches in flower
Spread: spreading
Soil: moist to dry
Sun: full
Bloom: spring to summer
Foliage: Fast growing. Larval host plant for little yellow butterfly. Low salt tolerance. Turf replacement - can be mowed to 4". Flowers are spherical with purple-pink stamens, tipped with yellow. Can be found in pinelands and streambanks

Lantana depressa | pineland lantana



Type: shrub
Height: 2'
Spread: 2-5'
Soil: limestone substrate
Sun: full
Bloom: continuous
Foliage: evergreen
Notes: Low, mat-forming shrub. Flowers are yellow to gold. Beware the invasive *L. camara*, which is often crossed with *L. depressa* (such as Lantana Gold or Gold Rush). Native to pine rocklands. Food and nectar source for many butterflies and birds.

Liatris gracilis | slender blazing-star



Type: perennial
Height: 4-5' in bloom
Spread: 12"
Soil: well-drained
Sun: full
Bloom: October, November
Foliage: deciduous
Notes: Prone to falling over, plant with grasses and wildflowers that will help support stalks. Drought tolerant.

Sorghastum secundum | lopsided indiagrass



Type: grass
Height: 2-5', 6' in flower
Spread: 2-3'
Soil: moist but well-drained
Sun: full
Bloom: summer/fall
Foliage: evergreen/deciduous
Notes: Host plant to butterfly larvae. Drought-tolerant once established. Not tolerant of salt wind or water. Bloom lasts about 2-3 weeks. Does well in high pine shade.

Symphoricarum dumosum | rice button aster



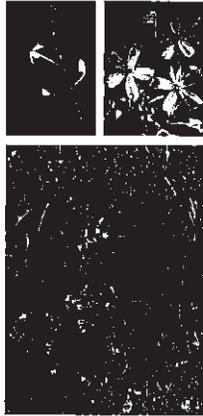
Type: perennial
Height: 2-4'
Spread: 2-4'
Soil: moist but well-drained limestone soils
Sun: full
Bloom: spring to fall
Foliage: deciduous
Notes: Moderate to fast growth rate. Native to pinelands and prairies, can range far north to the Great Lakes. Can tolerate some wetness. Showy flowers are white to blue. Larval host plant for butterflies.

Zamia integrifolia | coontie



Type: cycad
Height: 1-4'
Spread: 1-4'
Soil: full to partial
Sun: evergreen
Foliage: tolerant once established. Slow-growing. Drought tolerant of salt/water, but moderately tolerant of salt spray. Starchy tuber is poisonous unless properly prepared; it is traditionally used for flour, leading to the other common name of Florida arrowroot. Larva: host plant for the atlas butterfly.

Plumbago scandens | doctorbush



Type: perennial
Height: 1-3'
Spread: 3-4'
Soil: dry
Sun: partial to shade
Bloom: spring to fall
Foliage: evergreen
Notes: Tiny white blooms. Poisonous to humans, attractive to butterflies - host plant to the Cassius blue butterfly. Will spread and climb. Seeds stick to fur and clothes. Found in shady hammocks.

Additional species

Asclepias longifolia | longleaf milkweed

Chaptalia albicans | pineland daisy

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EXISTING VEGETATION EXISTING TREE SURVEY IS UNDERWAY

The Underline currently benefits from a number of existing trees, many of which are mature and offer much-appreciated shade. Volunteers are in the process of surveying these existing trees in the Brickell and the University of Miami demonstration project areas. This volunteer tree survey will include tree location, species, and height, as

BRICKELL

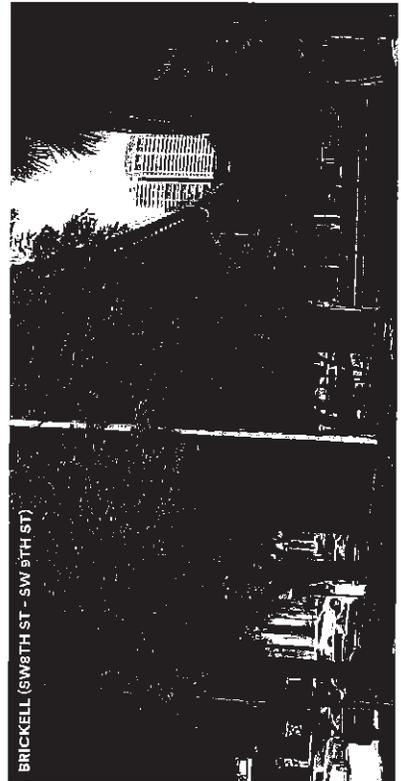
281 trees were surveyed, from the Miami River to SW 17th Rd.

42% of the existing tree species are already part of our planting palette, highlighted in green below.

Existing tree list:

Albizia lebeck
Bursera simaruba
Calophyllum aitifolium
Chrysobalanus icaco
Clusia rosea
Coccoloba uvifera
Coccoloba argentea
Coccoloba laurifolia
Cocos nucifera
Conocarpus erectus
Conocarpus erectus var. sericeus

Serenoa repens
Schefflera actinophylla
Swietenia mahagoni
Syagrus romanzoffiana
Tabebuia heterophylla
Tabebuia serratifolia
Terminalia catappa
Thrinax radiata
Veitchia merrillii



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well as a grade for tree health. Criteria for determining tree health are being developed. This survey will help us to identify which trees are healthy, mature, and can be retained and incorporated into the design. It will also help us to better understand the existing conditions, so we know how these trees will fit into the new Underline palette.

UNIVERSITY OF MIAMI

373 trees were surveyed, from Stanford Drive to Red Rd (SW 57th Ave).

74% of the existing tree species are already part of our planting palette, highlighted in green below.

Existing tree list:

Bismarckia nobilis
Burkea buceras
Eugenia foetida
Ficus citrifolia
Jatropha integerrima
Ligustrum japonicum
Myrcianthes fragrans
Phoenix canariensis
Psidium castellanum
Quercus virginiana
Sabal palmetto

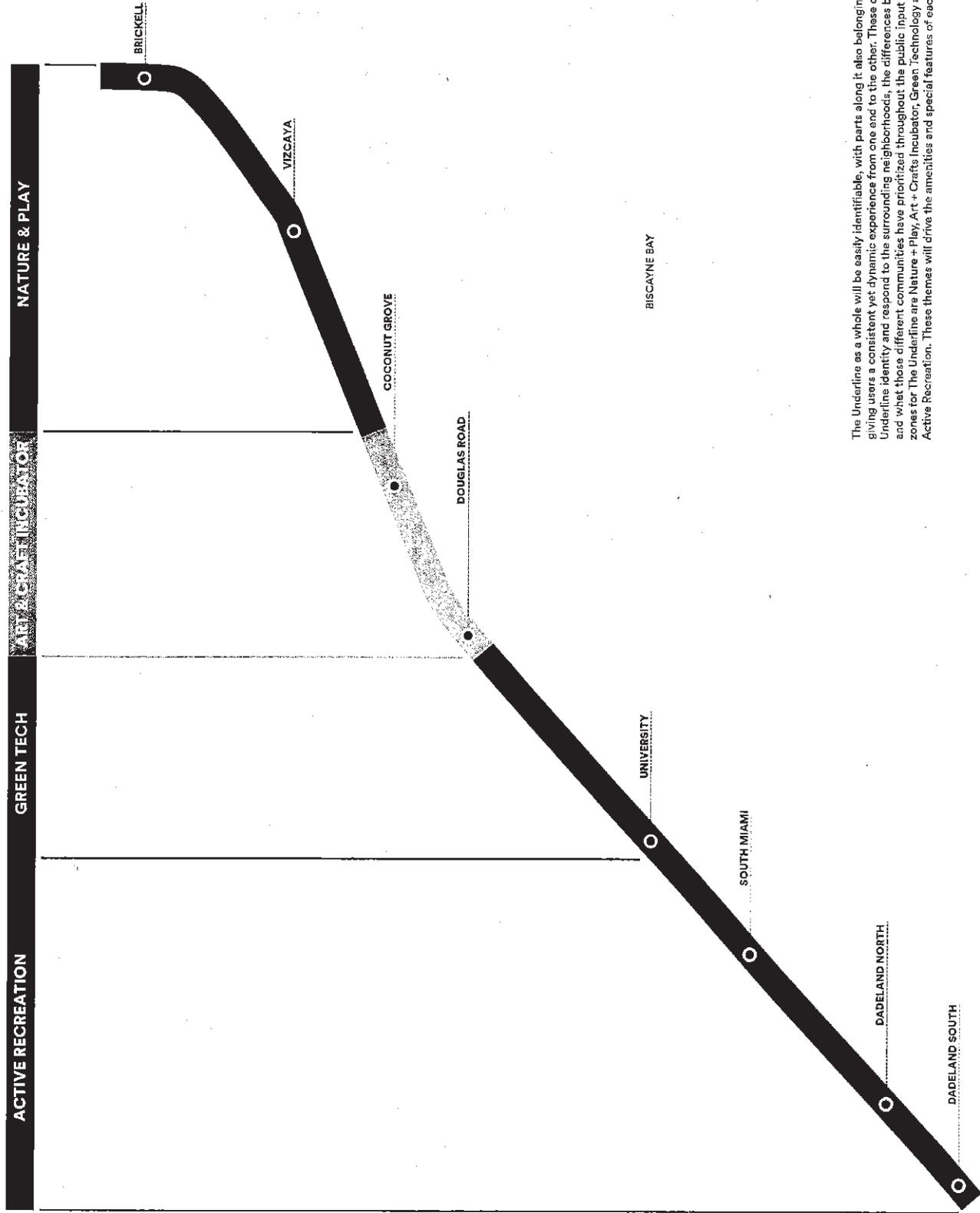
Schefflera actinophylla
Swietenia mahagoni
Tabebuia caraiba
Veitchia merrillii



2.3 CHARACTER ZONES

The approach to the paths and planting creates an overall design identity that anchors the entire 10-mile length of The Underline, providing consistent features and an identifiable character that is uniquely "Underline". In addition to the overall identity, The Underline will have character zones that draw from the surrounding neighborhoods and provide a varied experience including a number of unique programmed spaces along the way.

CHARACTER ZONES

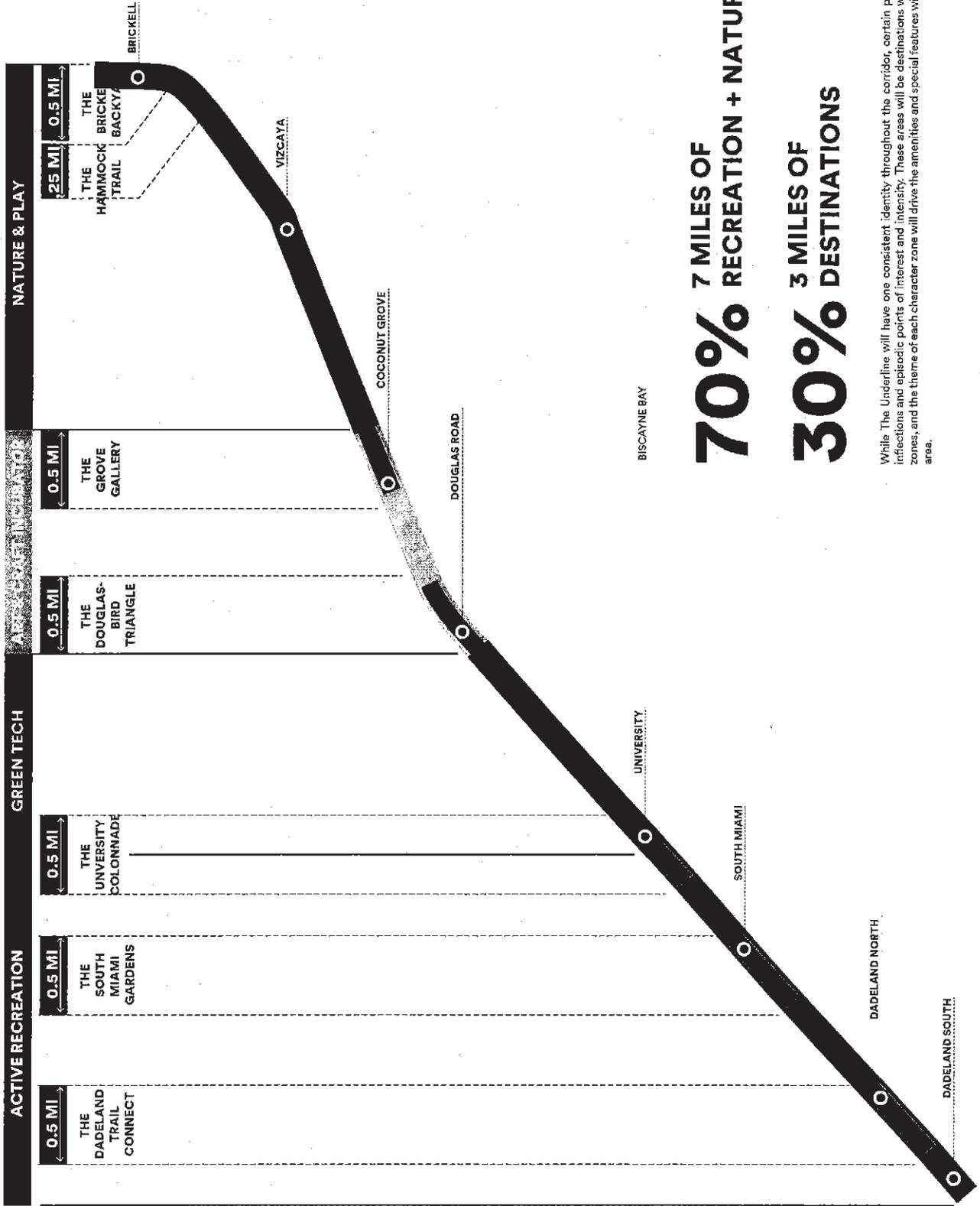


The Underline as a whole will be easily identifiable, with parts along it also belonging to a specific character zone, giving users a consistent yet dynamic experience from one end to the other. These character zones build upon the Underline identity and respond to the surrounding neighborhoods, the differences between those neighborhoods, and what those different communities have prioritized throughout the public input process. These four character zones for The Underline are Nature + Play, Art + Craft, Incubator, Green Technology and Sustainable Initiatives, and Active Recreation. These themes will drive the amenities and special features of each segment.

NOT TO SCALE

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CHARACTER ZONES
AREAS OF INTENSITY WITHIN EACH LARGER ZONE



70% 7 MILES OF RECREATION + NATURE
30% 3 MILES OF DESTINATIONS

While The Underline will have one consistent identity throughout the corridor, certain portions will have specific inflections and episodic points of interest and intensity. These areas will be destinations within the larger character zones, and the theme of each character zone will drive the amenities and special features within each higher-intensity area.

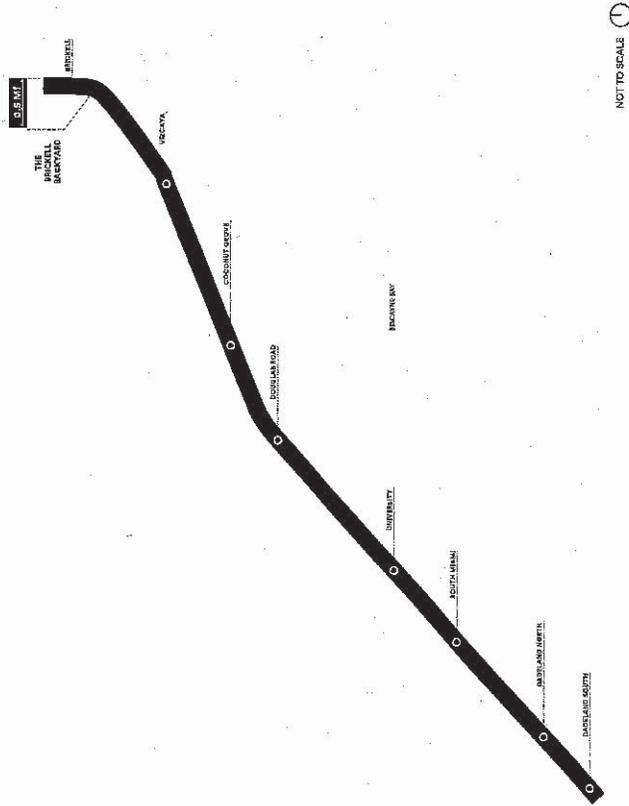
NOT TO SCALE

THE BRICKELL BACKYARD

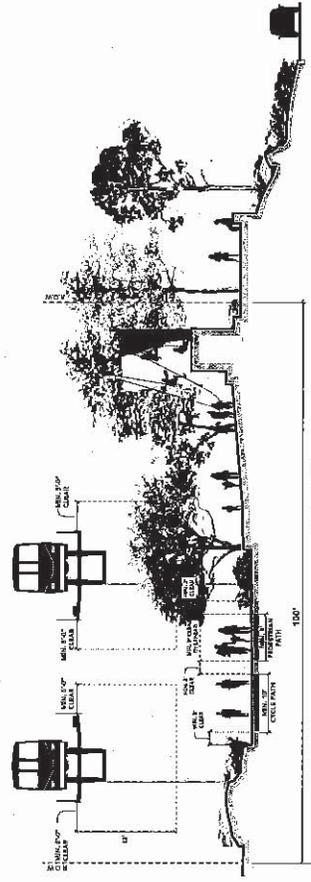
MIAMI RIVER TO SW 13TH ST

Brickell is a rapidly-growing neighborhood. The Brickell Backyard will unite the many existing site elements, including the Metrorail station, bus pickups, new construction, and adjacent nightlife, to create a communal space that is lush, verdant, and vibrant. The Brickell Backyard will provide play-focused amenities for both adults and children, in a park-like natural setting that contrasts from the highly urban neighborhood around it. Existing features, such as the current ocotte outcrop south of the Brickell Metrorail station, will be highlighted and expanded.

See Chapter 3.1 for more detailed designs of the Brickell Backyard.



THE BRICKELL BACKYARD LOCATION PLAN



PROPOSED SECTION BETWEEN SW 11TH ST AND SW 12TH ST

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THE BRICKELL BACKYARD
MIAMI RIVER TO SW 13TH ST



EXISTING CONDITIONS AT BRICKELL

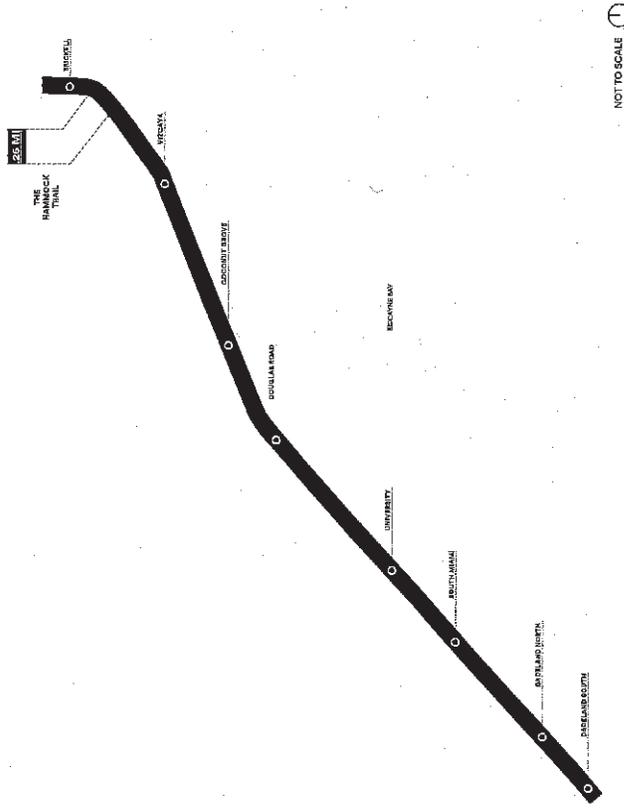


THE OOLITE ROOM AT THE BRICKELL BACKYARD

67

THE HAMMOCK TRAIL SW 13TH ST TO SW 17TH RD

As part of the Nature + Play character zone, this area will prioritize the natural environment and explorative, integrated play. Historically, this area was part of the Brickell Hammock, of which a small remnant remains in adjacent Simpson Park. The Hammock trail will feature the Hammock plant community (see Chapter 2.2 for more information on planting), as well as nature trails, and play that expands beyond traditional playgrounds.

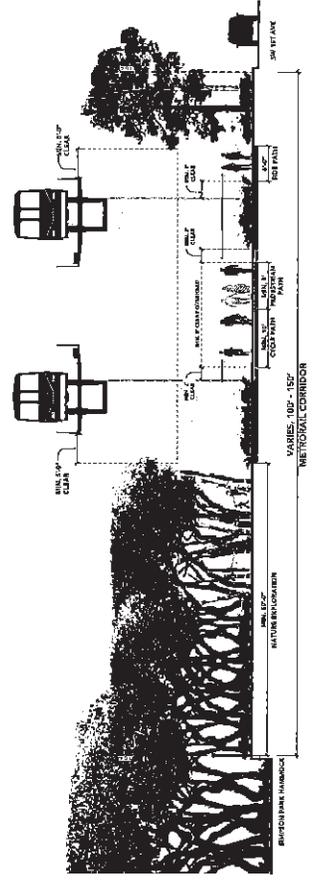


NOT TO SCALE



NOT TO SCALE

THE HAMMOCK TRAIL LOCATION PLAN



EXISTING SECTION BETWEEN SW 15TH RD AND SW 17TH RD

68

THE HAMMOCK TRAIL
SW 13TH ST TO SW17TH RD



EXISTING CONDITIONS NEAR SIMPSON PARK HAMMOCK

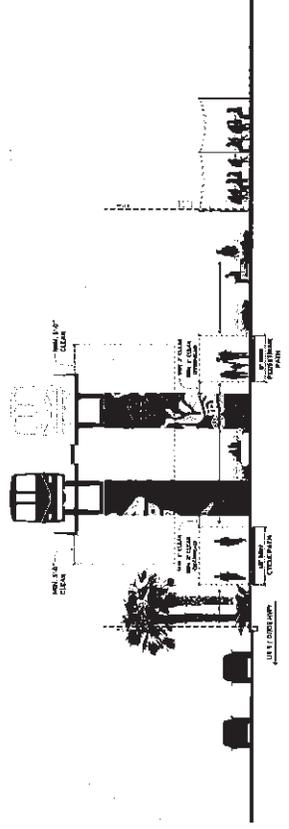
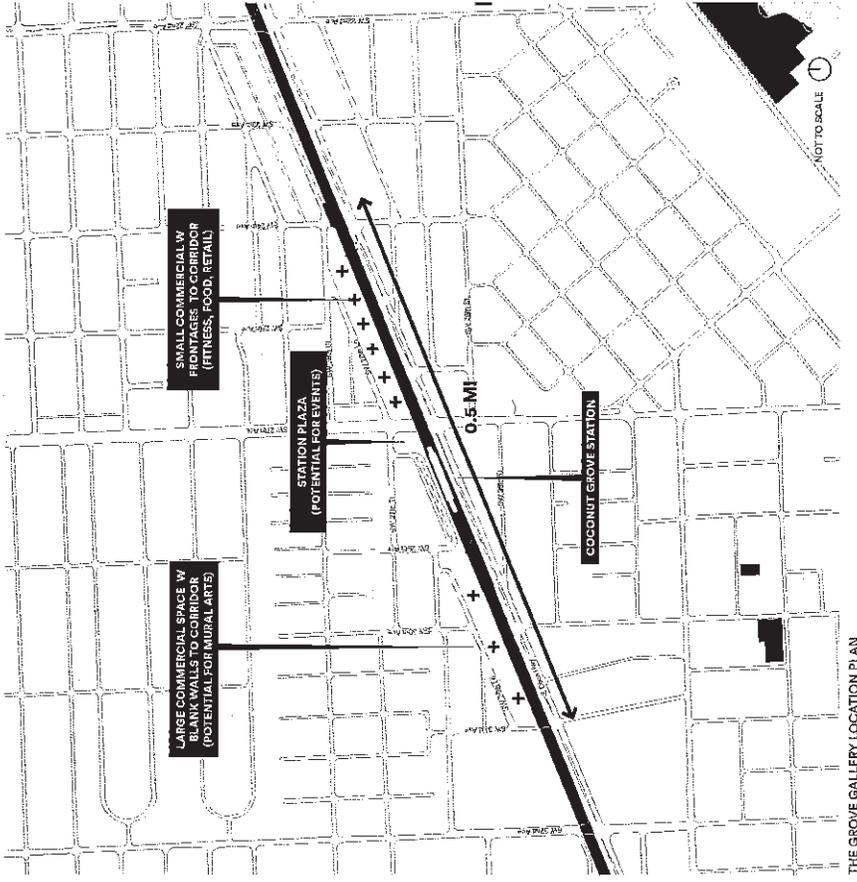
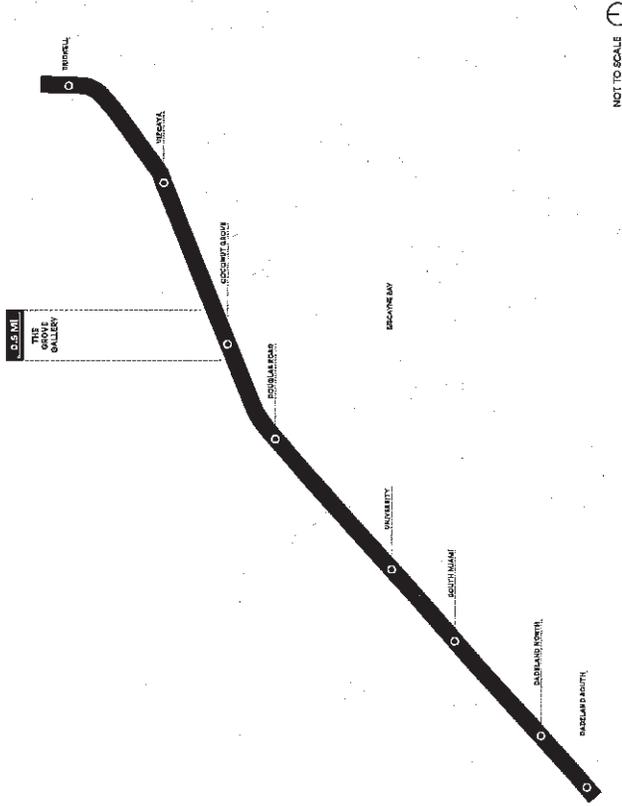


THE HAMMOCK PLAY ZONE AND NATURE PATH NEAR SIMPSON PARK HAMMOCK

69

THE GROVE GALLERY SW 24TH AVE TO SW 31ST AVE

This area of The Underline, within the Arts + Craft Incubator, is already beginning to be activated by popular local businesses that directly abut the corridor. The Grove Gallery hopes to encourage businesses to open up to The Underline by activating what is now their back facade against the corridor, essentially creating the opportunity for double frontages. In addition, this area will focus on art, creating outdoor galleries that use the primary elements of the corridor as a canvas—the Metro rail columns for murals or the path for lighting installations.



EXISTING SECTION BETWEEN SW 24TH AVE AND SW 27TH TERRACE

THE GROVE GALLERY
SW 24TH AVE TO SW 31ST AVE



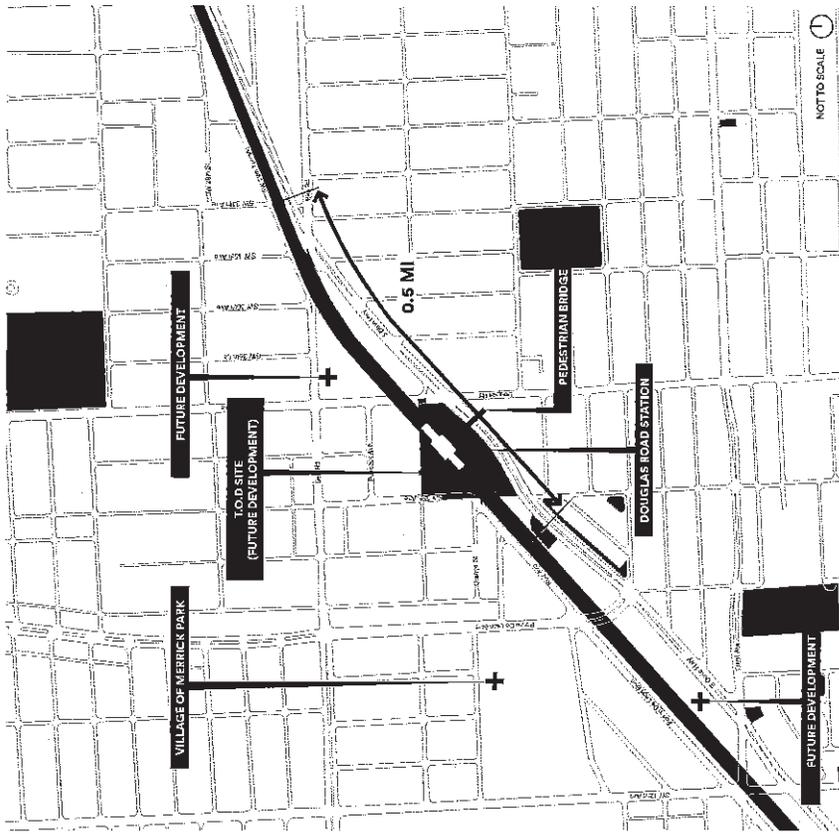
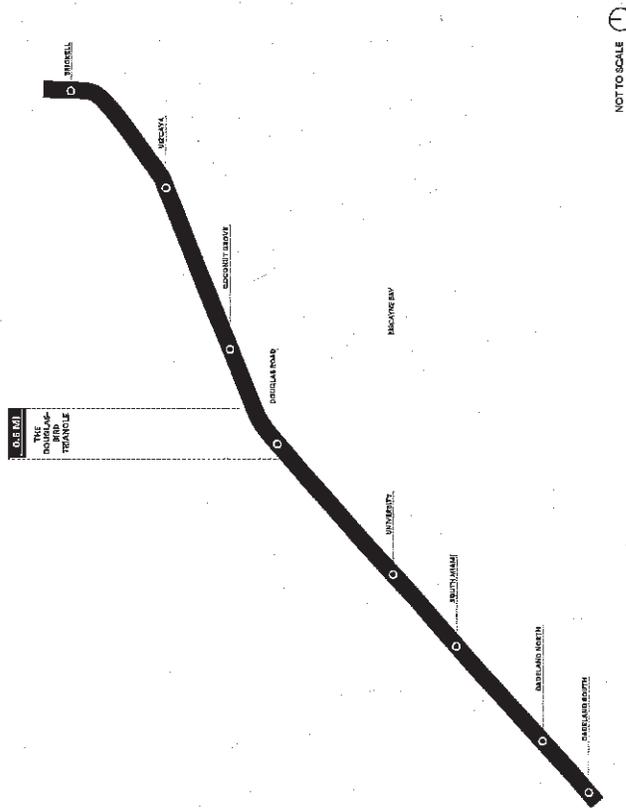
EXISTING CONDITIONS NEAR SW 24TH AVENUE



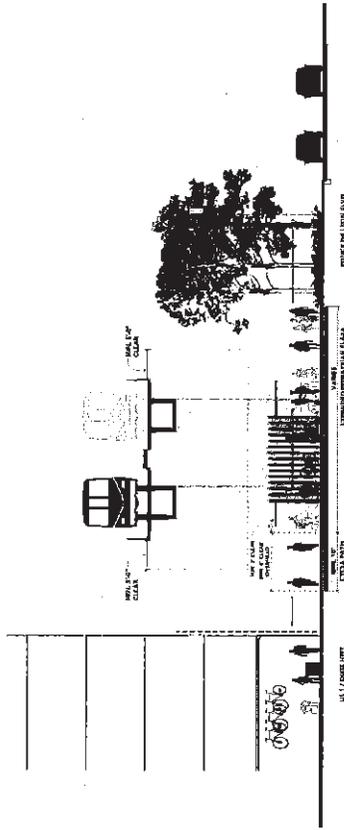
PICNIC AREA NEAR SW 24TH AVENUE

THE DOUGLAS-BIRD TRIANGLE BIRD ROAD TO SW 38TH AVE

The Douglas-Bird Triangle will provide opportunities that allow nearby communities that concentrate on arts and crafts and light manufacturing to create, display, and teach their crafts in a way that enhances the public realm. Through gathering places and integrated infrastructure (such as hook-ups and stands), the public will be encouraged to interact with the artisans and crafts themselves.



THE DOUGLAS-BIRD TRIANGLE LOCATION PLAN

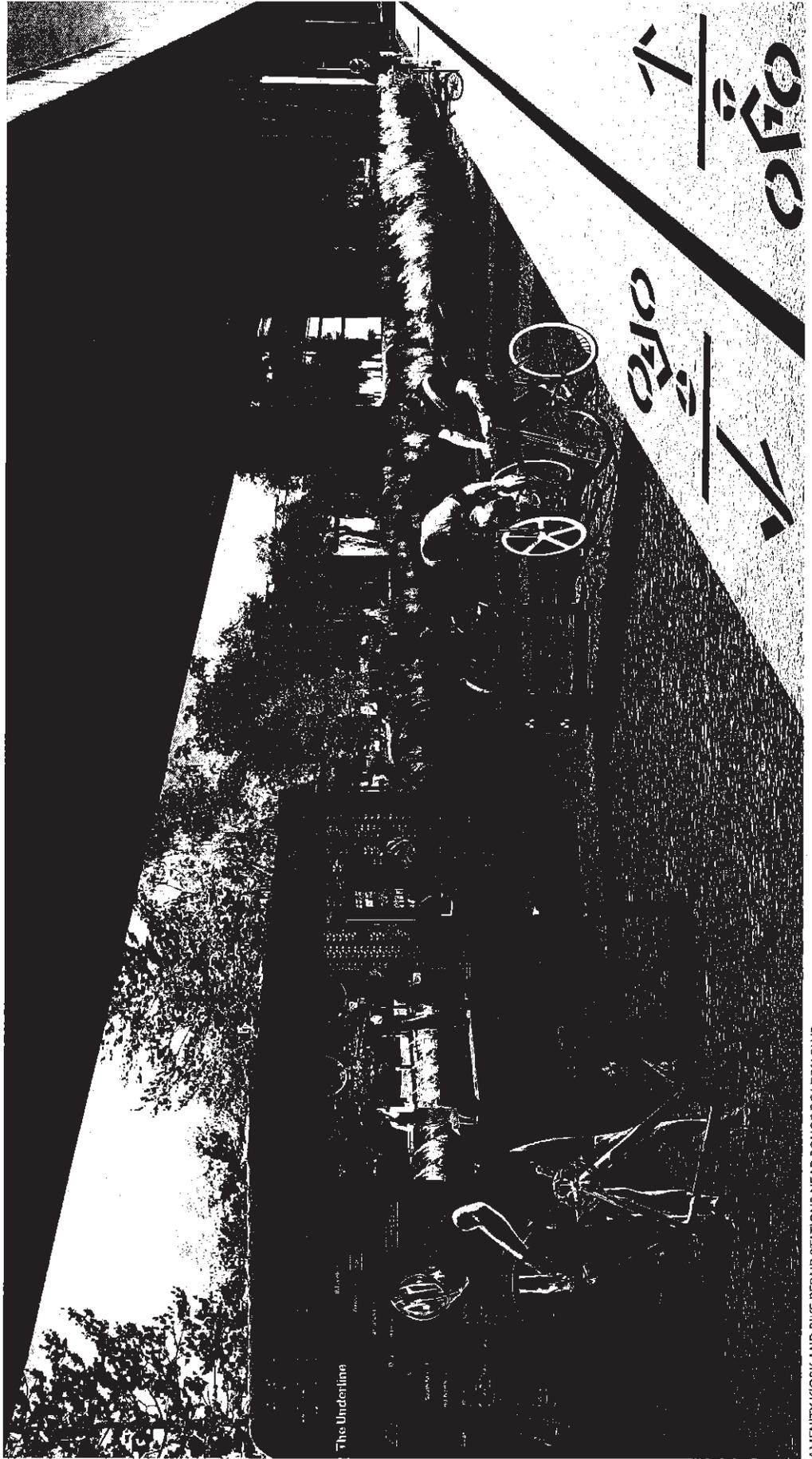


PROPOSED SECTION BETWEEN FROW AVE AND LEIRJUNE

**THE DOUGLAS-BIRD TRIANGLE
BIRD ROAD TO SW 38TH AVE**



EXISTING CONDITIONS NEAR PONCE DE LEON BLVD

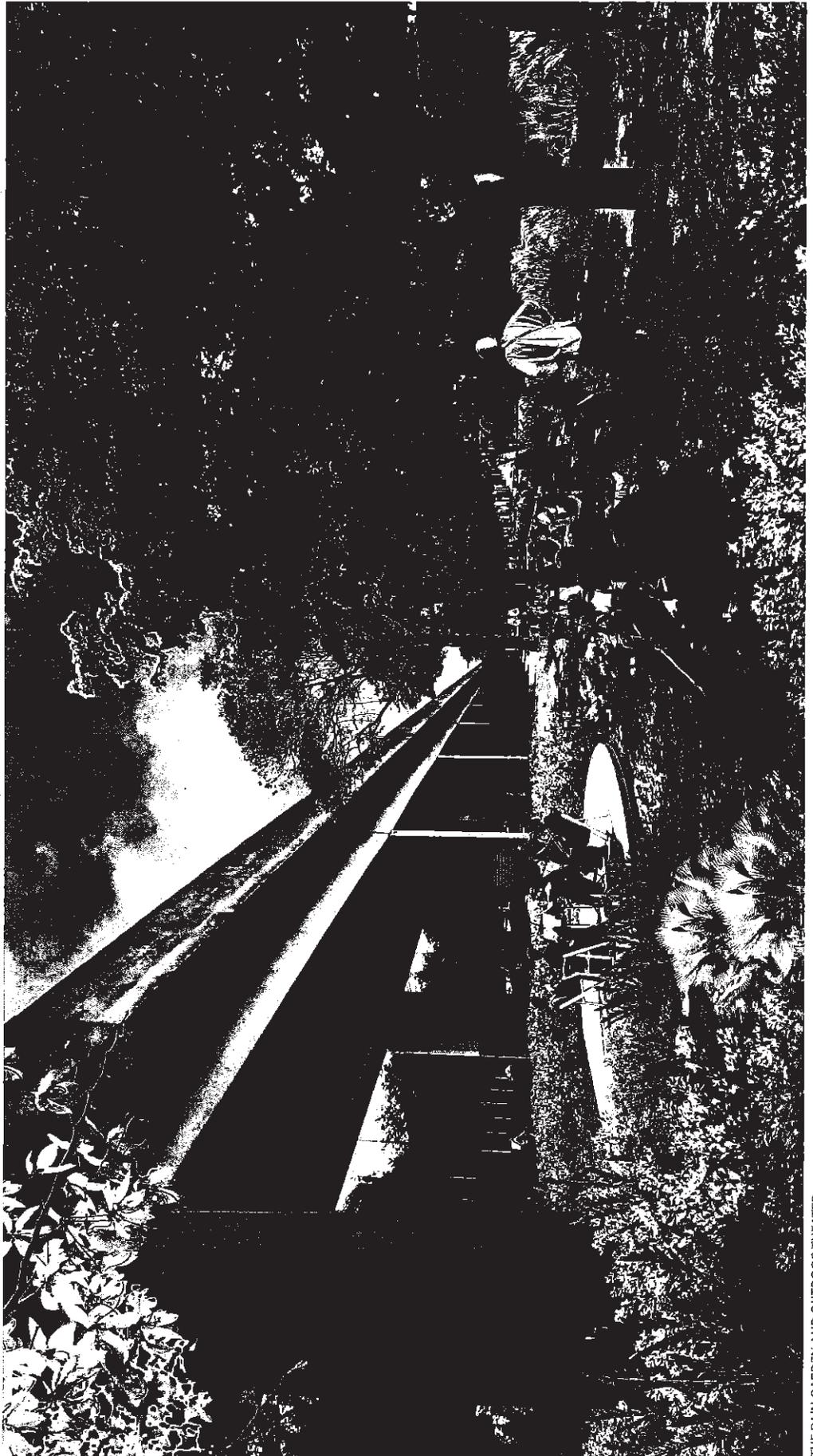


AMENITY KIOSK AND BIKE REPAIR STATIONS NEAR PONCE DE LEON BLVD

**THE UNIVERSITY COLONNADE
RAIN GARDEN**



EXISTING CONDITIONS NEAR
DICKINSON DR

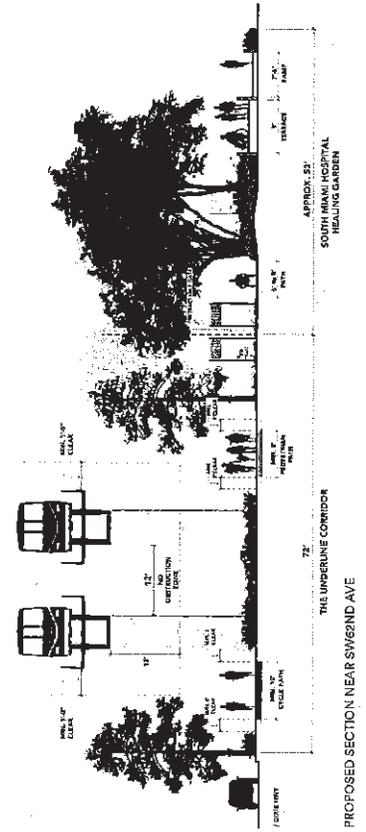
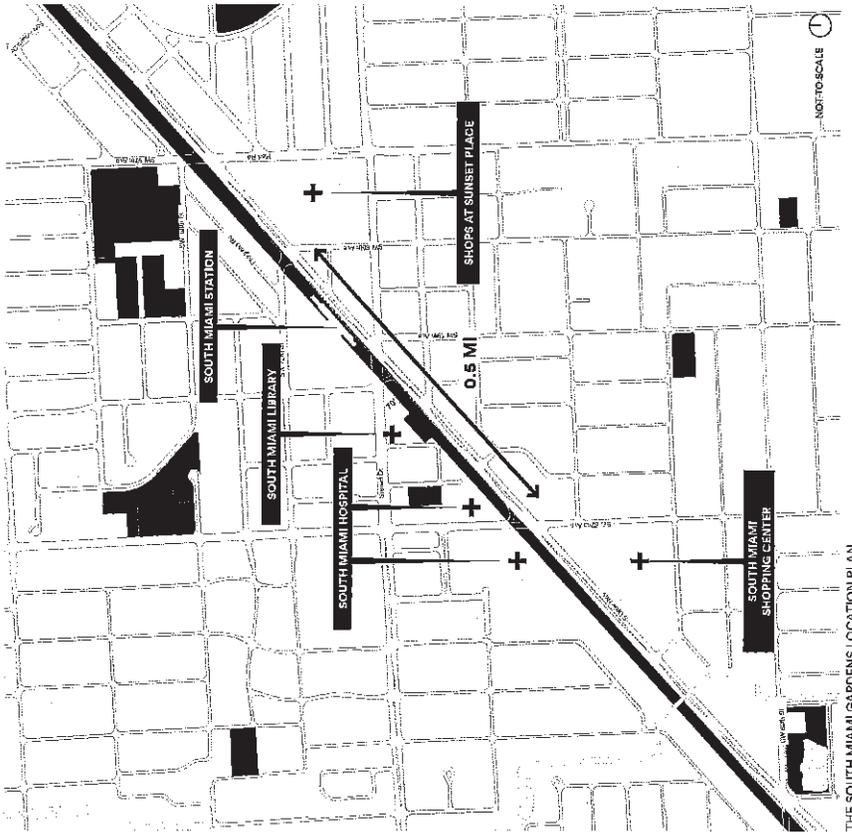
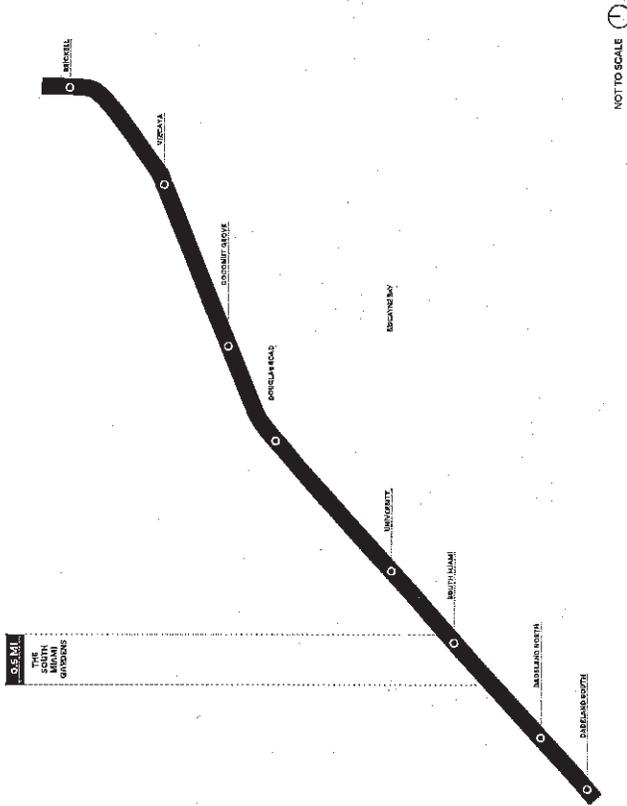


THE RAIN GARDEN AND OUTDOOR THEATER

THE SOUTH MIAMI GARDENS SW 72ND ST TO SW 62ND AVE

This portion of the corridor between Sunset Drive and US-1 and SW 62nd Ave and US-1 includes South Miami Hospital (Baptist Health, South Florida) and South Miami City Hall and Library. It will be flanked with a series of thematic gardens dedicated to health and well-being. Due to their small scale, these gardens will incorporate more varied vegetation driven by specific thematic elements such as butterfly habitats or healing and aromatic plants.

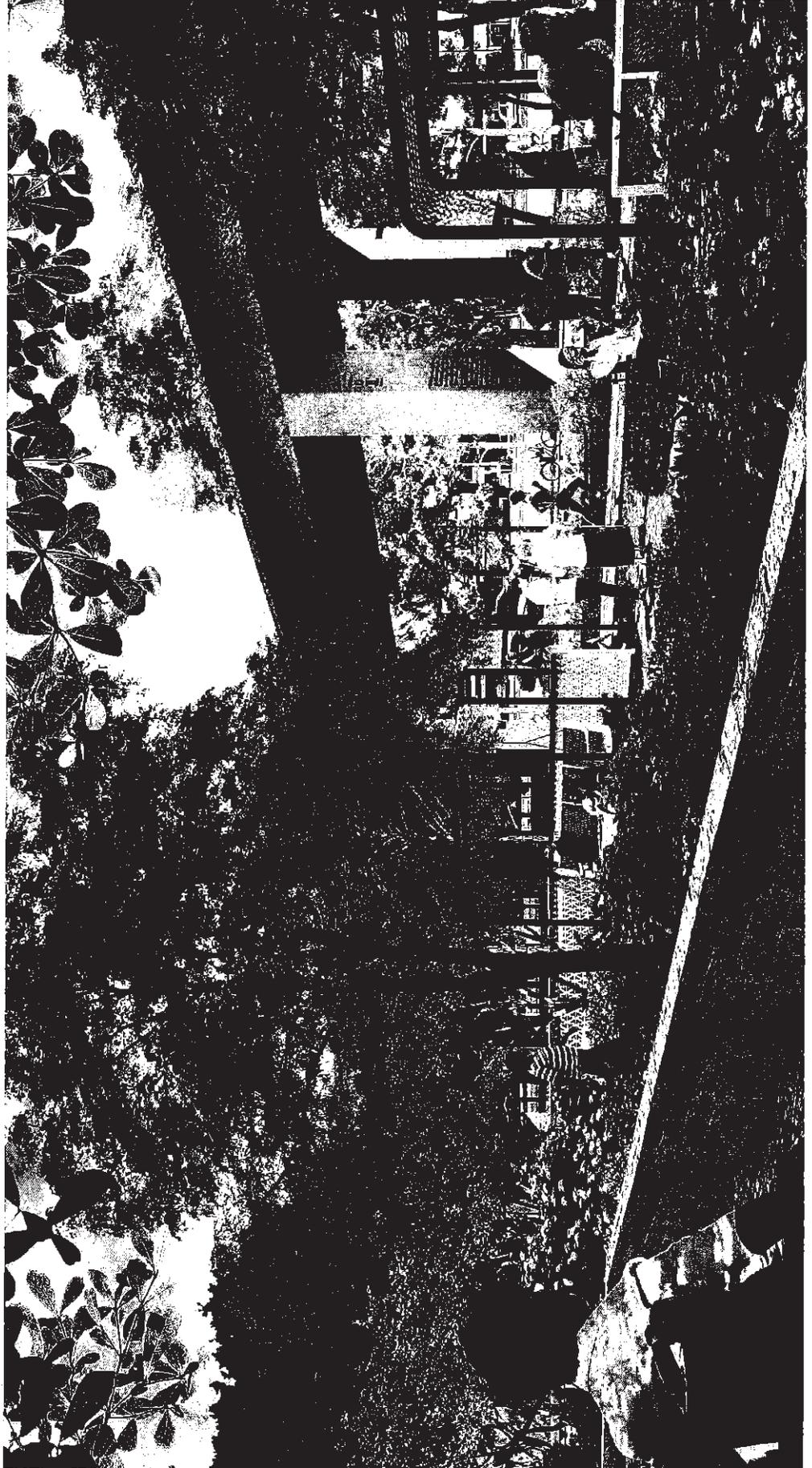
One of these gardens will be located at the South Miami Hospital grounds between SW 62nd and SW 61st CT where the Hospital has expressed an interest in developing a partnership with The Underline to develop this private lot as part of the open space network of the corridor, serving both the Hospital and the general public.



**THE SOUTH MIAMI GARDENS
SW 72ND ST TO SW 62ND AVE**



EXISTING CONDITIONS AT
SOUTH MIAMI HOSPITAL GARDEN

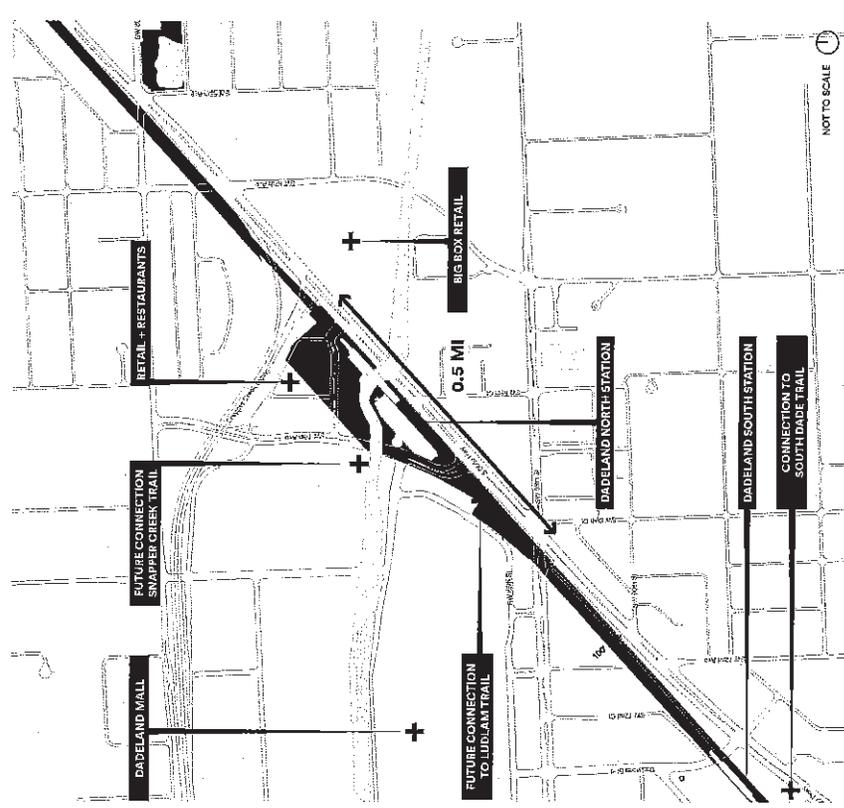
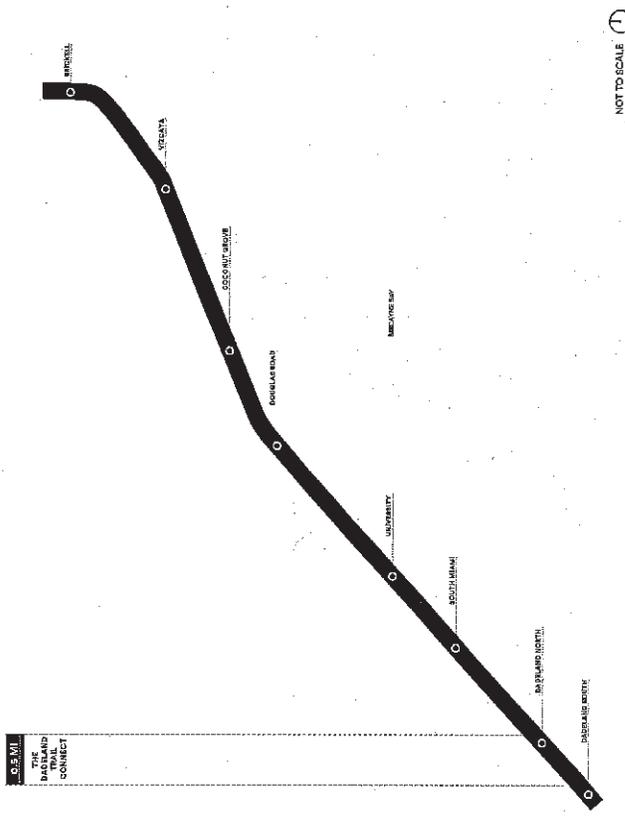


HEALING GARDEN AT THE SOUTH MIAMI HOSPITAL

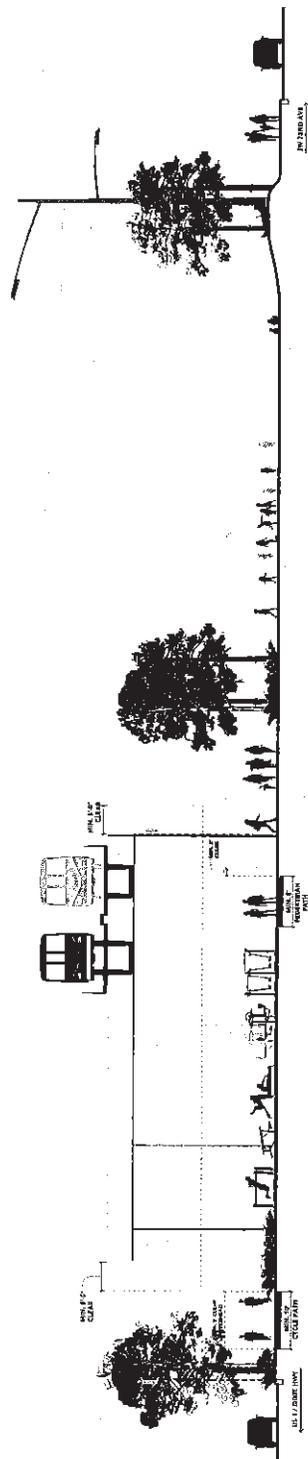
77

DADELAND TRAIL CONNECT SNAPPER CREEK EXPY TO SW 88TH STREET

The Dadeland Trail Connect will encourage activity of all sorts, from group sports to individual fitness. This portion of The Underline is wider than most other areas, and can accommodate larger design elements related to fitness and health. Equipment and topography will facilitate outdoor workouts, larger multi-purpose lawns will accommodate pickup games like soccer and Frisbee, painted lanes will provide structure for running and racing, and lighting will encourage use into the evening, when the temperature is cooler. Situated in short proximity to the future Ludlum Trail, this area will also provide links to other trails and trail connections, connecting The Underline corridor to a larger network of regional trails.



THE DADELAND TRAIL CONNECT LOCATION PLAN

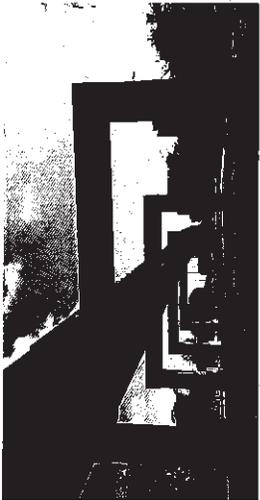


PROPOSED SECTION BETWEEN SW 70TH AVE AND SW 88TH ST

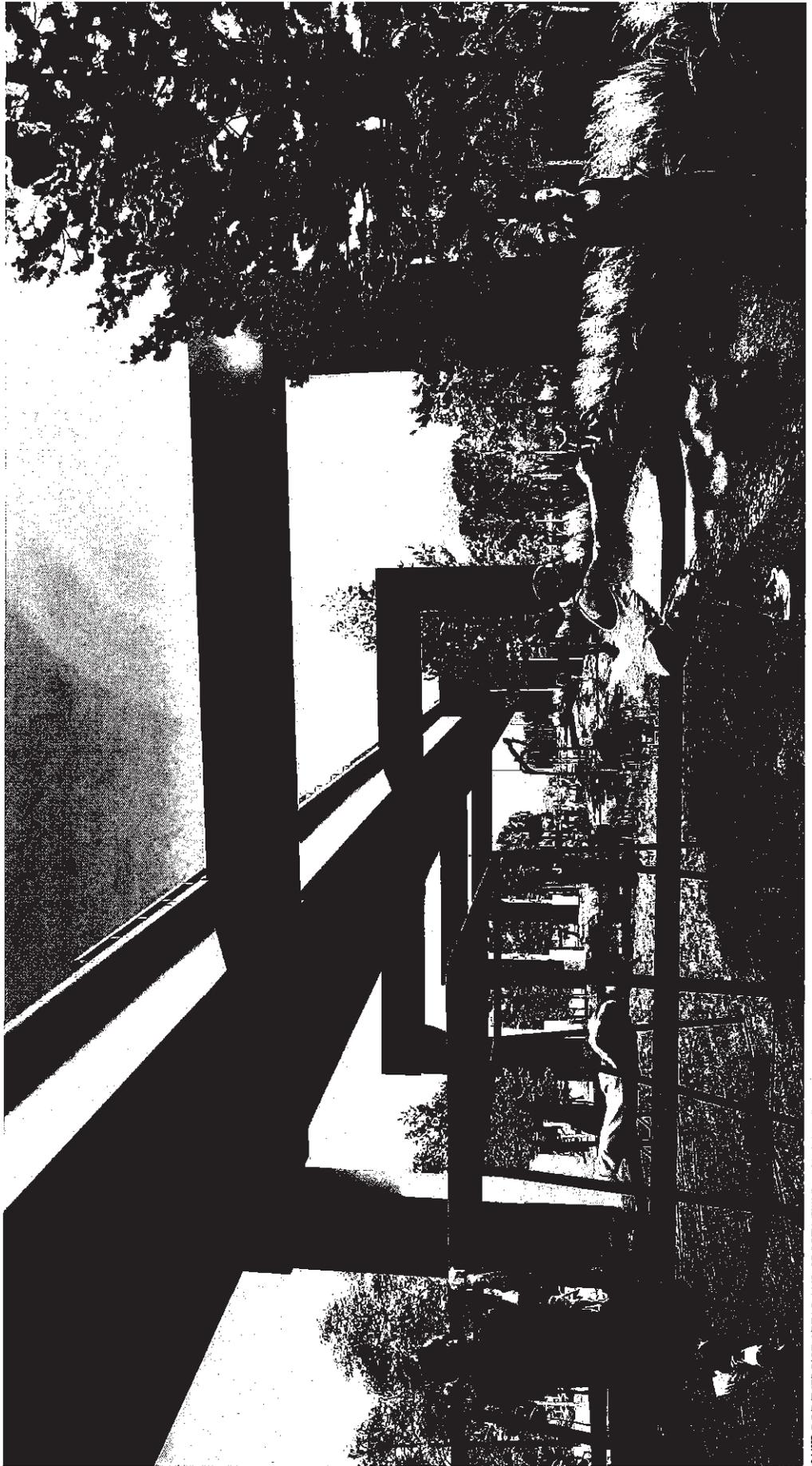
FRAMEWORK PLAN, THE UNDERLINE, MIAMI

78

DAELAND TRAIL CONNECT
SNAPPER CREEK EXPWY TO SW 88TH STREET



EXISTING CONDITIONS NEAR SW 70TH AVENUE



OUTDOOR EXERCISE AREAS AND SPORTS FIELDS AT SW 70TH AVENUE

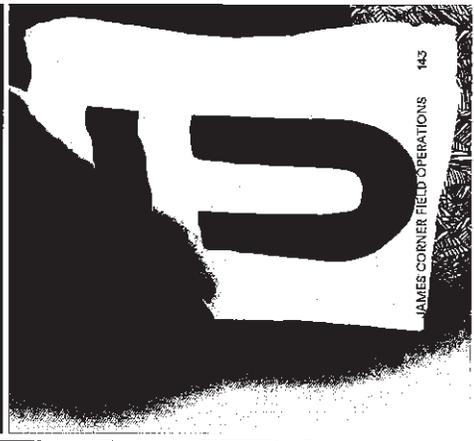
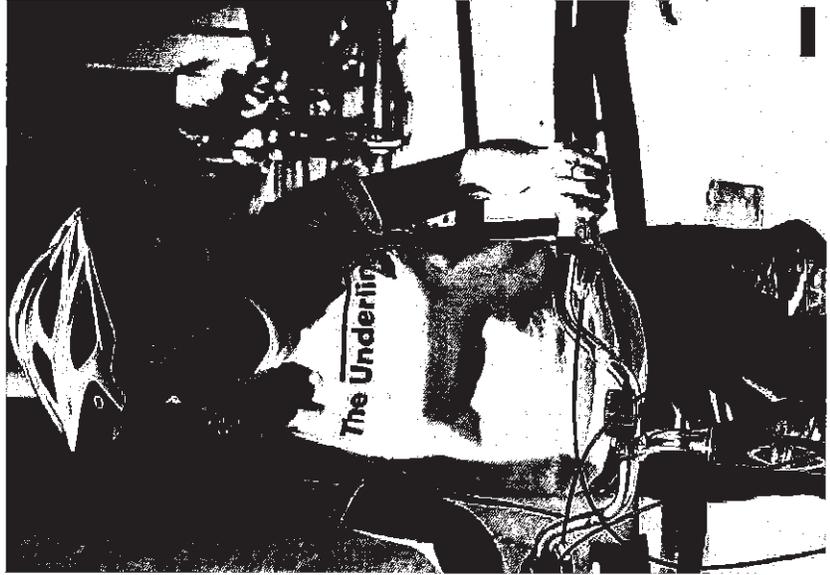
79

2.4 DESIGN ELEMENTS

The scale and the context of The Underline demand that it have a unique and memorable identity. While the neighborhoods along The Underline bring diverse and localized character to the various segments of corridor, design elements such as the path design and markings, wayfinding and graphics, and furnishing and lighting are orchestrated to provide a cohesive legibility and unified design vocabulary along the 10-miles.



The Underline



JAMES CORNER FIELD OPERATIONS 143

IDENTITY AND BRANDING

- UNIQUE
- BOLD
- MEMORABLE
- RECOGNIZABLE

Since its inception as a project, The Underline has carried a strong graphic and recognizable identity as a brand. Its strong branding efforts expand from its bold logo, to its recognizable website and communications.

This memorable identity is expanded to the physical design elements to continue to reinforce the identity of The Underline such as the color palette, font and type, symbols and icons and graphics and patterns.

Logo

The Underline

Fonts

Circular Black
Circular Book

Symbol

U

Colors



The Overline (as graphic element)

**The Underline will transform
the land below Miami's
Metrorail into a 10-mile
linear park and urban trail.**

88

**IDENTITY AND BRANDING
PROPOSED TYPEFACE**

Stencil type
We propose creating a custom Stenciled version of Circular for exclusive use by The Underline.

Stenciling the typeface allows for rapid and cost effective painting, while referencing street art and graffiti.

Circular Black
Circular Stencil

83

A B C D E F G H I J K L M N

O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n

o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

/ ? : ; ! @ # \$ % & - +

84

A B C D E F G H I J K L M N

O P Q R S T U V W X Y Z

a b c c d e f g h i j k l m n

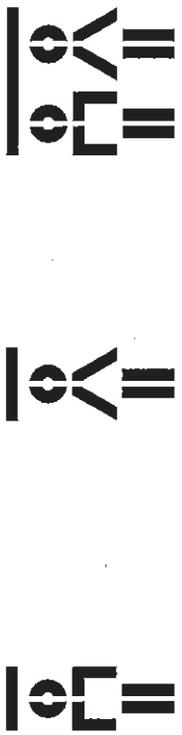
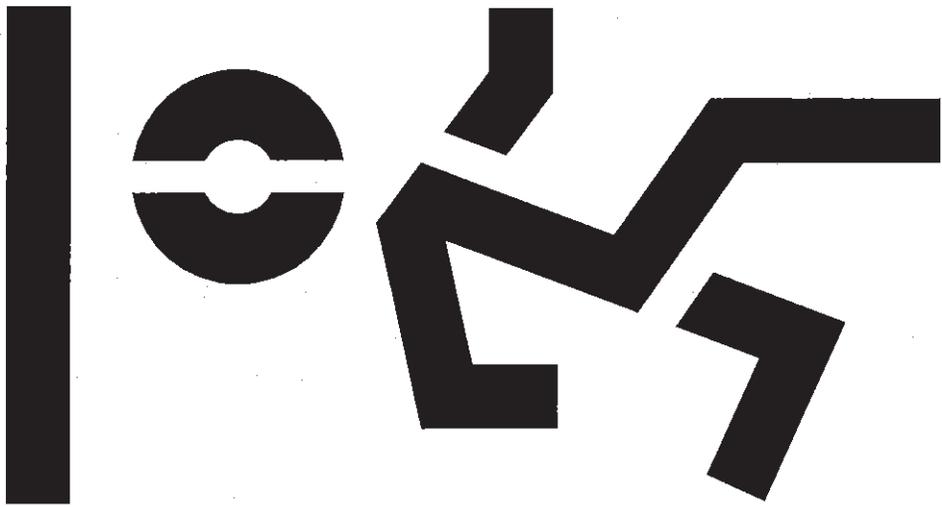
o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

/ ? : ; ! @ # \$ % & +

**IDENTITY AND BRANDING
ICONS**

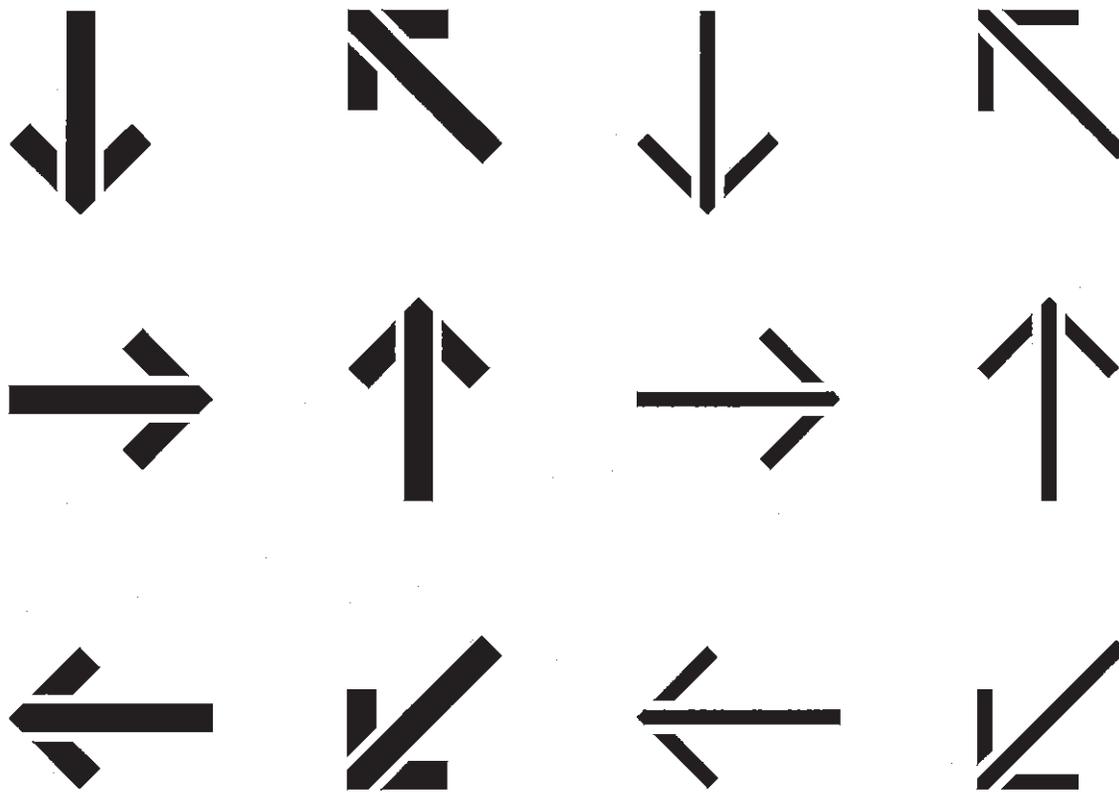
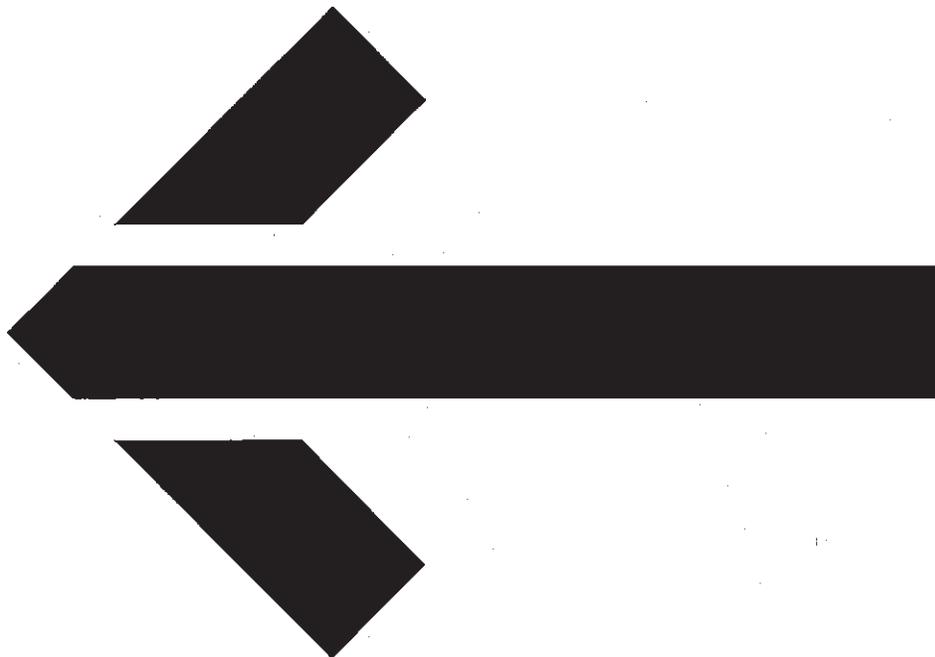
Icon set
An icon set can be created
using the same principals.



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IDENTITY AND BRANDING
ARROW SET

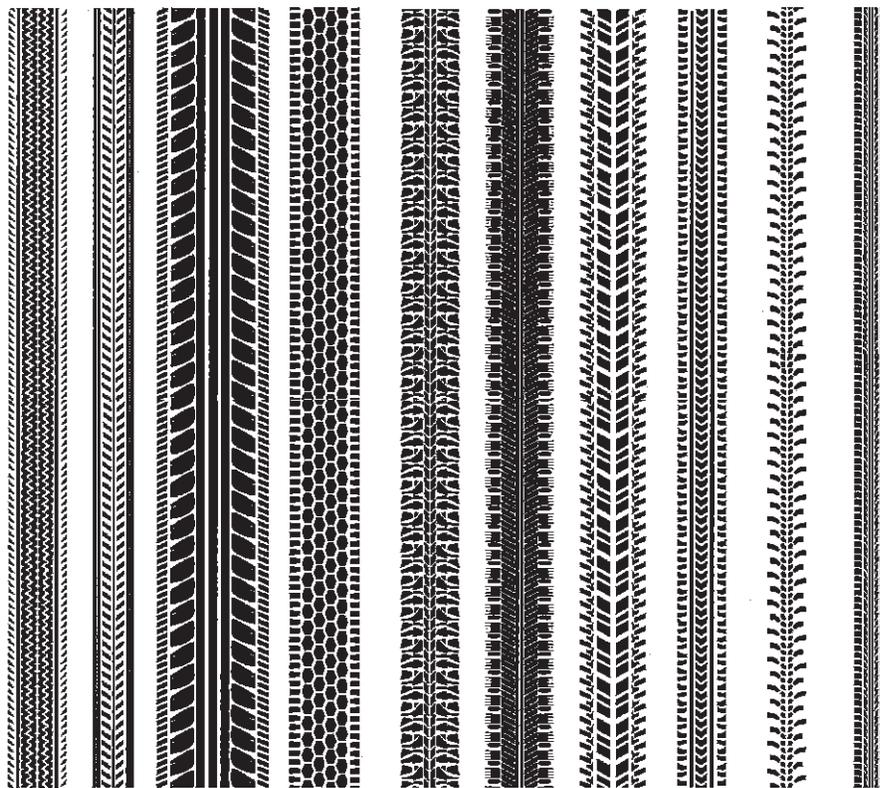
Arrow set
An arrow set can be created
using the same principals.



07

IDENTITY AND BRANDING BICYCLE INSPIRED GRAPHICS

In looking for elements that can amplify the unique nature of the Underline, bicycle tire tracks stand out as a relevant and reproducible marking that can be incorporated into the graphic identity of the project.



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WAYFINDING AND SIGNAGE

- COST EFFECTIVE
- INTEGRATED
- URBAN
- CLEAR

The wayfinding and signage strategy for the Underline is based on the following principles:

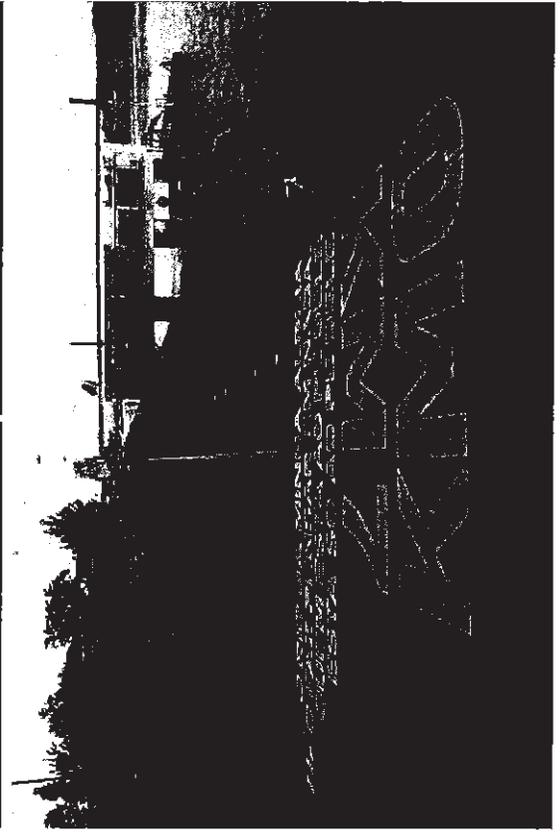
1. Encourage walking and commuting along the trail with an indication of distance and travel time.
2. Connect The Underline, and direct users, to surrounding trails and neighborhoods.
3. Encourage multi-modal transport.
4. Light touch. Minimize free standing signs and refrain from signs that attach to columns.



WAYFINDING AND SIGNAGE CASE STUDIES : LISBON BIKEWAY , LISBON PORTUGAL

Year Built: 2009
Length: 4.5 miles
Type of trail: off-road, multi-modal trail: two way dedicated cycle track with adjacent pedestrian path

While the Lisbon Bikeway is an international reference, governed by different cycle track marking and signaling criteria than those used in the United States, this project is a great example of how the use of a strong and distinctive graphic vocabulary can address practical wayfinding and regulatory requirements of a dedicated bicycle facility while incorporating unique features. In this project, the graphics are derived from the site's unique context through the introduction of a poem about the river that runs parallel to the path.



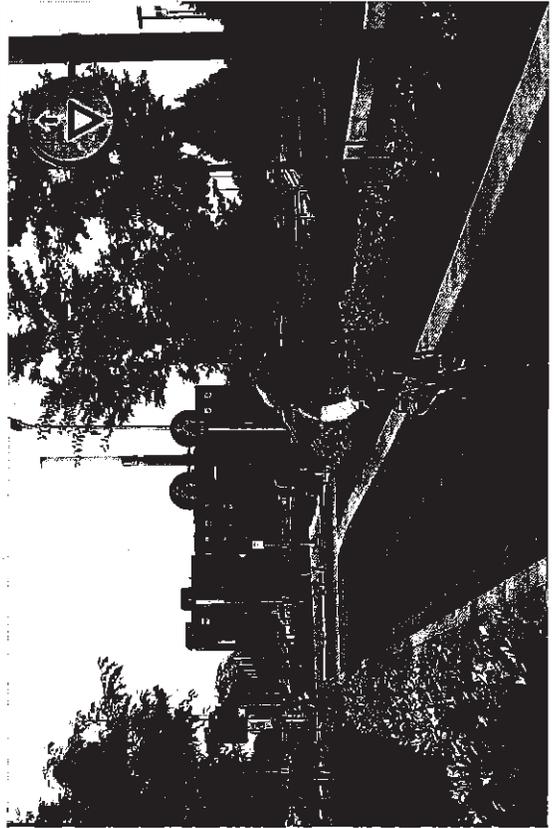
90

WAYFINDING AND SIGNAGE
CASE STUDIES : INDIANAPOLIS CULTURAL TRAIL, INDIANAPOLIS, INDIANA

Year Built: 2013
Length: 8 miles
Type of trail: off-road, multi-modal trail; two way dedicated cycle track with adjacent pedestrian path

The Indianapolis Cultural trail pavement markings and wayfinding system purposefully depart from typical MUTCD requirements in an effort to demarcate this designated bicycle facility as a unique off-road trail that is worthy of a custom system tailored to its immediate context and anticipated users.

The team composed of both private sector designers and government agencies including the local department of public works, under the review and purview of FHWA representatives, used engineering judgment allowances within the MUTCD to develop the unique markings and graphics.



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WAYFINDING AND SIGNAGE CASE STUDIES : TILIKUM CROSSING BRIDGE, PORTLAND, OREGON

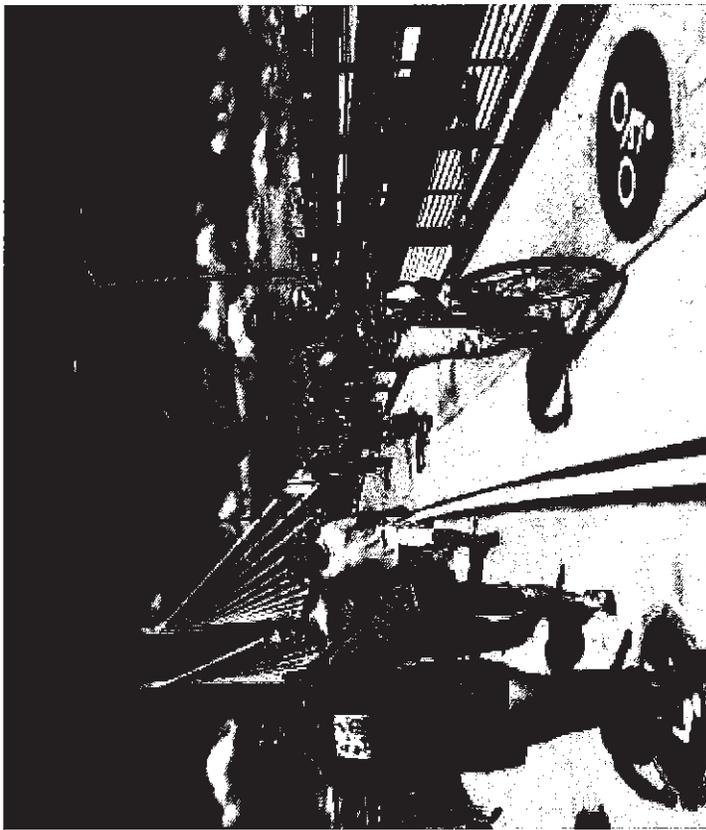
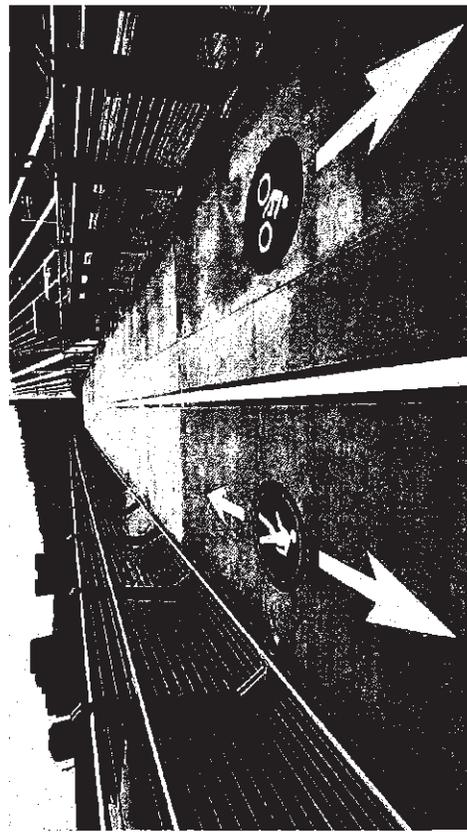
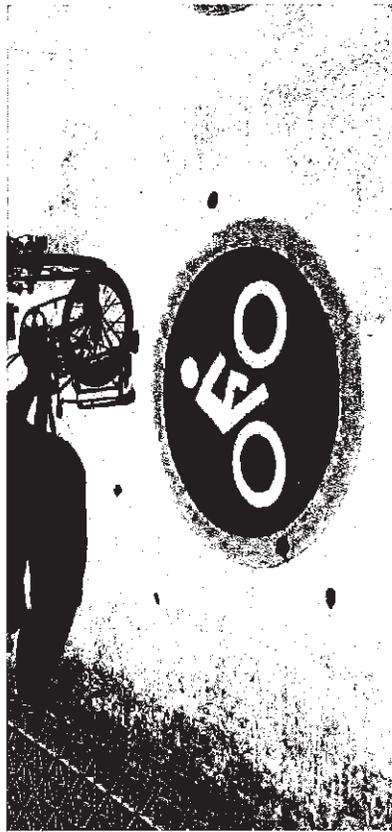
Year Built: 2015
Length: 1,700 feet
Type of trail: off-road, multi-modal bridge: one dedicated cycle line and one dedicated pedestrian path in each direction

The City of Portland metropolitan area's regional transit authority, TriMet, has recently instituted unique pavement markings on many of their off-road designated cycle tracks. The most recent of these projects is the Tilikum Crossing Bridge, a multi-modal bridge that includes designated pedestrian and bicycle lanes as well as buses, bikes, trains and streetcars.

For off-road dedicated paths and cycle tracks, TriMet has developed custom circle markings in two sizes, a 50 inch diameter and an 18 inch diameter. These are purposefully designed to be more compact and smaller than the standard MUTCD elongated path marker icon to be viewed from a cyclist or pedestrian perspective, rather than viewing by people driving in motor vehicles.

Similarly to the Indiana Cultural Trail, these pavement markings were developed as symbols for guidance based on engineering judgment permitted under the MUTCD section 3B.20, paragraph 2.

The Tilikum Bridge included FTA funding and its design was reviewed and approved by FTA.



02

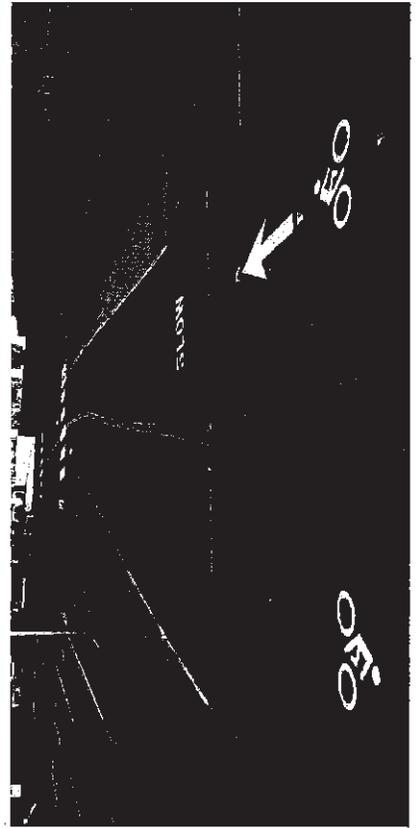
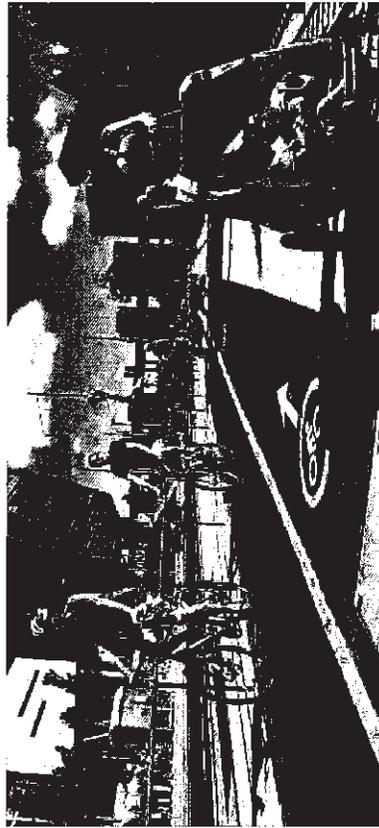
WAYFINDING AND SIGNAGE
CASE STUDIES : SW MOODY AVENUE, PORTLAND OREGON

Year Built: 2015
Length: N/A
Type of trail: off-road, two way dedicated cycle track with adjacent pedestrian path

The City of Portland metropolitan area's regional transit authority - TriMet - recently completed a path and marking improvements on South West Moody Avenue's cycle track, one of the most frequented bicycle facilities in Portland, Oregon.

Improvements include custom circular markings that indicate designated bicycle lanes and direction of travel over a custom green colored pavement. In some areas to further distinguish the designated cycle lane from the adjacent pedestrian walkway. Other segments of the path include concrete pavement with a black painted line separating the lanes of travel.

This project was developed by TriMet and received FTA funding.



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WAYFINDING AND SIGNAGE REGULATORY AND IDENTITY SIGNAGE

The Underline will be an off road, designated, two-way cycle track accompanied by a separated pedestrian walkway. As an off-road trail, with the majority of the corridor completely separated from vehicles, The Underline merits a custom palette of wayfinding, signage and pavement markings that is tailored to its unique context and users. With that in mind, signage and markings for The Underline corridor will be approached in two ways:

1- **Regulatory traffic control signage** required at intersections with cross streets or other on-road bicycle facilities will follow all MUTCD requirements for signs and markings. The location of these regulatory elements will be limited to intersections where The Underline corridor right-of-way stops and the cross street right-of-way takes precedent. These limits will be physically established as the area between the face of the first set of columns abutting the cross street corridor.

2- **Custom signage and markings** will be installed within The Underline right-of-way only, where the trail is designated exclusively for cyclists and pedestrians. The design of these markings will pursue allowances for engineering judgement under the MUTCD to ensure their size, placement and graphics meet all of the criteria for comprehension from a cyclist and pedestrian perspective.

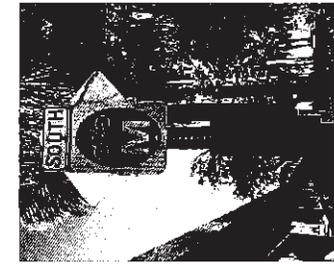


94

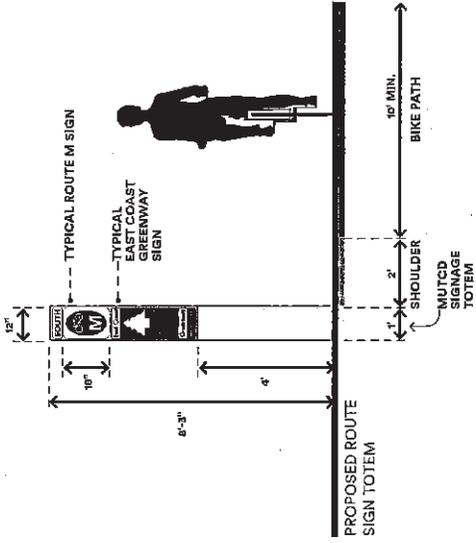
WAYFINDING AND SIGNAGE REGULATORY AND IDENTITY SIGNAGE

The Underline will be an off road, designated, two-way cycle track, situated within the larger East Coast Greenway network that connects Miami to Maine. Required signs identifying this route will be installed on a "totem" structure located within the cross street right-of-way along with any other MUTCD required regulatory signage.

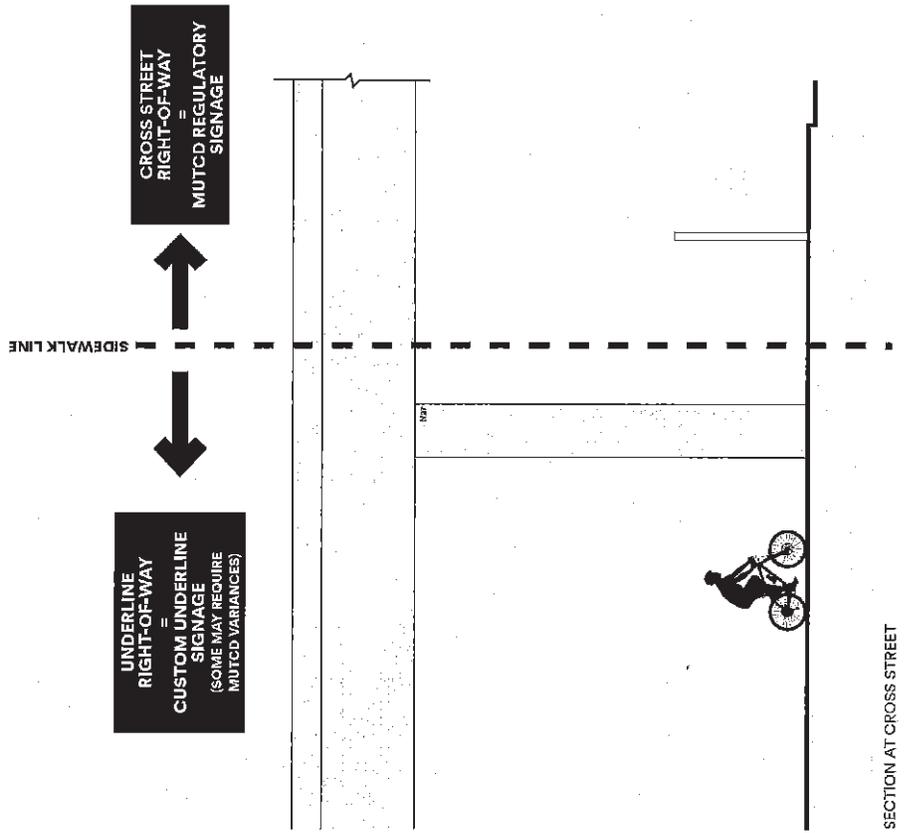
Entries into The Underline corridor will be clearly demarcated with The Underline name, stenciled in bold letters on the face of the first column facing a cross street and / or intersection.



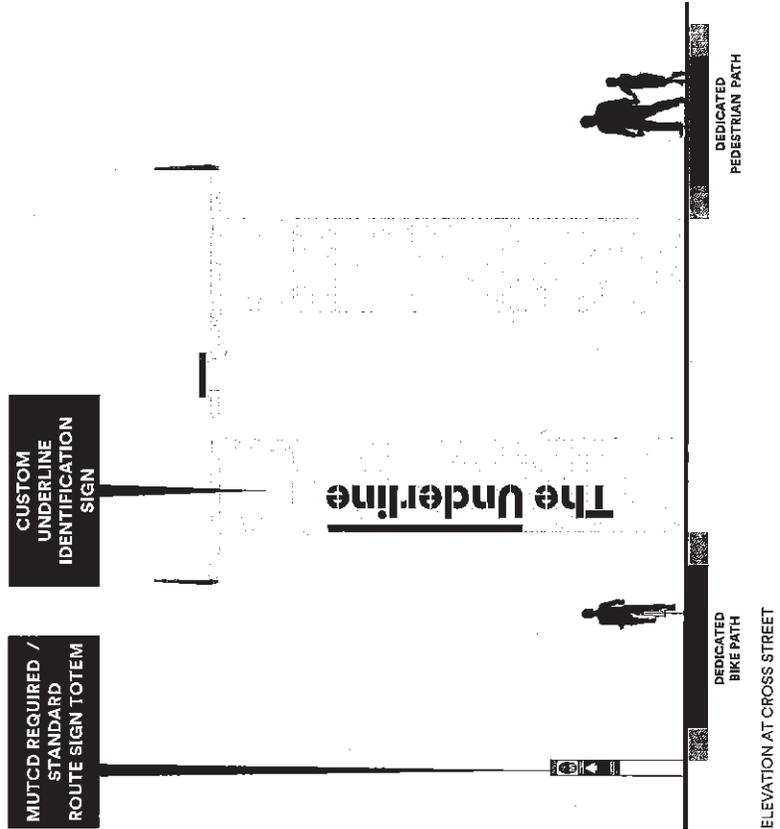
EXISTING ROUTE SIGNS



PROPOSED ROUTE SIGN TOTEM



SECTION AT CROSS STREET



ELEVATION AT CROSS STREET

- 1. ENCOURAGE WALKING AND COMMUTING ALONG THE TRAIL WITH AN INDICATION OF DISTANCE & TIME.**
- 2. CONNECT THE UNDERLINE, AND DIRECT USERS, TO SURROUNDING TRAILS AND NEIGHBORHOODS.**
- 3. ENCOURAGE MULTI-MODEL TRANSPORT.**
- 4. LIGHT TOUCH. MINIMIZE FREE STANDING SIGNS AND REFRAIN FROM SIGNS THAT ATTACH TO COLUMNS.**

9/6

WAYFINDING AND SIGNAGE PREDICTED USERS AND THEIR NEEDS

Locals using The Underline for:

Recreation
(eg. riding/walking the trail for enjoyment)

Exercise

(eg. running clubs, joggers, bikers, yoga, etc.)

Park/green space

(eg. visiting a small section of the park)

Commuting

(eg. walking, jogging, cycling to work)

Special events

(eg. a movie screening)

These users require the lightest touch of wayfinding/signage. They generally know where they are, where they are going, and how to access The Underline.

One key group is the exercisers. There are numerous ways we can enhance their enjoyment with signage (eg. mile markers, pavement markings).

Visitors using The Underline for:

Recreation
(eg. riding/walking the trail for enjoyment)

Exercise

(eg. joggers, bikers, yoga, etc.)

An attraction

(eg. visiting a small section of the park or a plaza)

Special events

(eg. a movie screening)

Being unfamiliar with The Underline and the surrounding areas, visitors require heavier signing and rely more on directional wayfinding.

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Someone arrives
at the underline:

1. Where am I
(along The Underline)?

University Station
Mile 5.2

2. Which direction am I facing?

Downtown ⇌

3. Where can I go from here?

⇌ **South Miami Station**

4. What is around me?

 **Restrooms**

98

WAYFINDING AND SIGNAGE
DISTANCE MARKERS

Distance markers

As a linear path, we think it's important to regularly sign miles, kilometers, and walking time.

Idea

We propose including mile and kilometer readings at a regular, predictable interval.

Frequency of signs TBD, but a mile marker should always be visible to someone wherever they are on the path.

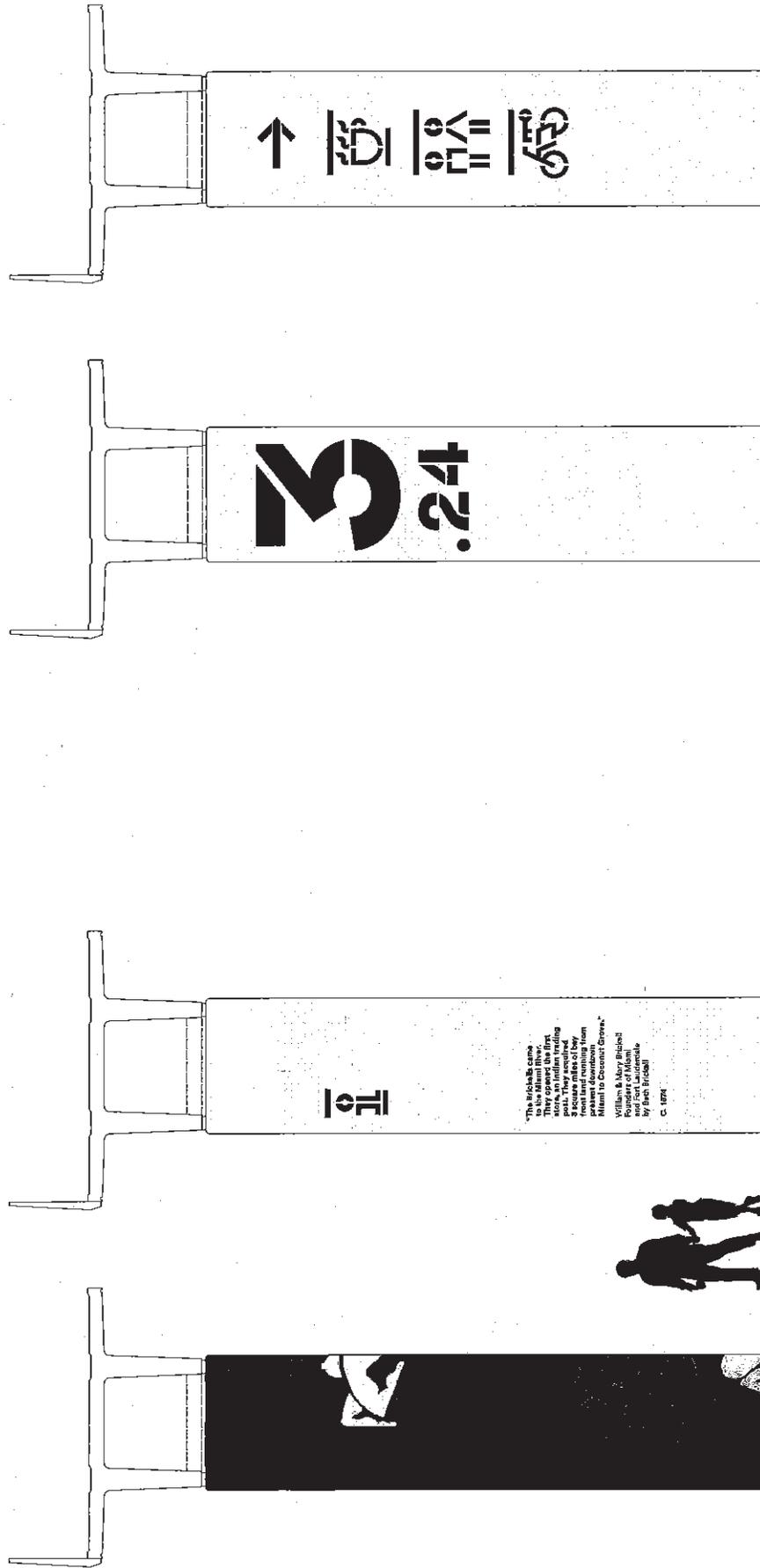
3.24 mile

5.28 km

99

**WAYFINDING AND SIGNAGE
COLUMN THEORY**

1. **Art**
Created by local artists from the Miami area.
2. **Interpretive**
Facts and information about specific locations.
3. **Mile markers**
Consisting of miles and kilometers.
4. **Wayfinding**
Shows significant types of amenities.



100

**WAYFINDING AND SIGNAGE
COLUMN THEORY**

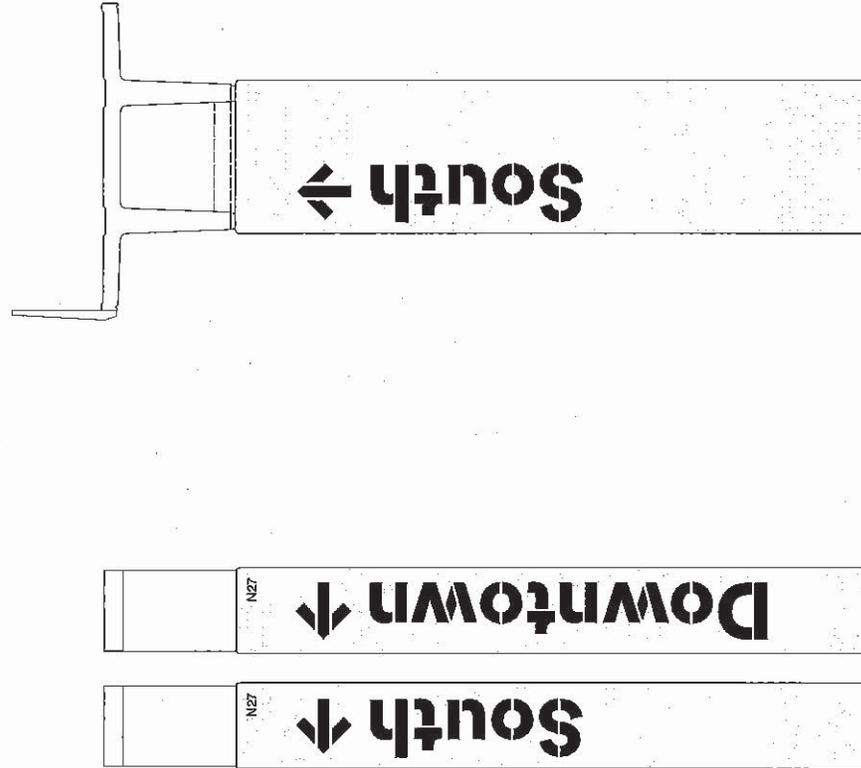
5. Entrances

5b. Entrances



6. Directional Marker

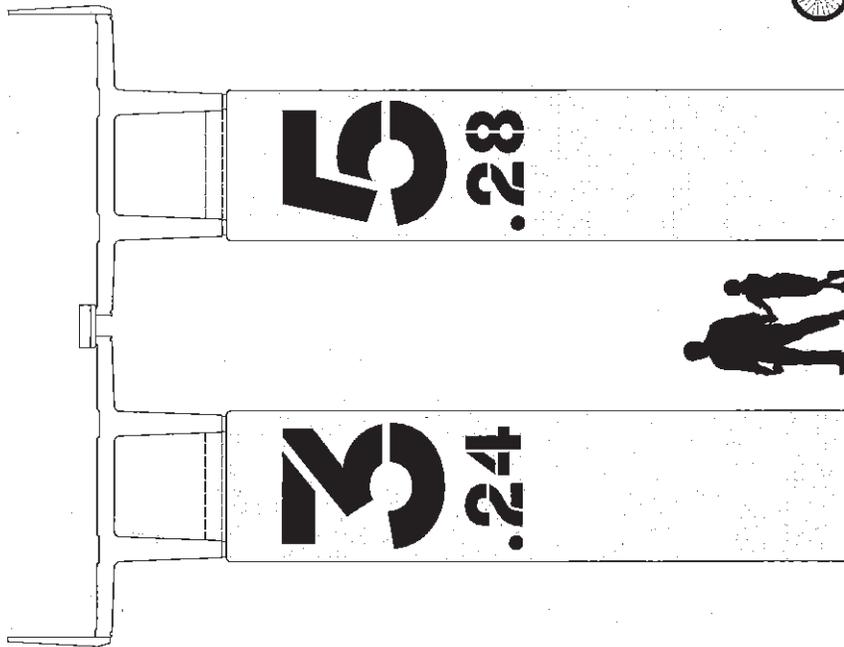
6b. Directional Marker



WAYFINDING AND SIGNAGE DISTANCE MARKERS

Miles
Other side of column displays distance for that direction.

Kilometer
Other side of pylon displays distance for that direction.



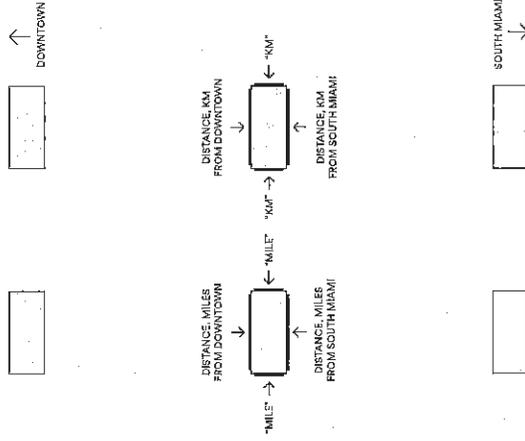
Profile
km



Profile
Miles



Both sides of pylon display unit of measure so they can be seen irrespective of where the bike/walk path is.



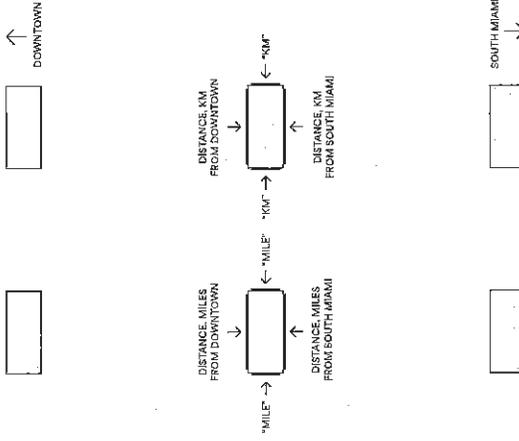
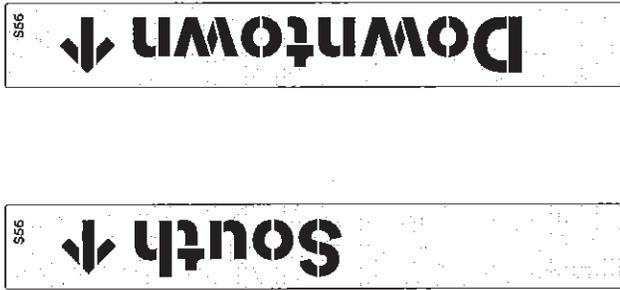
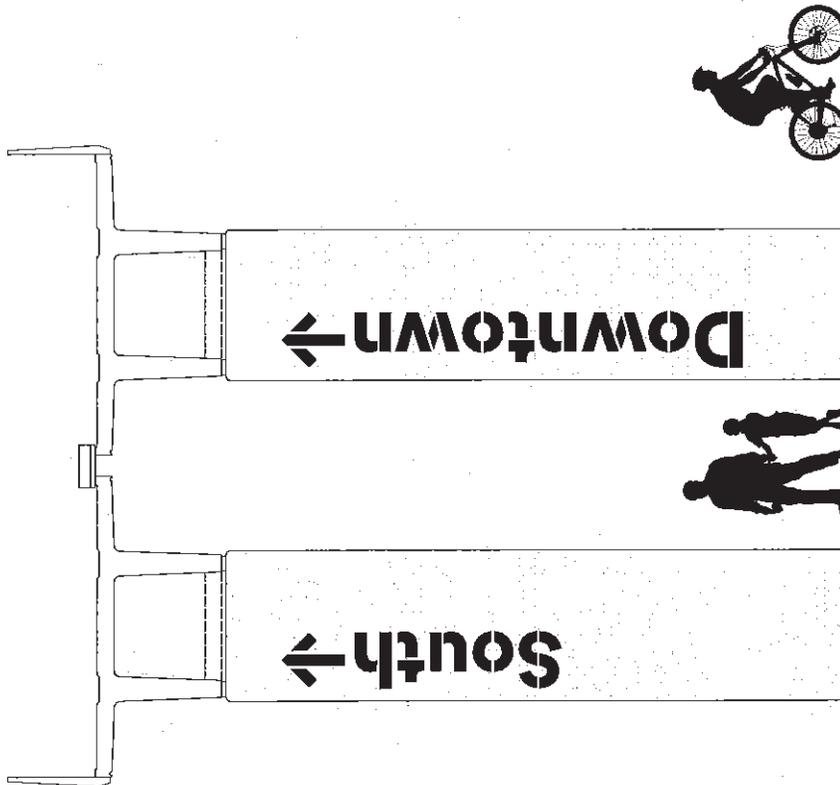
102

**WAYFINDING AND SIGNAGE
DIRECTIONAL MARKERS**

Directional signage
Painted on the outside of pylons.

Inside signage
Painted on the inside
of pylons.

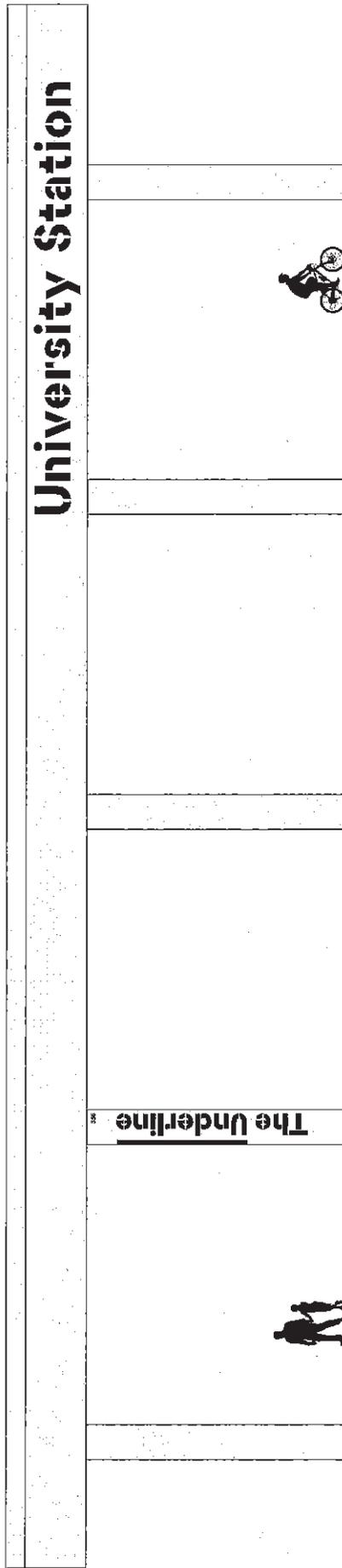
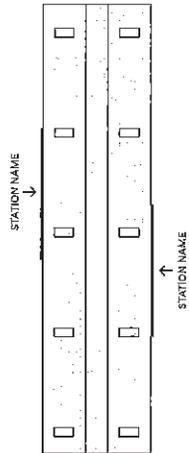
Both sides of pylon
display unit of measure
so they can be seen
irrespective of where
the bike/walk path is.



WAYFINDING AND SIGNAGE
STATION NAMES

Station names
 Station names signal a destination. Positioned alongside the guideway.

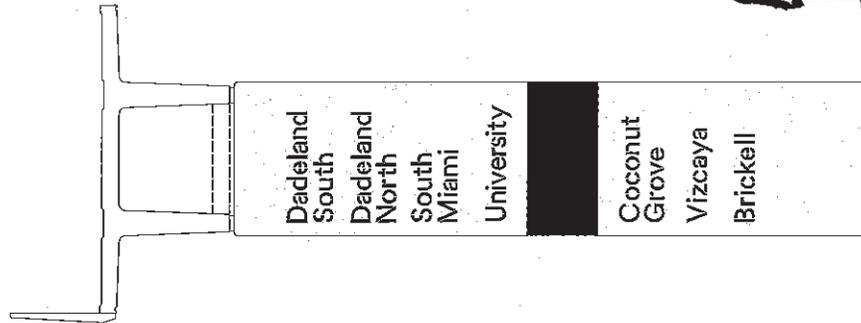
Material
 Painted lettering on the pylons and structure with stencils.



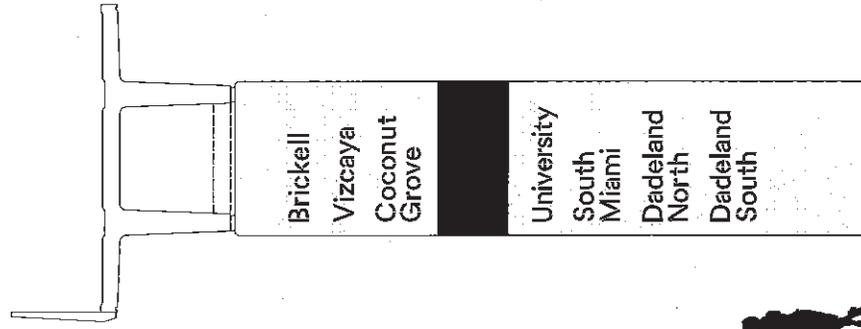
104

**WAYFINDING AND SIGNAGE
COLUMN MAP**

Side 1
At entrance near station



Side 2
At entrance near station



Side 3
At entrance near station



Side 4
At entrance away from station
(side 1 & 2 not marked)



105

WAYFINDING AND SIGNAGE FREESTANDING MAP

Path diagram

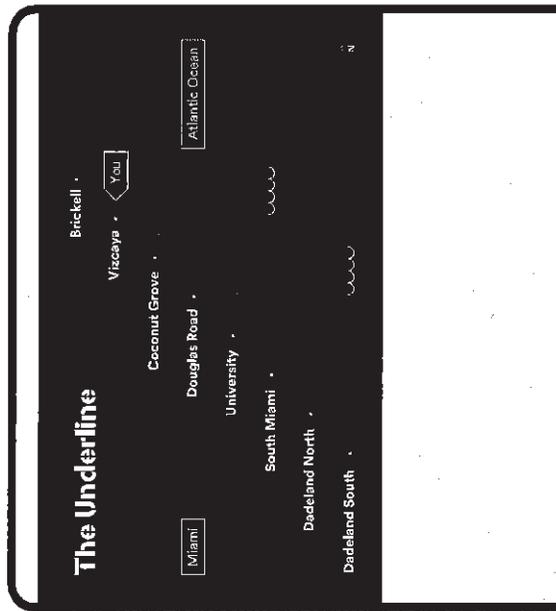
Potential, detailed free standing map located at entrances, JCFO to structure in line with other furniture.

Destinations and/or trail connections could be incorporated if desired.

Donor signage / recognition

Potential example of donor recognition that is incorporated into the back of freestanding maps.

Front



Back

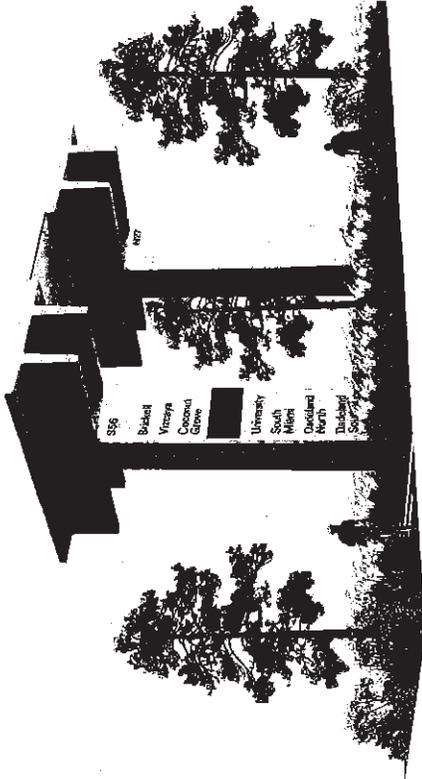


106

**WAYFINDING AND SIGNAGE
COLUMN GRAPHICS**



TYPE 5 | ENTRANCES AT INTERSECTIONS



TYPE 7 | MAP AT STATIONS



TYPE 6 | DIRECTIONAL MARKERS

108

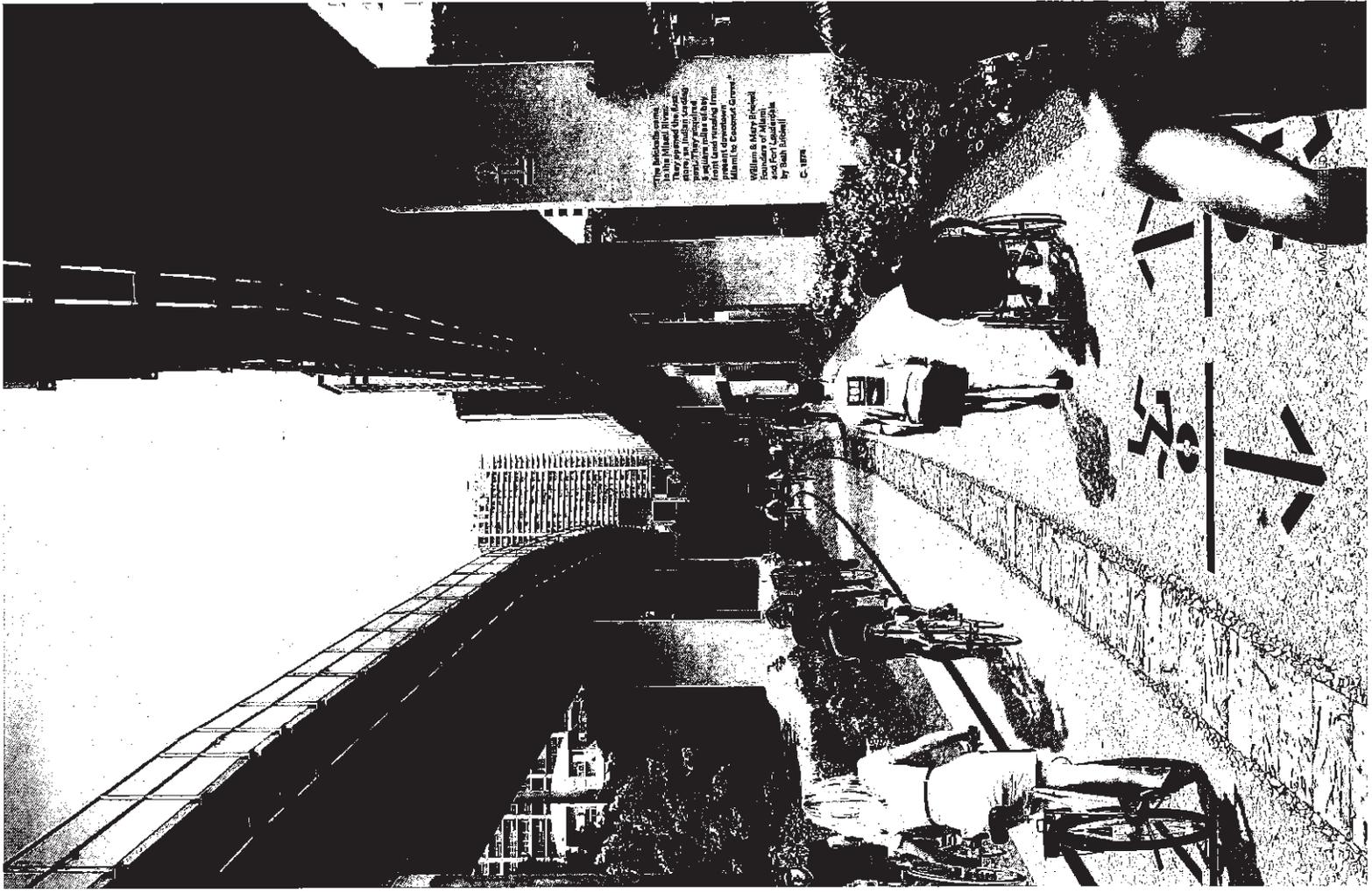
PATHS

- PRACTICAL
- LIGHT COLORED
- DURABLE
- DISTINGUISHABLE

The pedestrian and bicycle paths of The Underline are the park's most extensive and consistent design element. As such, their design needs to be practical, durable and cost effective while also unique and aid in defining of The Underline corridor.

To that end, the design of the paths seek to utilize a robust material palette composed primarily of asphalt with a light colored aggregate that can serve as a backdrop for strong graphic markings that further expand The Underline brand and reduce the urban heat island effect by increasing reflectivity and therefore lowering temperatures of the pavement.

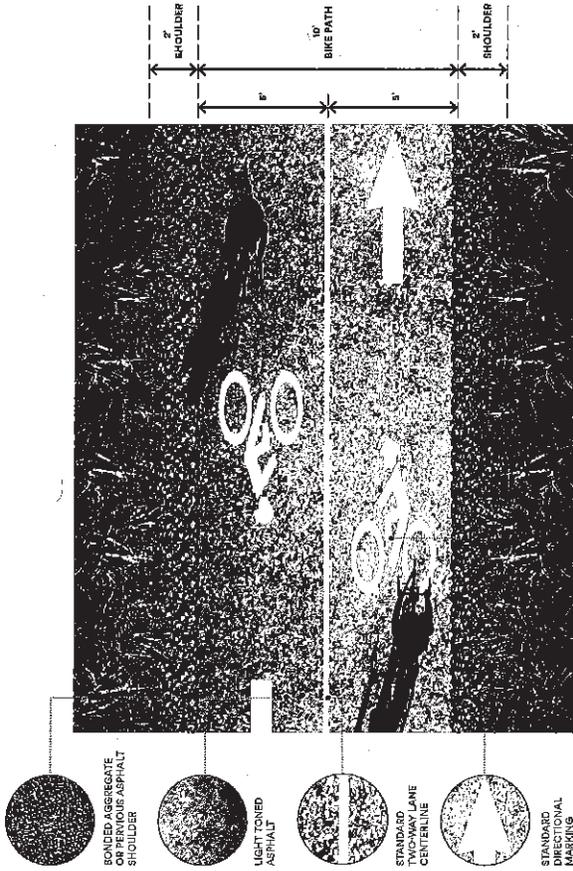
The master plan designs propose that many of the path markings be custom when located within The Underline right-of-way only, where the trail is designated exclusively for cyclists and pedestrian, without vehicle traffic. The design of these custom markings will pursue allowances for engineering judgement under the MUTCD to ensure their size, placement and graphics meet all if the criteria for comprehension from a cyclist or pedestrian perspective.



The Underline is a public space that is designed to be a place where people can walk, run, and bike. It is a place where people can connect with each other and with the city. The Underline is a public space that is designed to be a place where people can walk, run, and bike. It is a place where people can connect with each other and with the city.

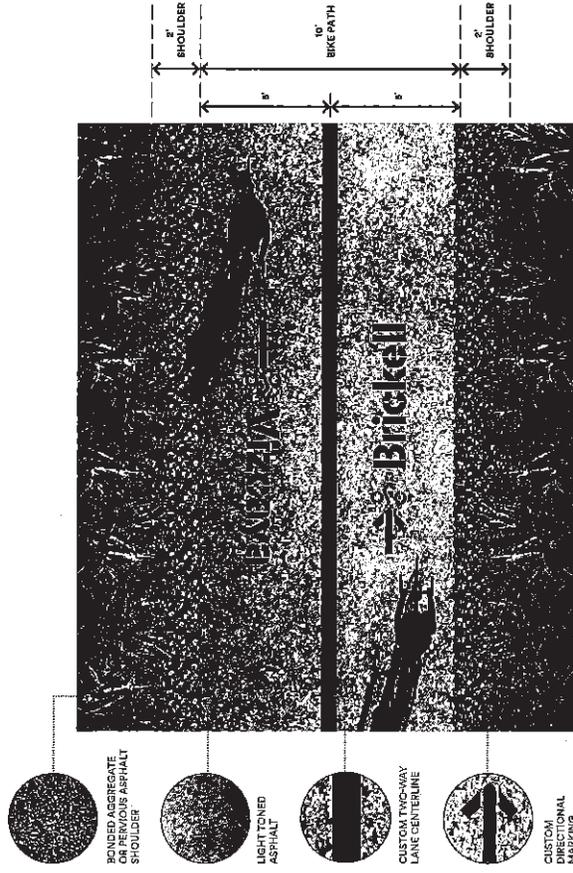
William & Mary School
Founders of Miami
and Fort Lauderdale
by John J. Sorell
© 1988

PATHS
TYPICAL PATH DESIGN WITH STANDARD MARKINGS

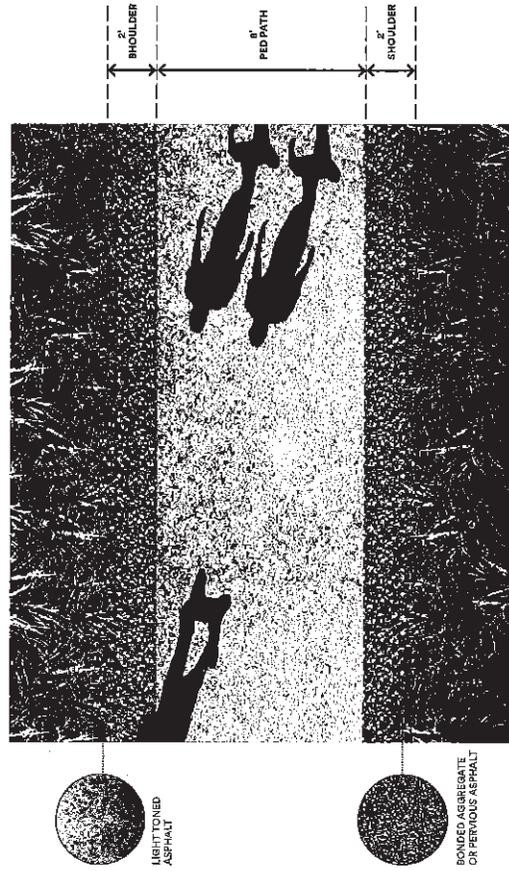


TYPE 1 | TYPICAL DEDICATED, TWO-WAY BIKE PATH WITH STANDARD MARKINGS

PATHS
TYPICAL PATH DESIGN WITH PROPOSED CUSTOM MARKINGS



TYPE 1 | TYPICAL DEDICATED, TWO-WAY BIKE PATH WITH PROPOSED CUSTOM MARKINGS



TYPE 2 | TYPICAL DEDICATED PEDESTRIAN PATH

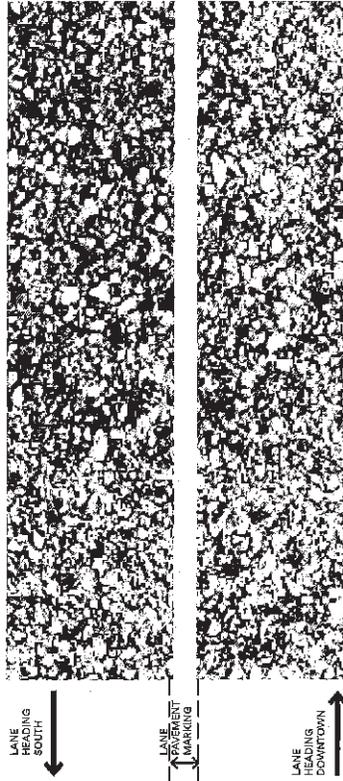


TYPE 2 | TYPICAL DEDICATED PEDESTRIAN PATH

PATHS STANDARD PAVEMENT MARKINGS

TWO-WAY BICYCLE LANE MARKING

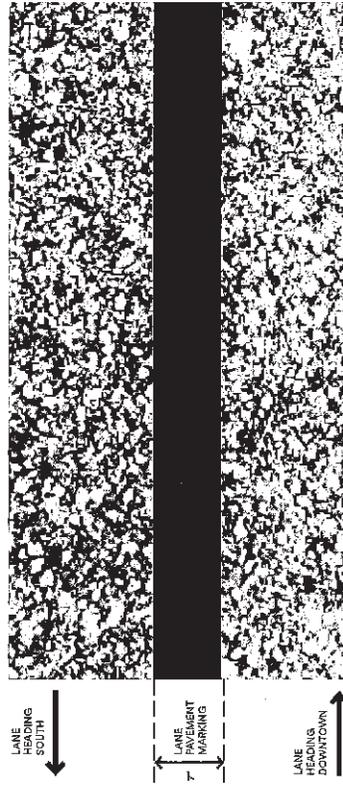
Recommended feature: A solid yellow centerline is typically used to separate two-way bicycle traffic. A dashed yellow centerline is used to indicate passing is allowable.*



PATHS PROPOSED CUSTOM PAVEMENT MARKINGS

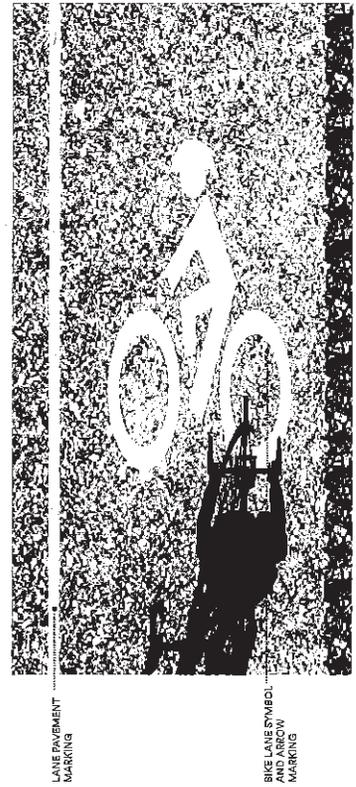
TWO-WAY BICYCLE LANE MARKING

Proposed: For The Underline, we propose changing this graphic to a solid green line with a geometric bicycle tire marking on top. The use of the color green, recently adopted by many US cities to designate and distinguish bicycle facilities, further reinforces The Underline as a dedicated bicycle facility and differentiates it from a typical roadway.



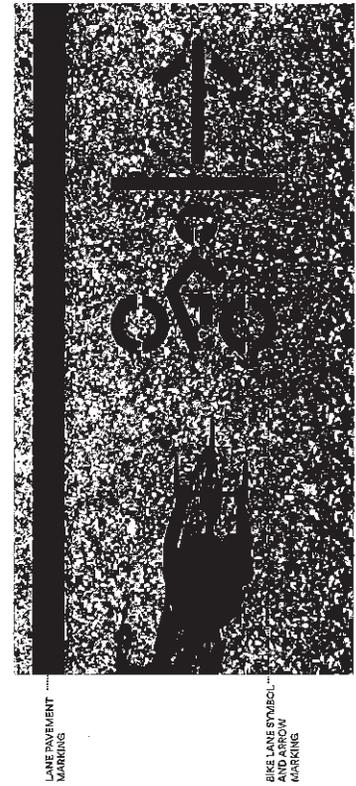
TWO-WAY BICYCLE LANE DIRECTIONAL MARKING

Required feature: Bicycle lane word, symbol, and/or arrow markings (MUTCD Figure 9C-3) shall be placed at the beginning of a cycle track and at periodic intervals along the facility to define the bike lane direction and designate that portion of the street for preferential use by bicyclists*



TWO-WAY BICYCLE LANE DIRECTIONAL MARKING

Proposed: For the Underline, we propose a unique symbol and arrow, in-keeping with the overall proposed wayfinding and signage vocabulary. Similar to the MUTCD symbols, the proposed graphic includes a cyclist with two legs and a helmet.

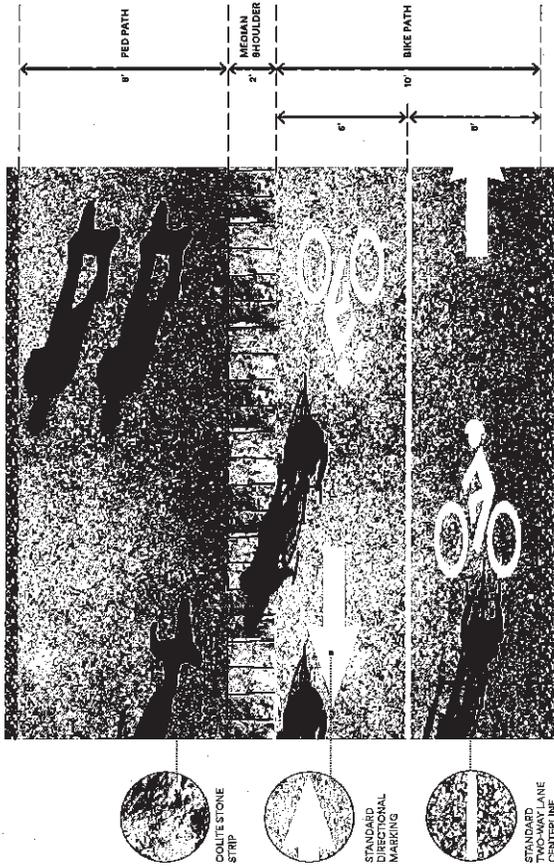


PATHS TYPICAL PATHS WITH STANDARD MARKINGS

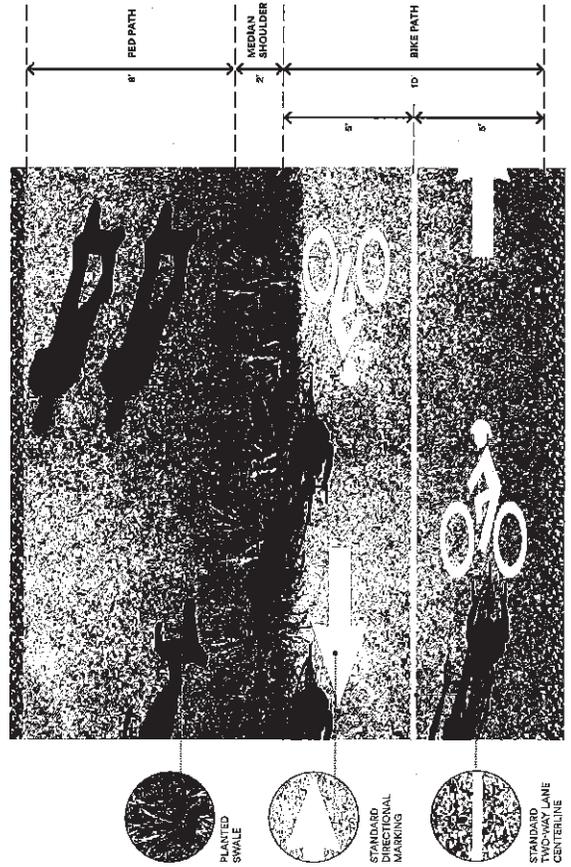
BICYCLE AND PEDESTRIAN LANE SEPARATORS

Recommended feature: If configured at a height flush with the sidewalk, color, pavement markings, textured surfaces, landscaping, or other furnishings should be used to discourage pedestrian use of the cycle zone.

Proposed: For The Underline, we propose a textured coltite stone strip or a planted swale that can also collect and filter path water run-off.

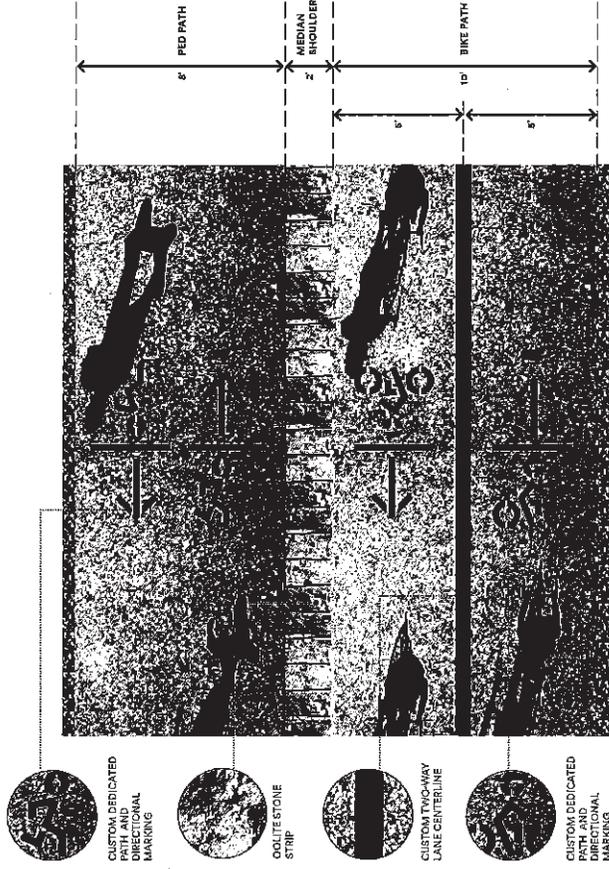


TYPE 3 | PEDESTRIAN AND BIKE PATH DELINEATION TYPE A WITH STANDARD MARKINGS

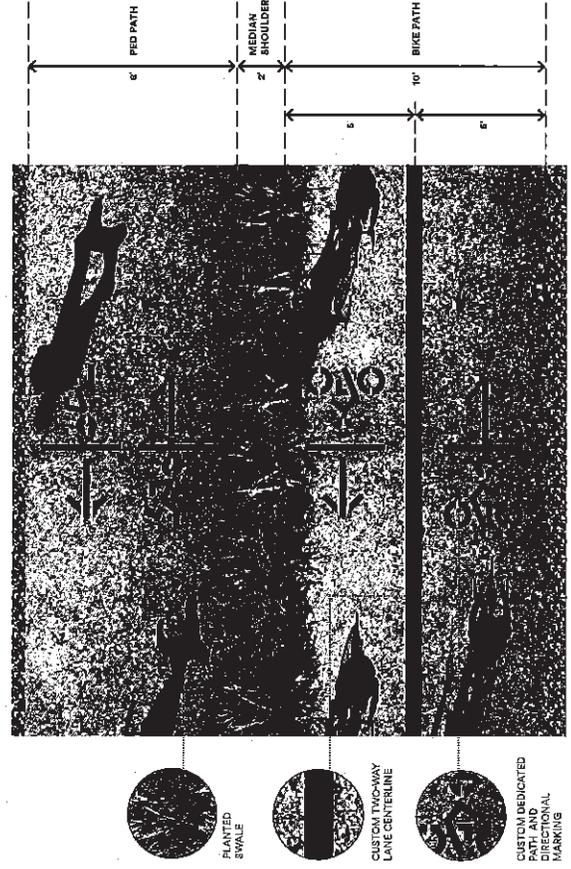


TYPE 4 | PEDESTRIAN AND BIKE PATH DELINEATION TYPE B WITH STANDARD MARKINGS

PATHS TYPICAL PATHS WITH PROPOSED CUSTOM MARKINGS



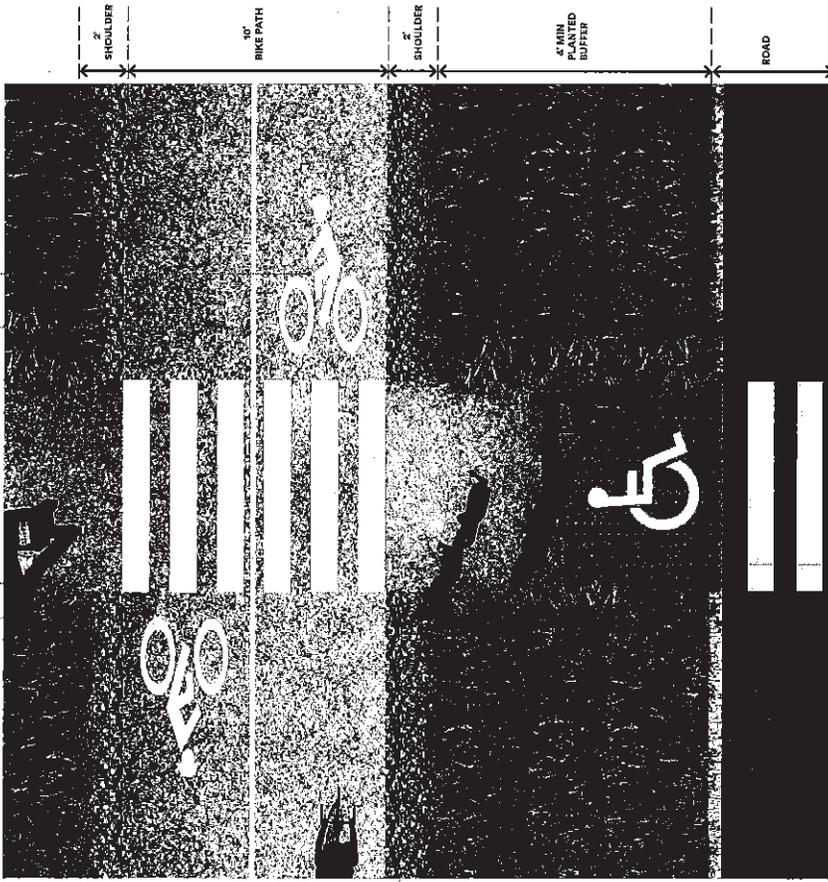
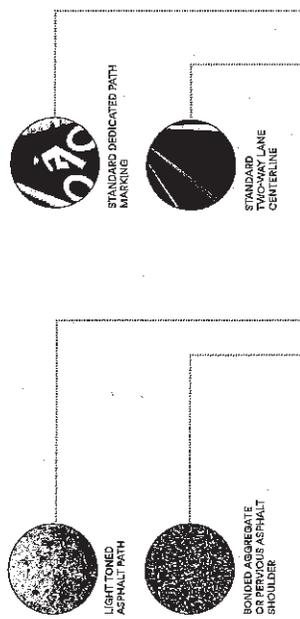
TYPE 3 | PEDESTRIAN AND BIKE PATH DELINEATION TYPE A WITH CUSTOM MARKINGS



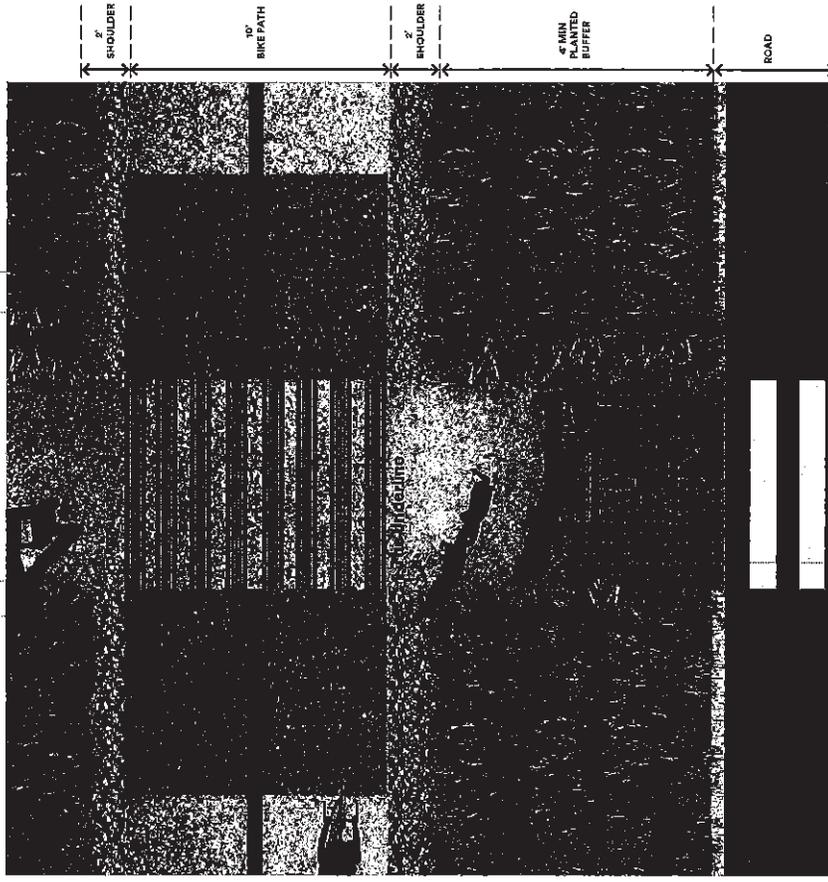
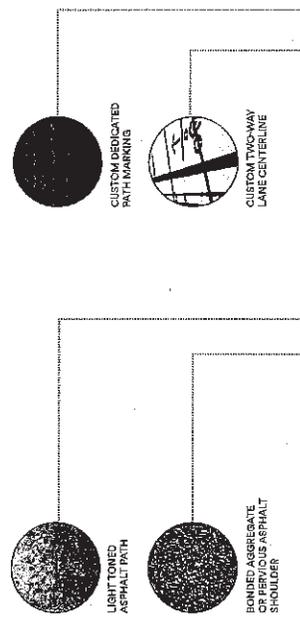
TYPE 4 | PEDESTRIAN AND BIKE PATH DELINEATION TYPE B WITH CUSTOM MARKINGS

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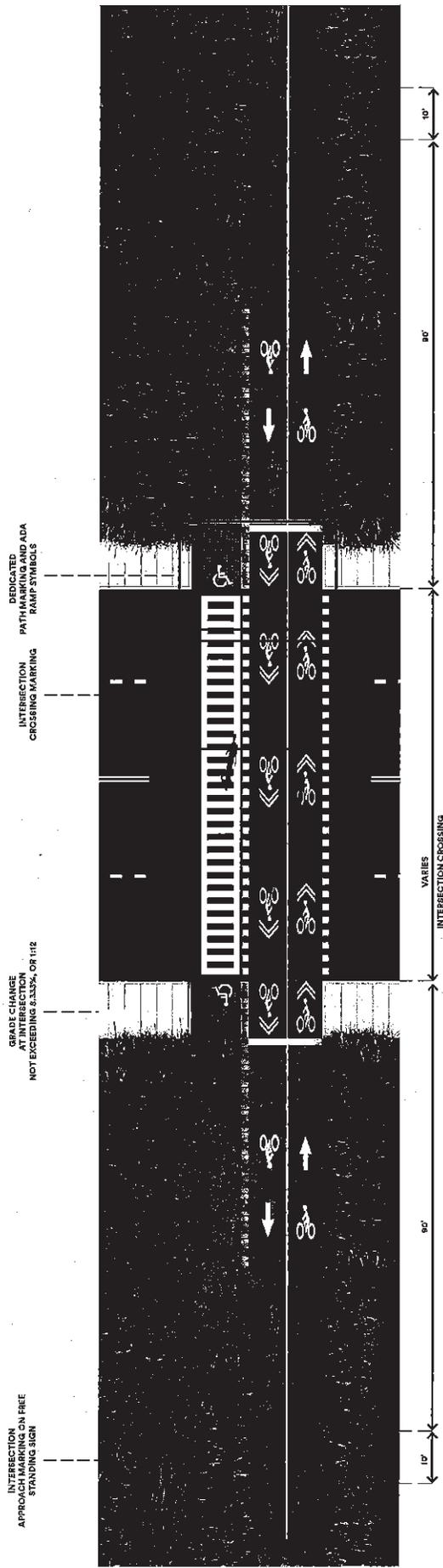
PATHS
STANDARD PATH MARKINGS AT PEDESTRIAN CROSSING



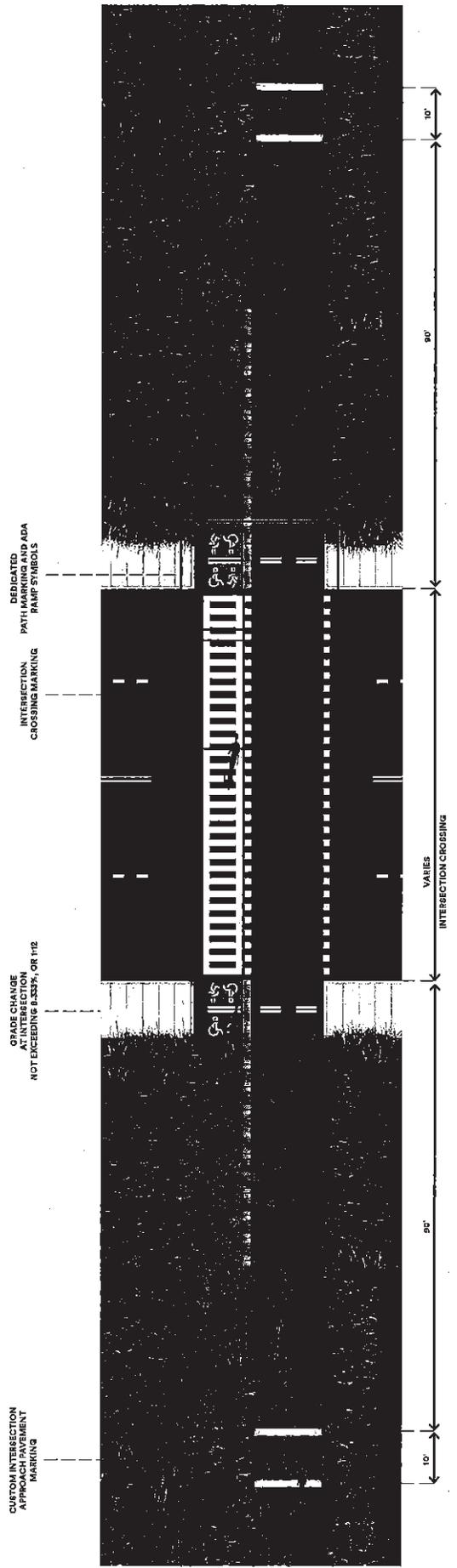
PATHS
PROPOSED CUSTOM PATH MARKINGS AT PEDESTRIAN CROSSING



INTERSECTIONS LAYOUT WITH STANDARD MARKINGS



INTERSECTIONS LAYOUT WITH PROPOSED CUSTOM MARKINGS



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INTERSECTIONS PAVEMENT MARKINGS

INTERSECTION APPROACH MARKING

Recommended feature: Pavement markings should be used on slopes from raised cycle tracks to slow bicyclist speed prior to the transition out of the cycle track, and to warn users of potential conflicts with motor vehicles*

Proposed: One hundred feet away from the intersection, a pavement marking will warn cyclists of the intersection approach.



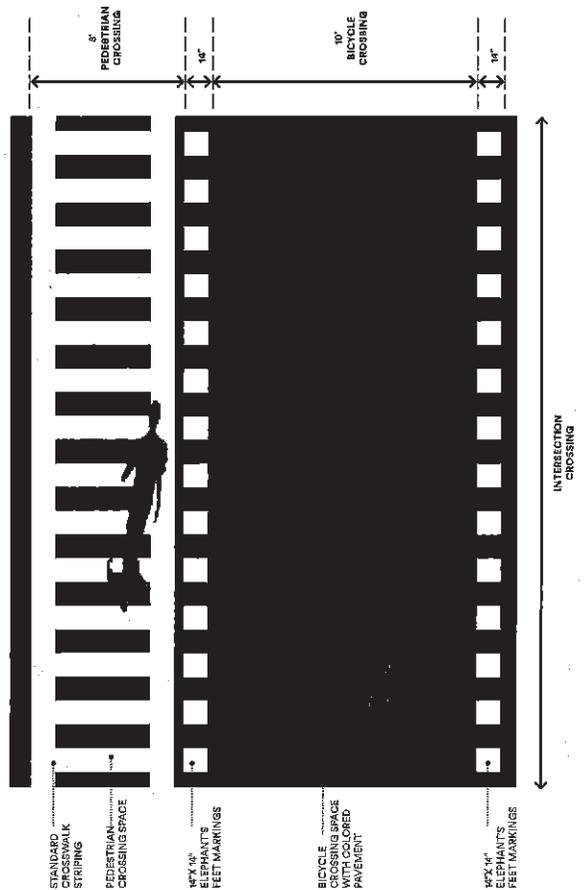
LANE PAVEMENT MARKINGS
INTERSECTION WARNING

INTERSECTION CROSSING MARKING

Required feature: Dotted lines shall bind the bicycle crossing space.*

Optional Feature: Elephant's feet markings may be used as an alternative to dotted line extensions to offer increased visibility. If used, the markings should be 14 to 20 inches square, with equal distance spacing between markings. Markings should be positioned on outside of lane.*

Proposed: For the Underline, we propose both the bicycle crossing space be bound by elephant's feet markings and highlighted with green colored pavement in order to increase vehicle visibility of crossing.

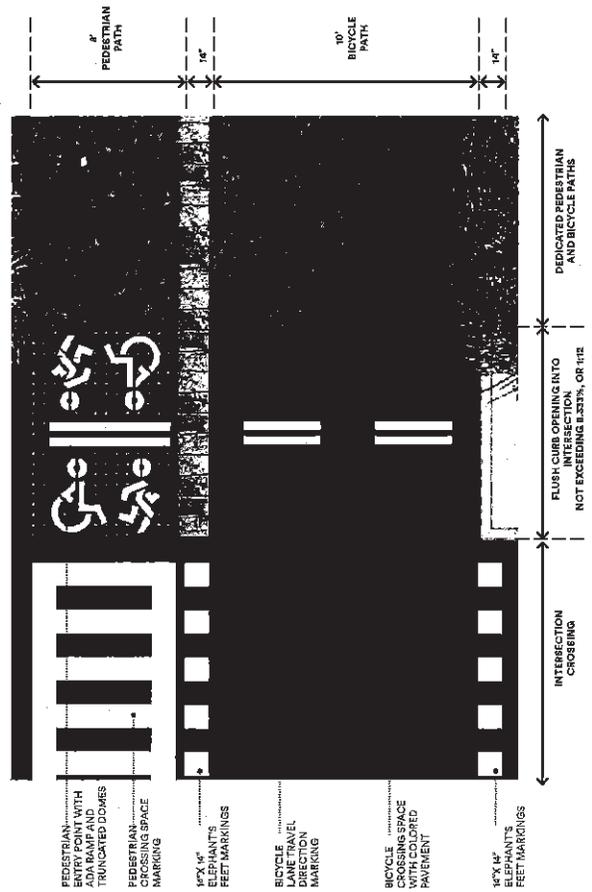


* as per NACTO.org bikeway design guidelines FRAMEWORK PLAN, THE UNDERLINE, MIAMI

DEDICATED PATH MARKING

Recommended feature: On crossings of two-way paths and cycle tracks, markings should indicate that there is two-way traffic either by marking the path center line through the intersection, or by marking bicycle silhouettes and / or chevrons in opposite directions in the two lanes.*

Proposed: For the Underline, we propose the bicycle lanes include pavement markings indicating their designation as a dedicated path, using a bike symbol and the color green and each lane's direction of travel. The pedestrian lane will be marked with a pedestrian and ADA symbol at its point of entry and typical pedestrian crossing markings along its length within the intersection.



* as per NACTO.org bikeway design guidelines JAMES CORNER FIELD OPERATIONS

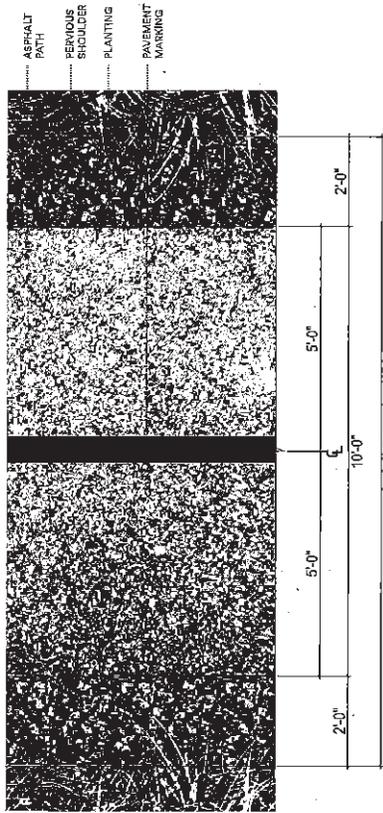
115

PATHS TYPICAL PATH DESIGN AND MATERIALS

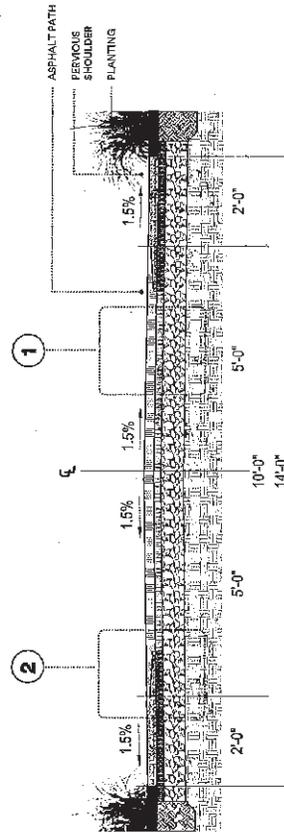
TYPICAL PATH MATERIALS

The material for the typical Underline path, both for pedestrians and cyclists, is proposed as light colored asphalt. Asphalt is the most effective surface for cycling. A light colored aggregate will also minimize heat absorption against the hot tropical sun.

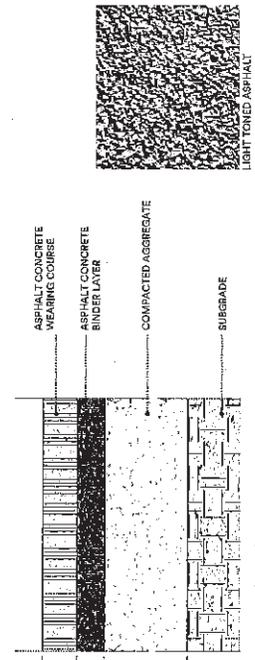
Two materials are being explored for the two-foot shoulder: pervious asphalt or bonded aggregate. Both materials are porous and ADA accessible



TYPICAL PATH PLAN



TYPICAL PATH SECTION



1 TYPICAL ASPHALT BIKE PATH PAVING DETAIL

TYPES OF PAVEMENT MARKING MATERIALS*

Colored pavement is proposed in limited locations as a treatment for a conflict area or intersection crossing marking, as a means to incorporate wayfinding and guidance graphics on the path or to indicate cycle path lanes. Colored pavement for use within bikeways may take the form of an overlay, when the colored material is placed on top of the pavement or be embedded, when the colored material is mixed into the pavement. Below is a summary of the different treatment types commonly used for bicycle facilities. Further research on the selection of the appropriate treatment for The Underline will be developed in future phases of detailed design.

PAINT

Recommended for temporary, pilot, or experimental spot treatments. Must be retroreflective when used for traffic control.

Pros: Easy application and moderate dry time.

Cons: Proven to wear quickly in areas with moderate to heavy motor vehicle traffic.

DURABLE LIQUID PAVEMENT MARKINGS (DLPM)

These include epoxy and Methyl Methacrylate (MMA). MMA is more appropriate for spot treatments than epoxy. Must be retroreflective when used for traffic control.

Pros: Material is durable if installed according to manufacturer specifications. MMA has quick dry times and good durability.

Cons: Epoxy can have long dry times, causing increased disruption to roadway traffic. Requires special installation equipment.

THERMOPLASTIC

Recommended for spot treatments. Ideal for intersection treatments and other high-traffic conflict areas. Must be retroreflective when used for traffic control.

Pros: Quick cure time minimizes traffic impact. Relatively low-cost equipment investment. Easy spot maintenance. Shown to wear well in conflict areas.

Cons: May be cost-prohibitive for large scale applications. Requires special installation equipment.

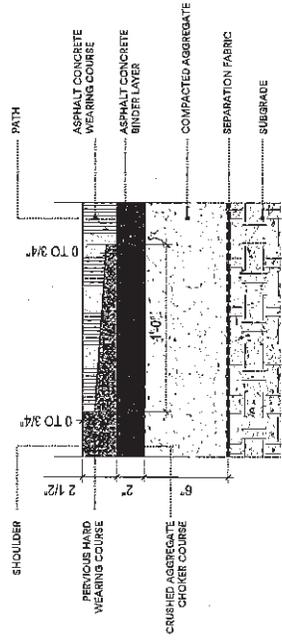
COLORED ASPHALT

Recommended for corridor treatments.

Pros: Integral to path construction.

Cons: Spot maintenance is difficult and may result of color loss when trenching occurs. Requires equipment and expertise to install.

* sources: NACTO.org bikeway design guidelines

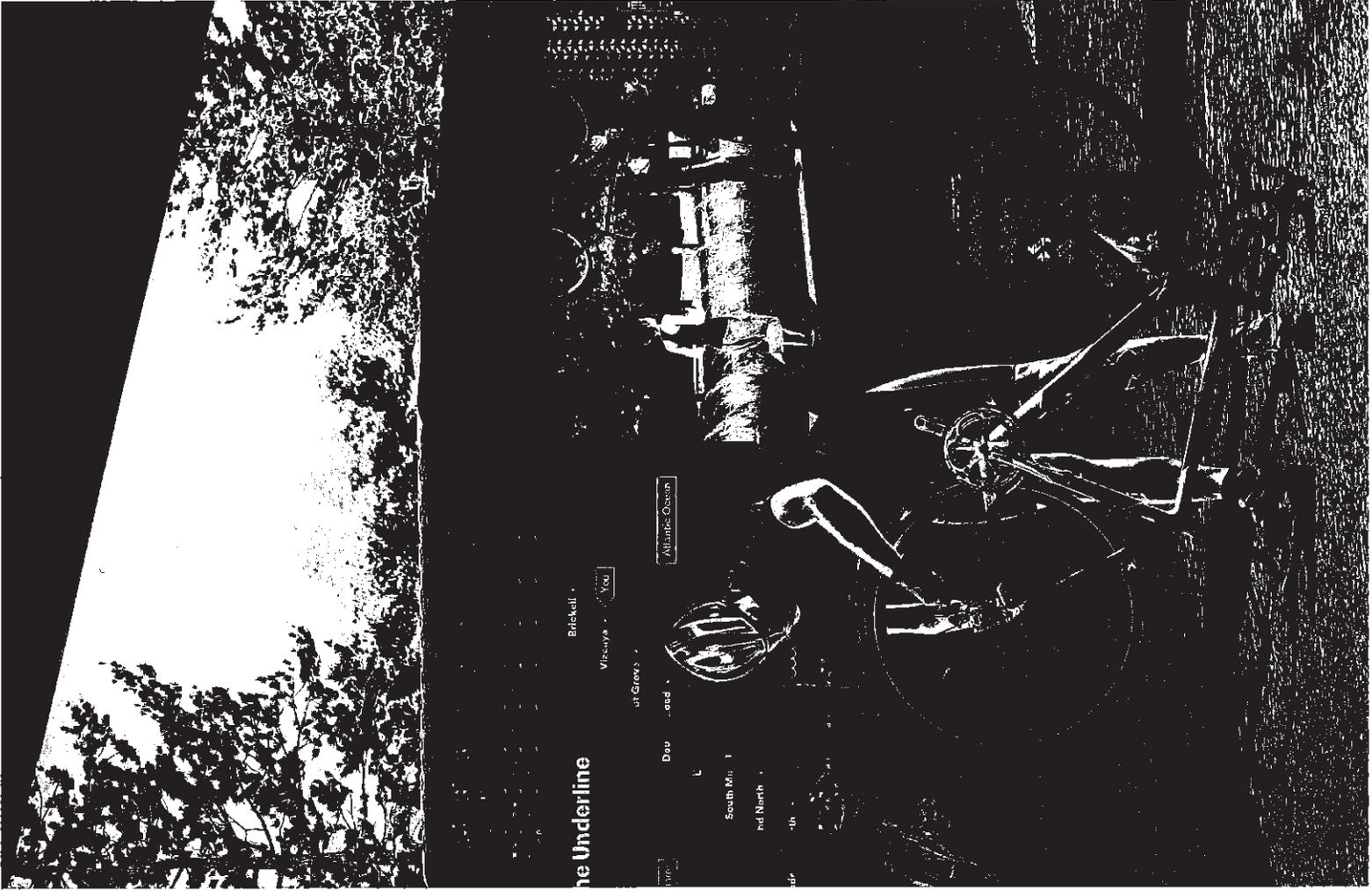


2 TYPICAL DETAIL AT SHOULDER

FURNITURE AND AMENITIES

- SIMPLE
- DURABLE
- DISTINCTIVE
- SOCIAL

Site furnishings will be thoughtfully peppered throughout the 10-mile corridor, activating the areas alongside the paths as social spaces while also providing necessary amenities for The Underline's most active users such as bike parking units, bike repair stations and water bottle filling stations. Each piece of furniture will carry The Underline signature branding in a variety of ways- in its simple U-shaped profile, its color palette of light grey and "Underline green" and bicycle tire perforated pattern.



FURNITURE AND AMENITIES
FURNITURE FAMILY

The existing graphic logo of The Underline will be expanded to create a family of furnishing elements including benches, trash receptacles, bike parking, amenity equipment and canopy structures that reinforce the unique identity of the linear park.



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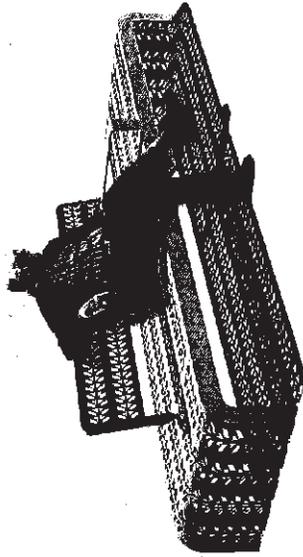
FURNITURE AND AMENITIES
FURNITURE FAMILY

The profile of the inverted Underline "U" inspires custom, perforated metal furniture elements that feature abstracted bike track patterns. The finishing elements will be colored light grey on top, minimizing heat gain, and the signature "Underline green" underneath as an accent color.

Two materials are being considered for the surface: powder coated paint or thermoplastic paint.



BENCH



BENCH WITH A BACK



PICNIC TABLE

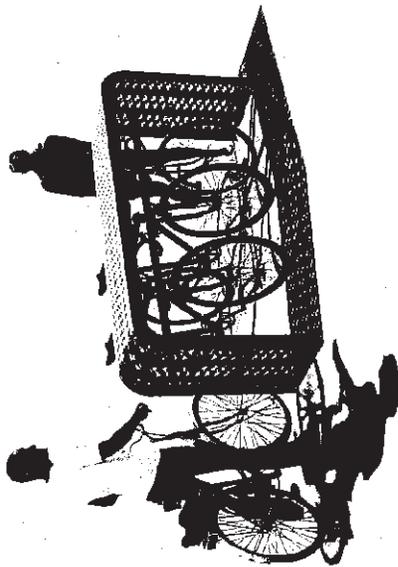


TRASH AND RECYCLING RECEPTACLE

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FURNITURE AND AMENITIES FURNITURE FAMILY

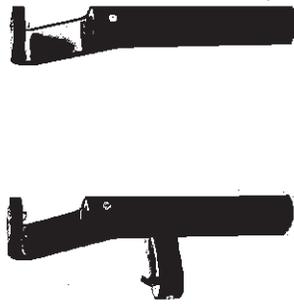
The Underline furniture family includes elements uniquely designed with bike culture in mind: large bike parking units, bike repair stations consisting of off-the-shelf pieces similar to those distributed by parkabike.com yet customized with The Underline vocabulary, a drinking fountain that is combined with a water bottle filler (a new sustainable initiative currently being implemented in many public spaces nationwide by GlobalTap.com), and a series of amenity kiosks that can host anything from snacks and drinks to outposts for local bike shops.



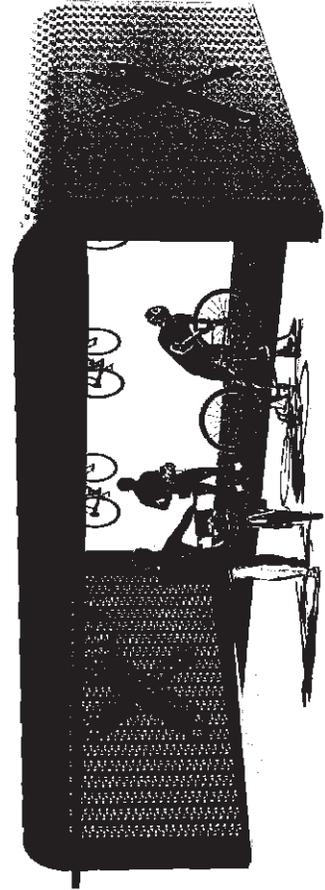
BIKE PARKING



BIKE REPAIR STATION
(BASED ON MODELS BY PARKABIKE.COM)



DRINKING FOUNTAIN AND WATER BOTTLE FILLER
(BASED ON MODELS BY GLOBALTAP.COM)



BIKE REPAIR AND AMENITY KIOSK

221

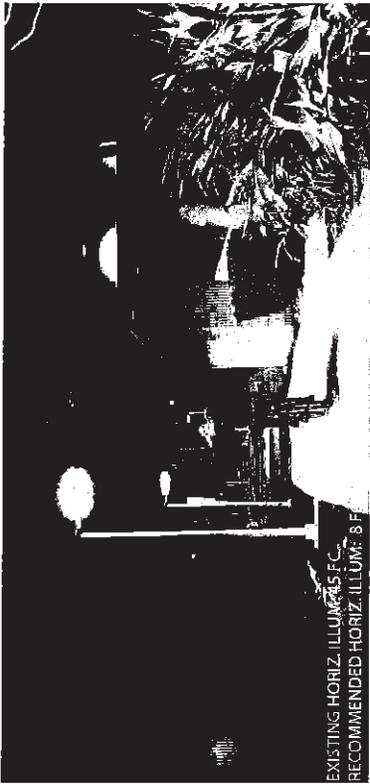
LIGHTING

- ECO-SMART
- EFFECTIVE
- SIMPLE
- VARIED

Quality lighting and illumination are essential to the success of public spaces. The quality of lighting will define the character of the space and its type of use at night. For The Underline, lighting is considered as a series of layers. The first layer is a consistent framework of light posts that can evenly illuminate the paths with sufficient light levels for safety, combined with column up-lighting that will both highlight the unique structure as well as the signage on the columns. The second layer includes accent lighting of key features ranging from benches and kiosks to entire outdoor rooms and unique programmatic areas. Some of these may consider lighting installations by invited artists. The third layer considers lighting at the Metrorail stations as an opportunity to highlight the unique elevated guideway that frames the entire Underline corridor running underneath.



EXISTING SITE CONDITIONS AND OBSERVATIONS
BRICKELL STATION



EXISTING HORIZ. ILLUM: 8 FC
RECOMMENDED HORIZ. ILLUM: 8 FC
CAREFUL CARE FROM TOWER AND HIGH CONTRAST WITH ADJACENT FOOTCOTTS



EXISTING UNIF. RATIO: 180:1
RECOMMENDED UNIF. RATIO: 3:1
DRAMATIC LIGHT LEVELS ADJACENT TO STREET ABOVE - VISUAL CONTRAST



EXISTING LIGHT SOURCES: METAL HALIDE, HIGH PRESSURE SODIUM AND LED
RECOMMENDED LIGHT SOURCE: LED
VARIATION OF LIGHTS SOURCE AND COLOR TEMPERATURES

EXISTING SITE CONDITIONS AND OBSERVATIONS
UNIVERSITY OF MIAMI STATION



EXISTING VERT. ILLUM: 16 FC
RECOMMENDED VERT. ILLUM: 2 X SURROUNDING VERTICAL LIGHT LEVELS
CHECK FOR LIGHT ON COLLUM AND QUAD AND HOW SOURCE LIGHT WHICH TRAVEL INTO SUBTERR



EXISTING UNIF. RATIO: 6:1
RECOMMENDED UNIF. RATIO: 3:1
INCONSISTENT LIGHT LEVELS AND HAZARD CONTRAST BETWEEN BOLLARDS AND STATION CANOPY

Our site observations at night of The Underline have discovered a lack of identity for the iconic element, no consistent lighted definition of the pathway, dramatic variations in lighting levels along the line, safety concerns with visibility of bikers and pedestrian and a variety of light sources. Lighting does not have to be high levels to see or be seen. What is critical is the perception of light and shadow which must be achieved with both vertical light (on architecture, illumination on trees, objects) in conjunction with an appropriate complimentary horizontal light (markers or bollards).

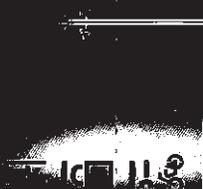
TYPICAL LIGHTING FIXTURE OPTIONS

LIGHT POLE STUDIES

24'

18'

12'



OPTION 2
SELUX
GRAPHIC COLUMN

SELUX OLV10 WITH MULTIPLE HEADS

- Graphic form factor with a signature look
- Multi-head area light luminaires with full cut-off and glare reduction
- Custom option available for a luminaire element at the top with the signature color for the Underline or an LED color changing floodlight head
- Environmental considerations: wind-loading and marine environment
- Maintainability: ease of replacement, long life, LED, 5 year warranty
- Reputable manufacturer: US based in Highland, NY
- Proprietary design
- Illumination characteristics: good uniformity with greater dynamic quality, 20% savings on pathway
- One power luminaire possibly incorporates lighting, security camera, wifi, power ports, and/or speakers
- Dynamic, intelligent with dimming/motion activation - confirming option
- Total wattage: 120W per head (3 heads typical) total 360 watts per pole and quantity
- Budget range: \$6,000 to 510,000 depending on features, procurement, installation, Councils Bluff, Iowa

OPTION 3
TECHNIUM POLE
GRAPHIC COLUMN

TECHNIUM BIPODE WITH MULTIPLE HEADS

- Graphic form factor with a signature look
- Multi-head area light luminaires with full cut-off and glare reduction
- Customizable pole form that can be combined with any manufacturer head
- Environmental considerations: wind-loading and marine environment
- Maintainability: ease of replacement, long life, LED, 5 year warranty
- Reputable manufacturer: based in France with US headquarters in NY
- Open Source Proprietary design
- Illumination characteristics: good uniformity with greater dynamic quality
- One power luminaire possibly incorporates lighting, security camera, wifi, power ports, and/or speakers
- Total wattage determined by heads
- Budget range: \$2,000 to \$2,000 depending on selected pole and heads, additional features, procurement, and quantity

TYPICAL LIGHTING OPTION 2: SINGLE POLE WITH MULTIPLE ADJUSTABLE HEADS

POINT ILLUMINATION

Option 2 uses a single pole with multiple heads to provide horizontal lighting on the path and vertical illumination on the signage pillars. The multiple heads create a sculptural tree-like configuration.

CONFIGURATION

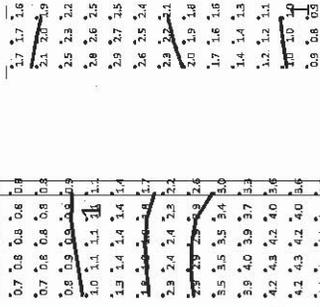
2-4 heads for Selux (4-6 heads for Technilum) per pole aimed at paths and columns

TYPICAL PLAN



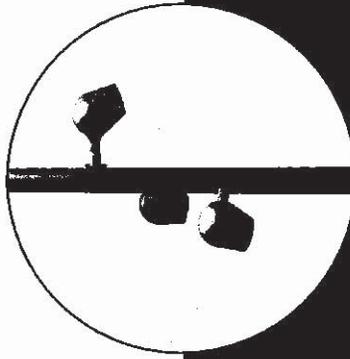
LIGHTING LEVELS

Area	Avg	Max	Min	Avg/Min	Max/Min
Bike Path	2.16	4.4	0.3	7.20	14.67
Column Side 1	1.83	2.8	0.8	2.29	3.50
Column Side 2	1.97	2.9	1.0	1.97	2.90
Column Side 3	1.84	2.9	0.8	2.30	3.63
Column Side 4	1.98	3.0	1.0	1.98	3.00
Pedestrian Path	2.23	4.6	0.4	5.58	11.50



PLAN VIEW

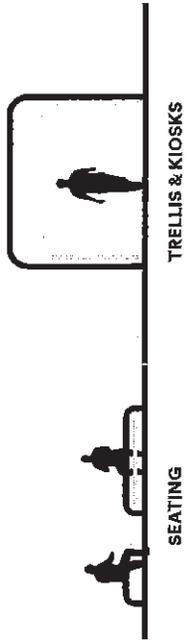
COLUMN ELEVATION



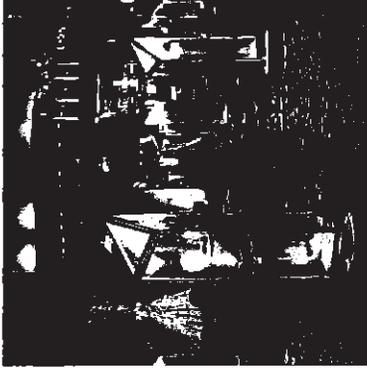
WDB

125

**TYPICAL LIGHTING
URBAN FURNITURE LIGHTING**



**ADDITIONAL LIGHTING
ACCENT LIGHTING**



LIGHT ART INSTALLATION - HUMAN INTERACTION



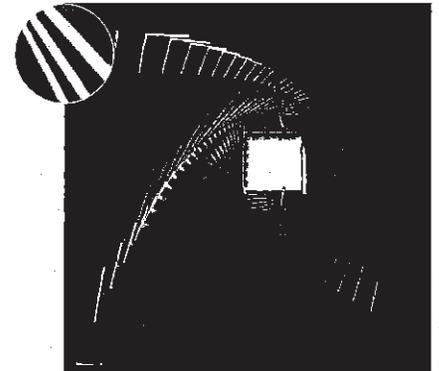
LIGHT ART INSTALLATION - LIGHTING EFFECT ON STRUCTURE



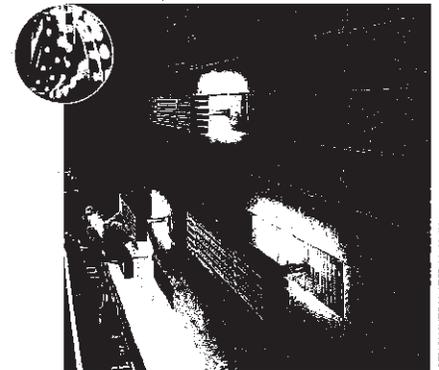
PHOTOLUMINESCENT SURFACE COVERING



FESTIVE LIGHTING INTEGRATED WITH ARCHITECTURE



TRELLIS INTEGRATED LIGHTING



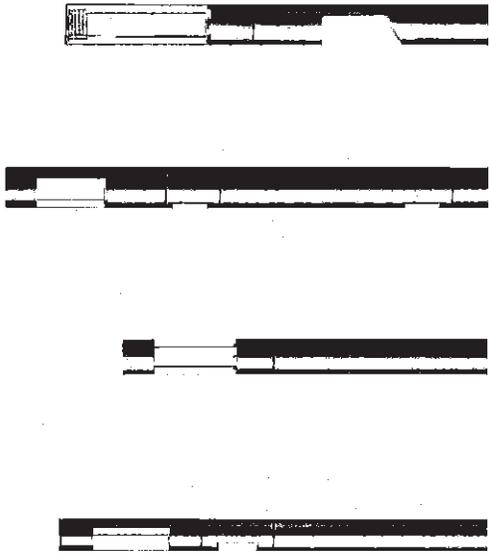
BENCH INTEGRATED LIGHTING

926

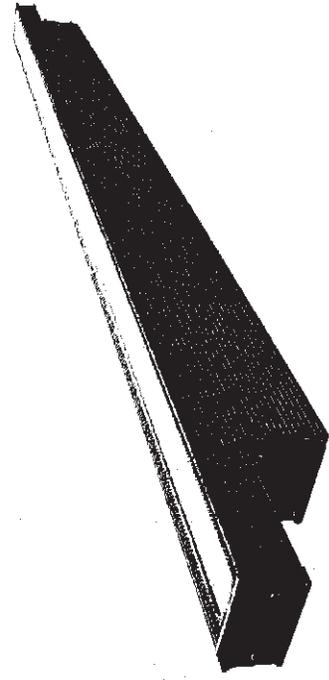
LUMINAIRES
PROPOSED FIXTURE ALTERNATIVES



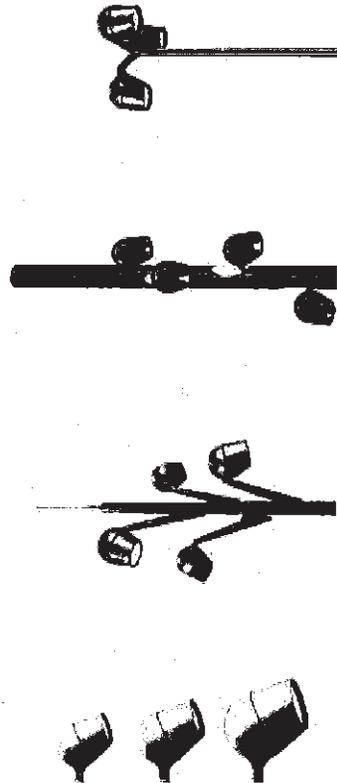
POST OPTION 3
TECHNILUM POLE WITH MULTIPLE HEADS



POST OPTION 1
HESS CITY ELEMENTS 230



FURNITURE LIGHTING
LUMENPULSE LUMENFACADE



POST OPTION 1
SELUX OLIVIO FAMILY

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**DESIGN ELEMENTS
THE UNDERLINE BY NIGHT**



TYPICAL EXISTING CONDITIONS ALONG THE CORRIDOR



TYPICAL NIGHT VIEW OF THE DEDICATED BIKE PATH

**THE UNDERLINE ENVIRONMENT
TYPICAL PATH**



TYPICAL EXISTING CONDITIONS ALONG THE CORRIDOR



TYPICAL VIEW OF THE DEDICATED BIKE PATH

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2.5 REAL ESTATE STRATEGY

CORRIDOR OPPORTUNITY ANALYSIS

Introduction

The Underline will become a signature linear park and world-class trail improving the quality of life for Miami-Dade residents, and bringing positive economic impacts to thousands of residents, businesses and properties. It will create a new type of open space amenity serving its surrounding neighborhoods, and bolstering transportation nodes throughout the 10-mile corridor. Similar signature linear parks across the country have demonstrated well-documented value creation in terms of catalyzing new real estate development and increasing the value of surrounding property, which benefit from proximity and views to open space, access to destination programming and improved urban connectivity. The proven value that parks create in their communities can be harnessed and enhanced through coordinated actions and strategic planning, recognizing that the value-driving components of park creation can be engineered to maximize direct impact.

This study presents a corridor-wide real estate strategy aiming to achieve these primary goals.

1 Highlight approaches for The Underline to maximize positive impact on the value of existing and planned real estate surrounding the corridor and serve as a catalyst for new development.

2 Create funding opportunities and ways in which The Underline can tap into incremental real estate value generated by the linear park.

3 Identify ways to promote complementary uses and the cohesive design of properties surrounding The Underline to improve the character of the corridor.

This plan seeks to integrate surrounding development with the long-term vision for The Underline, encourage best practices to increase the value generated by the park, and create a more dynamic corridor by both enhancing and shaping surrounding neighborhoods. As implementation plans for The Underline are advanced, these recommendations, too, should be studied and refined by Friends of the Underline, the County, and the municipalities. A coalescing around both the vision for The Underline and the means to catalyze its surrounding neighborhoods is required to fully unlock the benefits of this signature park and the opportunities it represents for the region.

Real Estate Overview

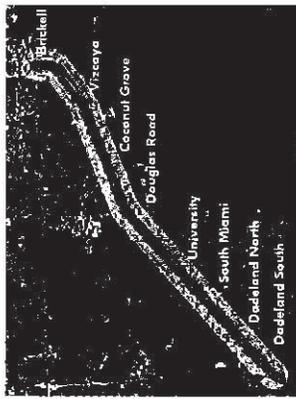
This study assesses property surrounding the corridor likely to experience positive economic impacts from The Underline, focusing on real estate within one-third of a mile from the corridor. Studies have documented the value premium created by parks in urban settings to impact properties up to a distance of approximately 2,000 feet away from the park. Based on this impact buffer, this study has identified an "opportunity study area" (hereafter referred to as the "opportunity zone") surrounding the 10 mile corridor encompassing 11,000 parcels and totaling roughly 160 million square feet (3,650 acres) of land area that may be directly impacted by the creation of a signature park.

This opportunity zone is defined as any parcel outside of the County-owned right-of-way within a one-third mile (1,760 feet) radius of The Underline corridor. Within this larger buffer, we also examined properties immediately adjacent to The Underline including parcels within 500 feet,

understand development potential immediately surrounding the park, as well as the wider opportunity zone. Where specified, we have also examined areas surrounding existing Metrorail stations within a quarter-mile (1,320 feet) radius of the Metrorail stations along the corridor.

Real estate surrounding the corridor falls within the boundaries of three distinct municipalities, including the cities of Miami, Coral Gables, South Miami, as well as the Village of Pinecrest along with unincorporated Miami-Dade County land. Roughly 50% of the land area within the opportunity zone is concentrated in the City of Miami, while 20% is within Coral Gables, 1% is within South Miami, and 7% is within Pinecrest. The remaining 12% is comprised of unincorporated County land.

Several factors will influence the level of impact The Underline will likely have on surrounding real estate, including property ownership, land-uses, zoning, physical characteristics and connections as well as existing and future nodes of activity along the corridor. A larger study of the corridor has found that 56% is flanked directly on either one or both sides by adjacent development, while the remaining portions are separated from surrounding development by U.S. 1, walled construction, or other barriers. These factors, examined further in the sections below, all impact the development potential of the surrounding district, the understanding of which is key to developing a comprehensive real estate strategy for the linear park.



Map illustrating the one-third mile "opportunity zone" and the smaller 500 foot buffer surrounding the corridor.

Ownership & Ownership Concentration

Roughly 80% of the opportunity zone consists of privately-owned land. Individuals who own single-family homes and condominiums comprise the majority of private ownership, possessing more than 50% of the total real estate in the opportunity zone, reflective of the large single-family residential neighborhoods that span portions of The Underline. Much of the documented value premium generated by parks impact residential properties, and because the majority of private ownership falls within the boundaries of the various municipalities, a substantial portion of the value premium generated by the signature park will accrue to the local taxing authorities that have jurisdiction over the neighborhoods within the opportunity zone. The benefits include an increased tax base, a reduction on the burden of municipal transportation systems, the multiplier effects of increased spending, and quality of life. These form the basis of the rationale for major and diverse property owners along the corridor to actively engage in creating a

sense of place and investing in the corridor to unlock value potential.



A section of the University of Miami campus, a significant landholder along The Underline, showing a performance space and parking lot directly facing the University Metrorail station.

Nearly 30% of the land is owned by institutions, developers and corporations. The University of Miami is a large institutional anchor along the corridor that owns 7% of land within the total opportunity zone, its landholdings make up approximately one-third of the total property likely to benefit from The Underline in the City of Coral Gables. Large consolidated landowners that stand to benefit from the signature park may present partnership opportunities to shape adjacent development to complement The Underline.

Of the roughly 16% of real estate in the opportunity zone owned by public sector entities, the County owns the largest share equating 12% of the opportunity zone, exclusive of the right-of-way, while the remaining 4% is split between the municipalities as well as the regional, state and federal governments. Within 500 ft. of the corridor, the share of public ownership increases to approximately 20%. The County owns 17% of this land within 500 feet of the corridor, while the municipalities own 3%.

The County also owns significant portions of land immediately adjacent to specific station areas, including Vizeys, where it owns nearly 80% of the land within a quarter-mile of the station, nearly 30% of the land surrounding Douglas Road, and about 20% of the land surrounding the South Miami and Dadeland South station areas.

Municipal holdings, while smaller than County holdings, are present throughout the corridor and in some locations of potential strategic significance. The City of Miami is the largest municipal land owner along the corridor, with at least 2% of all land holdings in the opportunity zone. This includes small but potentially strategic holdings in the active Brickell station area, including a vacant lot adjacent to The Underline and Southside Park, recently designated a Brownfield Site with significant redevelopment potential. The City of Coral Gables also owns large parcels adjacent to The Underline near the Douglas Road station, currently being used for retail and parking. Instances of public ownership along the corridor represent opportunities for further engagement with The Underline.

Land Use

In terms of active uses within the opportunity zone, about one half of the zone is composed of residential uses, roughly 38% single family and 16% multifamily, 13% is composed of office uses, and 6% of the area is comprised of commercial businesses. Immediately adjacent to the corridor (within 500

feet), the proportion of residential land is reduced to about a third, while office and commercial business use increase to ~20% and ~16% respectively, indicating that existing uses immediately adjacent to the corridor are already primed for commercial uses that can complement the public realm. This is likely due to the proximity to road and transit infrastructure along the corridor. Segments near the Coconut Grove station, for example, contain commercial businesses directly fronting The Underline; however, some of these uses include public storage facilities, automobile shops or furniture stores, which are incompatible to most pedestrian-oriented activities.



The Shops at Sunset Place is an existing mall that directly faces onto The Underline near South Miami station.

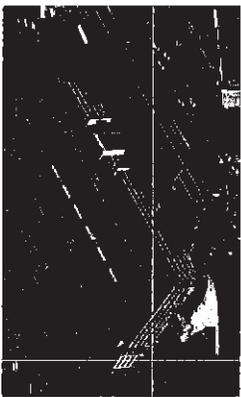


Smaller commercial properties directly fronting The Underline show great potential for more complementary uses that can help create a creative corridor.

While the majority of the opportunity zone is composed of uses that stand to gain from further activation and connectivity to The Underline, roughly 3% of the opportunity zone is designated as "vacant" space, and 1% of the area is used for industrial purposes, totaling 4 million square feet and 1 million square feet respectively.

Standalone public and private parking lots consist of only about 1% of the corridor, however, many parking structures and lots as part of railway terminals, transit, commercial and publicly-oriented spaces are not classified as parking under formal land use records, and thus excluded from this data measurement, but visibly make up a substantial portion of the land directly facing the corridor, which present opportunities for long term repositioning to more active uses that can complement and be sustained by The Underline.

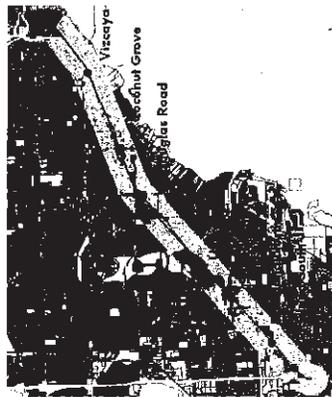
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The large County-owned transit parking structure at South Miami Station may present opportunity for further activation.

Zoning

Real estate within the opportunity zone of The Underline is regulated by five distinct zoning codes across the three municipalities, Pinecrest and unincorporated County land. In general, the land area immediately surrounding the corridor (within 500 feet) is zoned for higher density than the wider opportunity zone. For instance, the area surrounding the Brickell station is exclusively classified under Urban Core - T6, which allows for the highest density and greatest variety of uses under the City of Miami zoning code, while the area surrounding the neighboring Vizcaya station is zoned 90% suburban, with maximum as-of-right building heights of 2-3 stories, reflective of the single family residential neighborhoods surrounding this station area. Roughly 1/5 of the opportunity zone surrounding the corridor is zoned for mixed-use development; this proportion increases to roughly one third within 500 feet of the corridor.

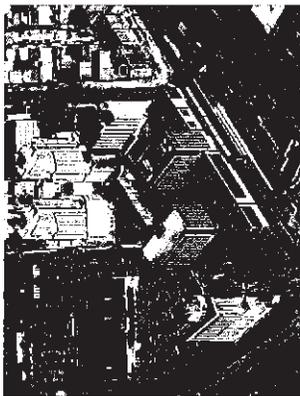


Zoning map depicting higher density and mixed-use zones in blue, with lower-density, largely residential zones in yellow. Station areas as well as sections along the corridor are generally zoned for denser, more flexible uses.

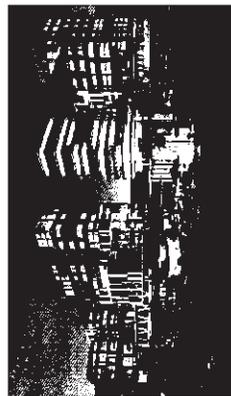
Miami-Dade County Transit's designation of higher density development zones surrounding Metrorail station areas have been effective in increasing denser mixed-use development and creating new revenue streams. Zoning regulation to encourage high-value development oriented around transit has been adapted into the County code allowing for increased density and regulating the way new construction projects face onto open space and public right-of-ways. Policies pertaining to these station area development zones may serve as precedents for how complementary new

construction can be encouraged beyond station areas to apply to the corridor as a whole.

Existing and planned rapid transit zones currently under development include Douglas Road, South Miami Station, Dadeland North and Dadeland South (Downtown Kendall Urban Center District), Douglas Road and the Dadeland North and South development zones are undergoing large-scale transformations that are already being shaped by the planned linear park, by reorienting and opening the development onto the park, facing and concentrating activity areas to complement the public realm.



Bret's eye view of high-density development near Dadeland South station.



Rendering of Link from the Adler Group/7th Floor Investments for the planned TOD project near Douglas Road. Courtesy of: The Real Deal.

Despite the higher proportion of denser and mixed-use activity surrounding the Metrorail segments of the corridor may still benefit by extending flexible use and higher density prescriptions more widely throughout the opportunity zone. Portions of prime development areas near the corridor are still zoned for uses that do not contribute to public space activation (industrial, wholesale retail, etc.) and may benefit from rezoning actions that will allow for flexibility in envelope and usage restrictions. Portions of The Underline near the Douglas Road station are home to light industrial activity, with 10 acres of land within a 5-minute walk of the station zoned for industrial use. As pipeline transit oriented development (TOD) projects are slated to change the character of this station area, municipal and county zoning authorities may explore how they can reposition underutilized land.



Back-facing industrial properties abutting The Underline.

Building Age

While signature parks generate value premiums on existing building stock, they can also catalyze new development and redevelopment in surrounding neighborhoods with vacant land or aging building stock poised for redevelopment to integrate new or higher uses. Across the corridor, more than 70% of the total building stock within the opportunity zone was developed before 1960, while only 5% was constructed in 2000 or later. As market conditions advance, new development may be poised to occur, particularly in proximity to a signature new open space amenity. The Underline does not pass through any historically designed zones and adjacent nearby development is unlikely to be subject to any historic preservation requirements.

Newer building stock is concentrated in distinct nodes near Brickell Station, and surrounding Dadeland Mall, near Dadeland North and South. Within 500 feet of The Underline in Pinecrest, where Dadeland North and South are located, around 20% of all building stock was built in 1990 or later, compared to 5-7% in other municipalities along The Underline, indicating that County TOD efforts have been successful in promoting new development around concentrated transit nodes. Data shows that a substantial portion of the building stock in the City of Miami is dated. Within 500 feet of the corridor in the City of Miami, 70%-80% of all building stock was constructed before 1960, compared to between 7-20% in other municipalities. Most of the newer development is heavily concentrated around Brickell Station, consisting largely of infill projects and the large-scale mixed use Brickell City Center project. Mixed-use neighborhoods with substantially older building stock of little historic value may be strong candidates for future growth, either through infill projects that preserve the character of the neighborhoods or large-scale redevelopment.

There are currently 8 active building permits on County land pertaining to new construction or demolition, the majority of which are concentrated near the Dadeland North and Dadeland South stations. This represents the greatest concentration of active County building permits throughout the corridor, and is an effective example of County initiatives that have already generated development momentum surrounding transit nodes, which may be further boosted with the prospect of the enhanced multi-modal linear park and opportunities to orient new development around this signature transit-based and open space amenity.

Opportunity Nodes

The Underline corridor will offer seven miles of recreation and nature, with three miles of destination programming and development. Today, the corridor can be characterized by relatively isolated pockets of denser developments surrounding Metrorail station areas, with stretches of sparser development in between. Key districts along the corridor will be well-positioned for increased development activity due to enhanced connections to the linear park or planned activity centers, and superior access to The Underline as well as linkages to established community anchors. The areas identified below present near-term and future opportunities based on existing and planned physical considerations, and may warrant planning actions to encourage denser improvements to maximize the value that these areas will likely incur.

Existing nodes are positioned for further growth in conjunction with the creation of The Underline, while future nodes of activity will likely catalyze new value creation.

- **Brickell Station Area.** While Brickell is already the most densely developed node along the corridor, the "Brickell Backyard" activity center and park will serve as an amenity for existing development, further enhancing surrounding property values.
 - **Vizcaya Station Area:** The opportunity in this area lies in its proximity to existing bike trails and cultural institutions, improving the connectivity and access of which can enhance community benefit and value.
 - **Coconut Grove Station:** The pedestrian-oriented commercial properties facing directly onto The Underline near this segment of the corridor present genuine opportunities to accommodate complementary uses that can both contribute to the character of the corridor and create street-wide activation. The creation of the "Grove Gallery" at Coconut Grove Station may encourage more attractive commercial uses by generating higher foot traffic to the area coupled with the presence of civic buildings including Miami City Hall. In the long-term, adjacent existing uses in this area that do not complement the corridor, including public storage facilities, industrial office spaces, and the like may be strong candidates for repositioning.
 - **Douglas Road Station Area:** This area, located on the boundary between Miami and Coral Gables, is rapidly transforming and presents many opportunities to shape pipeline development that complement The Underline as well as existing transit uses. Earlier this year, County Transit solicited proposals from developers for a planned transit-oriented development project that will likely include a mix of retail, residential and hotel uses within the Rapid Transit Zone, which will further activate the site. Currently, the County is finalizing developer selection, weighing factors including total square footage, lease payments to the County, and proposed improvements to public property and the transit station itself. Nearby, multiple soft sites in the form of empty lots and underutilized parcels flank The Underline, presenting medium-term redevelopment opportunities.
- This station area also benefits from an existing elevated walkway bridging U.S.1, with county-owned greenspace flanking the entryways, demonstrating potential for integration and coordination with The Underline. Larger County-owned parcels comprise 80% of the land within

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BEST PRACTICES AND IMPLICATIONS

This section provides a series of potential strategies that The Friends of the Underline, their government and private sector partners should explore to maximize the positive economic impacts of The Underline, create new opportunities for capital and operating funding streams, and improve the general condition of the surrounding corridor by promoting complementary uses and cohesive design. These preliminary recommendations have been put forth as a first step toward establishing a comprehensive framework for broader value creation, and include:

1. Positioning underutilized County and municipal land for redevelopment to bring higher and more complementary uses that activate the corridor.
2. Considering the application of design guidelines and targeted zoning to encourage complementary uses and design in new development adjacent to The Underline.
3. Investing in a network of key streets and open space to set a physical framework for growth.
4. Exploring means of tapping into the incremental real estate value generated by The Underline to fund park construction and operations.
5. Introducing targeted programming to key nodes along The Underline – both within the park and in currently underutilized adjacent spaces - to create identity, generate visitation and spur new development opportunity.
6. Spurring greater investment around The Underline through coordinated neighborhood partnerships to improve and activate the corridor.

Goals Reached

1 2 3 BEST PRACTICE I

Position underutilized County and municipal land for redevelopment to bring higher and more complementary uses that activate the corridor.

The consolidation and redevelopment of publicly-owned land can help transform target areas along The Underline, unlocking untapped real estate value and better activating key stretches. Particularly where land exists in urban centers and near planned or existing activity nodes, a targeted approach will not only create individual new developments on these public sites, but also shape and spur adjacent development. Near Metrorail stations, Miami-Dade County has sought joint development opportunities to create dense, walkable pedestrian-oriented communities that improve Metrorail ridership and reduce traffic and environmental burdens. These development projects are also an important source of revenue for the County through ground lease payments, an increased tax base, and station area improvements.

Existing uses on publicly-owned parcels should be further assessed against potential redevelopment and activation opportunities. Public entities may consider relocating services such as mail-sorting facilities or storage facilities in instances where land holding values and adjacent parcels stand to gain significant value by freeing up higher-value land for more beneficial uses. Rezoning to more flexible uses should be considered to increase density and activation-oriented uses along the corridor, as is explored further in subsequent recommendations.

With regard to their land holdings, County and municipal entities may consider the following:

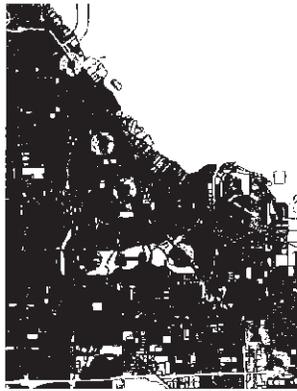
- The County should explore opportunities to prime its largest single public land owner of adjacent real estate properties within The Underline's potential opportunity

500 feet of the station end may present opportunities for consolidation and complementary development. This station is also adjacent to a high-end outdoor shopping center, the Village of Merrick Park, which might help anchor visitation and increase value at this node.

University Station Area: The University of Miami (UM) is the primary land-owner surrounding this station area. While the Campus is located directly across from The Underline, the campus is inward facing and separated from existing retail by U.S. 1. A partnership with UM may present opportunities for near-term programming and site activation, as well as long-term redevelopment including establishing connections across U.S. 1 and complementary uses on park facing land. The western edge of the UM campus is also about 1/2 mile outside of the South Miami CRA zone, which intersects directly with The Underline, and may benefit from value increases associated with the park.

South Miami Station Area: An adjacent 5-acre County-owned parking structure on the north side is an example of the type of property that may be explored for potentially higher sportable uses post-park creation that are more complementary to The Underline, such as ground floor retail or community uses. This node is also close to an existing retail destination, including the Shops at Sunset Place as well as a vibrant retail corridor along 72nd Street. Connection to The Underline may catalyze further growth in retail development, extending foot traffic both ways to support higher uses in this area.

Dadeland North and South: These two stations command the highest boarding rates out of all eight stations along the corridor. Proximity to the Dadeland Trail may bolster new uses oriented toward hospitality and tourism and continue to draw new residents seeking an active, urban lifestyle, while the major transit oriented mixed-use developments currently under construction at this site will establish a more permanent base of activity, in addition to the large quantity of existing commercial and office uses in Downtown Dadeland including the Dabron office complex and Dadeland Mall. The Downtown Kendall Urban Center District governs adjacent development, and could serve as a useful model to expand application to the rest of the corridor, as its zoning regulations aim to increase density around station areas and shape the way buildings front onto the open space and streets to improve the character of the district as a whole.



Mixed-use zoning is prevalent within a quarter mile of most station areas.

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zone, the County should start by assessing broader areas surrounding Metrorail stations and establish coordinated actions to rezone sections to allow for increased density and activation-oriented uses that will be enhanced by the construction of The Underline. The designation of Rapid Transit Zones (RTZ) surrounding station areas has already resulted in a successful joint development project at Dadeland South Station (see case study below).

Significant County-owned land currently used as parking lots along The Underline corridor offer opportunities for full or partial repositioning to more complementary uses, including the large South Miami station lot, which exists in the center of a commercial district, and/or other portions along US Highway 1 near Vizcaya Station. In other instances, the County may consider assessing the potential benefits of consolidating office space and facilities to free up additional land for further activation and revenue generation.

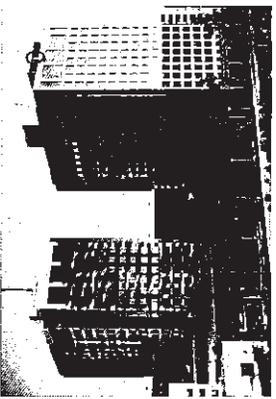
On public sites that serve important community functions including affordable housing, public entities may evaluate opportunities to enhance existing uses through the development of complementary, revenue-generating components including retail. Near the Douglas Road station, the County might consider the opportunity to modernize significant affordable housing land holdings, redeveloping these aged properties to incorporate mixed uses that can leverage the increased activity generated by The Underline, while continuing to serve the local community.

Potential joint development projects should encourage active uses that complement The Underline and spur adjacent economic activity. TOD expansion projects have brought exciting large scale development projects to districts around Brickell, Douglas Road, and Dadeland South, increasing the vibrancy of the region. Zoning regulation in RTZs allow for flexible uses in new development as long as they complement transit goals. Similar zoning tools can be employed for park development to complement The Underline with park-oriented uses and accommodations, such as the inclusion of park-facing design, access requirements, and park amenities (e.g. bicycle lock stations), among other elements.

Municipalities along The Underline corridor should also examine opportunities to create value with their land holdings. While municipal ownership is smaller along the corridor, publicly-owned parcels in key locations stand to activate portions of the corridor if rezoned for more complementary uses. Potential candidate sites include a vacant lot adjacent to Brickell station owned by the City of Miami and retail parking lots owned by the Cities of Coral Gables and South Miami adjacent to The Underline.

Case Study | South Dadeland Joint Development | Miami-Dade County, Florida

The 1984 development of Dabron Center (d)l at South Dadeland station constituted Miami-Dade County's first use of joint development as a tool to increase transit-agency revenues. The first three phases of this development included a luxury 305-room hotel, more than 500,000 square feet of Class A office space, and 35,000 square feet of retail space. The County and a private developer negotiated a 99-year ground lease guaranteeing the County a minimum annual income of \$300,000 over the life of the lease. The County also receives a share of gross revenues received each year from office and retail rentals, as well as lodging earnings. Today, the County earns well over half a million dollars per year in lease income, while the office and hotel development onsite experiences among the highest occupancy rates in Southern Florida.



Dadeland South Station. Courtesy of Dadeland District.

higher than those in the surrounding area. In conjunction with The Underline's implementation, enhanced commercial development of industrial parcels and underutilized commercial and office parcels could be further encouraged by tax-incentives for job creation. While the program has not been renewed by the State Legislature, Miami-Dade County might consider continuing to offer similar incentives spurred by successes in South Beach and Wynwood.

The Underline corridor intersects with two Miami-Dade Targeted Urban Areas (TUAs), designated under a program which allocates up to \$3 million for qualifying development projects that drive job creation and economic development. Zoning in TUAs adjacent to The Underline near Coconut Grove south of Highway 1 and near South Miami station north of Highway 1 might spur further, large-scale development.

1 3 BEST PRACTICE II

Consider the application of design guidelines and targeted rezoning to encourage complementary uses and design in new development adjacent to The Underline.

Zoning overlays and incentive programs can help shape the character and relationship between open spaces and their surrounding neighborhoods. Design guidelines can compel new development to create stronger district appeal by requiring direct frontage onto public space, pedestrian-oriented courtyards that extend park character, or other complementary approaches. Rezoning for higher uses can encourage new development that is attracted by proximity and views to open space, including denser residential or commercial districts. While special consideration should be granted to areas immediately adjacent to transit nodes, other pockets of real estate may benefit from higher density, particularly in relation to other existing nodes of activity such as established retail or cultural districts. In underutilized areas, incentives in conjunction with open space development can foster the creation of new commercial districts.

Areas which sections of The Underline corridor can benefit from rezoning or zoning incentives. While Rapid Transit Zones increase density immediately adjacent to station areas, and regulate use and design of new development to facilitate greater relationship to transit stations, other sections along the corridor may also benefit from appropriate rezoning and encourage complementary development in relation to the future Underline. These might include areas surrounding existing and planned nodes of activity such as the Coconut Grove station, expansions of high-density zoning near Dadeland stations North and South, and zoning that might encourage further development surrounding retail activity at South Miami station. Incentives may also incentivize new development in areas already zoned for density, such as allowing The Underline to meet open space requirements if properties establish direct linkages and access to the park.

Create opportunities to further expand value creation potential. While zones density allowance is greater within 500 feet of the corridor than within the opportunity zone as a whole, the corridor may further expand its revenue generating potential by allowing higher density development as-of-right in appropriate areas along the corridor beyond RTZs and Metrorail stations, including the segment between Coconut Grove Station and Douglas Road, which links two urban areas but has a significantly lower density allowance.

Consider new tax-incentives for job creation or softcost development eligible under current programs. A recent analysis by the Florida State Office of Economic and Demographic Research found that commercial and industrial property values in Florida Enterprise zones rose

1 2 3 BEST PRACTICE III

Invest in a network of key streets and open space to set a physical framework for growth.

Prioritized public and private investments in connectivity and open space can foster district identity. Investments in signature open spaces made in tandem with reinforced, safe pedestrian connections to surrounding neighborhoods can increase a park's positive impact on real estate values and centers of commercial activity. These complementary physical investments might include streetscape improvements, such as improved signage and wayfinding, and infrastructure enhancements, such as bike lanes and shared-lane marking or "sharrows." Fragmented jurisdiction along corridors or park boundaries can present challenges in terms of funding, ownership, and land use regulations, underscoring the need for a broader strategy that aligns diverse interests.

Local community organizations and other public-private entities are often best positioned to gather support for and maintain physical improvements that can accrue district-wide, cross-jurisdictional benefits. See Best Practice VI for further expansion on their potential roles.

Several considerations can help establish physical conditions for growth along The Underline Corridor:

- Utilize streetscape improvements, such as clear signage, wayfinding, and safer pedestrian crossing across US Highway 1, to further connect surrounding neighborhoods and activity centers to The Underline. Nearly half of the planned Underline is physically separated from the surrounding real estate, creating challenges to accessibility and impeding proximity value premiums. The future pedestrian bridge at University Station and other planned connections should be complemented by improved signage, while at-grade pedestrian crossings on Highway 1 should be simplified and made safer in commercial districts that stand to be improved, such as Coconut Grove. Enhanced physical connections to programming planned along The Underline, such as that being introduced at the University of Miami, or an established retail district in South Miami, can deepen the impact of The Underline framework plan.

- Invest in physical connections to Miami's broader open space network. Miami-Dade enjoys an established network of bike trails and existing and planned linear trails, including the Miami River Greenway, the South Dadeland Trail, and the Ludlum Trail. Connectivity to these trails will enhance the recreational impact of The Underline, strengthen bicycle and pedestrian transit modality, and may bolster patronage of adjacent businesses with increased recreational usage.

Greenlight for Midtown | New York City

The New York City Department of Transportation (NYCDOT) undertook the Green Light for Midtown project to simultaneously improve mobility and safety along the dangerous Broadway corridor in the Midtown core, and ultimately reposition the area to be more attractive to residents, workers, and tourists. Improvements to the streetscape such as wayfinding, improved signage, plaza on reinforced curbs, and seating areas created pleasant areas for residents, shoppers, workers, and visitors to congregate, and expanded the impact zones of key corridor attractions such as Times and Herald Squares. Safety measures employed included simplifying complex intersections to make vehicular flow more predictable to transit users, shortened crosswalks to diminish exposure to traffic, and organized and defined traffic lanes.

Following the implementation of these measures, an assessment by NYCDOT found significant changes in behavior and usage. Pedestrian injuries decreased by 35%, 53% along the corridor. At each key node activity node, the

stationary population increased, with increases in peak-hour population growing by 20-94% along the corridor. 84% more people stayed in Times and Herald Squares to read, eat, or take photographs, while 42% of local residents surveyed in Times Square say they shop in the neighborhood more frequently and 22% of workers leave their offices for lunch more frequently. Perhaps most indicative of an enhanced feeling of connectivity, bus ridership increased by 11%, while taxi pickup decreased by 12%.



Streetscape improvements for Greenlight for Midtown enhanced transit usage, improved safety, and helped establish an improved sense of place.

2 BEST PRACTICE IV

Explore means of tapping into the incremental real estate value generated by The Underline to fund park construction and operations.

The impact of parks on the value of new and existing real estate is well-documented. Parks can catalyze new development and generate net new income for adjacent land owners and governing entities through ground leases, land sales, and newly created tax revenue streams. Parks generate incremental value on existing real estate through property value appreciation, particularly in residential districts. The extent of The Underline's economic impact will be the subject of a study by HR&A Advisors, following this framework plan.

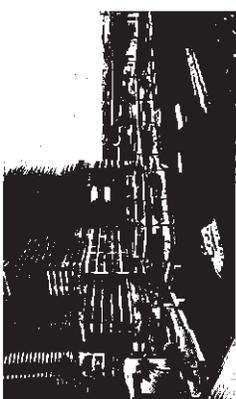
Reflective of the enormous value created by open space in urban settings, signature parks nationwide have utilized creative structures to access incremental value that help fund park maintenance and operations. Lessons learned from other parks may be applicable to The Underline:

- A portion of new revenue generated along the corridor could be redirected to support The Underline's operational costs. Because much of The Underline's footprint will be on County-owned land, the creation of the park will likely generate additional on-site revenue for the County through the use of its land for park programming, concessions and sponsorship, as well as through the incremental real estate value generated within the RTZs. The County should consider coordinating redevelopment projects with the buildout of The Underline, creating new sources of revenue by land disposition or ground lease, and securing a portion of these new revenue streams for park-funding.

Isolated pockets of development are already occurring along the corridor, largely tied to station area improvement initiatives including special transit development zones. Because The Underline may create opportunities to expand the area in which new development is able to occur and further elevate the value of proximate land where development has occurred, The Underline may be able to justify securing a portion of the incremental revenue streams generated by The Underline to support ongoing operations and maintenance.



The Riverwalk Metromover station serves the Miami Riverwalk.



Rendering of the planned Miami Riverwalk large-scale mixed-use development that will be anchored by linear open space along the waterfront. Courtesy of SkyScraperCity.

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Explore the potential for The Underline to leverage its intersection with the existing South Miami Community Redevelopment Area (CRA). Incremental value appreciation that can be attributed to park development could be redirected to park operations. The last CRA plan, approved in 2005, includes capital funds allocated for a Parks Improvement Program.

Evaluate the potential to utilize a TIF value capture mechanism in newly designated CRA areas. The TIF method of value capture has proven a highly effective tool for financing development in some areas of Miami-Dade County, such as South Pointe in Miami Beach. However, a potentially successful regime along The Underline corridor will require both an appetite for the reallocation of incremental appreciation and careful management to dispose of funds in a timely and effective manner.

Consider alternatives to value capture such as impact fees and development budget allocations. These alternatives may range from allocating a portion of new development project budgets to help fund The Underline, following the successful model of the Art in Public Places program, to redirecting impact fees to applicable uses including mass transit, parks and recreation, and streets and sidewalks.

Leverage additional public funding sources for smart growth and transit oriented development. These opportunities may include the Federal Highway Administration, the Florida Department of Transportation, and U.S. Department of Transportation's (DOT) Transportation Investment Generating Economic Recovery (TIGER) funding programs such as the Surface Transportation Programs and Transportation Enhancement Activities program.

Brooklyn Bridge Park | New York, New York

Built on the site of formerly underutilized industrial space and today one of New York City's iconic open spaces, Brooklyn Bridge Park's extensive program spans 75 acres (at completion) with passive and active recreational spaces, including lawns, sports fields, barbecue areas, playgrounds, and concessions. Local public funding of park capital costs was contingent on full private funding of park operations and maintenance. Park operating costs, expected to reach \$15 million, are almost entirely supported by ground leases and PILOT's paid by on-site development. At completion, 10 acres of real estate development will rest on park-owned land, including more than 1,200 residential units, commercial space, parking and retail. The conversion of One Brooklyn Bridge Park to 440 condos and ground floor retail was completed in 2008. Pierhouse, with 100 residential units, a 200-room hotel, and retail, is currently under construction.



Brooklyn Bridge Park

1 2 3 BEST PRACTICE V

Introduces targeted programming to key nodes along The Underline - both within the park and in currently

underutilized adjacent spaces - to create identity, generate visitation and spur new development opportunity.

Particularly in untested markets, targeted investments in programming can activate sites, create new identities for districts, and attract visitation locally and regionally, ultimately spurring further investment. These investments can be either permanent or transitory. The first of several phases of investment intended to create "early wins"—as in the case of The Underline's demonstration areas, aimed to maximize foot traffic and cultivate excitement in areas that are primed for growth. New programming can occur both within The Underline park itself, as well as on adjacent sites as part of a larger, coordinated effort.

Signature parks frequently program open space to provide cultural amenities and spur on-site visitation. Examples of programming that have effectively driven visitation include public art installations, outdoor concerts, pop-ups by beloved local businesses, food and beverage oriented festivals, flea and farmers markets, and family-oriented activities. In some cases, programming such as beer gardens or pop-up events can also provide sources of revenue to offset costs while permitting or development is underway. Partnerships and sponsorships can provide operating costs for programming, or profitable revenue streams for use of space.

In the case of The Underline, several actions can encourage future investment in districts adjacent to the planned park to maximize positive impact on surrounding real estate development:

- Target operating funds to expand programming capacity in key nodes. Drawing visitation to underutilized spaces can prime districts to attract developer interest. Interim activation is a valuable tool to generate momentum and establish critical mass on sites sufficient to spur additional activity. This includes the planned Grove Gallery character zone, which will entail programming around arts and dining, and help establish a new identity to the fronting retail uses in the area.
- Promote programmed spillover from established activity nodes along the corridor to adjacent areas. In areas such as the existing retail nodes in South Miami, and the concentration of University of Miami students in Coral Gables, there is opportunity to expand the footprint of activity to adjacent areas along the corridor by hosting events in shared public space or co-marketing on campus as well as on the corridor, engaging in sponsorships, opportunities for recreation, art, or site improvements, and establishing amenities such as ancillary retail, and food and beverage concessions can capitalize on and funnel existing energy to adjacent underutilized parcels.
- Encourage the temporary, synergistic activation of adjacent publicly-owned land such as the County-owned greenspace near Douglas road adjacent to The Underline to extend the influence of the corridor's identity.

However, the implementation of programming noteworthy enough to broaden appeal raises important considerations:

- Signature programming can be costly. Some subsidy may be required, particularly in initial stages, and sponsorships or partnerships with local businesses or institutions should be pursued.
- Funding considerations may also drive management structures. The management of programming requires dedicated resources and partnerships through third-party non-profits such as the Friends of The Underline, business improvement districts, and/or local businesses.
- Land use restrictions may inhibit activation. Much of the land physically capable of accommodating activities along the corridor is publicly owned, and come with associated usage and income restrictions. The Underline should be sensitive to these regulations, while establishing arrangements that will enable flexible uses and revenue structures.

The Lawn on D | Boston, Massachusetts

In the formerly unknown neighborhood between the Innovation District in Fort Point and South Boston, the Massachusetts Convention Center Authority is planning a significant expansion of the Convention Center, including new hotels, convention and exhibit space, and retail space. The Authority has utilized a creative programming series at a 2.7-acre interim landscape called The Lawn on D—formerly an unused dirt lot—to serve its long-term development goals and rebrand the site by creating a new destination at the Boston Convention and Exhibition Center that is appealing to the area's diverse customer base of residents, workers, and conventioners.

Programming at the site launched in August 2014 and has included a series of high-profile public art installations, concerts featuring local and national talent, and regular food and bar concessions furnished by popular local businesses. In less than one year, The Lawn on D has become both a leader in Boston's cultural landscape and its most beloved outdoor gathering space, creating an entirely new identity for the D Street district in advance of the opening of its first new hotels and residential developments in 2016.



Solar powered swing sets activate the Lawn on D at night. Courtesy of Massachusetts Convention Center Authority (MCCA).



Daytime activities at the Lawn on D. Courtesy of MCCA.



Irondees, a public art installation, is an example of interim programming that attracts visitors onsite. Courtesy of the Boston Globe.

1 2 3 BEST PRACTICE V

Spur greater investment around The Underline through coordinated neighborhood partnerships to improve and activate the corridor.

The physical relationship between open space and its surrounding real estate has significant impacts on the overall value increment the park will be able to generate. This benefit can be magnified by promoting signature parks as a brand that can be integrated into local businesses and new development to attract both local and tourist visitation. By supplementing planned corridor-wide activity beyond official activity nodes, local business owners can seek to capitalize on this benefit, creating a park-side presence that both leverages and contributes to the character of the corridor. Business improvement districts and other community improvement organizations can be particularly helpful in vesting local interest in a cohesive open space network, by coordinating district-wide improvements, providing resources for local business owners, and overseeing park-adjacent programming.

Activation along The Underline corridor can be supported by forging neighborhood partnerships in a number of ways:

- Continue to promote The Underline as a brand to mutually benefit the corridor, and adjacent real estate through co-marketing opportunities. This might include regular block parties, programming of nearby open public spaces, such as Alice Weinwright or Bernacle Historic State Park, and outdoor food festivals sponsored by local businesses in conjunction with The Underline.
- Engage local business owners to foster organic, independent and complementary uses. Particularly in existing activity nodes that are not directly adjacent to the corridor such as the areas around Coconut Grove, South Miami, and Dadeland North and South stations, independent activation can extend the character and impact zone of The Underline further into the extended community and benefit the marketing initiatives of participating businesses. One tool other districts have used to create a more integrated identity are storefront improvement programs, that could potentially draw from a fund to reimburse costs of facade improvements - including alternate frontages to The Underline - that collectively complement and improve the character of the district.
- Focus on creating synergies with existing and proposed uses along the corridor by forming programming partnerships with existing cultural anchors and regional and local events. Cultural anchors with established audiences include Vizcaya Museum and Gardens, the University of Miami, and the Bank United Center. High-profile local events, such as the Coconut Grove Arts Festival, the Miami Marathon, Food Network Wine and Food Festival, and Ultra may be drawn to the opportunity for association with a new venue, and similarly brand The Underline Corridor or nearby parcels. Management capacity should be reserved for the solicitation and implementation of such events.
- Build local organizational capacity to oversee synergistic programs and coordinate district-wide improvements. Representation should be sought on existing board and steering committee for BIDs and other stakeholder organizations along the corridor, and management capacity building efforts targeted on organizations that recognize the benefits to be accrued by proximity to the corridor. These might include Friends of the Underline itself, or local organizations such as the Coconut Grove Business Improvement District or the Lincoln Road Business Improvement District being considered in Brickell Village.

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Grand Park | Los Angeles, California

While Grand Park had long been a public space adjacent to important cultural institutions, its identity had languished, in part due to its proximity to Downtown's "skid row" and isolated location amidst a municipal district. A joint venture by the city of Los Angeles, Los Angeles County, and private developer Related Companies, which was developing adjacent parcels along the Grand Avenue corridor, financed a \$66 million renovation of the space, but programming of the park by its neighboring cultural institutions has been key to activating the district. Events are being coordinated by the Performing Arts Center of Los Angeles County, which oversees the Dorothy Chandler Pavilion, Ahmanson Theatre, Mark Taper Forum and the Walt Disney Concert Hall. During the first six months, the Performing Arts Center hosted approximately 40 events at Grand Park with a mix of programming targeted for both a mass audience and local passers-by, including high-profile dance and music performances as well as daily food trucks and regular yoga classes. This dynamic program mix has transformed perceptions of the area; rather than a space cultural event attendees and workers must pass through by necessity, the park is drawing both daytime attendees and young workers and families in the evening, creating new activity that is generating momentum for the greater Grand Avenue corridor.



Figure 3. Grand Park serves as an outdoor concert venue anchoring 24/7 activity. Courtesy of Elliot Nigittire.



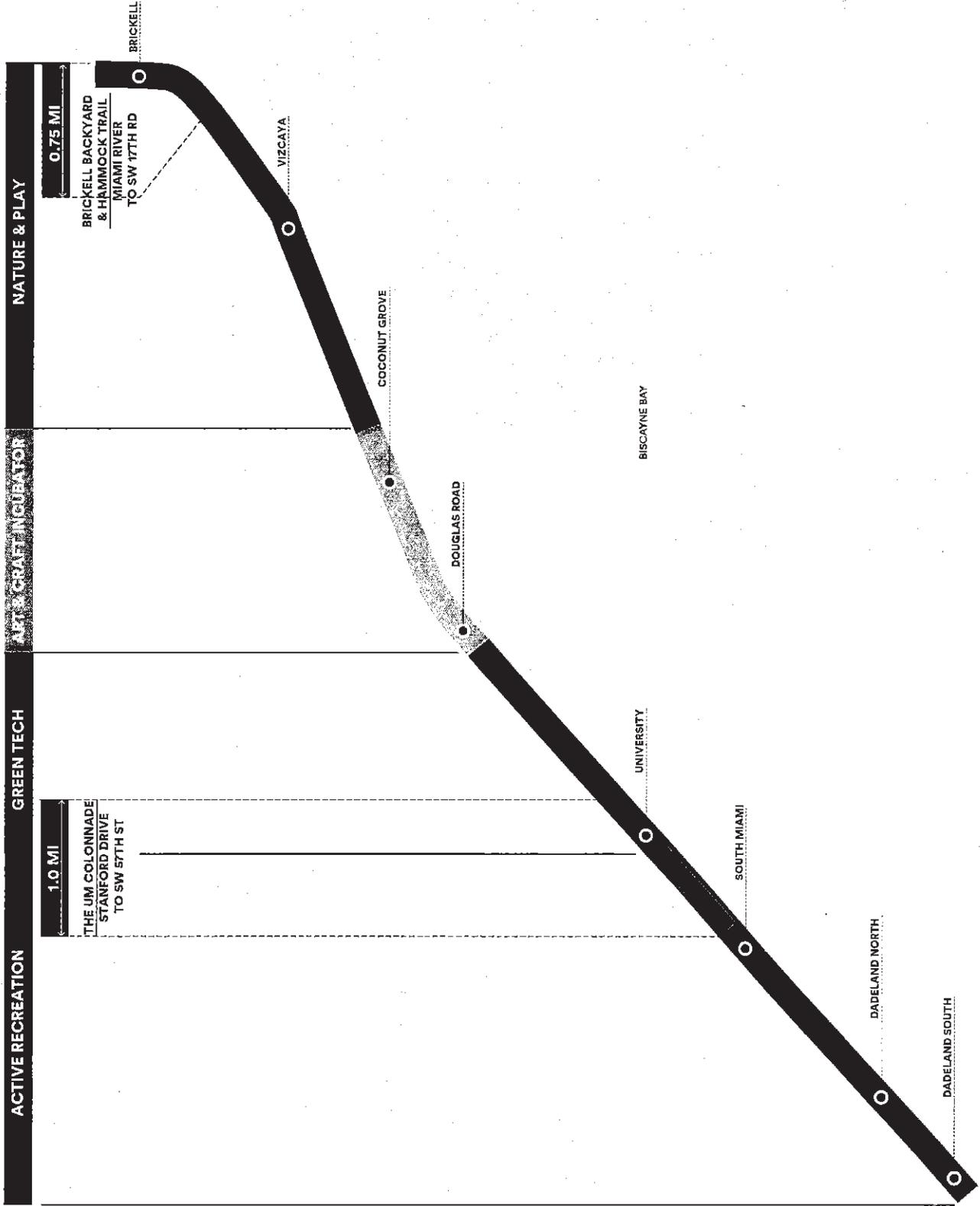
Grand Park hosts civic gatherings by day and connects various urban neighborhoods by serving as a central gathering place.

CHAPTER 3

DEMONSTRATION PROJECTS

- 3.1 THE BRICKELL BACKYARD
- 3.2 THE UM COLONNADE
- 3.3 PROJECTS LIGHTING

DEMONSTRATION PROJECTS



NOT TO SCALE

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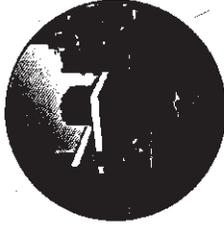
3.1 THE BRICKELL BACKYARD

THE BRICKELL BACKYARD CHARACTER ROOMS

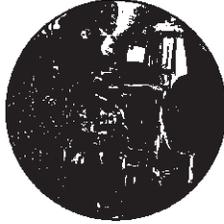
Brickell is both a central transportation hub and a rapidly-growing high density urban neighborhood. Its diverse character encourages a program that can balance open space for commuters during rush hour and a park-like natural setting that can provide the local community with a much needed backyard.

The Brickell Backyard is organized by a procession of "rooms", each articulated with a unique program that directly responds to its immediate context. The rooms include The River Room, offering a unique vantage point to views of the Miami River; The Picnic Pockets, a space to relax under the lush canopy of existing trees; the Dog Park, providing a much needed space for residents and their pets; The Gym, an active recreation space with flexible sports courts including basketball and volleyball; The Station Plaza, a flexible urban space that can accommodate multiple commuter routes; The Oolite Room, a naturalized area that highlights and carves out unique spaces within the existing stone outcrop; The Meadow Arc, a sheltered cycling and pedestrian path through existing commercial areas, and the Hammock Play Zone, an area that further extends Simpson Park Hammock's natural environment with a series of rooms that promote nature exploration through play. The rooms are tied together by revealing and exposing the oolite bedrock along their perimeter. Here, the oolite takes the form of benches, seatwalls, edges, paving and natural outcrops along the approximately 0.75 mile length.

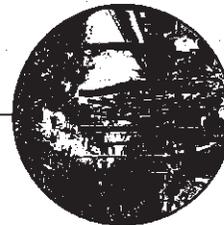
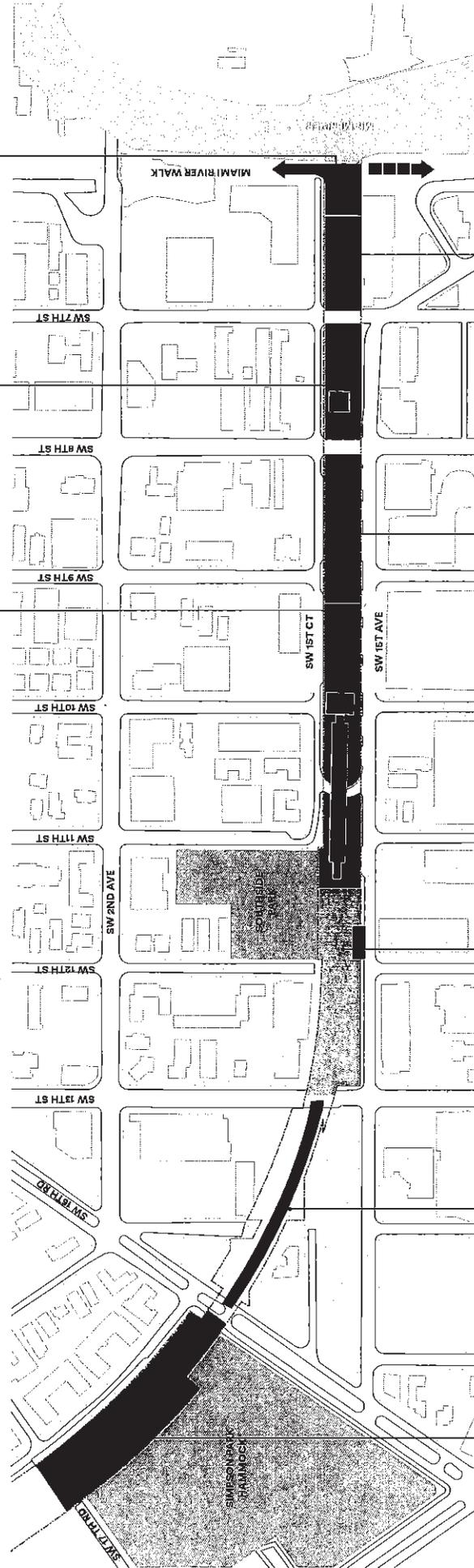
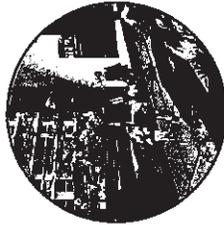
THE STATION PLAZA



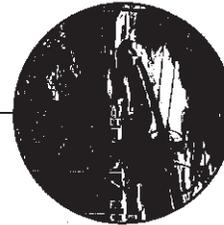
THE DOG PARK



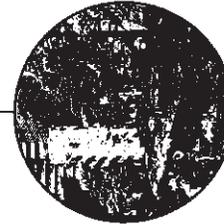
THE RIVER ROOM



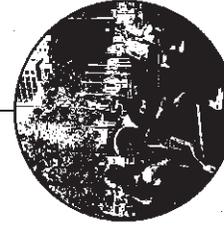
THE HAMMOCK PLAY ZONE



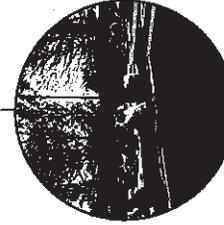
THE MEADOW ARC



THE OOLITE ROOM



THE GYM



THE PICNIC POCKETS



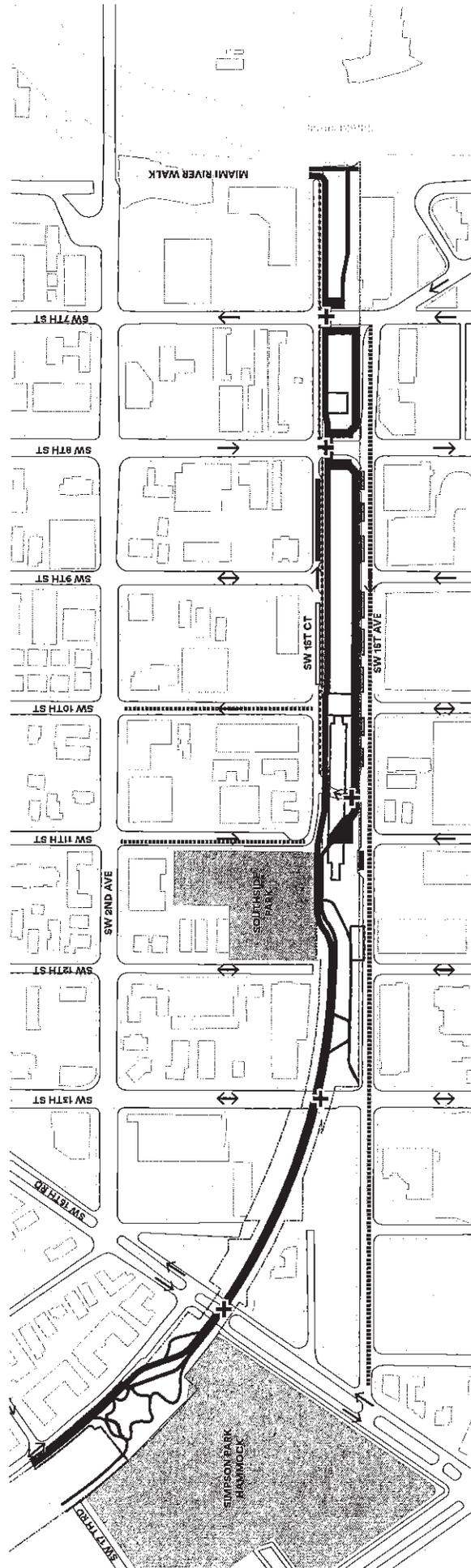
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THE BRICKELL BACKYARD PATHS AND INTERSECTIONS

In the Brickell Backyard, the off-road dedicated bicycle path is consistently located along the west side of the Metrorail structure (east side of SW 1st Court) from the Miami River to SW 1st St ensuring a mostly straight and easy to navigate trail within this complex urban environment.

Between the Miami River and SW 12th Street, a sidewalk lines the western side of the bicycle path providing a dedicated space for pedestrians approaching from the western streets.

The pedestrian path in this area varies in its location. Between the Miami River and the Brickell Metrorail station, the path is integrated with an expanded sidewalk along the west side of SW 1st Ave, ranging between 8 to 18 feet in width in order to accommodate perpendicular pedestrian flow from adjacent bus and trolley stops along SW 1st Ave. Once the path reaches the Brickell Station, it is reoriented, running parallel to the bicycle path from SW 11 St south to SW 15th Road.



LEGEND

- DEDICATED OFF-ROAD TWO-WAY BICYCLE PATH
- PEDESTRIAN PATH (PRIMARY)
- PEDESTRIAN PATH (SECONDARY)
- PROPOSED SIDEWALK
- PLANNED ON ROAD BICYCLE ROUTE (BY CITY OF MIAMI)
- MDT R.O.W
- EXISTING SIDEWALK

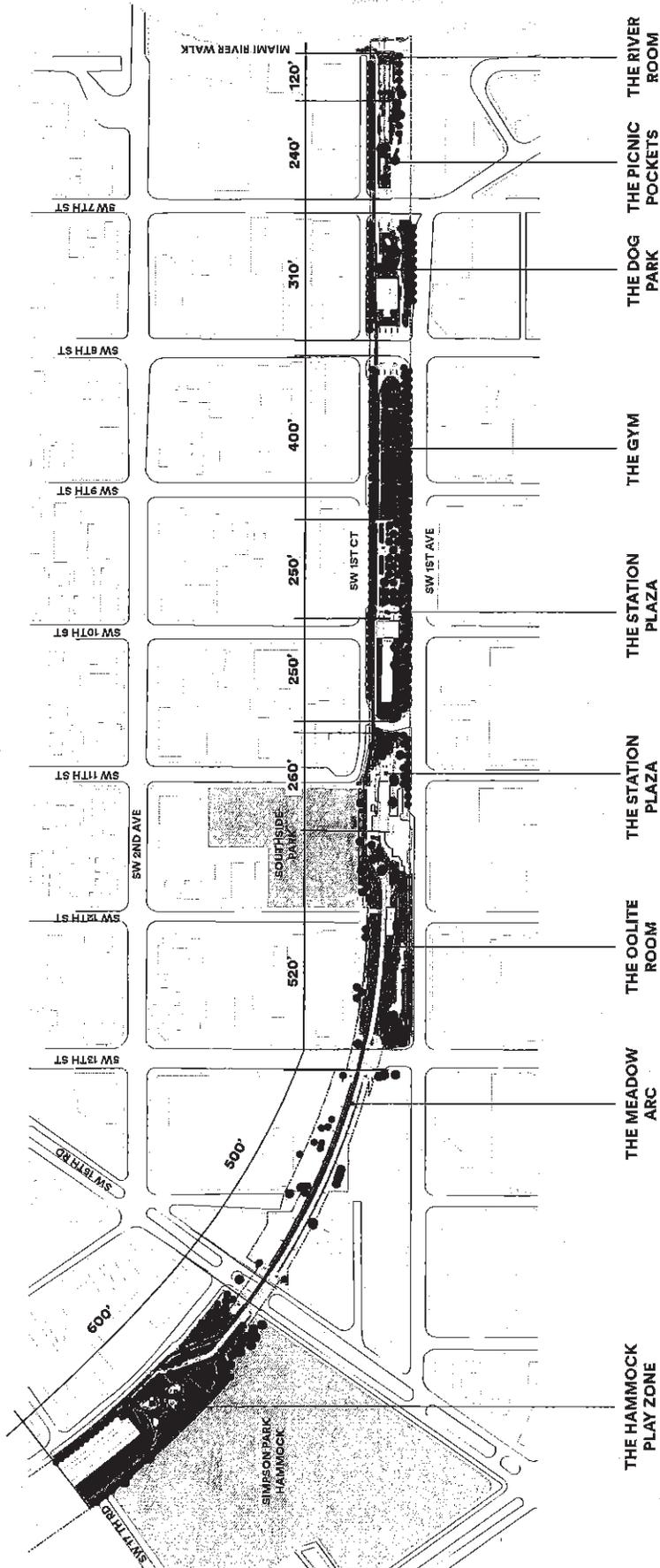
LEGEND

- PROPOSED BUS DROP-OFF BAYS (FOUR 60' BAYS & FOUR 40' BAYS)*
- PROPOSED BUS LAYOVER AREA*
- TROLLEY STOP*
- PROPOSED STATION KISS & RIDE*
- VEHICULAR CIRCULATION
- INTERSECTION : MINOR IMPROVEMENT (3 TOTAL)
- INTERSECTION : MAJOR IMPROVEMENT (2 TOTAL)

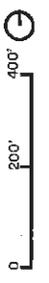
* Planning in coordination with MDT and the City of Miami

THE BRICKELL BACKYARD OVERVIEW PLAN

The design of The Underline aspires to have one consistent identity throughout the corridor, established by consistent design elements that articulate the park along its ten miles including its paths, native vegetation, signage and wayfinding, urban furnishings and lighting elements. The Brickell Backyard incorporates these unique elements as well as highlights the use of oolite stone as a consistent material that further articulates each of the park's unique rooms within this zone. The oolite functions as pavement along the enlarged sidewalks, as seatwalls and retaining walls enveloping each programmed space and as rough stone outcrops that celebrate the unique geology that characterizes the region.



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THE BRICKELL BACKYARD DETAIL PLAN 1 | MIAMI RIVER TO SW 8TH ST

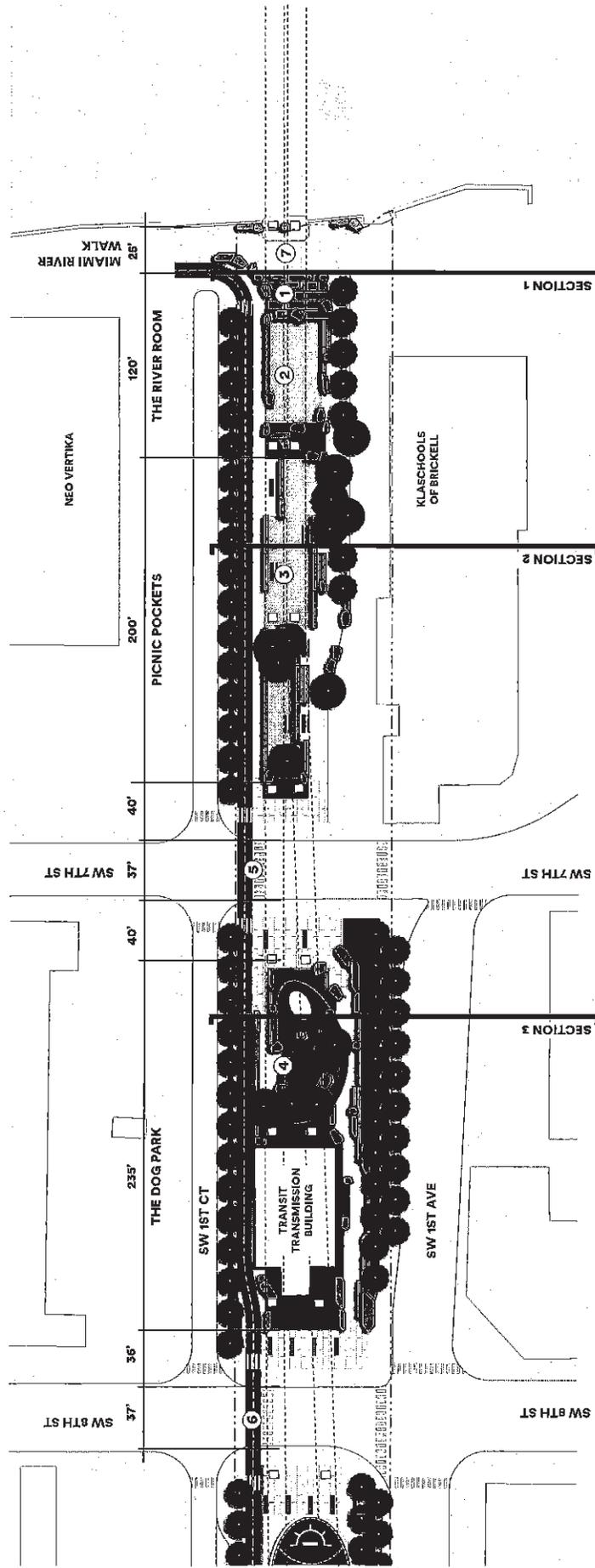


LEGEND

- DEDICATED OFF-ROAD TWO-WAY BICYCLE PATH
 - DEDICATED BICYCLE CROSSING
 - PEDESTRIAN PATH
 - PEDESTRIAN CROSSING
 - MDT RIGHT OF WAY
 - EXISTING TREES
 - PROPOSED TREES
 - BICYCLE PARKING
 - PICNIC TABLE
 - COLLITE STONE (ROUGH)
 - COLLITE SEATWALL
-
- 1 COLLITE SEATING STEPS
 - 2 SLOPED LAWN
 - 3 PICNIC AREA
 - 4 DOG RUIN
 - 5 SW 7TH ST INTERSECTION: MINOR IMPROVEMENT (SEE APPENDIX CH 4.2)
 - 6 SW 8TH ST INTERSECTION: MEDIUM IMPROVEMENT (SEE APPENDIX CH 4.2)
 - 7 25' WIDE PAVED AREA PER MIAMI RIVER GREENWAY PLANS

The River Room, Picnic Pockets and the Dog Park are located on the northern most portion of the Brickell Backyard, extending from the Miami River south to SW 8th Street. The River Room* celebrates its unique position along the river by carving out a series of collite seating steps oriented toward the River's unique views. Directly south, the Picnic Pockets* offer a recreational space for local residents within a lush, park-like setting that provides much needed relief from the area's dense and urban environment.

In response to popular public input received during various public meetings, a Dog Park is proposed between SW 7th and SW 8th Streets.

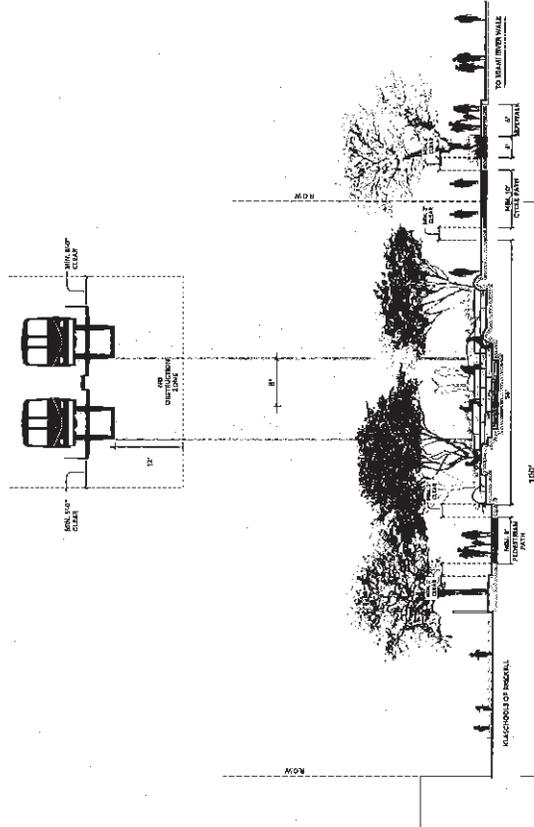


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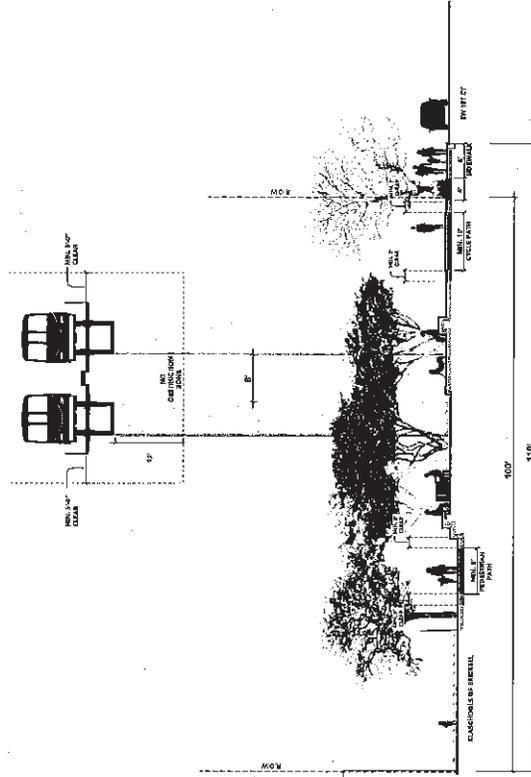
*The design for this area will be further coordinated with existing plans for the Miami River Greenway, potential plans for a Water Taxi stop, MD Country Transit and the City of Miami.

THE BRICKELL BACKYARD
 THE RIVER ROOM | MIAMI RIVER

THE BRICKELL BACKYARD
 PICNIC POCKETS | MIAMI RIVER TO SW 7TH ST



SECTION 1



SECTION 2

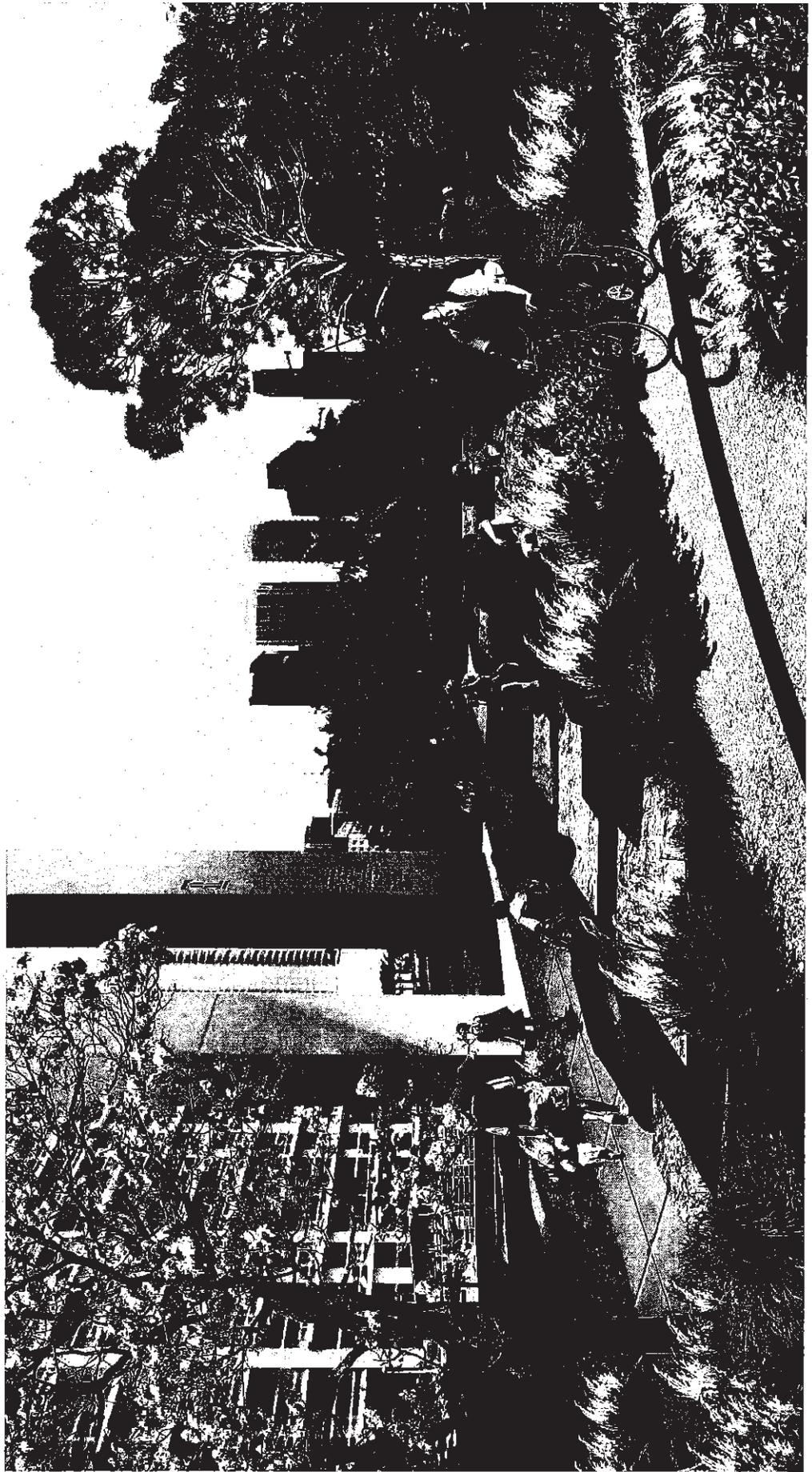


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**THE BRICKELL BACKYARD
THE RIVER ROOM**



EXISTING CONDITIONS AT
THE EDGE OF THE MIAMI RIVER



THE RIVER ROOM AT THE BRICKELL BACKYARD

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THE BRICKELL BACKYARD
DETAIL PLAN 2 | SW 8TH ST TO BUS TURNAROUND

LEGEND

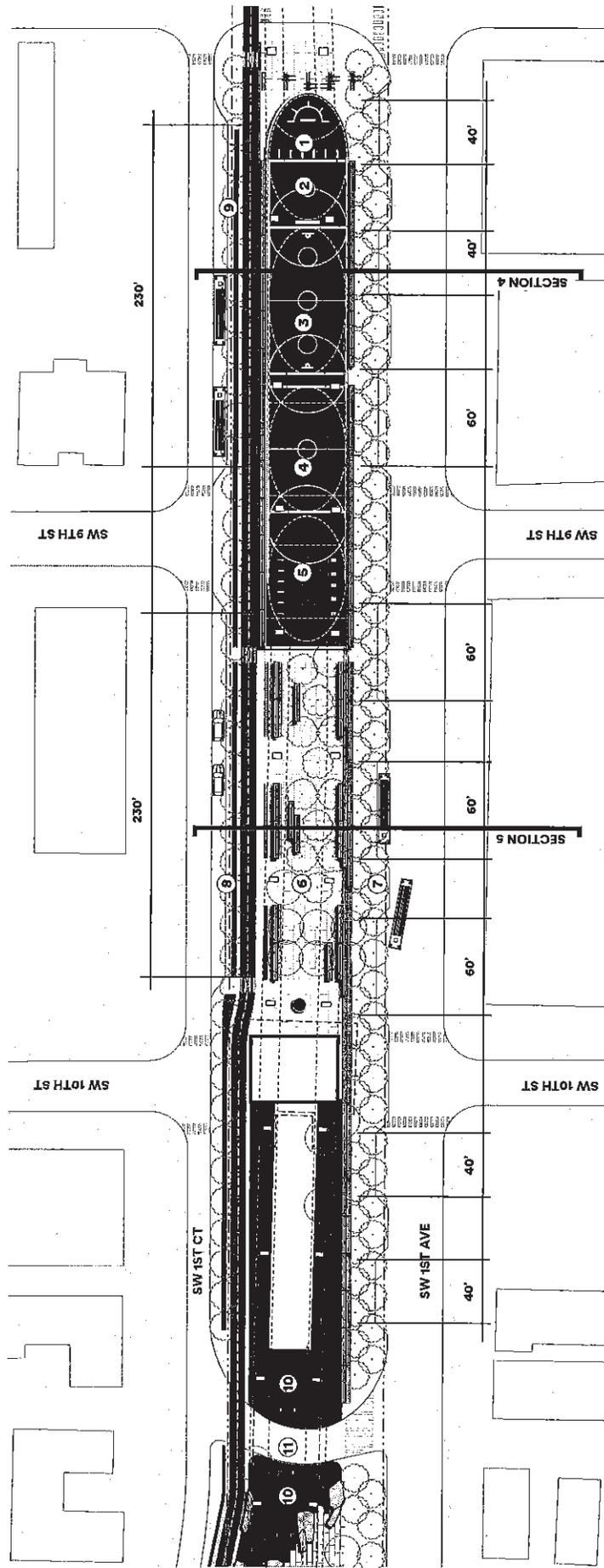
- DEDICATED OFF-ROAD
- TWO-WAY BICYCLE PATH
- DEDICATED BICYCLE CROSSING
- PEDESTRIAN PATH
- PEDESTRIAN CROSSING
- MDT RIGHT OF WAY
- EXISTING TREES
- PROPOSED TREES
- BICYCLE PARKING
- BENCH
- OOLITE STONE (ROUGH)
- OOLITE SEATWALL
- ART INSTALLATION

- 1 TRAINING ZONE
- 2 HANDBALL COURT
- 3 BASKETBALL COURT
- 4 VOLLEYBALL COURT
- 5 GROUP FITNESS
- 6 STATION PLAZA + GROVE
- 7 BUS WAITING + QUEUING
- 8 STATION KISS & RIDE
- 9 BUS LAYOVER AREA
- 10 THE STATION GARDENS
- 11 BUS TURNAROUND INTERSECTION MINOR IMPROVEMENT (SEE APPENDIX CH 4.2)

The Framework Plan studies for this area of The Underline seek to optimize the spatial organization of the Brickell Station plaza - one of the most critical transportation hubs along the corridor - where the Metrorail, various bus and trolley routes, pedestrian and cyclist connections all come together in a small space.

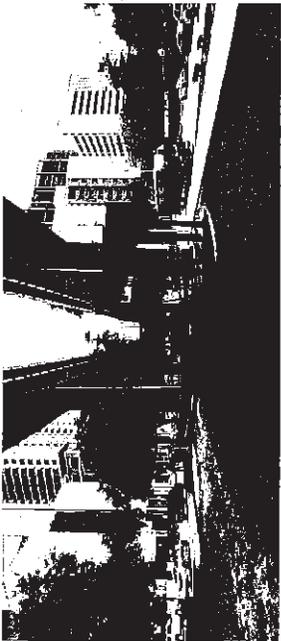
In collaboration with the City of Miami and Miami Dade Transit, the Station Plaza design proposes to relocate all bus stops to the west side of SW 1st Ave running parallel with an enlarged sidewalk that will also serve as the Park's pedestrian path. A station "kiss and ride" and bus layover areas are proposed on the east side of SW 1st Court separated from the dedicated cycling path by a planted buffer. In order to accommodate these spaces, the design proposes the reduction of one lane of traffic at SW 1st CT and will also require a careful study of the bus turnaround to ensure the safe crossing of cyclists and pedestrians across this road.

The station plaza will house a bust of Beethoven, honoring the Beethoven Promenade Concept adopted by City of Miami resolution.



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**THE BRICKELL BACKYARD
THE GYM**



EXISTING CONDITIONS BETWEEN
SW8TH ST AND SW9TH ST.



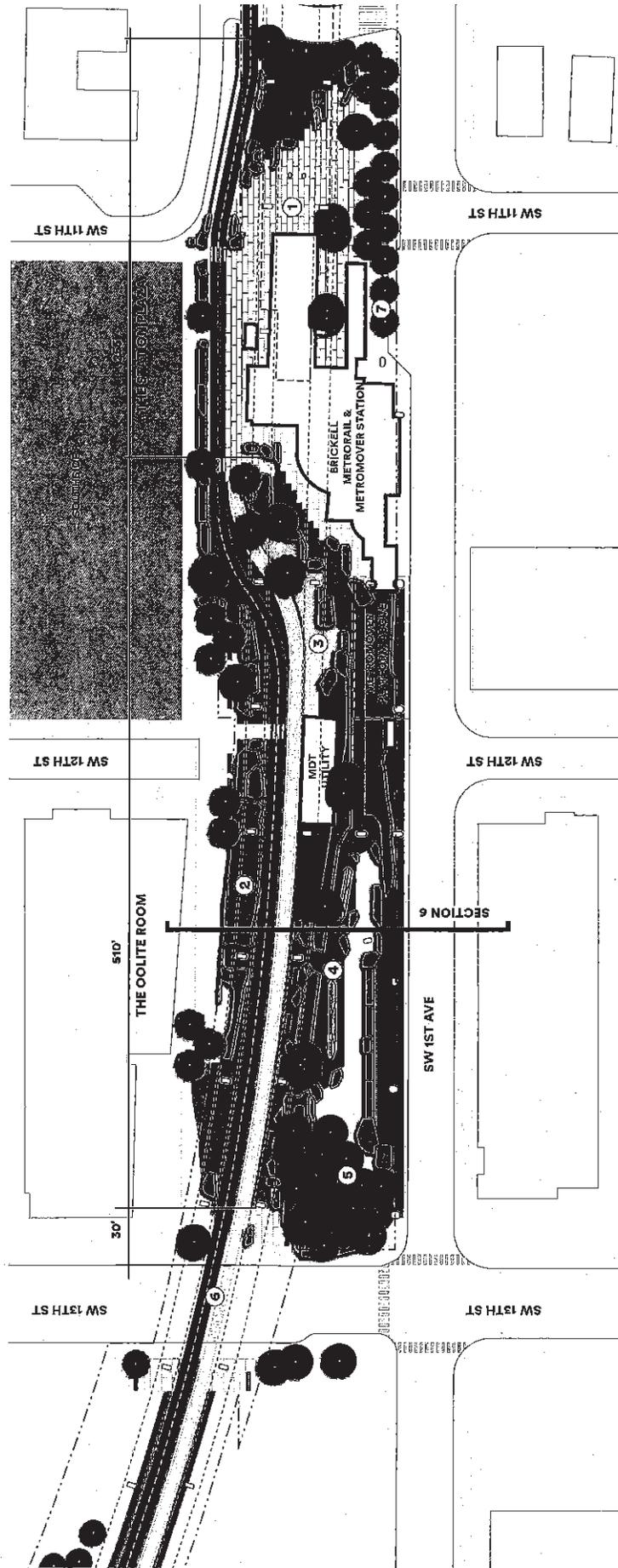
THE GYM AT THE BRICKELL BACKYARD

THE BRICKELL BACKYARD
 DETAIL PLAN 3 | SW 11TH ST TO SW13TH ST



- LEGEND**
- DEDICATED OFF-ROAD
 - TWO-WAY BICYCLE PATH
 - DEDICATED BICYCLE CROSSING
 - PEDESTRIAN PATH
 - PEDESTRIAN CROSSING
 - MDT RIGHT OF WAY
 - EXISTING TREES
 - PROPOSED TREES
 - BICYCLE PARKING
 - BENCH
 - OOLITE STONE (ROUGH)
 - OOLITE SEATWALL
- 1 STATION PLAZA
 - 2 EXISTING OOLITE OUTCROP
 - 3 LAWN
 - 4 CLIMBING WALLS
 - 5 EXISTING TREE GROVE
 - 6 SW 13TH ST INTERSECTION MEDIUM IMPROVEMENT (SEE APPENDIX CH 4.2)
 - 7 TROLLEY DROP-OFF

With its exposed oolite stone outcrop, The Oolite Room between SW 12th and SW 13th Street is one of the most memorable spaces along the entire 10-mile corridor. Capitalizing on its unique environment, the dedicated bicycle and pedestrian paths along this area run between large oolite formations, punctuated by naturalized garden spaces. Two large climbing walls further reinforce this unique geological environment while providing another space for active recreation to Brickell residents.



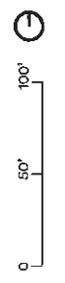
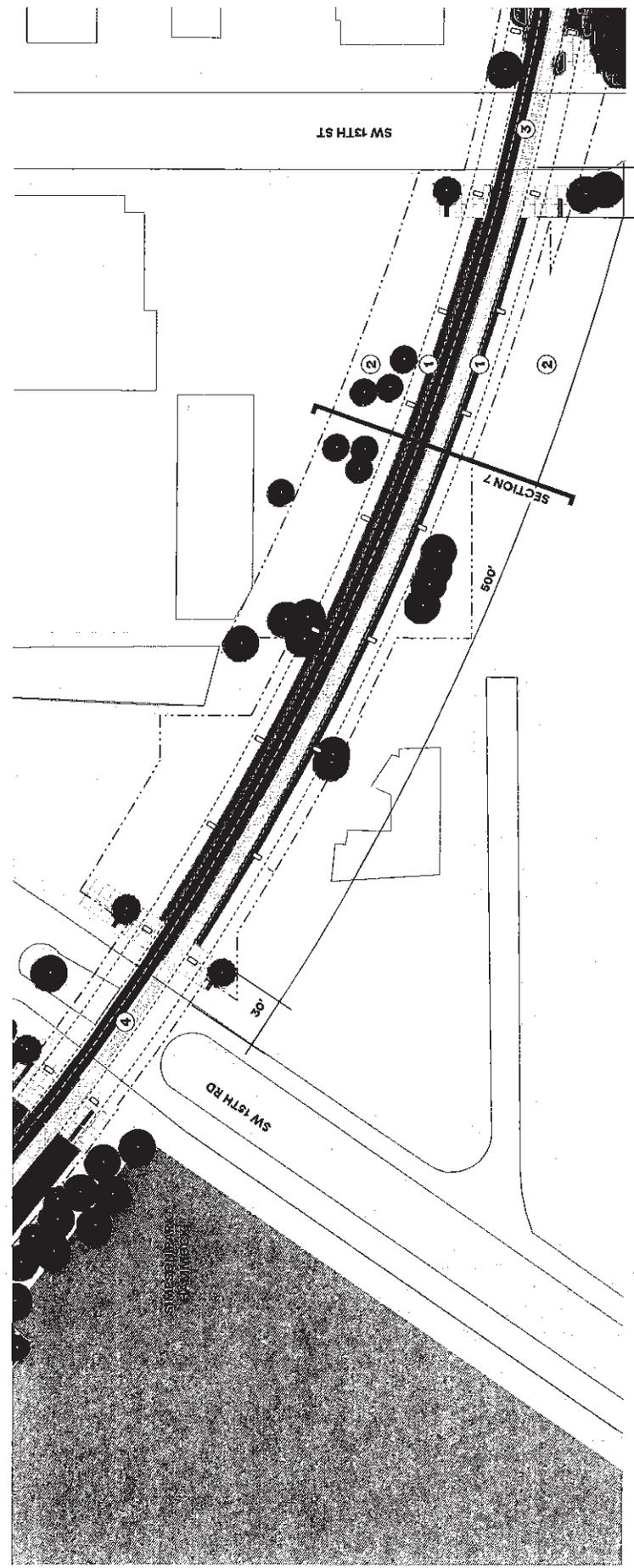
151

THE BRICKELL BACKYARD
DETAIL PLAN 4 | SW 13TH ST TO SW 15TH RD



- LEGEND**
- DEDICATED OFF-ROAD
 - TWO-WAY BICYCLE PATH
 - DEDICATED BICYCLE CROSSING
 - PEDESTRIAN PATH
 - PEDESTRIAN CROSSING
 - MDT RIGHT OF WAY
 - EXISTING TREES
 - PROPOSED TREES
 - BICYCLE PARKING
 - BENCH
 - COOLITE STONE (ROUGH)
 - COOLITE SEATWALL
 - 1 FLOWERING MEADOW
 - 2 ADJACENT PARKING LOT
 - 3 SW 13TH ST INTERSECTION, MEDIUM IMPROVEMENT (SEE APPENDIX CH 4.2)
 - 4 SW 15TH RD INTERSECTION, MINOR IMPROVEMENT (SEE APPENDIX CH 4.2)

Located between SW 13th Street and SW 15th Road, the Meadow Arc creates a continuous 32-foot wide corridor along what is now a space leased by MDT for commercial parking. In order to minimize its impact, the corridor dimension at this location is optimized to only accommodate the pedestrian and cycling paths, flanked by a narrow planted buffer on either side. These planters will feature a more varied understory palette of meadow grasses and native flowers. Along the arc, paths will be slightly raised off the ground, separating The Underline from the adjacent parking lot and providing its visitors with a unique and improved vantage point over the adjacent parked cars.

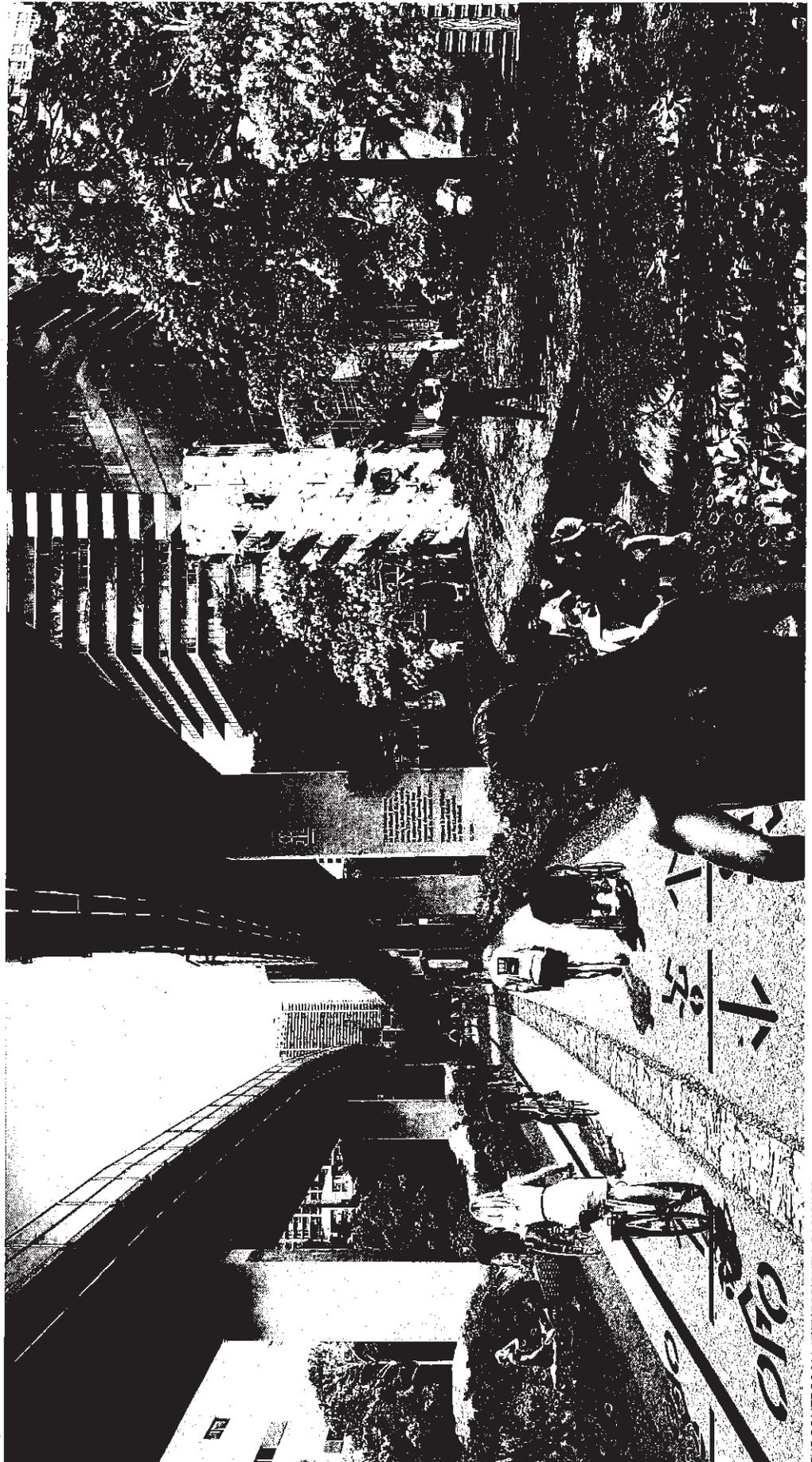


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THE BRICKELL BACKYARD
THE OOLITE ROOM



EXISTING CONDITIONS BETWEEN SW22TH ST AND SW18TH ST



THE OOLITE ROOM AT THE BRICKELL BACKYARD

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THE BRICKELL BACKYARD
 DETAIL PLAN 5 | SW15TH RD TO SW17TH RD

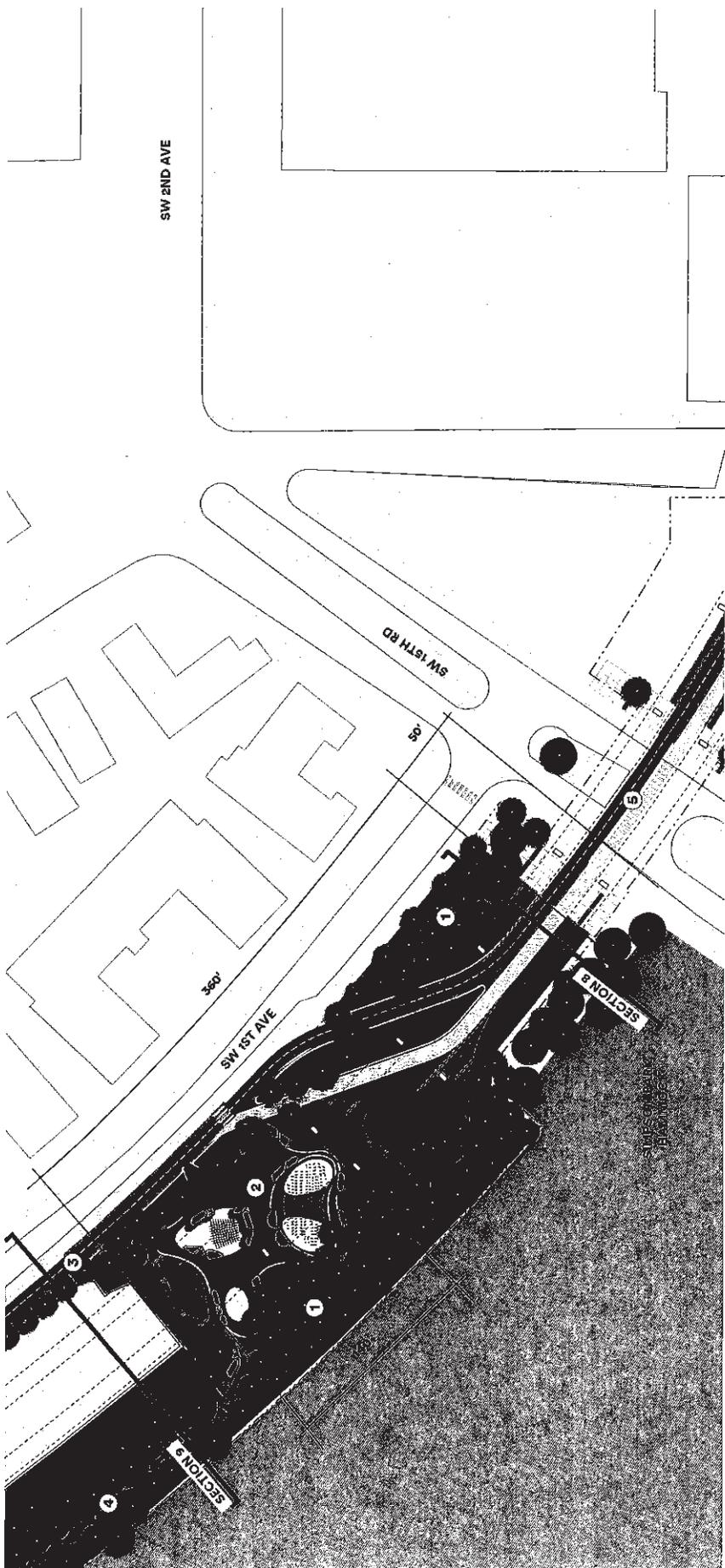


LEGEND

- DEDICATED OFF-ROAD
- TWO-WAY BICYCLE PATH
- DEDICATED BICYCLE CROSSING
- PEDESTRIAN PATH
- PEDESTRIAN CROSSING
- MDT RIGHT OF WAY
- EXISTING TREES
- PROPOSED TREES
- BICYCLE PARKING
- BENCH
- OOLITE STONE (ROUGH)
- OOLITE SEATWALL

- HAMMOCK ENVIRONMENT
- HAMMOCK PLAY ZONE
- TERRACED RETAINING EDGE
- TRAIL
- SW 15TH RD INTERSECTION: MINOR IMPROVEMENT (SEE APPENDIX CH 4.2)

The Hammock Play Zone in the Brickell Backyard, located between SW 15th and SW 17th Road, will prioritize the natural environment by expanding the Hammock community of the immediately adjacent Simpson Park Hammock- one of the few remnants of the historic Brickell Hammock. A natural play area is carved in to the Hammock community to encourage explorative and integrated play. There is also an opportunity for artist-designed permanent (and functional) works of art.



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**THE BRICKELL BACKYARD
THE HAMMOCK PLAY ZONE**



EXISTING CONDITIONS NEAR SIMPSON PARK HAMMOCK



THE HAMMOCK PLAY ZONE AND NATURE PATH NEAR SIMPSON PARK HAMMOCK

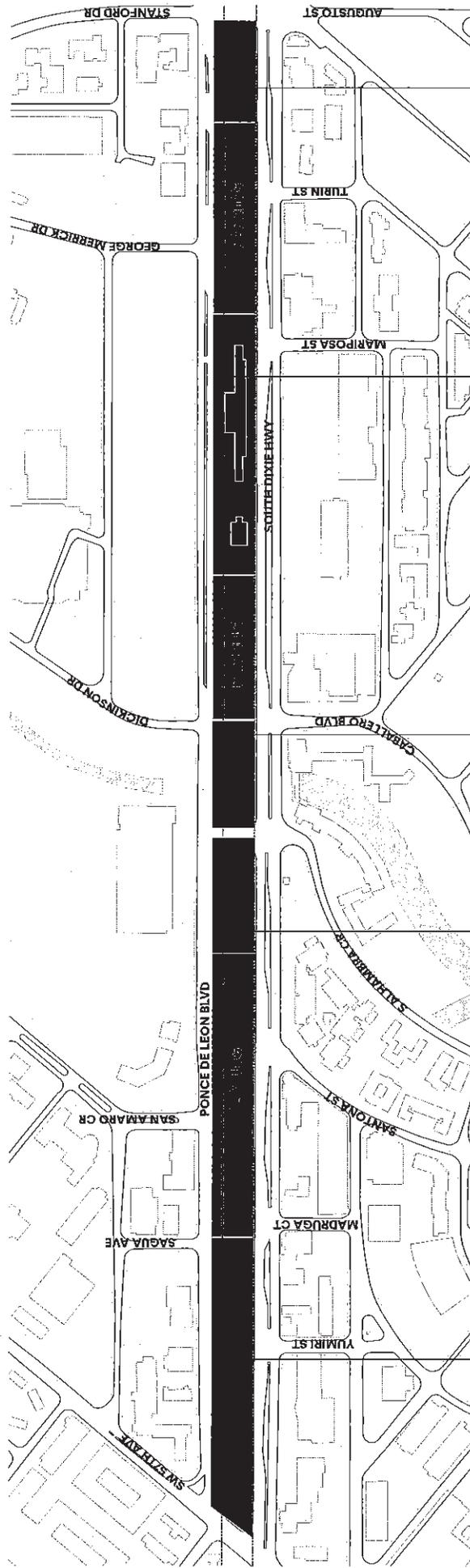
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3.2 THE UM COLONNADE

THE UNIVERSITY COLONNADE CHARACTER ROOMS

The University Metrorail station is one of the most frequented stations along the corridor, given its direct relationship to the University of Miami and the City of Coral Gables. The diverse range of users, including students, faculty, university employees, occasional visitors and neighbors inspires a program that balances education, culture and innovation with opportunities for retail, enjoyment and recreation.

To that end, the University Colonnade is organized as a series of "rooms" programmed with unique features that will attract the area's most frequent users, while at the same time create a new destination for the park's users. The rooms include: The Gateway Garden, an entry organized along a display or specimen palm trees; The Green Tech Gallery and the Pop-ups @ UM, a re-organized entrance plaza for University Station, where innovative green technologies will be displayed, along with pop-up container stores and pushcart docking stations flanking both sides of the station; The Rain Garden, a small outdoor performance space with water-loving native plants that collect and manage stormwater; The Ribbon Rink, a fun space for rollerblading, in-line skating, skateboarding and biking organized along a topographic surface; and the Birding Trail, a series of meandering paths around specimen trees known to attract birds.



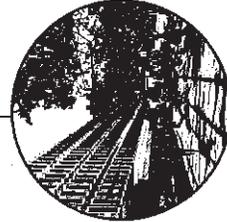
THE BIRDING TRAIL



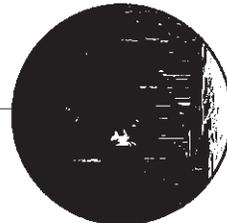
THE RIBBON RINK



THE RAIN GARDEN



GREEN TECH GALLERY
AND POP-UPS @ UM



THE GATEWAY GARDEN

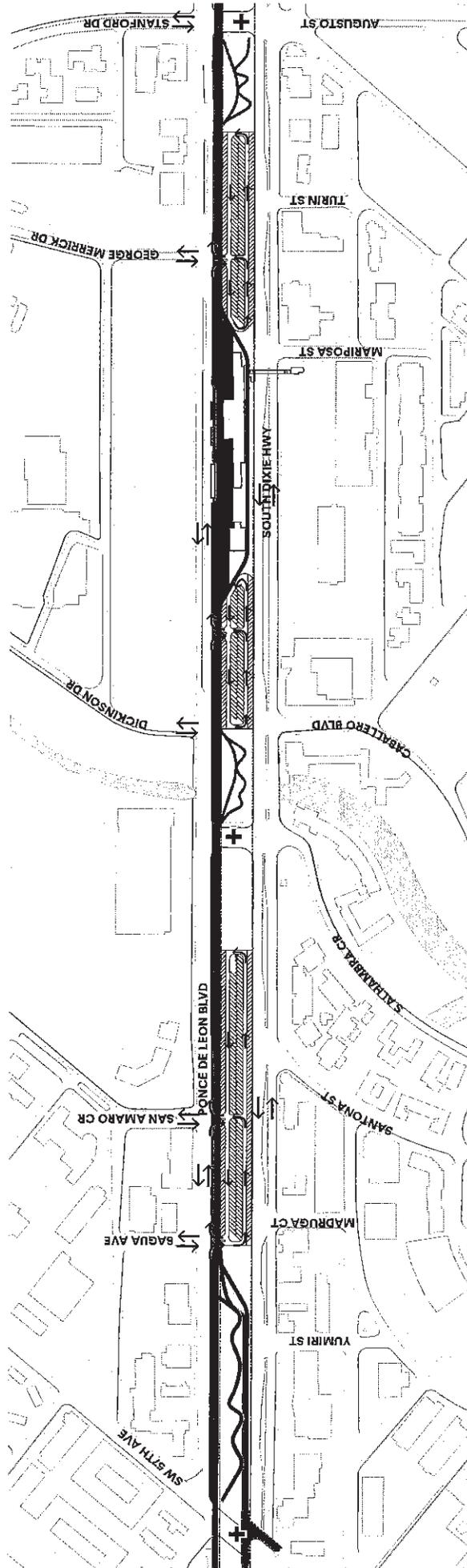


159

THE UNIVERSITY COLONNADE PATHS AND INTERSECTIONS

Within the University Colonnade study area, the majority of the off-road dedicated bicycle path is placed on the east side of Ponce de Leon Boulevard running parallel with the pedestrian path and an enlarged sidewalk. At the station however, the bicycle path is moved east, to run along the back side of the station in order to avoid conflicts with the perpendicular flow of pedestrians within the station plaza.

The layout for the area aims to balance a park-like environment and clear continuation of The Underline with the need to provide as much surface parking as possible. To that end, the design for this area introduces blocks of surface parking at regular intervals. The parking areas are interspersed with programmed areas, with an idea that, on occasions when large events and programs such as farmers markets occur, they can spill over into the parking areas.



LEGEND

- DEDICATED OFF-ROAD TWO-WAY BICYCLE PATH
- PEDESTRIAN PATH (PRIMARY)
- PEDESTRIAN PATH (SECONDARY)
- - - PROPOSED BUS / TROLLEY DROP-OFF
- ▨ PROPOSED STATION KISS & RIDE
- ▨ MDT R.O.W
- ▨ EXISTING SIDEWALK

LEGEND

- ↔ VEHICULAR CIRCULATION
- + INTERSECTION : MINOR IMPROVEMENT (2 TOTAL)
- + INTERSECTION : MAJOR IMPROVEMENT (1 TOTAL)
- ▨ ANGLED PARKING (APPROX. 485 SPACES)

NOTE: AN ADDITIONAL 178 SPACES ARE PROPOSED BETWEEN STANFORD DRIVE AND GRANADA BLVD. SEE PAGES 304-305.

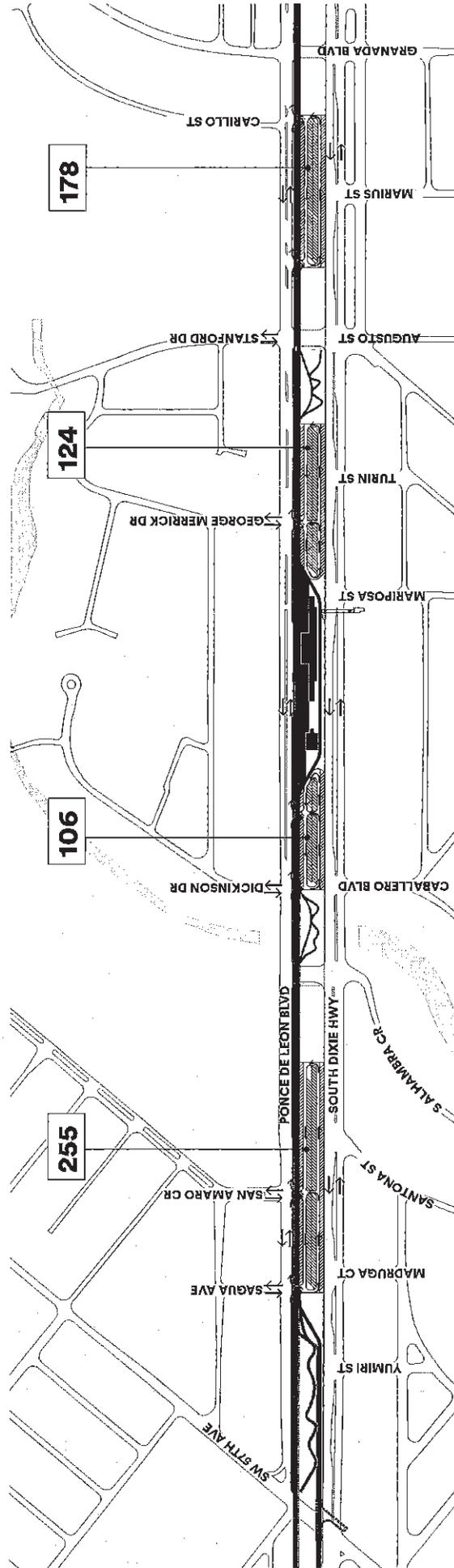


160

THE UNIVERSITY COLONNADE SURFACE PARKING STUDY

As a part of the masterplan, a preliminary parking study (done in conjunction with MDT) shows that the current demand of approximately 663 surface parking spaces can be met in the segment between SW 57th ave and Granada Blvd. Approximately 230 spaces are provided in close proximity to the station with the furthest spots being maximum 1,050' away from the station entrance. The entrance/exit points use the currently existing curb cuts along Ponce de Leon Blvd. The strategy aims to balance parking demand with park programs, to ensure adequate accessibility for transit users, the UM campus and for the Underline.

Detailed layout and circulation will be studied in the next phases of design.



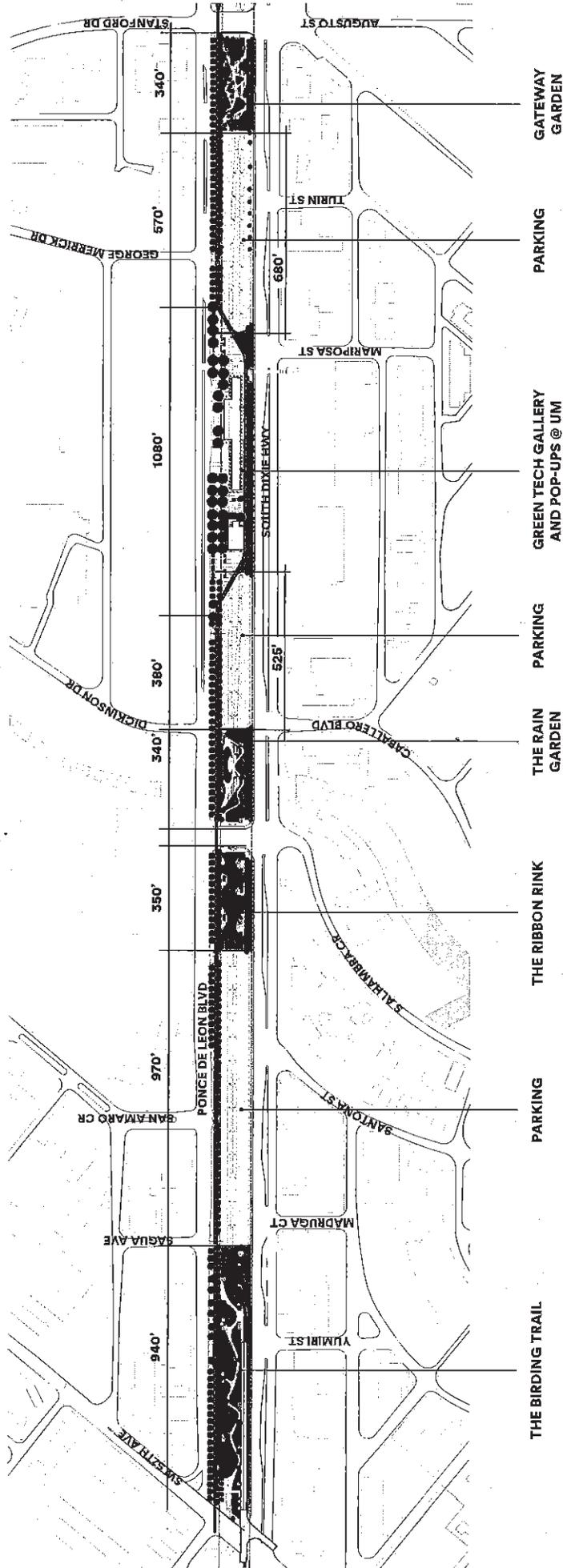
- LEGEND
- DEDICATED OFF-ROAD TWO-WAY BICYCLE PATH
 - PEDESTRIAN PATH (PRIMARY)
 - PEDESTRIAN PATH (SECONDARY)
 - ANGLD PARKING (663 SPACES)
 - ↔ VEHICULAR CIRCULATION

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THE UNIVERSITY COLONNADE OVERVIEW PLAN

Similar to the Brickell Backyard, the design for the University Colonnade looks to introduce an additional element to the typical Underline design vocabulary, in order to create a distinctive environment that distinguishes the UM Colonnade as a unique destination along the corridor.

Looking to expand the University of Miami's highly recognized arboretum, the design for the UM Colonnade introduces a number of new specimen trees. These new trees, in combination with the typical Underline native vegetation palette, will significantly increase tree canopy and transform the character of the space, breaking up the required surface parking with lush and green spaces that evoke the mission and identity of the adjacent University.



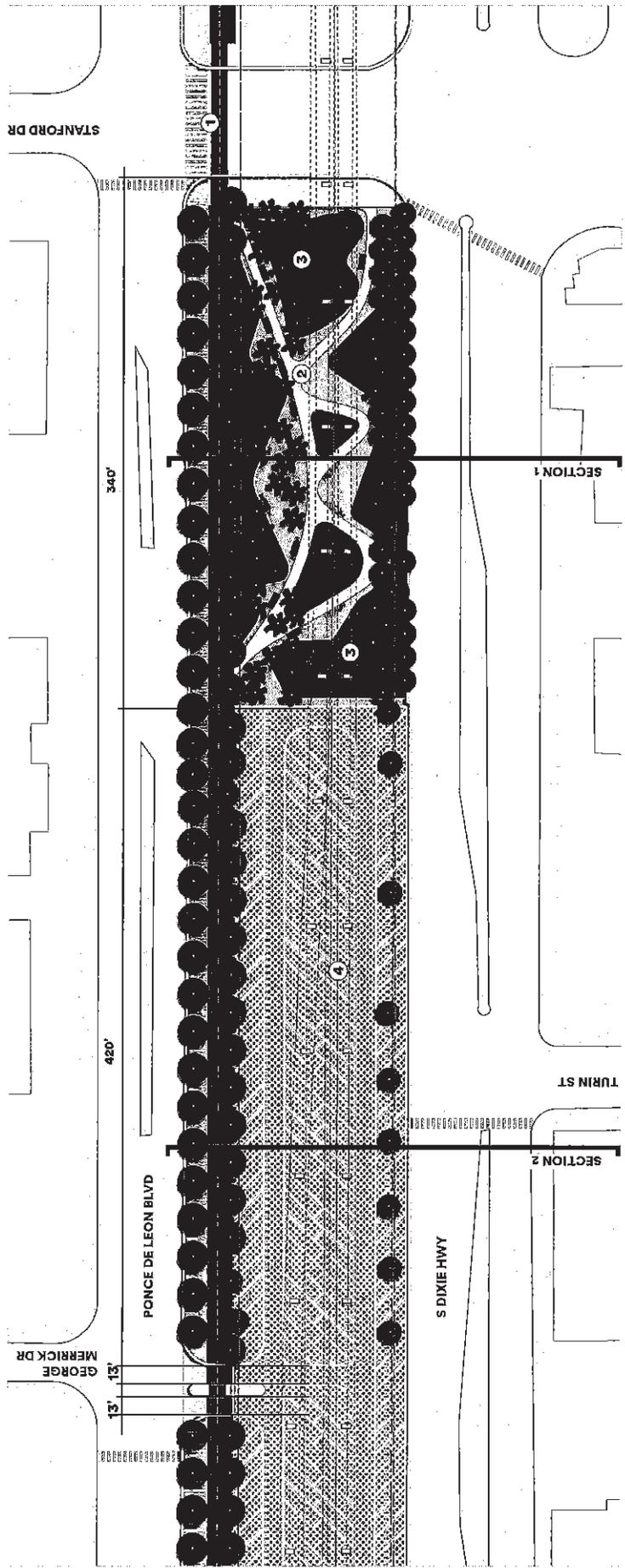
162

THE UNIVERSITY COLONNADE DETAIL PLAN 1 | STANFORD DR TO GEORGE MERRICK DR

- LEGEND**
- DEDICATED OFF-ROAD TWO-WAY BICYCLE PATH
 - DEDICATED BICYCLE CROSSING
 - PEDESTRIAN PATH
 - PEDESTRIAN CROSSING
 - MDT RIGHT OF WAY
 - SWALE
 - EXISTING TREES
 - PROPOSED SPECIMEN TREES
 - BICYCLE PARKING
 - PICNIC TABLES
 - BENCH
 - HAMMOCK
- ① STANFORD DR INTERSECTION: MINOR IMPROVEMENT (SEE APPENDIX CH 4.2)
 - ② SPECIMEN PALMS TRAIL
 - ③ STORMWATER GARDENS
 - ④ ANGLED PARKING

The northern edge of the UM Colonnade is located at the intersection with Stanford Drive, UM's primary entry point demarcated by a dramatic alley of royal palm trees. Reinforcing this environment, the first portion of the UM Colonnade, situated just south of Stanford Drive, creates a unique garden space articulated with a series of smaller pedestrian paths that meander around specimen palm trees.

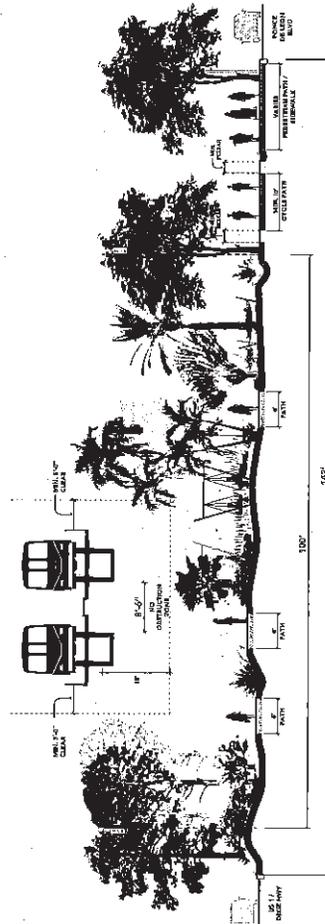
Following this space is the first of three parking lots, located between Stanford Drive and Segua Avenue. Along Ponce de Leon, an enlarged pedestrian path continues on next to the bike path, both lined with street trees for shade.



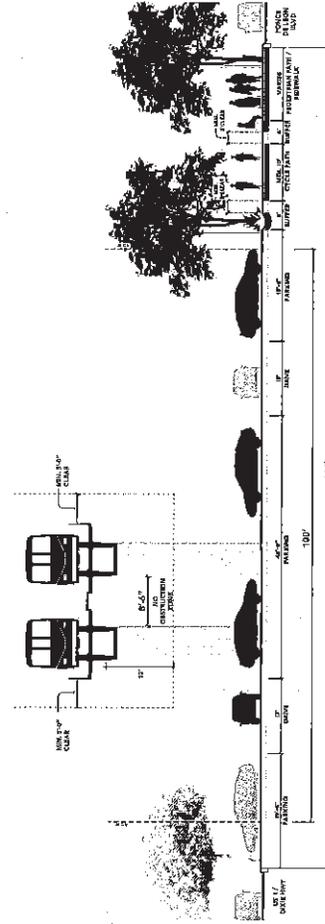
163

THE UNIVERSITY COLONNADE
 THE GATEWAY GARDEN | STANFORD DR TO GEORGE MERRICK DRIVE

THE UNIVERSITY COLONNADE
 PARKING @ UM | MULTIPLE LOCATIONS



SECTION 1



SECTION 2



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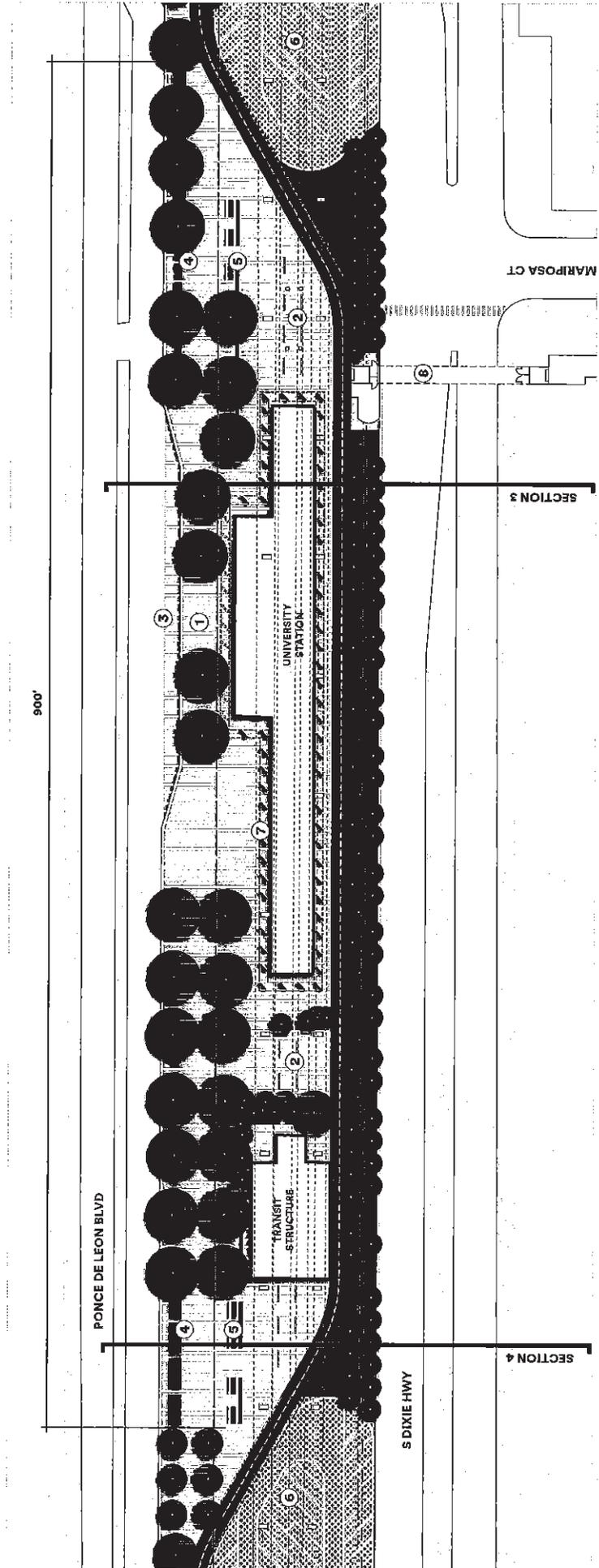
THE UNIVERSITY COLONNADE DETAIL PLAN 2 | UNIVERSITY STATION

LEGEND

- | | | | |
|---|----------------------------|---|--|
|  | DEDICATED OFF-ROAD |  | STATION PLAZA |
|  | TWO-WAY BICYCLE PATH |  | BICYCLE PARKING |
|  | DEDICATED BICYCLE CROSSING |  | BUS/TROLLEY DROP-OFF |
|  | PEDESTRIAN PATH |  | POP-UP CONTAINERS + VENDOR DOCKING AREA |
|  | PEDESTRIAN CROSSING |  | PICNIC AREA |
|  | MIDT RIGHT OF WAY |  | PARKING |
|  | SWALE |  | PHOTOVOLTAIC PANEL STRUCTURE |
|  | EXISTING TREES |  | PEDESTRIAN OVERPASS AT UNIVERSITY METRO RAIL STATION |
|  | PROPOSED TREES | | |
|  | BICYCLE SPECIMEN TREES | | |
|  | BICYCLE PARKING | | |
|  | PICNIC TABLES | | |
|  | BENCH | | |

As one of the primary gateways to the area, the University Station Plaza presents a great opportunity for the display of emerging green technologies, a program that can potentially operate in conjunction with various University of Miami academic departments. We imagine the station plaza to be populated with rotating interactive exhibits that can both educate commuters and foster innovative technologies. To that end, the design for this space engages the station building by cladding it with a free-standing, solar panel rain screen, that will showcase green technologies, provide power to the plaza, and highlight the station as a green tech demonstration. As the design develops, the cladding could become an opportunity for collaboration with artists, creating an innovative and spectacular intervention.

On either side of the station, oriented towards the east side of Ponce de Leon Blvd., temporary shipping containers and a docking area for pushcarts can house start-up businesses and vendors, potentially run by students themselves. These two pop-up areas are adjacent to areas with picnic tables and bicycle parking.



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THE UNIVERSITY COLONNADE
THE STATION PLAZA | GREEN TECH GALLERY



EXISTING CONDITIONS AT THE
UNIVERSITY METROPOLITAN STATION



THE UM STATION PLAZA + GREEN TECH GALLERY

THE UNIVERSITY COLONNADE
DETAIL PLAN 3 | CABALLERO BLVD TO SANTONA ST

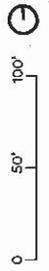
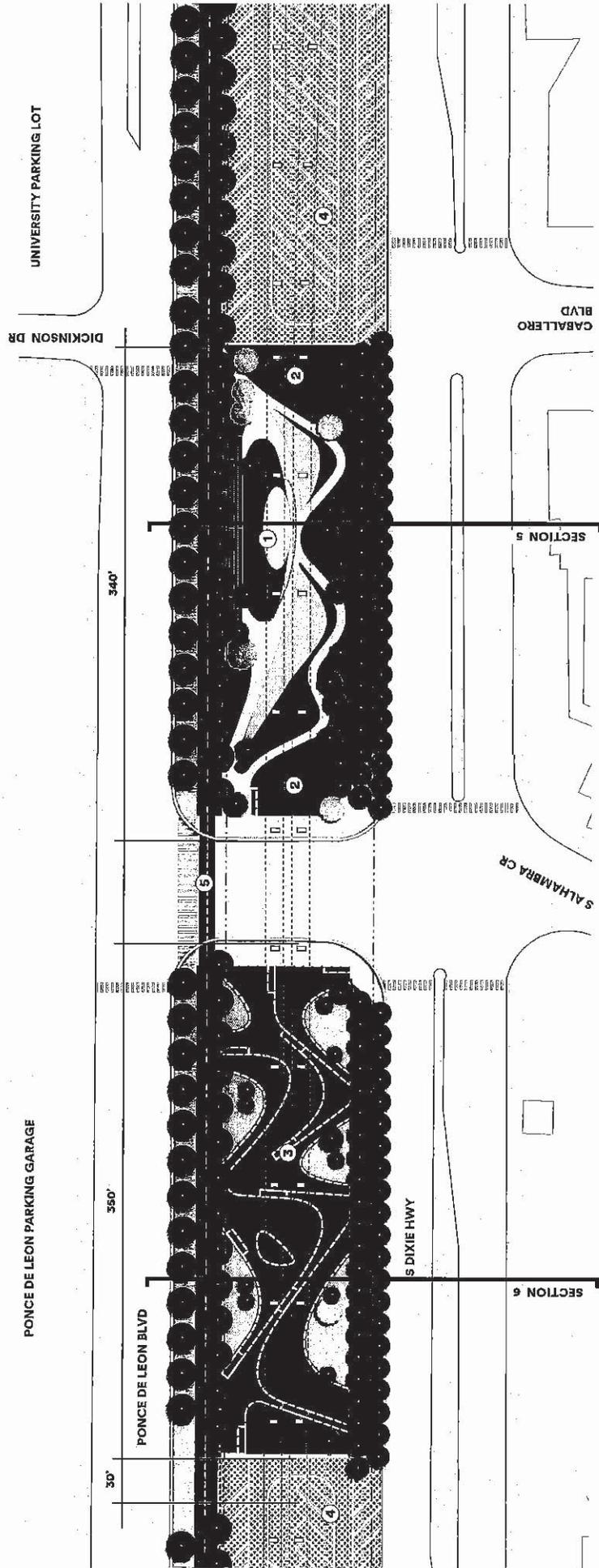


LEGEND

- | | | | |
|--|----------------------------|--|---|
| | DEDICATED OFF-ROAD | | GARDEN THEATER |
| | TWO-WAY BICYCLE PATH | | STORMWATER GARDENS |
| | DEDICATED BICYCLE CROSSING | | RIBBON RINK |
| | PEDESTRIAN PATH | | ANGLED PARKING |
| | PEDESTRIAN CROSSING | | S ALHAMBRA CIRCLE INTERSECTION :
MINOR IMPROVEMENT (SEE APPENDIX CH 4.2) |
| | MDT RIGHT-OF-WAY | | |
| | SWALE | | |
| | EXISTING TREES | | |
| | PROPOSED SPECIMEN TREES | | |
| | BICYCLE PARKING | | |
| | PICNIC TABLES | | |
| | BENCH | | |

There are two rooms just south of the Green Tech Gallery: The Rain Garden and The Ribbon Rink. Highlighting its location over the Coral Gables Canal, The Rain Garden, composed primarily of water filtering native plants, collects and filters a large part of the stormwater in the area, directed via swales along the UM Colonnade. A small outdoor amphitheater space is situated within this unique garden.

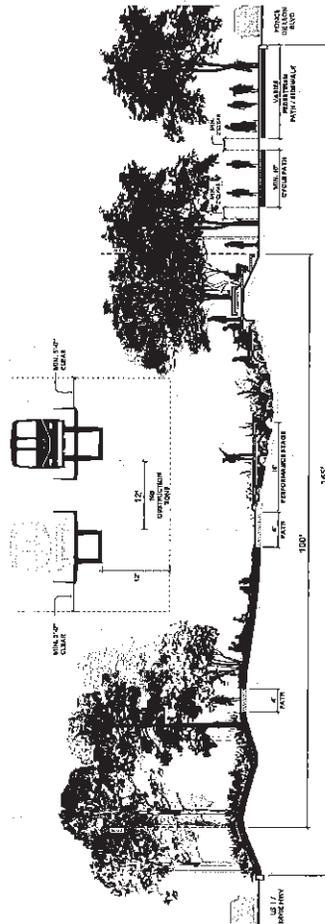
The Ribbon Rink is comprised of an undulating concrete topography that articulates a series of spaces intended for users of multiple types of wheels, such as in-line skaters, rollerbladers, skateboarders, razor scooter riders, and first-time bicycle riders. The dedicated bicycle and pedestrian paths flank the rink's western edge, separating fast cyclists and runners from leisurely users of the rink. The Ribbon Rink can be used for events at night. Lighting installations or public art can highlight the Metrorail structure.



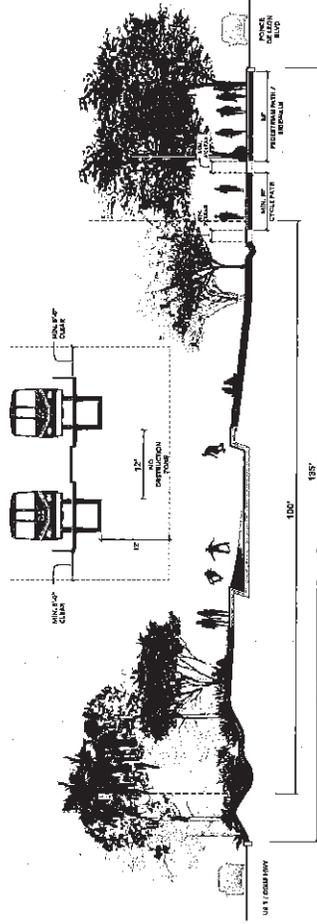
101

THE UNIVERSITY COLONNADE
 THE RAIN GARDEN | CABALLERO BLVD TO S ALHAMBRA CR

THE UNIVERSITY COLONNADE
 THE RIBBON RINK | S ALHAMBRA CR TO SANTONA ST



SECTION 5



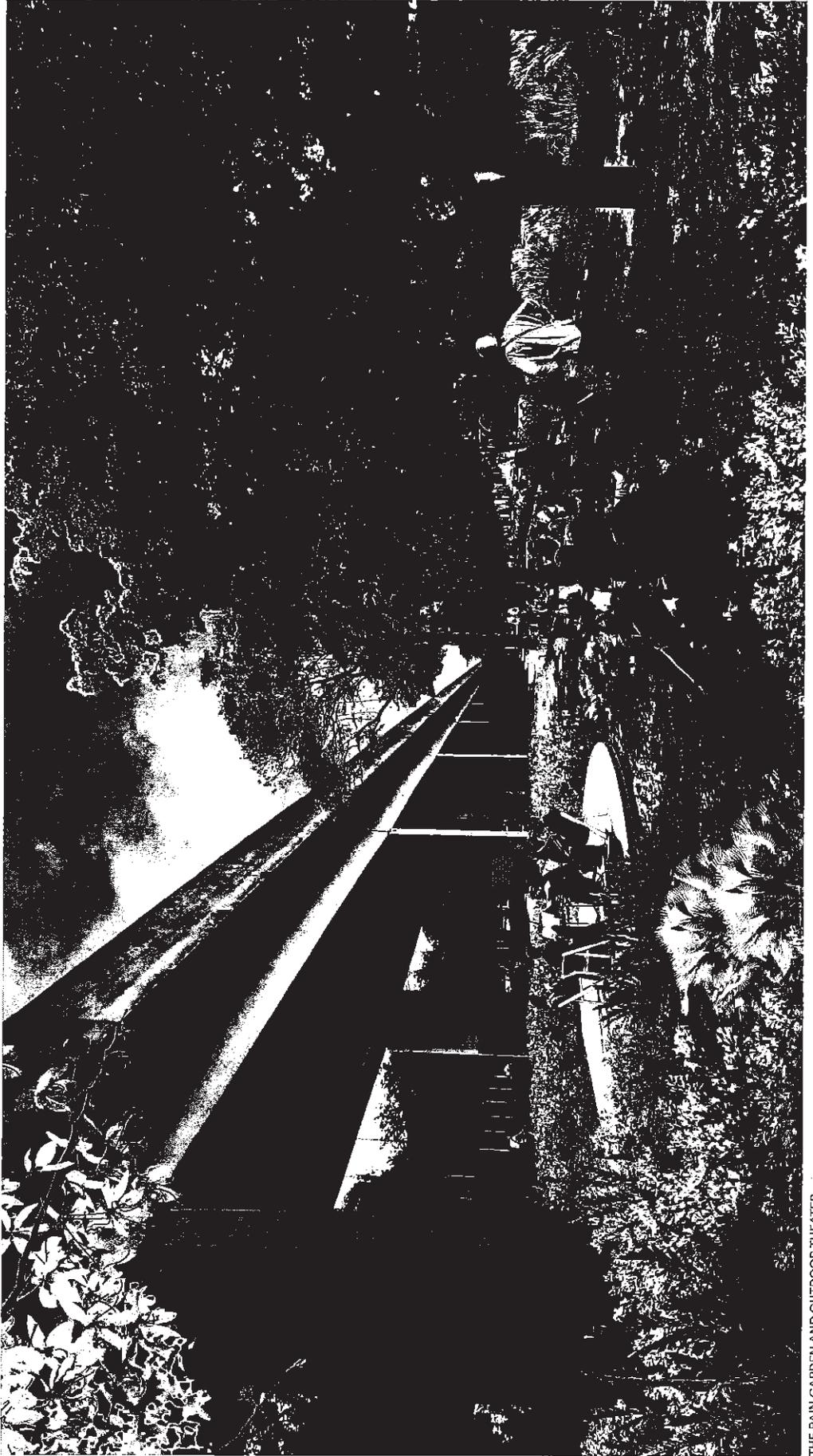
SECTION 6

169

**THE UNIVERSITY COLONNADE
RAIN GARDEN**



EXISTING CONDITIONS NEAR
DICKINSON DR



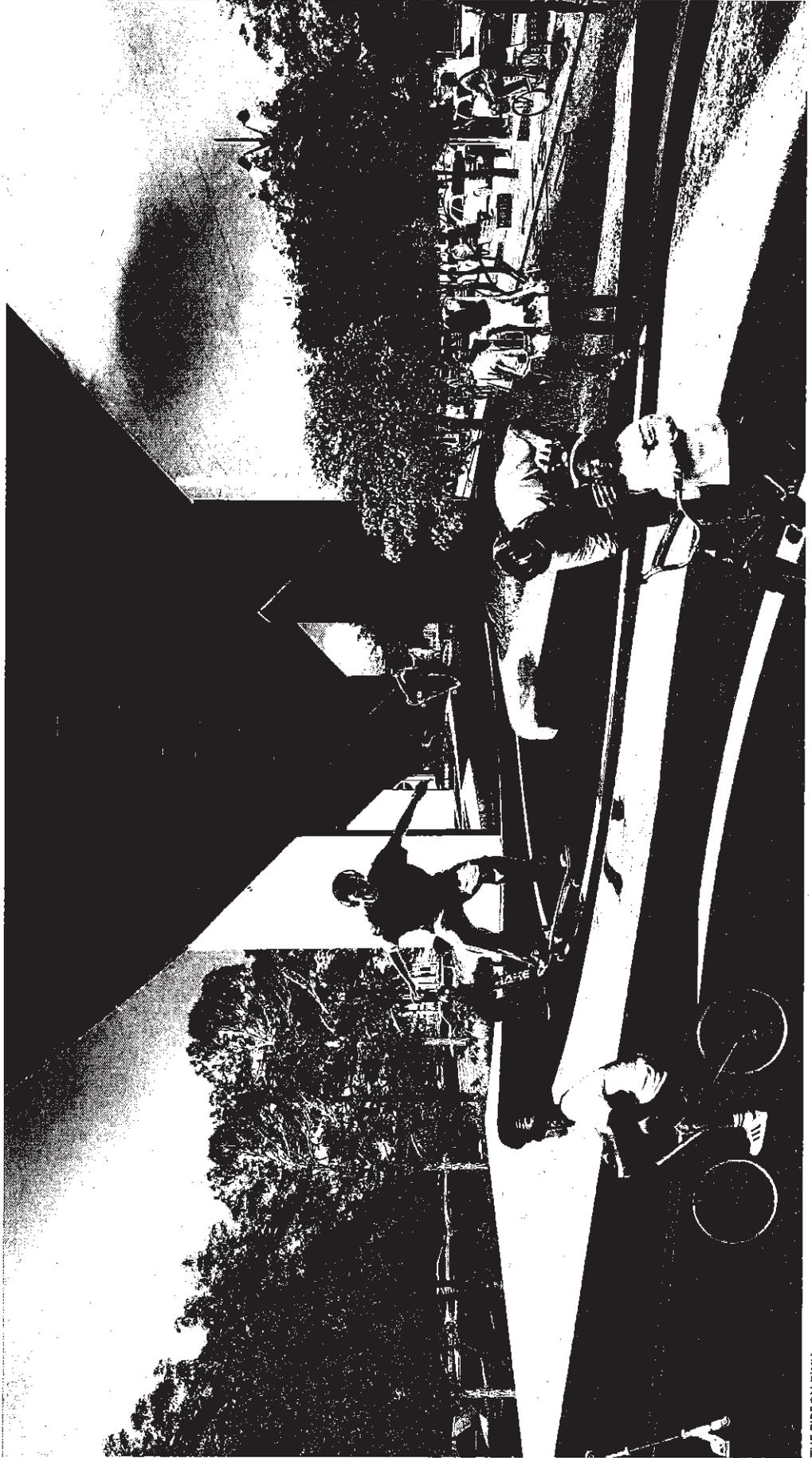
THE RAIN GARDEN AND OUTDOOR THEATER

170

**THE UNIVERSITY COLONNADE
THE RIBBON RINK**



EXISTING CONDITIONS NEAR
SANTONA STREET



THE RIBBON RINK

171

THE UNIVERSITY COLONNADE
DETAIL PLAN 4 | MADRUGA CT TO SW 57TH AVE

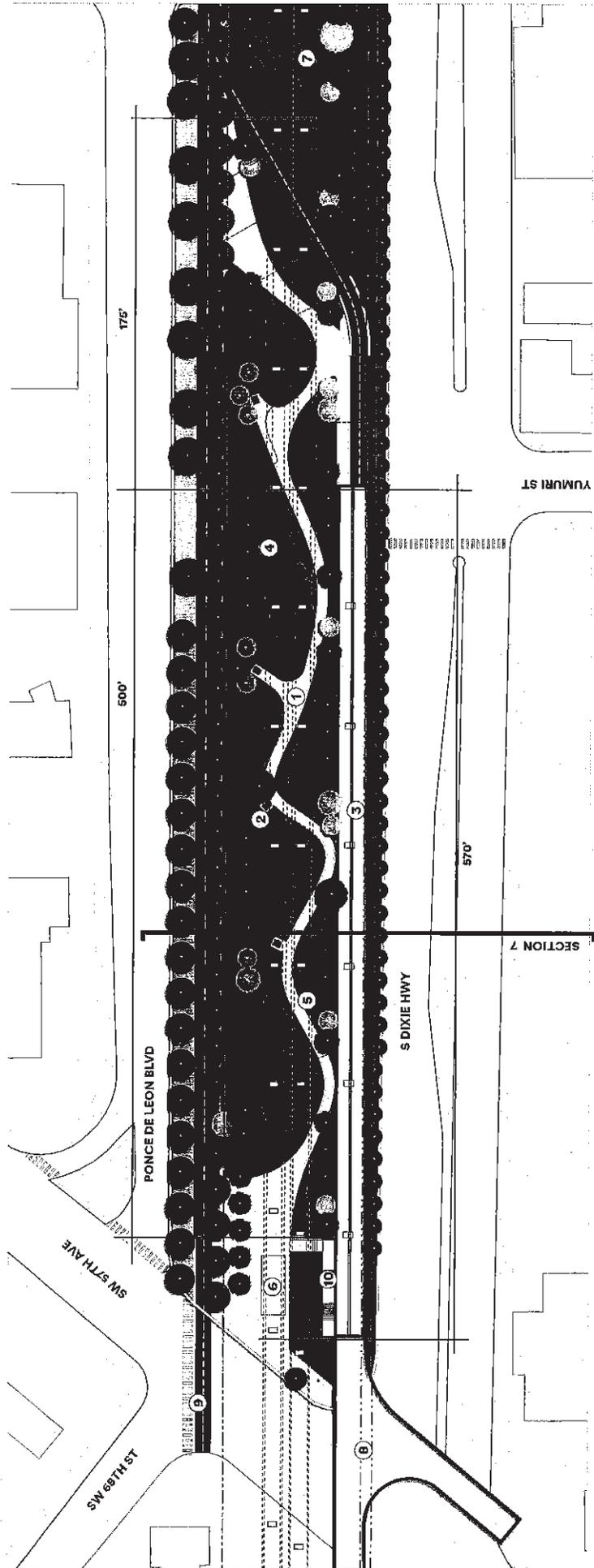


LEGEND

- | | | | |
|--|---|--|--|
| | DEDICATED OFF-ROAD TWO-WAY BICYCLE PATH | | MEADOW TRAIL |
| | DEDICATED BICYCLE CROSSING | | BIRD HOUSES |
| | PEDESTRIAN PATH | | BICYCLE & PEDESTRIAN BRIDGE |
| | PEDESTRIAN CROSSING | | MEADOW PLANTING |
| | MDT RIGHT OF WAY | | HAMMOCKS |
| | SWALE | | BIRDING KIOSK |
| | EXISTING TREES | | STORMWATER GARDENS |
| | PROPOSED TREES | | SW 57TH ST INTERSECTION: MAJOR IMPROVEMENT (SEE APPENDIX CH 4.2) |
| | PROPOSED SPECIMEN TREES | | SW 57TH ST INTERSECTION: AT GRADE CROSSING |
| | BICYCLE PARKING | | STAIR ACCESS TO BRIDGE |
| | PICNIC TABLES | | |
| | BENCH | | |

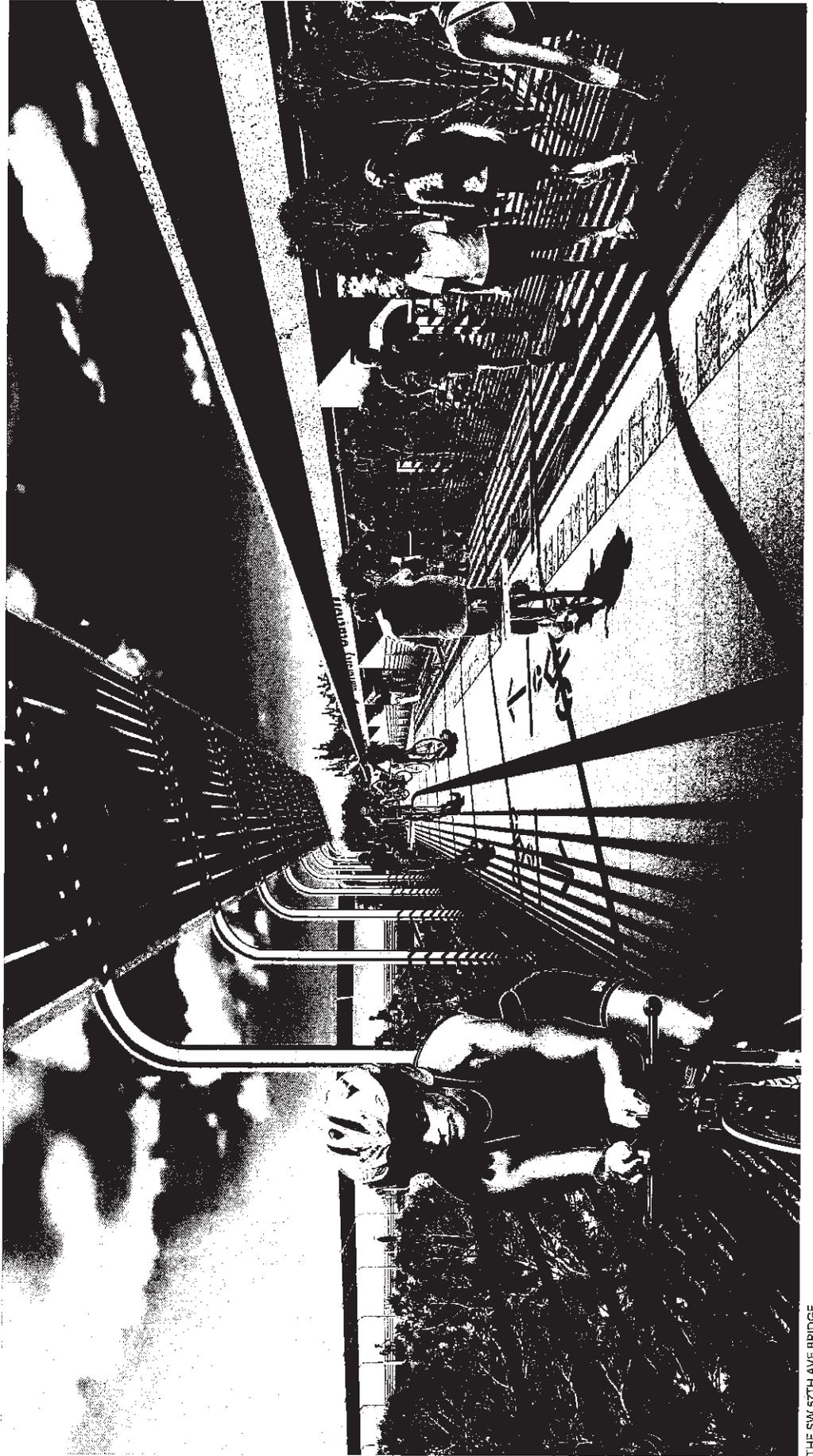
Between Madruga Ct and SW 57th Avenue, a bicycle and pedestrian bridge slowly raises in order to provide a safe, elevated crossing over SW 57th Avenue. Below the bridge, a soft path meanders through an undulating meadow.

The Birding Trail includes specimen trees known to attract birds, in order to create a unique habitat inspired by existing birding activity in the immediate area. Unique birdhouses strategically placed along the path are an opportunity to engage local artists.



172

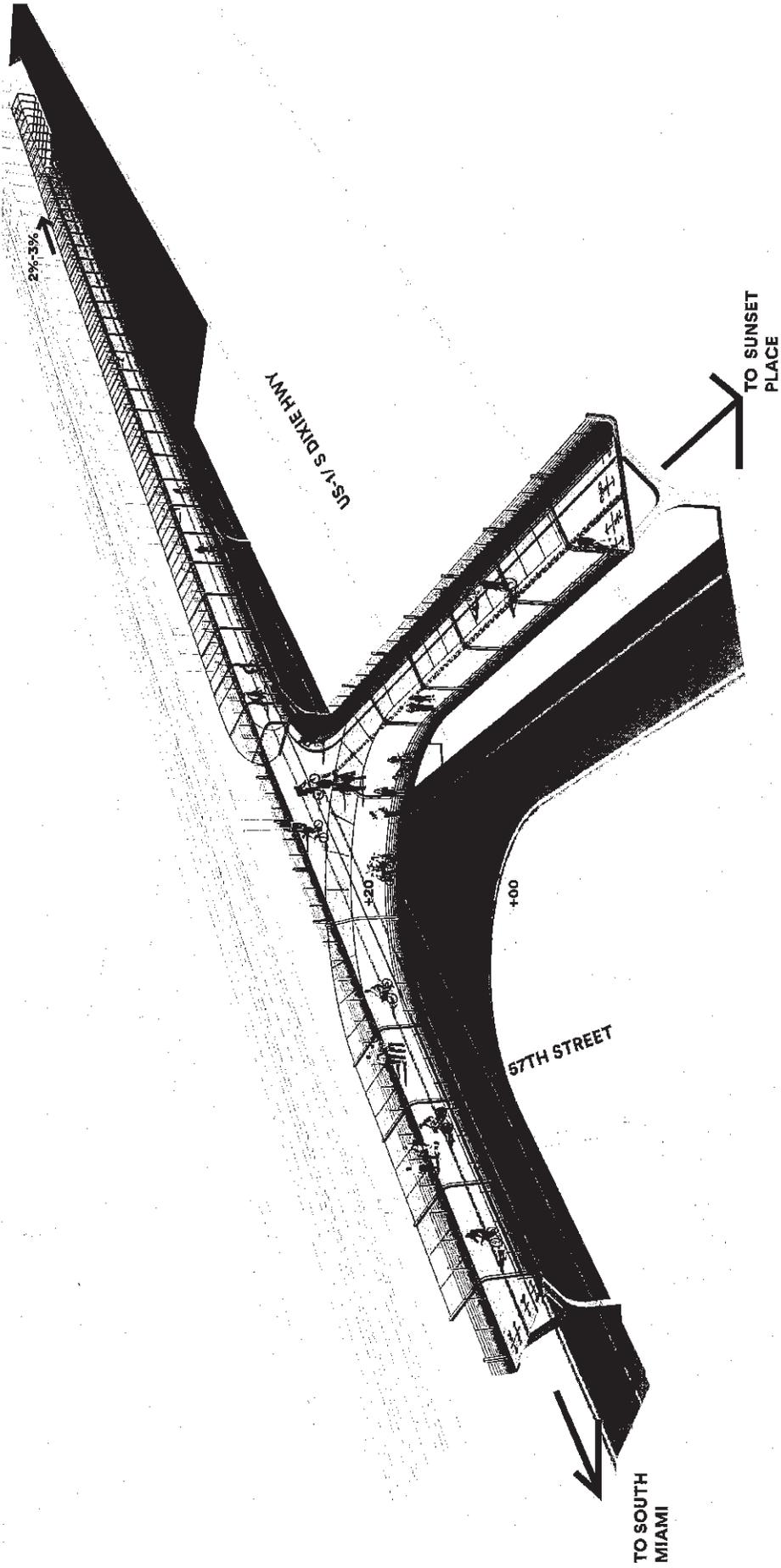
**THE UNIVERSITY COLONNADE
THE SW 57TH AVE BRIDGE**



THE SW 57TH AVE BRIDGE

174

**THE UNIVERSITY COLONNADE
THE SW 57TH AVE BRIDGE**



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3.3 PROJECTS LIGHTING

The drawings on this chapter seek to illustrate how the Underline's three part lighting approach - typical path lighting, access lighting and Metroall station lighting - is tailored to various character rooms on the Brickell Backyard and UM Colonnade.

THE BRICKELL BACKYARD
DETAIL PLAN 1 | MIAMI RIVER TO SW 8TH ST



MIAMI
RIVER

LANDSCAPE LIGHTING
GRASS ACCENT

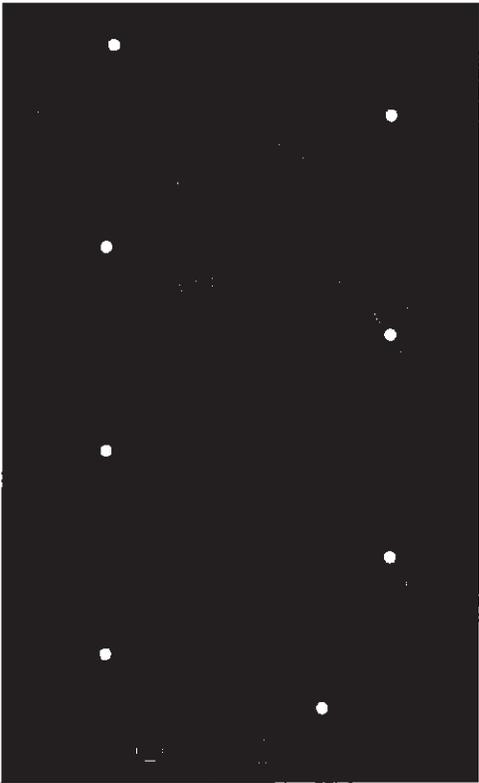
LANDSCAPE LIGHTING
SPECIMEN TREE UPLIGHT

PICNIC POCKET SECTION
SELWY OLIVIO OR TECHILUMI

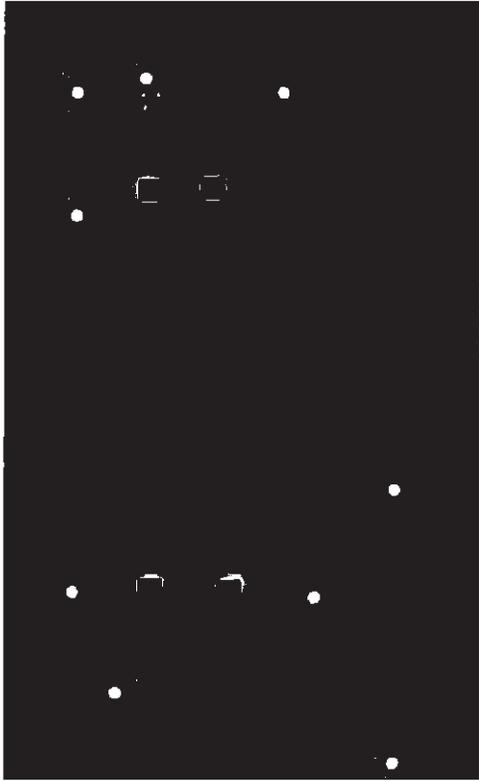
PICNIC POCKET SECTION
HESS CITY ELEMENTS

177

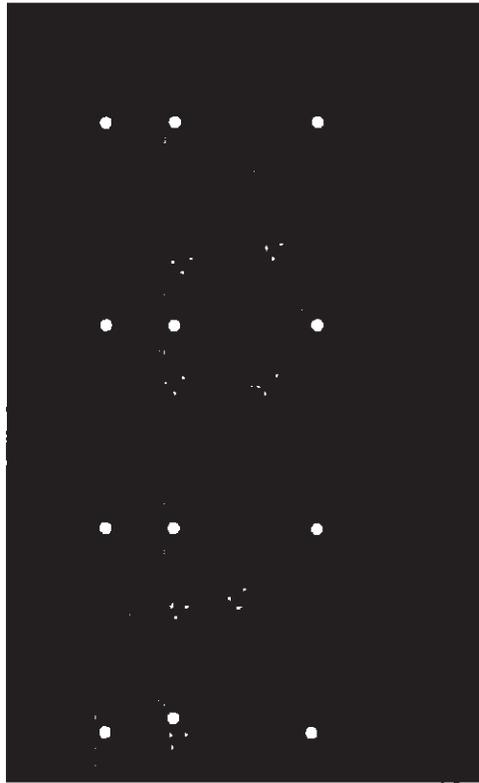
THE BRICKELL BACKYARD
MIAMI RIVER TO SW 8TH ST | CHARACTER ROOMS



THE DOG PARK



TYPICAL INTERSECTION



THE PICNIC POCKETS

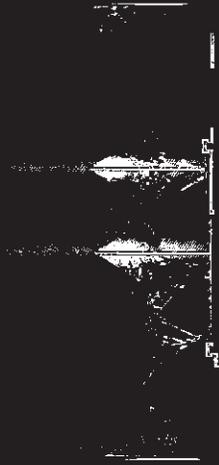
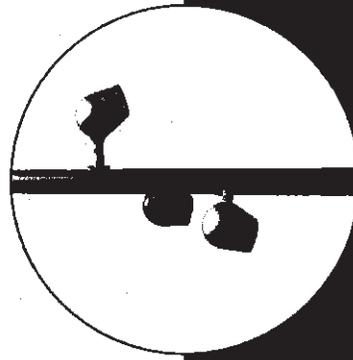
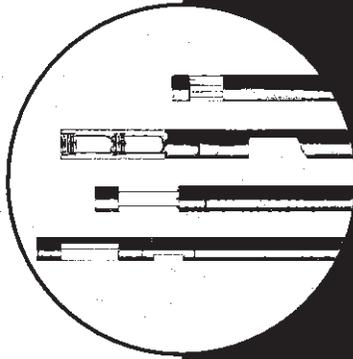


THE RIVER ROOM

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THE BRICKELL BACKYARD
PICNIC POCKETS | MIAMI RIVER TO SW 7TH ST

THE BRICKELL BACKYARD
PICNIC POCKETS | MIAMI RIVER TO SW 7TH ST



LIGHTING SECTION
FIXTURE OPTION 1 | HESS CITY ELEMENTS

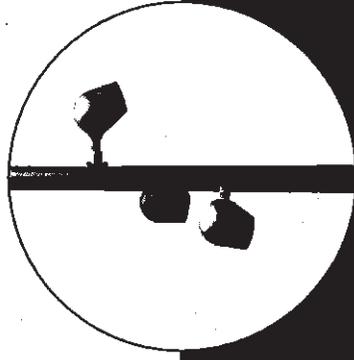
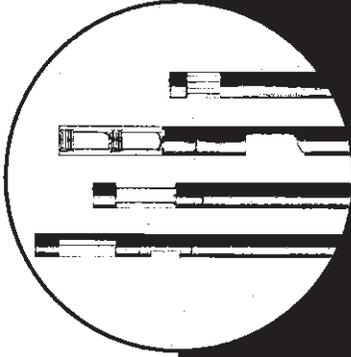


LIGHTING SECTION
FIXTURE OPTION 2 | SELUX OLIVIO WITH MULTIPLE HEADS



THE BRICKELL BACKYARD
THE MEADOW ARC | SW 13TH ST TO SW 15TH RD

THE BRICKELL BACKYARD
THE MEADOW ARC | SW 13TH ST TO SW 15TH RD



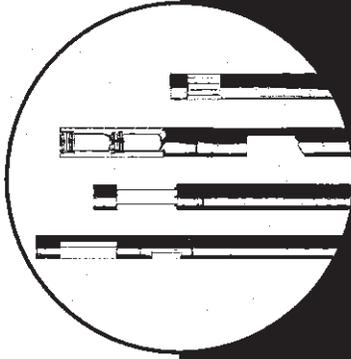
LIGHTING SECTION
FIXTURE OPTION 1 | HESS CITY ELEMENTS

LIGHTING SECTION
FIXTURE OPTION 2 | SELUX OLLIVIO WITH MULTIPLE HEADS



081

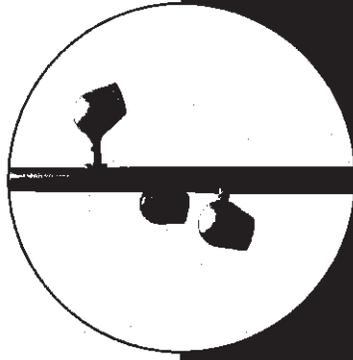
THE UNIVERSITY COLONNADE
THE RAIN GARDEN | CABALLERO BLVD TO S ALHAMBRA CR



LIGHTING SECTION
FIXTURE OPTION 1 | HESS CITY ELEMENTS



THE UNIVERSITY COLONNADE
THE RAIN GARDEN | CABALLERO BLVD TO S ALHAMBRA CR



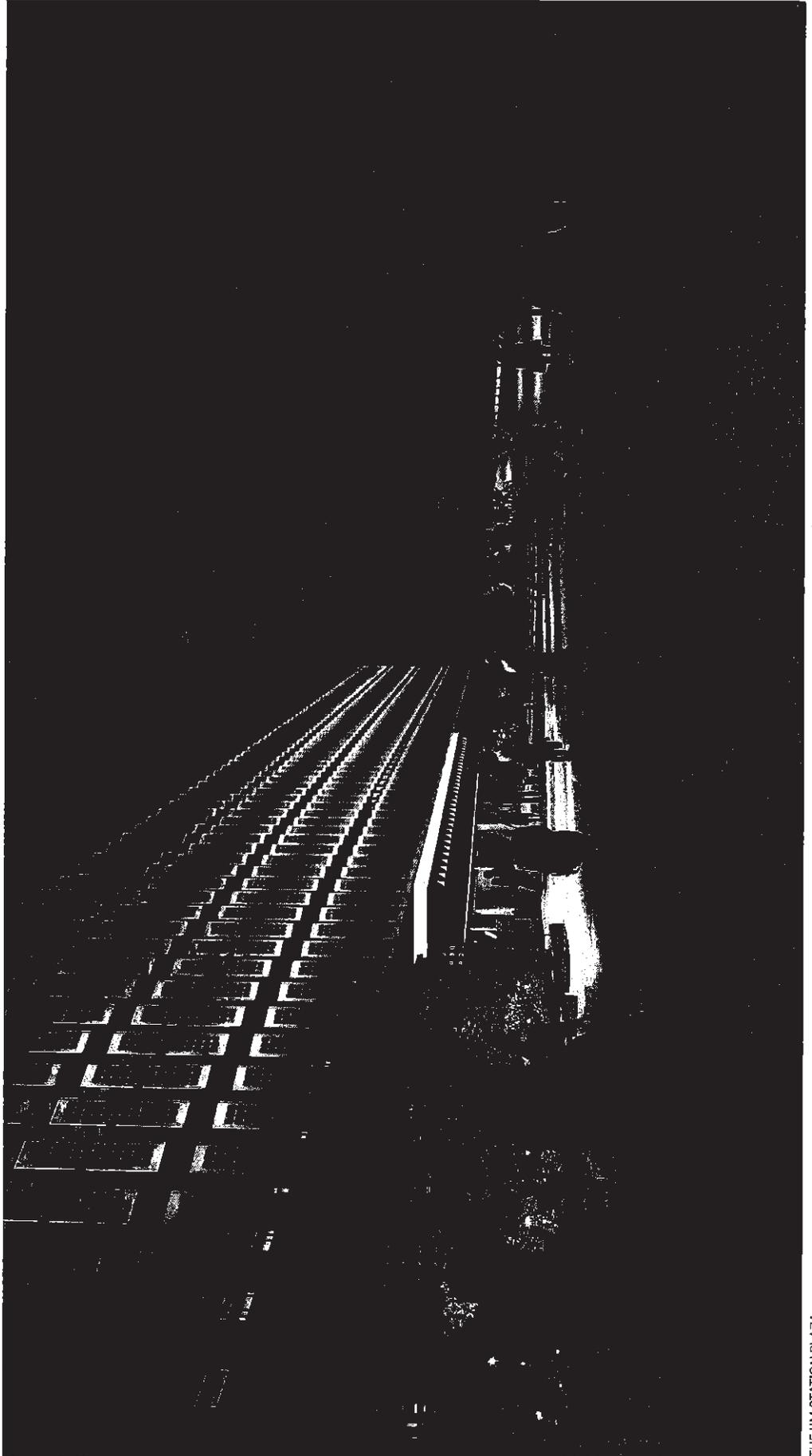
LIGHTING SECTION
FIXTURE OPTION 2 | SELUX OLIVIO WITH MULTIPLE HEADS



THE UNIVERSITY COLONNADE
THE STATION PLAZA | GREEN TECH GALLERY



EXISTING CONDITIONS AT THE
UNIVERSITY METRO RAIL STATION



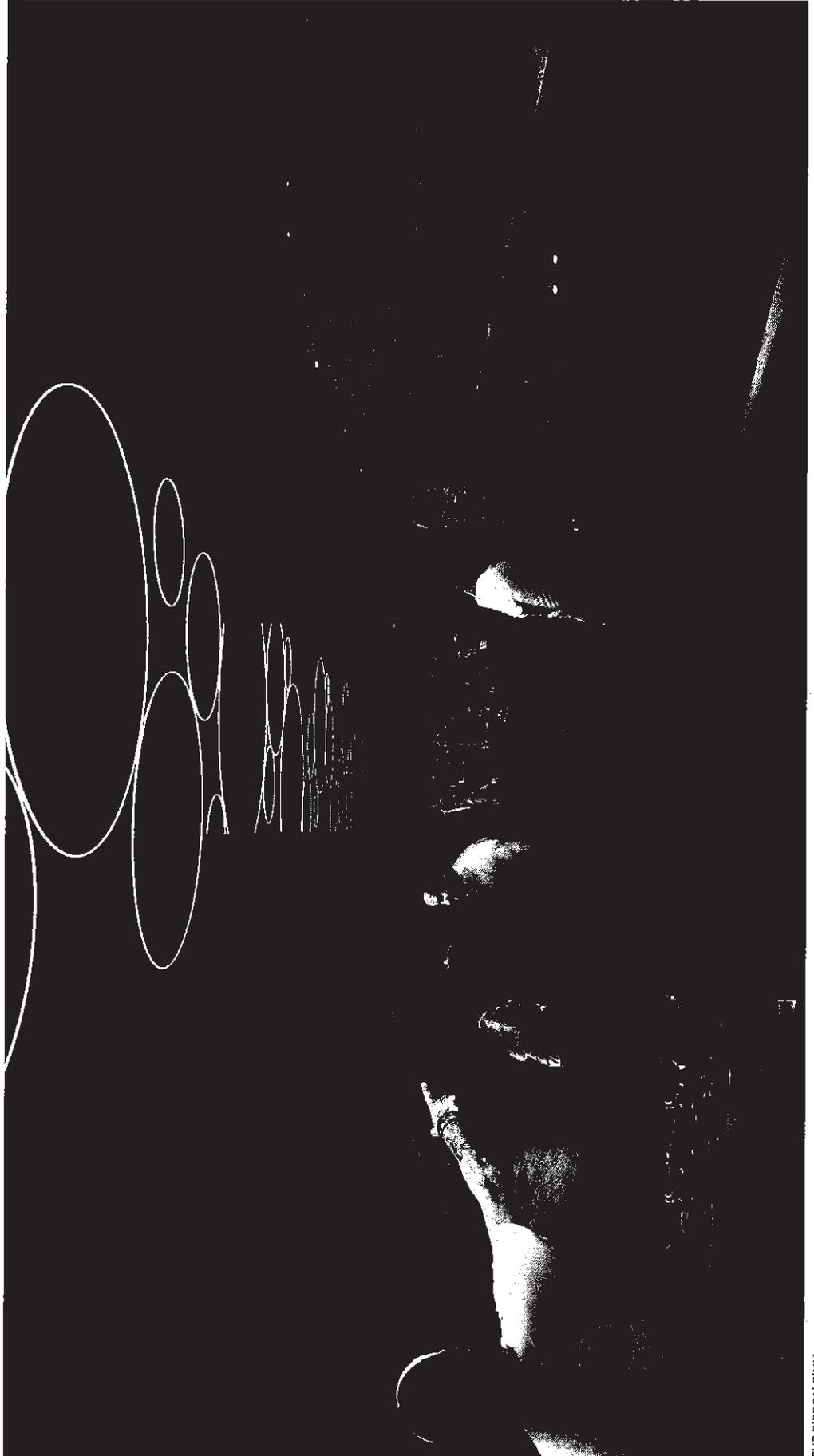
THE UM STATION PLAZA

182

THE UNIVERSITY COLONNADE
THE RIBBON RINK



EXISTING CONDITIONS NEAR
SAN AMARO CR



THE RIBBON RINK

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CHAPTER 4

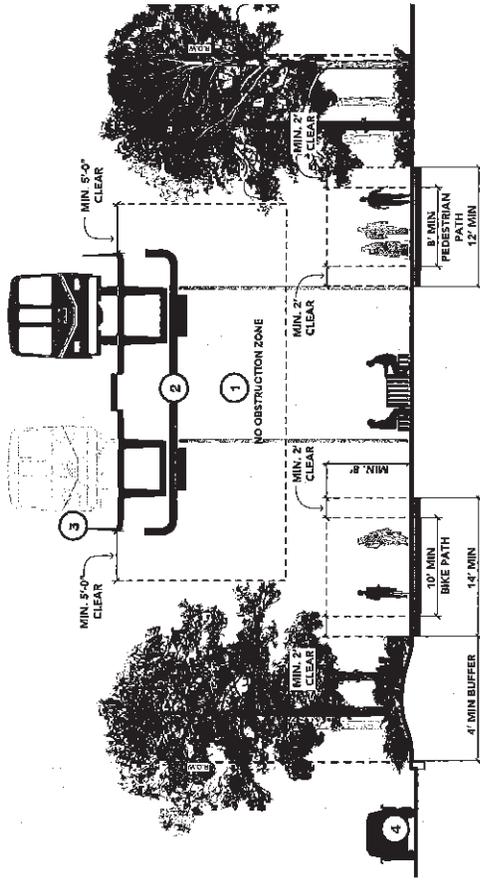
APPENDIX

- 4.1 MDT SETBACKS & MAINTENANCE
- 4.2 INTERSECTION RECOMMENDATIONS
- 4.3 THE UNDERLINE RIGHT-OF-WAY
- 4.4 MDT LEASE INFORMATION
- 4.5 AGENCY AND PUBLIC COMMENT LOG

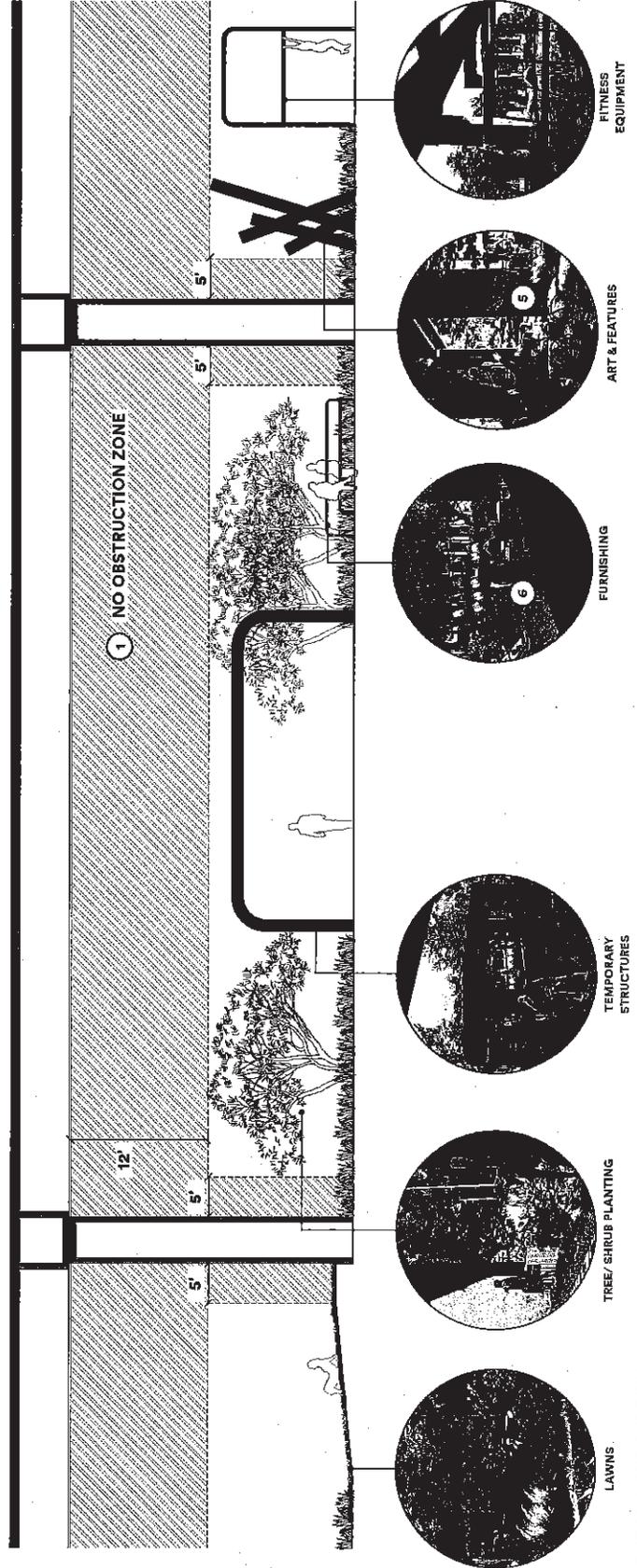
4.1 MDT SETBACKS & MAINTENANCE PARAMETERS

The following list of parameters are meant as a summary of points discussed during conversations held on various coordination meetings with Miami Dade Transit between April and August of 2015.

- 1 **Setbacks:** All park elements, such as trees, temporary structures, play and fitness equipment, furnishing, lawn areas etc will adhere to the setback requirements and "no obstruction zone" put forth in the Transit design Guidelines (1979).
- 2 **Debris protection:** An artistic netting system that captures debris from the tracks will be considered in high activity areas, where benches and places for park users to stop, sit etc. are located. It was mentioned that the edge of the guideway is the most prone. Transit to confirm the extents of netting structure, netting opening parameters and acceptable means for attachment to guideway structure.
- 3 **Sound wall repair:** This is an ongoing MDT lead repair that can potentially be phased to coincide with new trail construction.
- 4 **Buffer from US-1:** A minimum buffer with topography is proposed as a separation from cars.
- 5 **Column Maintenance Access:** Art on columns can potentially be curated and timed to coincide with the structure maintenance schedule, which MDT stated happens approximated every two years. Artists will potentially be responsible for repairs of art work due to maintenance, graffiti or tagging.
- 6 **Heat resistant paint** will be considered for metal furnishing elements.



TYPICAL CROSS SECTION

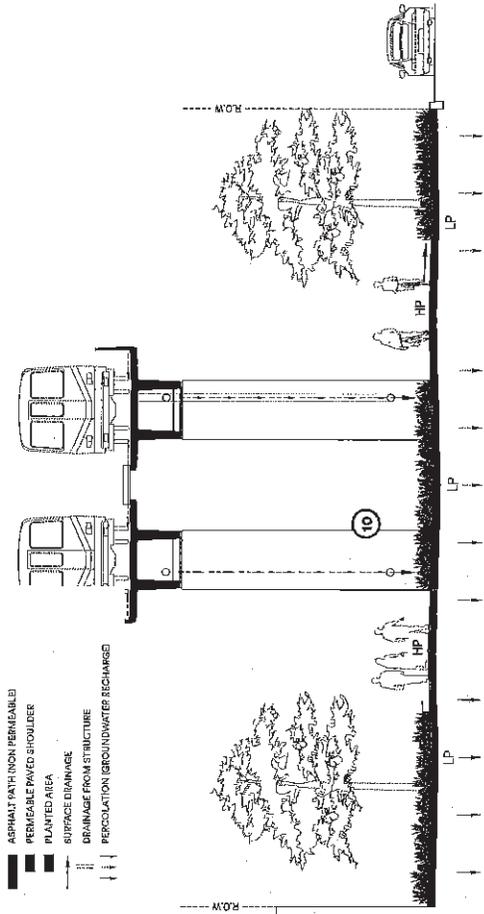


TYPICAL ELEVATION ALONG GUIDEWAY

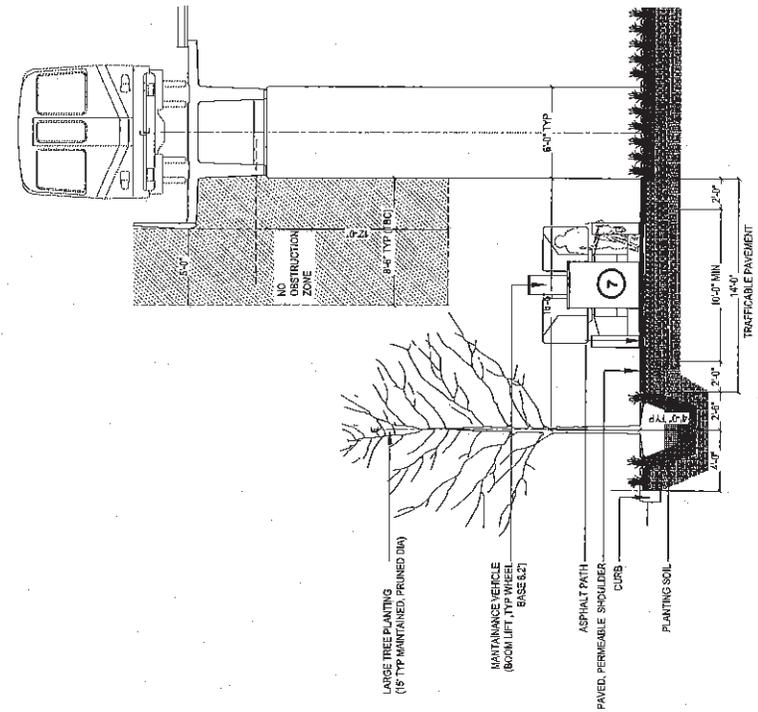
185

4.1 MDT SETBACKS & MAINTENANCE PARAMETERS (CONTINUED)

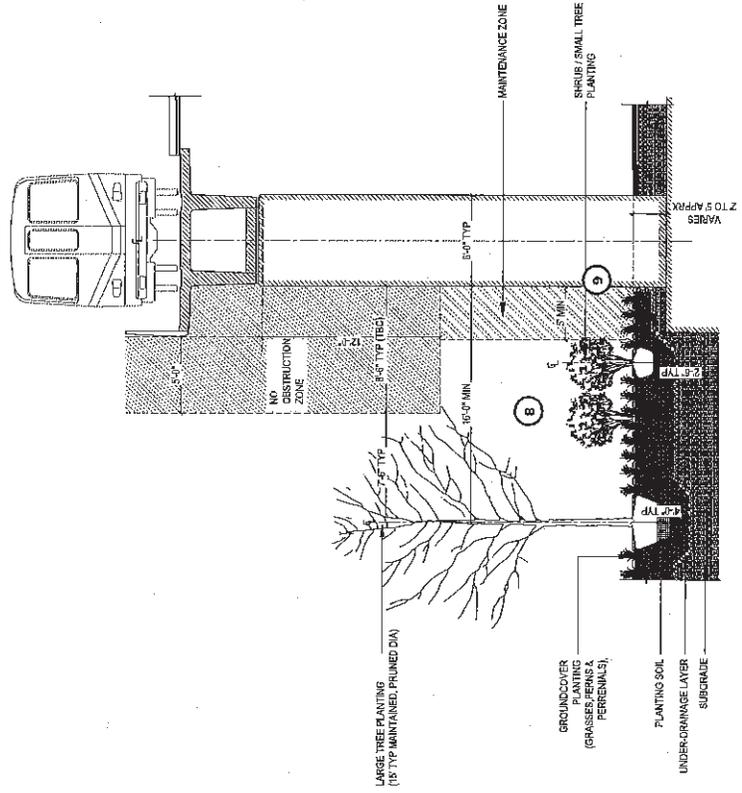
- 7 Maintenance Access: Both, the bicycle and the pedestrian path will be designed to accommodate wheelchair dimensions of the standard maintenance vehicles (typically 8.2' per datasheets provided by MDT on 08/17/2015). The main paths and 2' shoulders will be designed to be trafficable. Following current protocol, path segments may be shut down during ongoing repair work. Users will be notified of maintenance schedule and path closures via online postings and social media.
- 8 Trees: Large canopy trees (15' pruned, maintained diameter) will be typically planted at least 16' from the edge of column to maintain the 5' clear distance from the edge of guideway. Per discussions with MDT existing vegetation that does not adhere to these requirements may potentially be removed or relocated.
- 9 Shrubs and groundcover: Shrubs will be located so their dripline is min. 5' from the edge of column. Groundcover planting may be extended to the edge of columns. It is understood that in event of an emergency, groundcover adjacent to the columns might get trampled.
- 10 Stormwater runoff and drainage from MDT structures: Coordination is needed with DERM to go over permits and protocols for dealing with runoff and drainage from the structure.



TYPICAL CROSS SECTION SHOWING DRAINAGE



TYPICAL PLANTING ADJACENT TO COLUMN



TYPICAL PLANTING ADJACENT TO COLUMN

Intersections

Kimley-Horn prepared an analysis of the intersections along The Underline corridor to identify improvements necessary to meet the design intent of the master plan concept.

Several existing operational challenges have been documented for The Underline Intersections.

- Motorists entering or approaching U.S. 1 from a cross-street often will not notice bicyclists approaching from their right, as they do not expect traffic from this direction.
- Motorists waiting to enter U.S. 1 from a cross-street frequently block the path crossing and curb ramp opening, as drivers tend to pull forward to get an unobstructed view of southbound U.S. 1 traffic.
- Southbound U.S. 1 motorists turning right onto a cross-street often do not see southbound path users because they are not within the normal visual scanning area.
- Northbound U.S. 1 motorists wishing to make a permissive left-turn onto a cross-street often cannot see northbound path users, who have the right-of-way on green.

Intersection improvements have been divided into three categories based on the approach to maintaining safe bicyclist and pedestrian traffic along The Underline.

- **Minor Improvements** – Consider a combination of path realignment to eliminate disorienting travel paths and at-grade crosswalk improvements.
- **Medium Improvements** – Consider mid-block tableted crossings that maintain a straight path alignment and traffic calming improvements.
- **Major Improvements** – Consider elevated grade-separated crossings or significant path realignments associated with tactical opportunities such as redevelopment.

The Intersection Recommendations pages describe the results of this analysis. There are several common themes that will serve to unite the corridor across intersections.

- Re-align the path approach to improve visibility and user orientation.
- Provide early indicators for approaching path users including pavement marking and/or material changes and gradual grading to meet the roadway at-grade.
- Provide a minimum of 6 feet of buffer space between the adjacent U.S. 1 travel lane and the crossing.
- Widen the crosswalks and curb openings to match the width of The Underline, a total of 18 feet in width (10 feet for the bicycle crossing and 6 feet for the pedestrian crossing) to eliminate existing operational challenges and minimize cars blocking the curb openings.
- Consider re-turn-once for the cross-street right-turn movement, which may be required due to sight distance restrictions of the widened crossings.
- Provide leading pedestrian interval (LPI) for The Underline crossings to allow trail users to establish their right-of-way in the crossing and improve visibility.

Implementation of intersection improvements will require concerted coordination between several agencies including Miami-Dade County and the Florida Department of Transportation.

4.2 INTERSECTION RECOMMENDATIONS

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Underline Intersections

- **Major Improvements (5)**
 - SW 88th Street (Kendall Drive)
 - SW 57th Avenue (Red Road)
 - SW 42nd Avenue/Grand Avenue
 - SW 37th Avenue (Douglas Road)
 - SW 40th Street (Bird Road)
- **Medium Improvements (7)**
 - South Miami Hospital exit driveway
 - Merrick Circle
 - SW 31st Avenue
 - SW 24th Avenue
 - SW 15th Avenue
 - SW 13th Street (Coral Way)
 - SW 8th Street (Calle Ocho)
- **Minor Improvements (24)**
 - Dairlan Drive
 - Dadeland Boulevard
 - SW 70th Avenue
 - SW 84th Street
 - Snapper Creek Expressway (eastbound ramp terminus)
 - SW 67th Avenue (Luclam Road)
 - SW 80th Street (Davis Road)
 - SW 67th Avenue
 - SW 72nd Street (Sunset Drive)
 - SW 70th Street
 - Alhambra Circle
 - Stanford Drive
 - Granada Boulevard
 - Riviera Drive
 - SW 32nd Avenue
 - SW 27th Avenue
 - SW 22nd Avenue
 - SW 17th Avenue
 - SW 16th Avenue
 - SW 26th Road
 - SW 25th Road
 - SW 15th Road (Broadway)
 - Brickell bus turnaround driveway
 - SW 7th Street

Minor Improvements

- **Re-align path approach to improve visibility and orientation**
- **Provide early indicators for approaching path users**
 - Pavement marking and/or material changes
 - Gradual grading to meet roadway at-grade
- **Provide a minimum of 6 feet of buffer space between U.S. 1 travel lane and crossing**
- **Widen crosswalks and curb openings to 18 feet in width**
 - Bicycle crossing space 10 feet in width
 - Pedestrian crossing space 8 feet in width
 - Flush curb openings
- **Consider no-turn-on-red for cross-street right-turn movement**
 - May be required due to sight distance calculations of widened crossings
 - Dynamic no-turn-on-red during peak travel times could be considered for the highest volume right-turn movements
- **Provide leading pedestrian interval (LPI) for Underline crossing**

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Medium Improvements

- **Maintain straight approach path alignment across the intersection**
- **Provide early indicators for approaching path users**
 - Pavement marking and/or material changes
- **Provide tabled crossing or lift grade of roadway to provide smooth crossing**
 - Ramp to tabled crossing encourages motorists to drive slowly with care and notifies motorists of the crossing
- **Widen crosswalks and curb openings to 18 feet in width (minimum)**
 - Bicycle crossing space 10 feet in width
 - Pedestrian crossing space 8 feet in width
 - Flush curb openings
 - Consider wider crossings where appropriate

Major Improvements

- **Consider grade-separated crossing at highest volume intersections and/or crossings with unavoidable constraints**
 - Elevated/bridge crossings will be accompanied by at-grade solutions
- **Explore strategies for significant path re-alignment associated with tactical opportunities**

4.2 INTERSECTION RECOMMENDATIONS
MINOR IMPROVEMENTS

Minor Improvement Intersections

- Detran Drive
- Dadeland Boulevard
- SW 70th Avenue
- SW 84th Street
- Snapper Creek Expressway (eastbound ramp terminus)
- SW 67th Avenue (Ludlam Road)
- SW 80th Street (Davis Road)
- SW 62nd Avenue
- SW 72nd Street (Sunset Drive)
- SW 70th Street
- Alhambra Circle
- Starford Drive
- Granada Boulevard
- Riviera Drive
- SW 32nd Avenue
- SW 27th Avenue
- SW 22nd Avenue
- SW 17th Avenue
- SW 16th Avenue
- SW 26th Road
- SW 25th Road
- SW 15th Road (Broadway)
- Brickell bus turnaround driveway
- SW 7th Street

Dadeland Boulevard



- **Recommendations**
 - Early indicators
 - Maximize crossing width (constraints may cause less than 18-foot crossing width)
- **Potential Concerns**
 - Utilities
 - Location of Metrorail columns to the south and north of crossing may limit path alignment and effective crossing width



Datran Drive

- **Recommendations**
 - Early indicators
 - Buffer space
 - 18-foot crossing width
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Location of Metrorail tail tracks to the south will limit path alignment
 - Location of Dadeland South Station to the north will limit path alignment



SW 70th Avenue

- **Recommendations**
 - Re-align path approach
 - Early indicators
 - Maintain buffer space
 - 18-foot crossing width
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Long crossing (150 feet) although with islands
 - Utilities
 - Cross-street right-turn movement is unsignalized
 - Dadeland Station Shopping Center sign and utility pole may cause path bifurcation in median between SB and NB SW 70th Avenue



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**4.2 INTERSECTION RECOMMENDATIONS
MINOR IMPROVEMENTS**

SW 84th Street



- **Recommendations**
 - Re-align path approach
 - Early indicators
 - Maintain buffer space
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Dadeland Station Shopping Center sign may cause path bifurcation in median between EB and WB SW 84th Street



SW 67th Avenue



- **Recommendations**
 - Early indicators
 - Maintain buffer space
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope



Snapper Creek Expressway



- **Recommendations**
 - Early indicators
 - Maintain buffer space
 - 18-foot crossing width
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Cross-street right-turn movement is unsignalized



SW 80th Street



- **Recommendations**
 - Re-align path approach
 - Early indicators
 - Maintain buffer space
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope



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4.2 INTERSECTION RECOMMENDATIONS
MINOR IMPROVEMENTS

SW 62nd Avenue



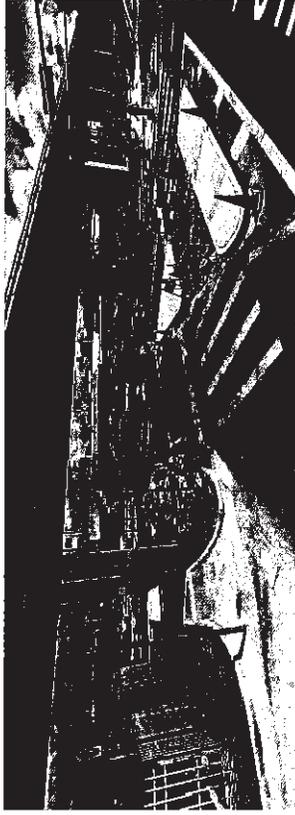
- **Recommendations**
 - Early indicators
 - Maintain buffer space
 - Maximize crossing width (constraints may cause less than 18-foot crossing width)
 - No-turn-on-red for cross-street right-turn
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope
 - Metrorail column in right-turn channelization island may limit crossing width



SW 70th Street



- **Recommendations**
 - Early indicators
 - Maintain buffer space
 - 18-foot crossing width
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope
 - Cross-street right-turn movement is unsignalized
 - Fire station parking lot on the south side may limit path approach alignment



SW 72nd Street



- **Recommendations**
 - Alternate 1 – Change to grade separation
 - Alternate 2 – Bifurcate crossing around Metrorail column, would require significant relocation of stop bar and elimination of a portion of the median landscaping
 - Alternate 3 – Relocate crossing to SW 59th Place (Unsignalized crossing to the west)
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope
 - Metrorail column in SW 72nd Street median will restrict crossing options
 - Median landscaping in SW 72nd Street
 - Consider bike path relocation to front side of South Miami Station (like Vizcaya and Coconut Grove)
 - "Pinch-point" created by proximity of Metrorail alignment at this location



Alhambra Circle



- **Recommendations**
 - Move crossing to Ponce de Leon side
 - Early indicators
 - Buffer space
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope
 - Proximity of tree roots
 - Existing parking lots on both sides
 - Short queue storage length may be a concern for no-turn-on-red



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**4.2 INTERSECTION RECOMMENDATIONS
MINOR IMPROVEMENTS**

Stanford Drive



- **Recommendations**
 - Re-align path approach
 - Early indicators
 - Buffer space
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope
 - Existing parking lot on the south side
 - Short queue storage length may be a concern for no-turn-on-red



Riviera Drive



- **Recommendations**
 - Early indicators
 - Buffer space
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
 - Leading pedestrian interval (LPI)
 - Widen path and provide bridge over Coral Gables Waterway west of Riviera Drive
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope
 - Short queue storage length may be a concern for no-turn-on-red



Granada Boulevard



- **Recommendations**
 - Early indicators
 - Buffer space
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope
 - Short queue storage length may be a concern for no-turn-on-red



SW 32nd Avenue



- **Recommendations**
 - Maintain straight path approach
 - Early indicators
 - Maintain buffer space
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
 - Leading pedestrian interval (LPI)
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope



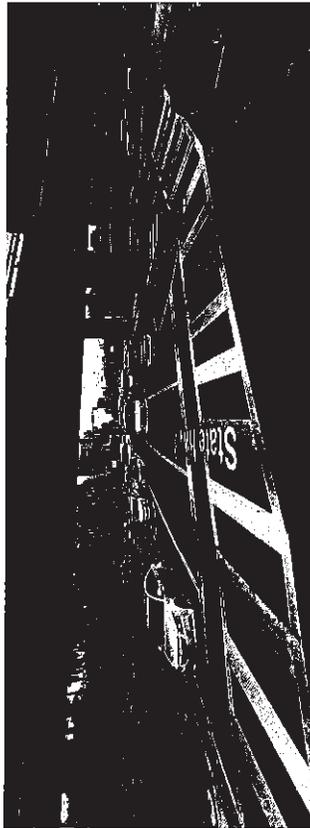
192

**4.2 INTERSECTION RECOMMENDATIONS
MINOR IMPROVEMENTS**

SW 27th Avenue



- **Recommendations**
 - Alternate 1 – Change to grade separation
 - Alternate 2 – Bifurcate crossing around Metrorail column, would require significant relocation of stop bar
 - Alternate 3 – Relocate crossing to SW 28th Lane (next signalized intersection north)
- **Potential Concerns**
 - Metrorail columns in center of cross-street
 - Utilities
 - Crosswalk cross-slope
 - "Pinch-point" created by proximity of Metrorail alignment at this location
 - Business parking on north side



SW 17th Avenue



- **Recommendations**
 - Re-align path approach
 - Early indicators
 - Buffer space
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
- **Potential Concerns**
 - Utilities
 - Crosswalk cross-slope



SW 22nd Avenue



- **Recommendations**
 - Early indicators
 - Maximize buffer space within constraints (will likely be less than 6 feet)
 - Maximize crossing width within constraints (will likely be less than 18 feet)
 - No-turn-on-red for cross-street right-turn
- **Potential Concerns**
 - Unusually long crossing (~180 feet)
 - Metrorail columns in center of cross-street
 - Utilities
 - Crosswalk cross-slope
 - "Pinch-point" created by proximity of Metrorail alignment at this location



SW 16th Avenue



- **Recommendations**
 - Re-align path approach
 - Early indicators
 - Maximize buffer space within constraints (will likely be less than 6 feet)
 - 18-foot crossing width
 - No-turn-on-red for cross-street right-turn
- **Potential Concerns**
 - Channelization island must be reduced
 - Potential drainage impacts; drainage structure within channelization island
 - Utilities
 - Crosswalk cross-slope



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4.2 INTERSECTION RECOMMENDATIONS
MINOR IMPROVEMENTS

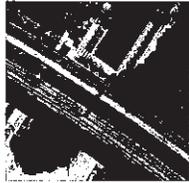
SW 26th Road



- **Recommendations**
 - Early indicators
 - Buffer space
 - 18-foot crossing width
- **Potential Concerns**
 - Unsignalized crossing (although rapid flash beacons recently installed)



SW 15th Road



- **Recommendations**
 - Early indicators
 - Buffer space
 - 18-foot crossing width
- **Potential Concerns**
 - Unsignalized crossing
 - Dependent upon path relocation to Public parking drive aisle on the north side



SW 25th Road



- **Recommendations**
 - Early indicators
 - Buffer space
 - 18-foot crossing width
- **Potential Concerns**
 - Unsignalized crossing (although rapid flash beacons recently installed)
 - Location of poles and trees complicate path approach on the north side



Brickell Bus Turnaround



- **Recommendations**
 - Relocate pedestrian path to SW 1st Avenue
 - Provide 10-foot crossing width for bike path on SW 1st Court
 - Early indicators
 - Buffer space (may be limited by columns)
 - Rebuild bus turnaround to reduce superlevation rate and to achieve gradient change before arriving at the crossing
 - Cross-slope in bike path should be as flat as possible
 - Provide flat-channel curb ramp opening for bike path rather than pedestrian design
- **Potential Concerns**
 - Superlevation
 - Gradient change between SW 1st Avenue and SW 1st Court
 - Proximity of Metrorail columns
 - Low clearance of the pedestrian bridge (11'-6") may control the vertical curvature of the bus turnaround driveway



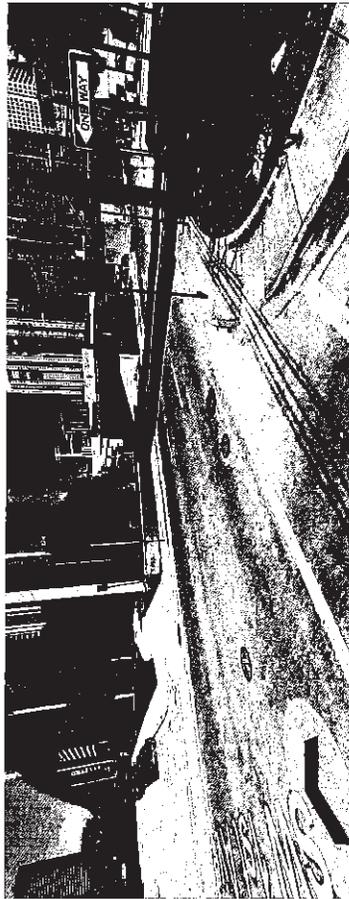
194

4.2 INTERSECTION RECOMMENDATIONS MINOR IMPROVEMENTS

SW 7th Street



- **Recommendations**
 - Early indicators
 - 18-foot crossing width
- **Potential Concerns**
 - Unsignalized crossing
 - Modifications to retaining wall on the north side will be required for crossing width



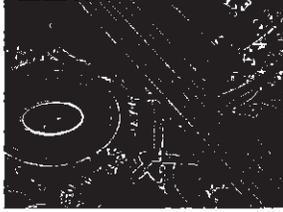
195

**4.2 INTERSECTION RECOMMENDATIONS
MEDIUM IMPROVEMENTS**

Medium Improvement Intersections

- South Miami Hospital exit driveway
- Merrick Circle
- SW 31st Avenue
- SW 24th Avenue
- SW 19th Avenue
- SW 13th Street (Coral Way)
- SW 8th Street (Calle Ocho)

Merrick Circle



- **Recommendations**
 - Maintain straight approach
 - Early indicators
 - Tabled crossing
 - 18-foot crossing width (minimum)
- **Potential Concerns**
 - Mid-block crossing would require modifying concrete crash barrier wall
 - Metrorail is triple-tracked with three columns in this area



South Miami Hospital



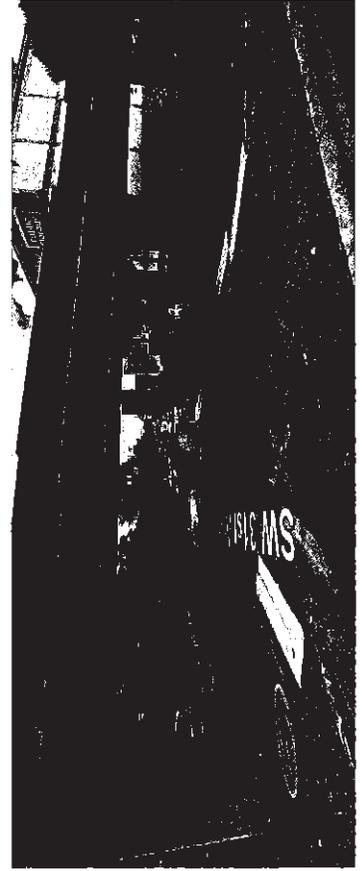
- **Recommendations**
 - Maintain straight approach
 - Early indicators
 - Tabled crossing
 - 18-foot crossing width (minimum)
- **Potential Concerns**
 - Drainage



SW 31st Avenue



- **Recommendations**
 - Maintain straight approach
 - Early indicators
 - Tabled crossing
 - 18-foot crossing width (minimum)
- **Potential Concerns**
 - Drainage
 - Raise Underline gradient on approach to match roadway



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**4.2 INTERSECTION RECOMMENDATIONS
MEDIUM IMPROVEMENTS**

SW 24th Avenue



- **Recommendations**
 - Maintain straight approach
 - Early indicators
 - Tabled crossing
 - 18-foot crossing width (minimum)
- **Potential Concerns**
 - Drainage
 - Utilities



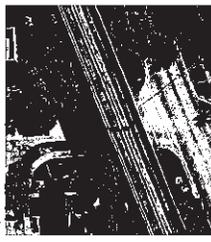
SW 13th Street



- **Recommendations**
 - Maintain straight approach
 - Early indicators
 - Tabled crossing, or re-align SW 13th Street to provide a median refuge for existing mid-block crossing
 - 18-foot crossing width (minimum)
- **Potential Concerns**
 - Drainage
 - Utilities



SW 19th Avenue



- **Recommendations**
 - Maintain straight approach
 - Early indicators
 - Tabled crossing
 - 18-foot crossing width (minimum)
- **Potential Concerns**
 - Drainage
 - Utilities



SW 8th Street



- **Recommendations**
 - Maintain straight approach
 - Early indicators
 - Add crosswalk on SW 1st Court side
 - May require signaling SW 1st Court and operating it as part of SW 1st Avenue signalized intersection
- **Potential Concerns**
 - Utilities
 - Signalized intersection operations



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**4.2 INTERSECTION RECOMMENDATIONS
MAJOR IMPROVEMENTS**

Major Improvement Intersections

- SW 88th Street (Kendall Drive)
- SW 57th Avenue (Red Road)
- SW 42nd Avenue/Grand Avenue
- SW 37th Avenue (Douglas Road)
- SW 40th Street (Bird Road)

SW 57th Avenue



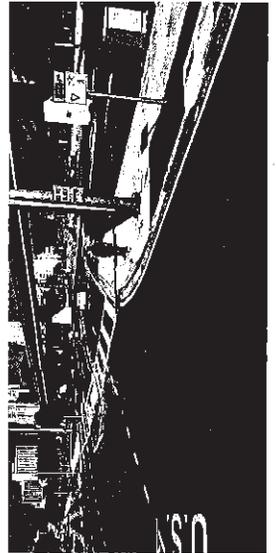
- **Recommendations**
 - Grade separation
 - Maintain existing sidewalk and crosswalk connections for local access
- **Potential Concerns**
 - Drainage
 - Utilities



SW 88th Street



- **Recommendations**
 - Grade separation
- **Potential Concerns**
 - Unusually long crossing (~ 220 feet)
 - Narrow width between existing parking lot and U.S. 1 sidewalk would create a challenge for designers regarding south side overpass ramp/landing



SW 42nd Avenue/Grand Avenue



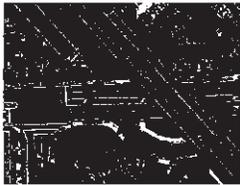
- **Recommendations**
 - Grade separation to eliminate two-stage crossing of both SW 42nd Avenue and Grand Avenue
- **Potential Concerns**
 - Drainage
 - Utilities
 - Trees and utility poles on the northeast corner where bridge landing would need to be



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**4.2 INTERSECTION RECOMMENDATIONS
MAJOR IMPROVEMENTS**

SW 37th Avenue



- **Recommendations**
 - Alternative 1 – Grade separation
 - Alternative 2 – Re-route Underline path alignment to cross SW 37th Avenue at Peacock Avenue
- **Potential Concerns**
 - Drainage
 - Utilities
 - South side overpass landing would be within northern area of Douglas Station
 - Re-routing alternative would require land acquisition from private entity
 - No marked crossing exists



SW 40th Street



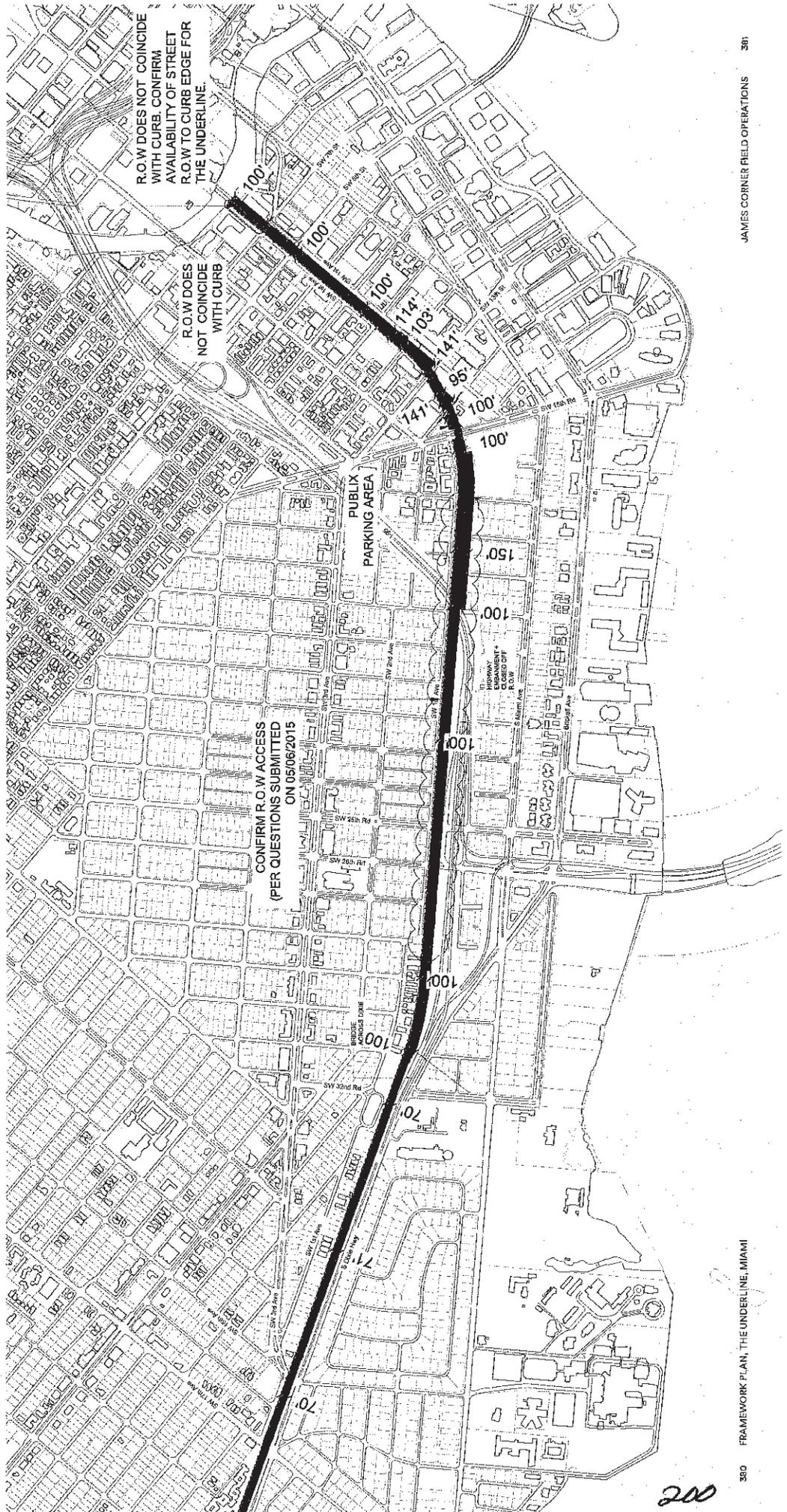
- **Recommendations**
 - Grade separation
- **Potential Concerns**
 - Unusually long crossing (~ 170 feet)
 - Drainage
 - Utilities
 - South side overpass landing would likely impact existing trees behind car wash
 - North side overpass landing would require re-routing Underline path to be on the U.S. 1 side of the Metrorail guideway



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4.3 THE UNDERLINE RIGHT OF WAY
 * BASED ON DRAWINGS PROVIDED BY MDPR & MDT

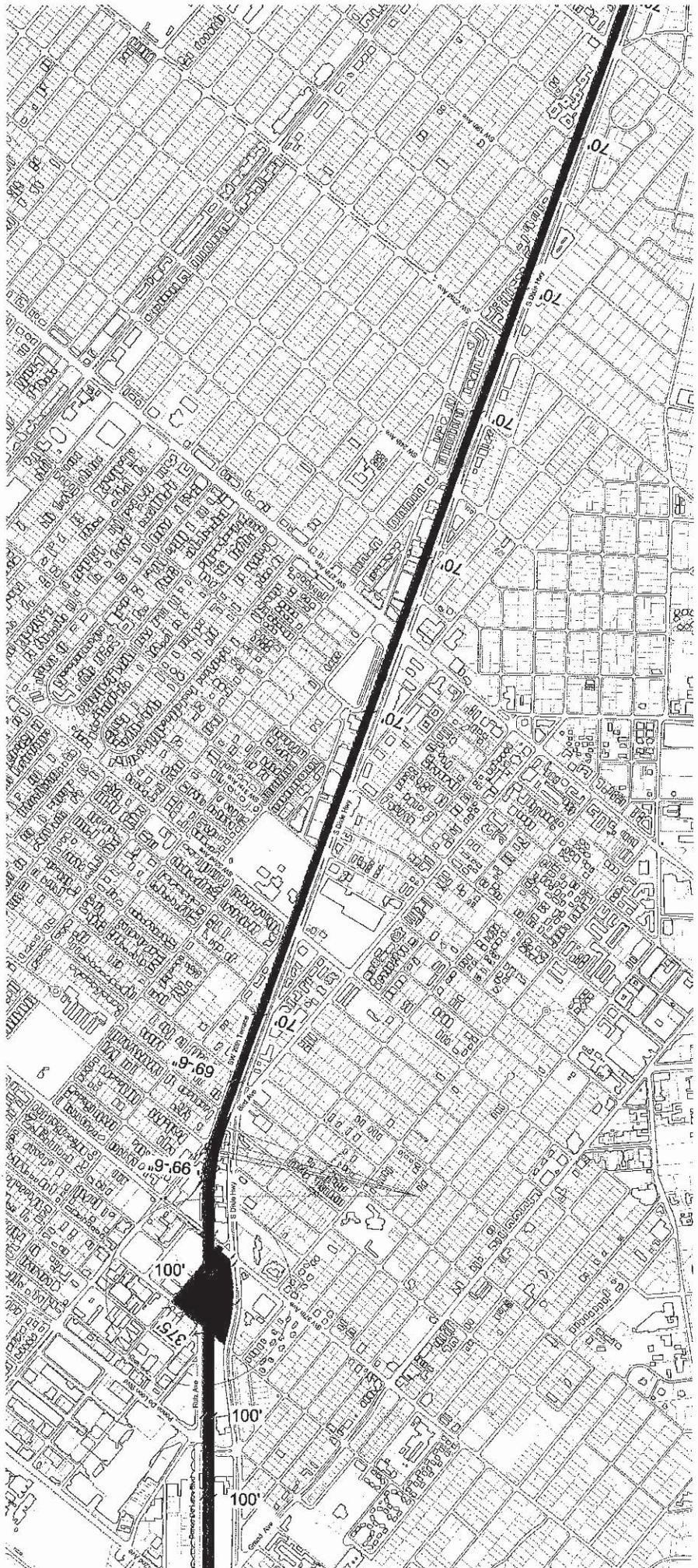
MDT R.O.W



200

4.3 THE UNDERLINE RIGHT OF WAY
* BASED ON DRAWINGS PROVIDED BY MDPR & MDT

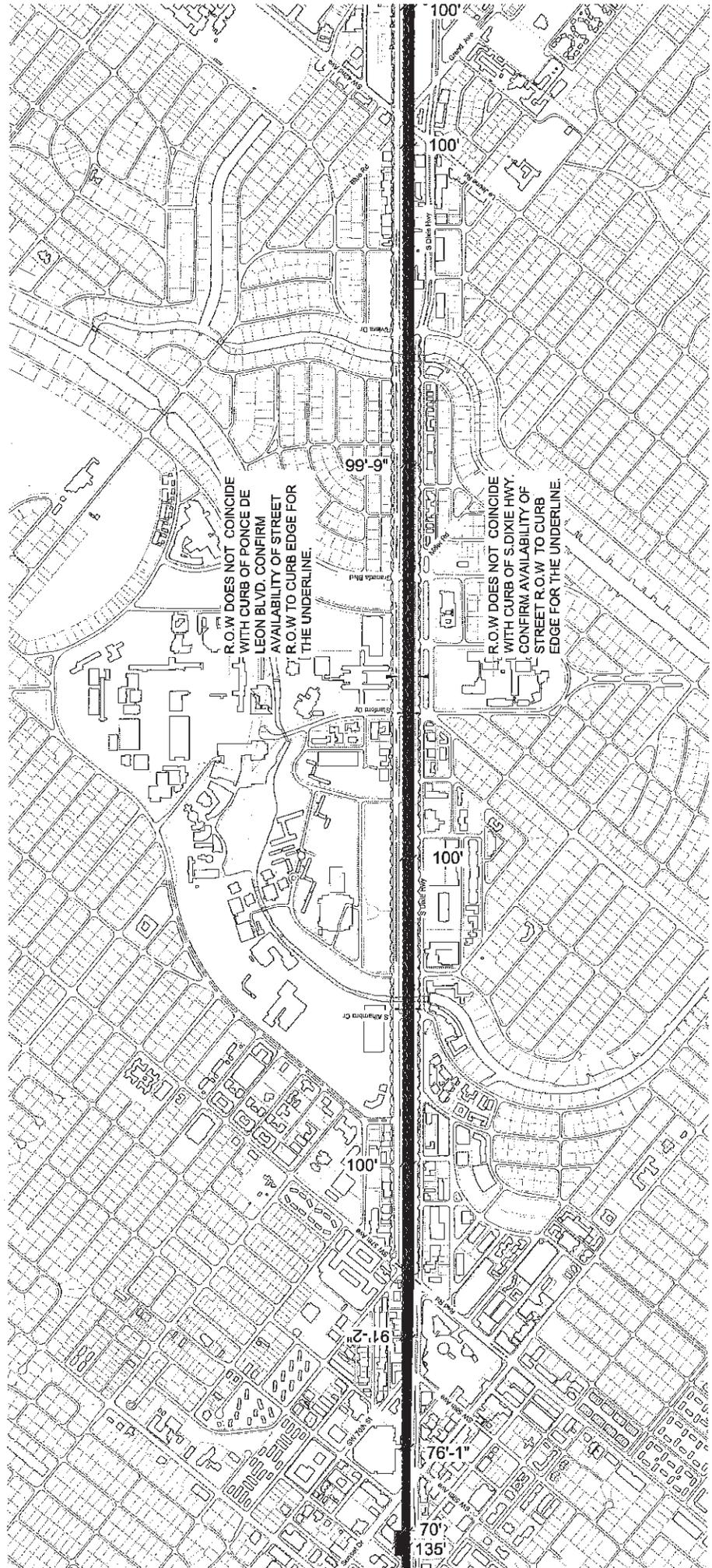
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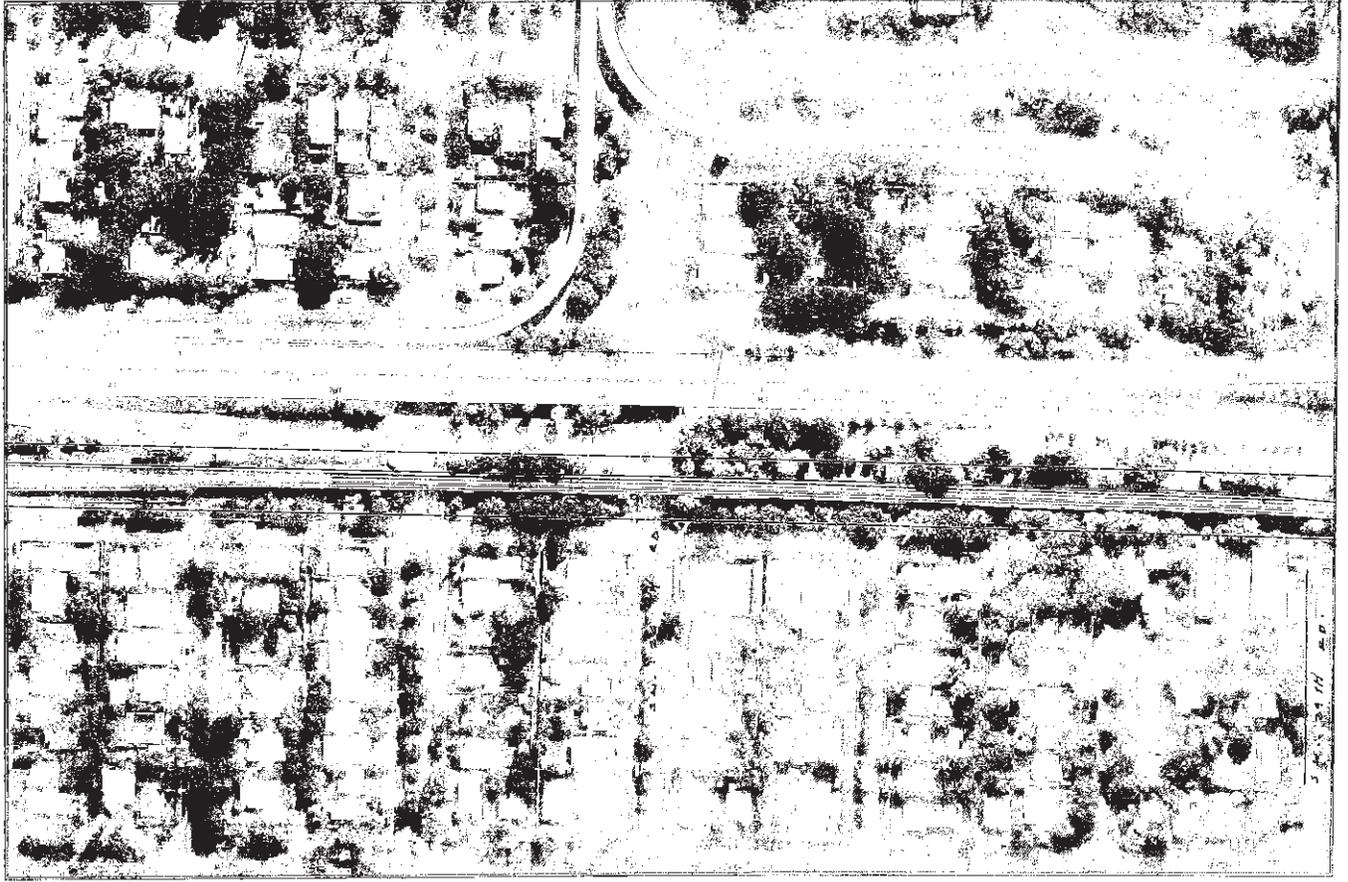
4.3 THE UNDERLINE RIGHT OF WAY
 * BASED ON DRAWINGS PROVIDED BY MDPR & MDT

MDT R.O.W



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4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MDRP & MDT



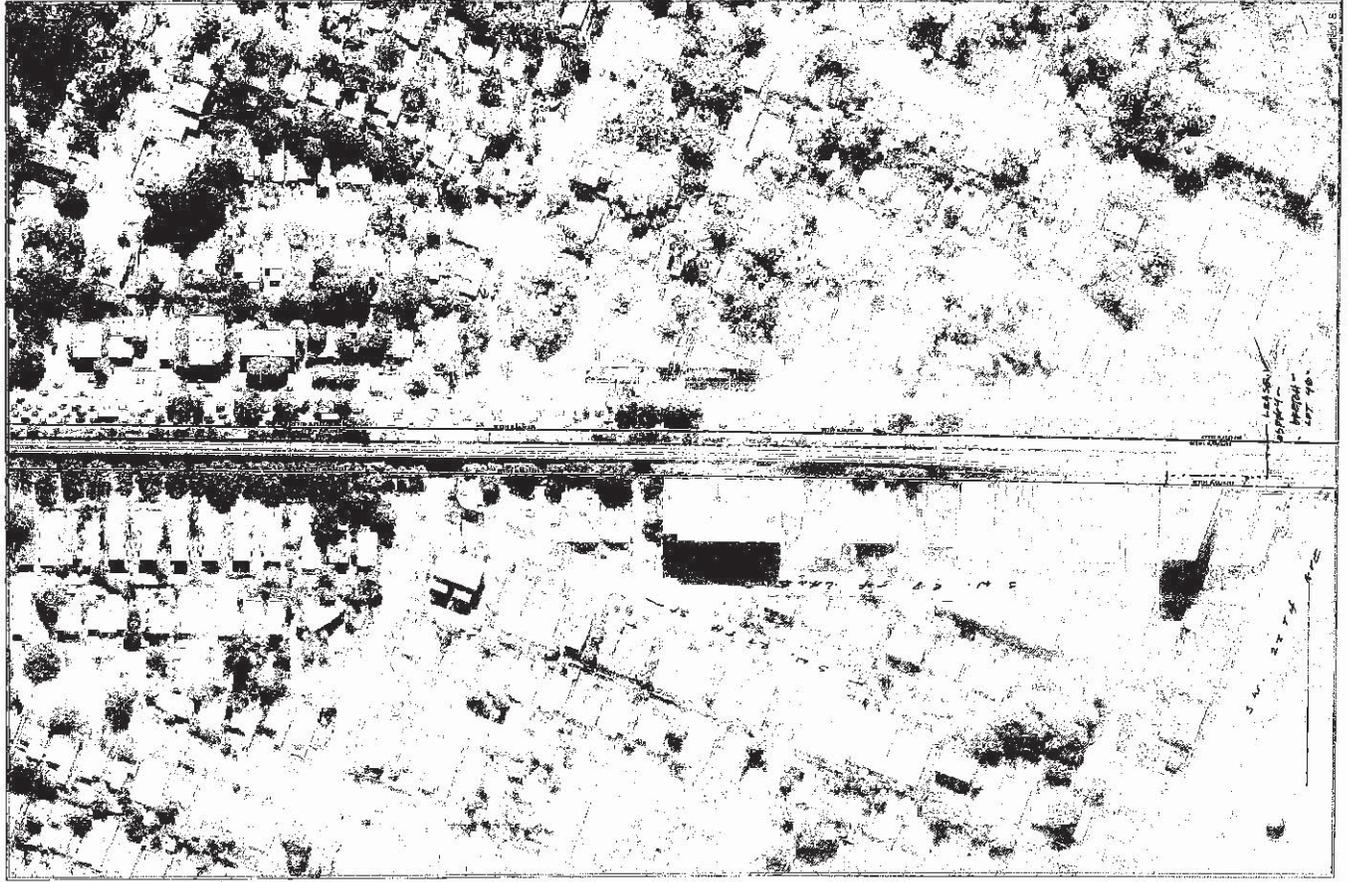
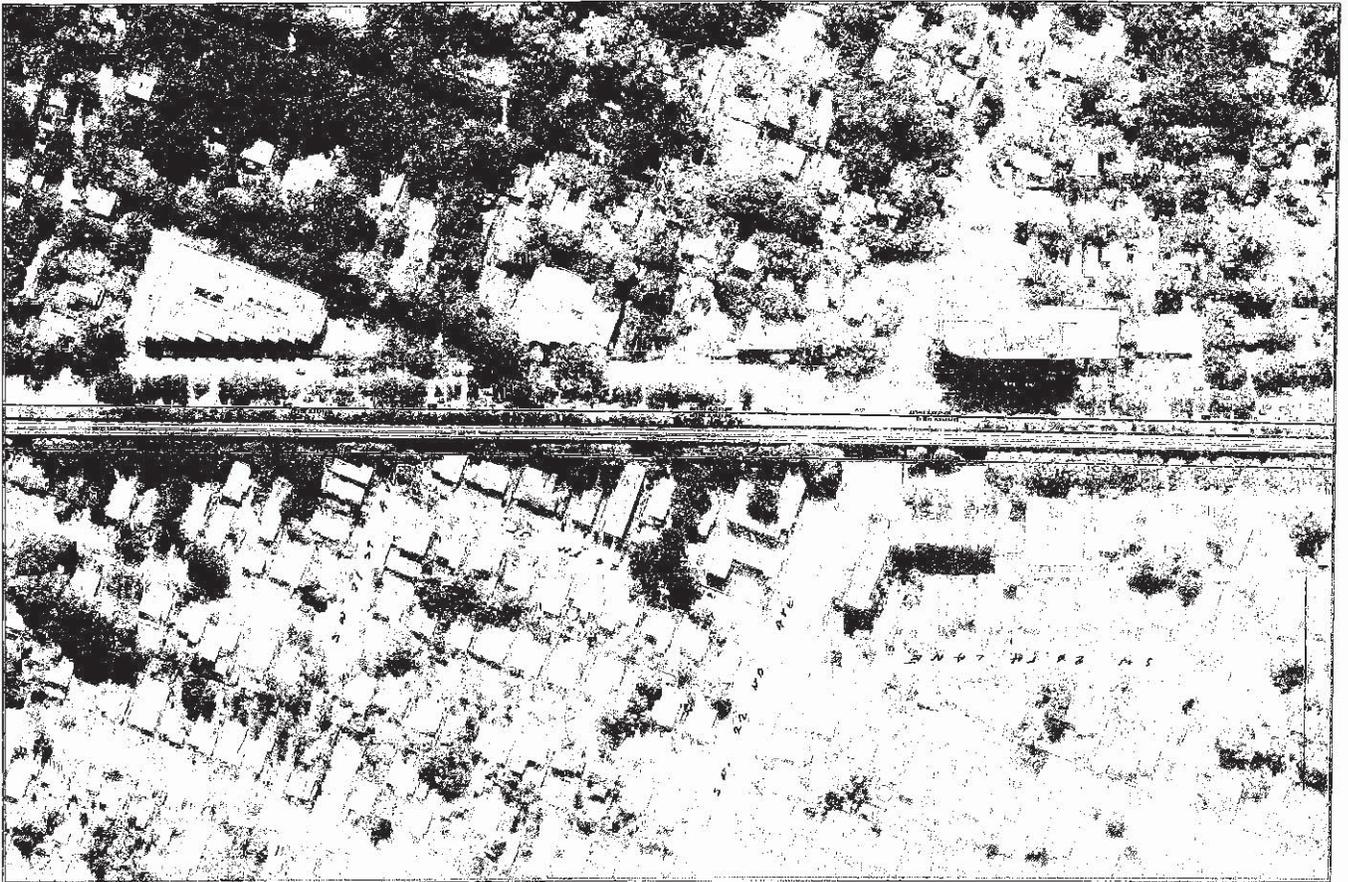
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4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MDRP & MDT



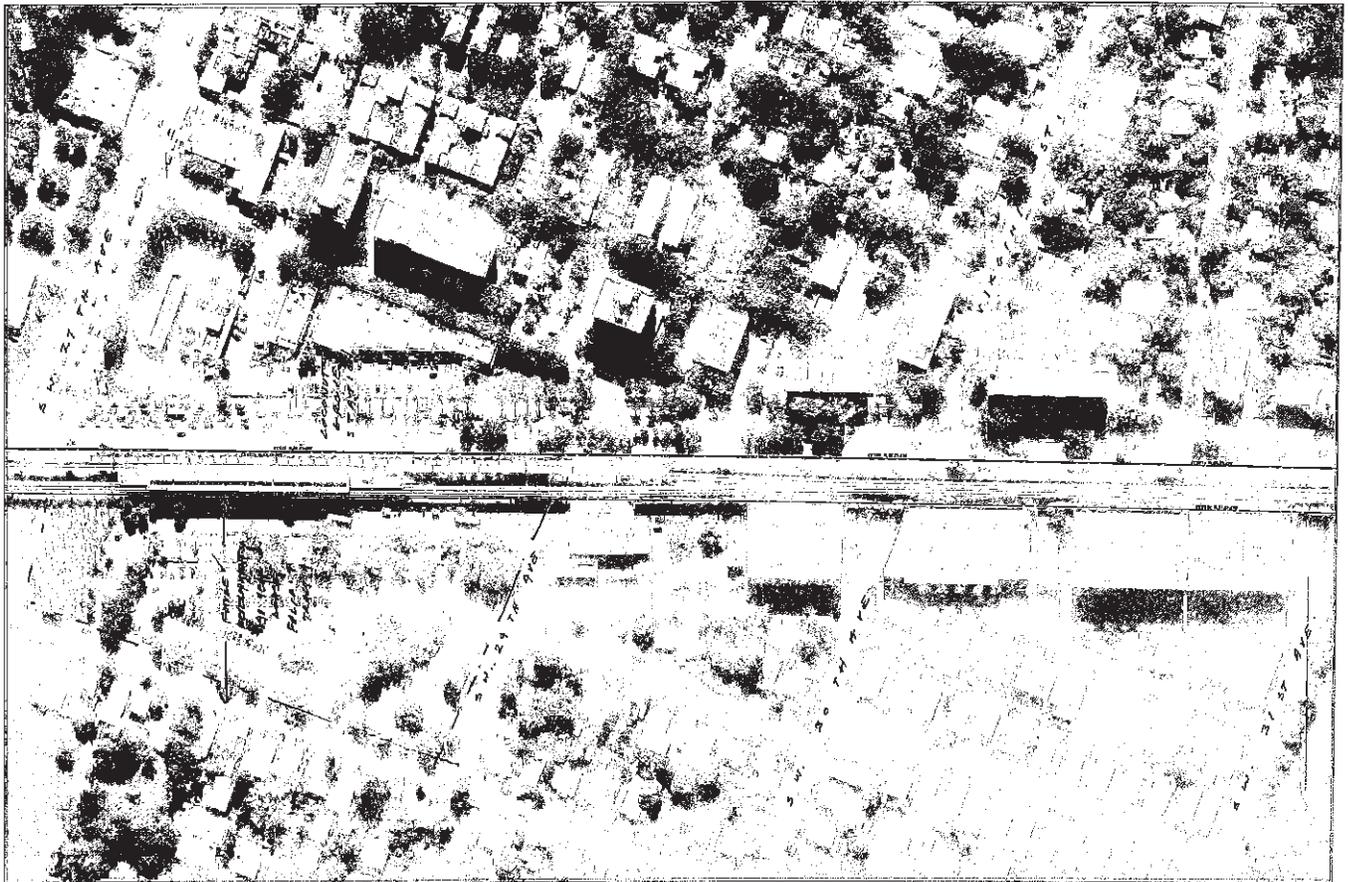
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4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MDPR & MDT



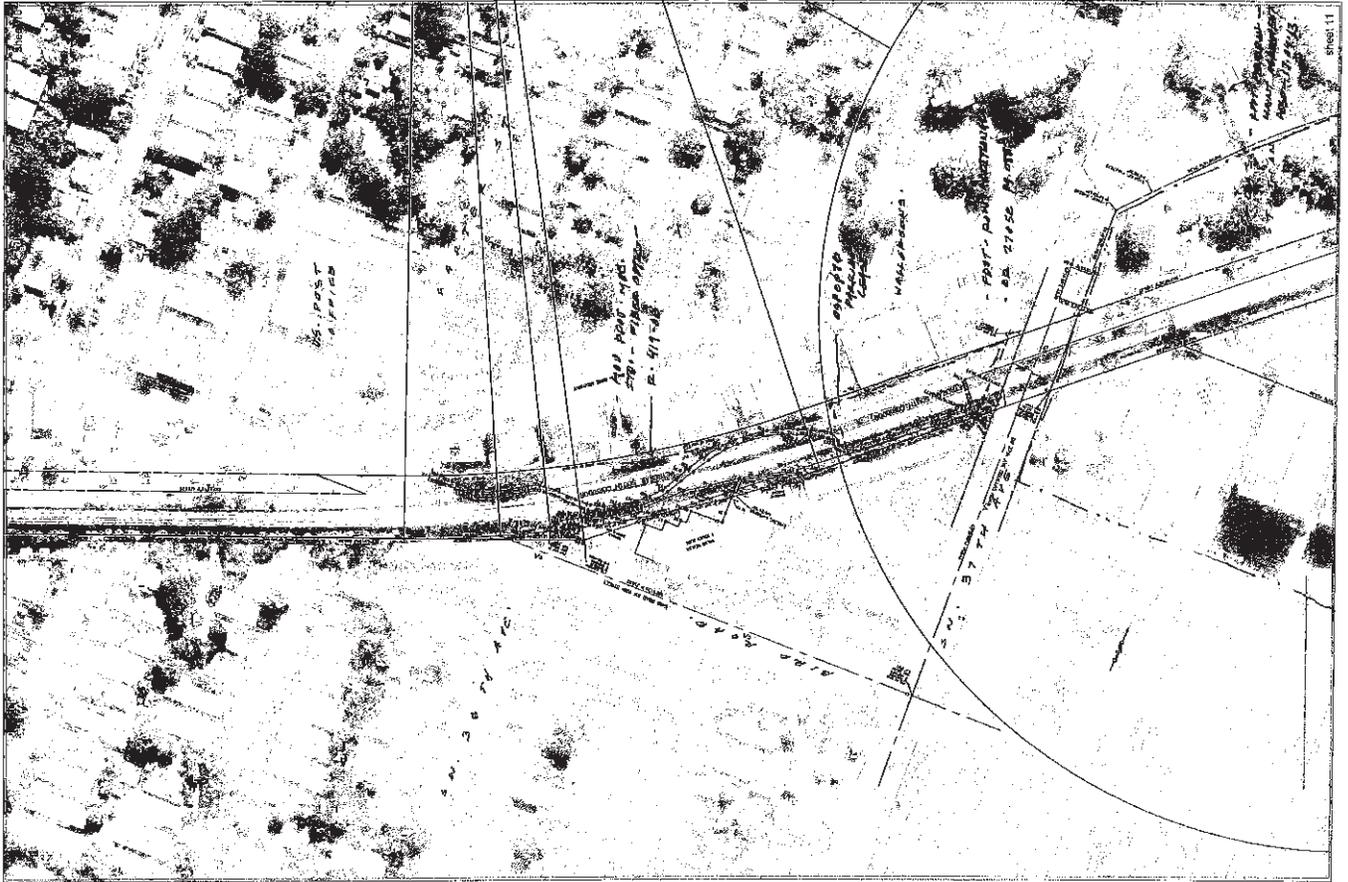
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4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MDPR & MDT

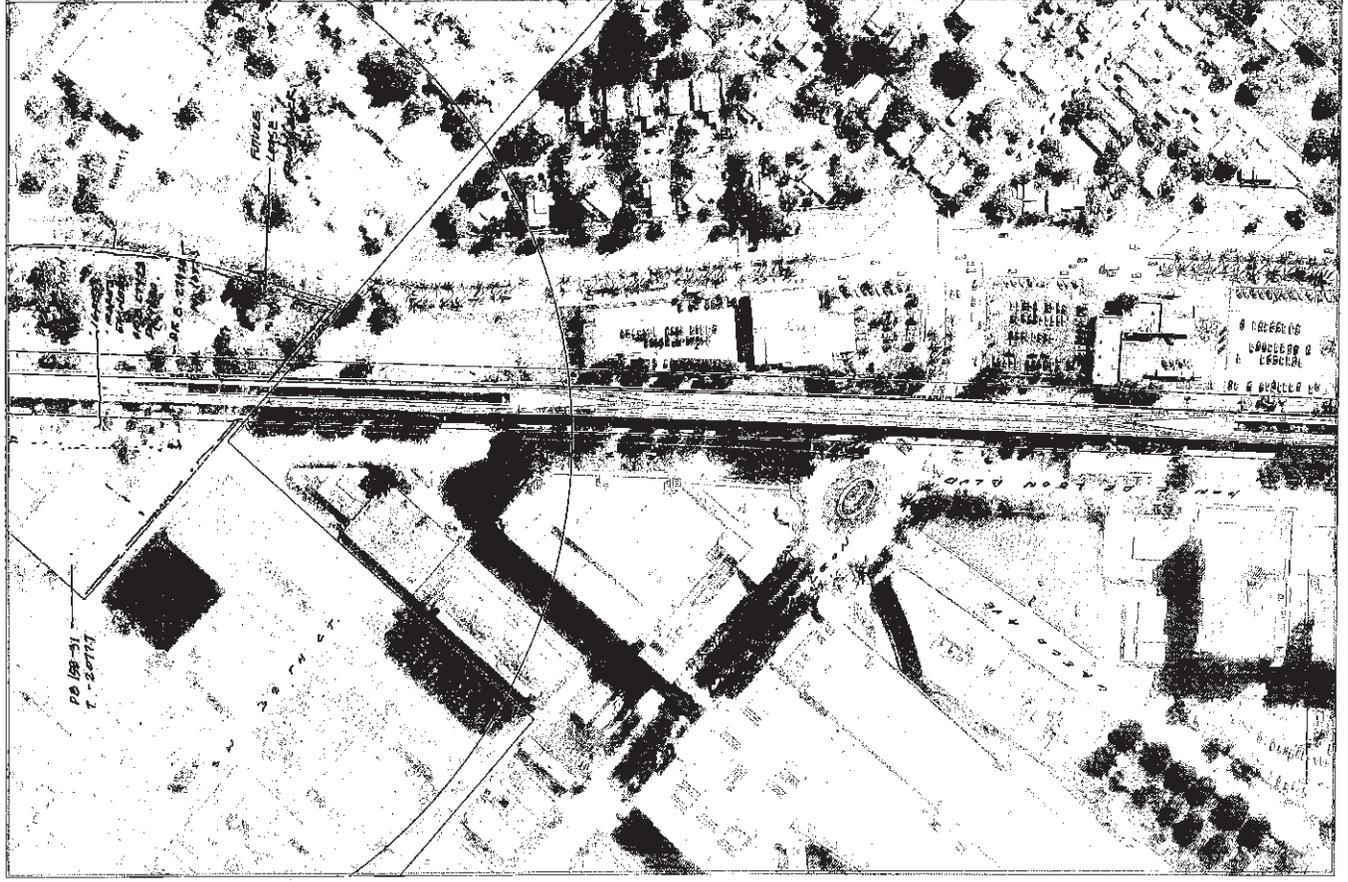


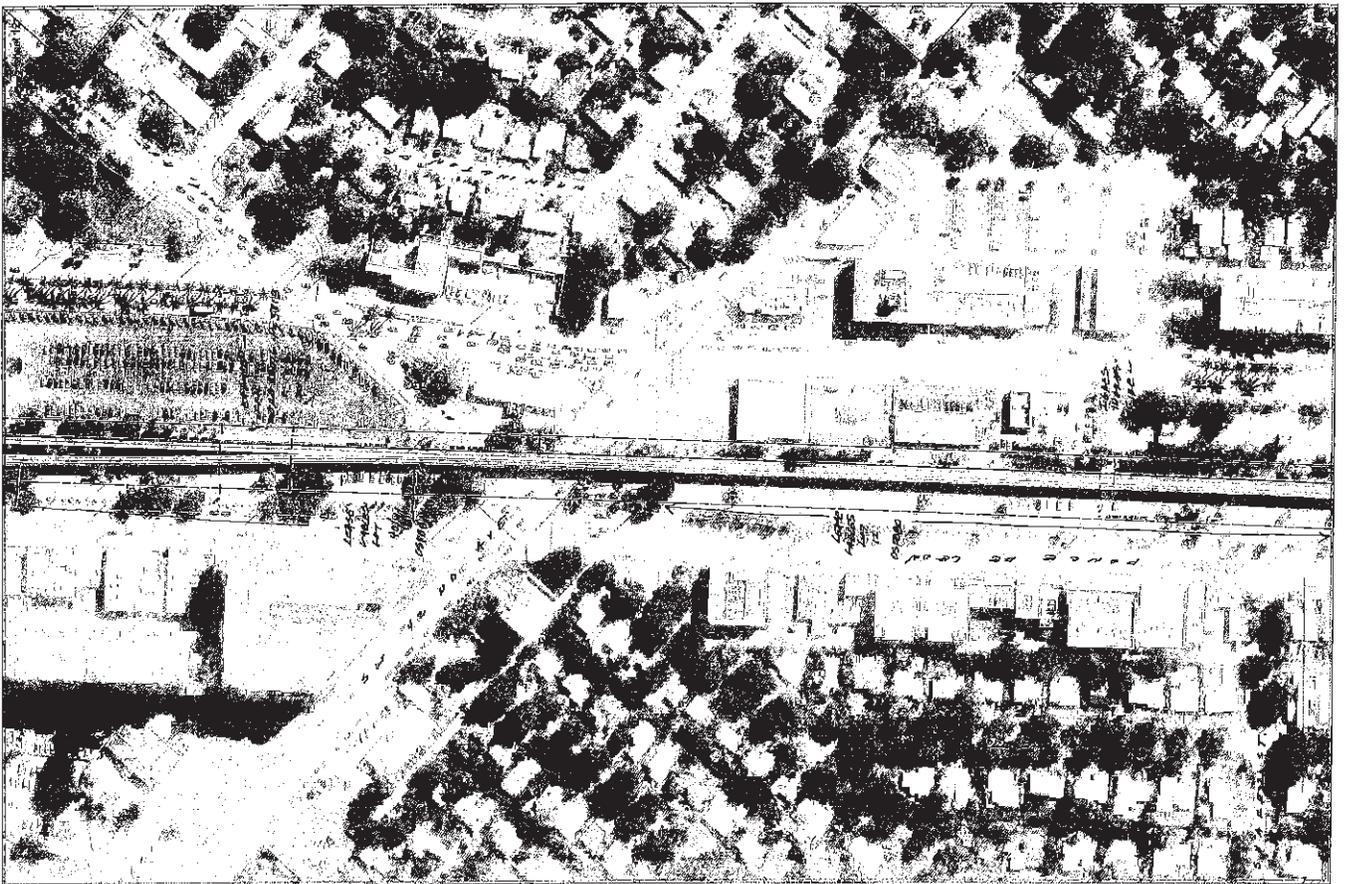
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4.4 MDT LEASE INFORMATION
 * DRAWINGS PROVIDED BY MDRP & MDT



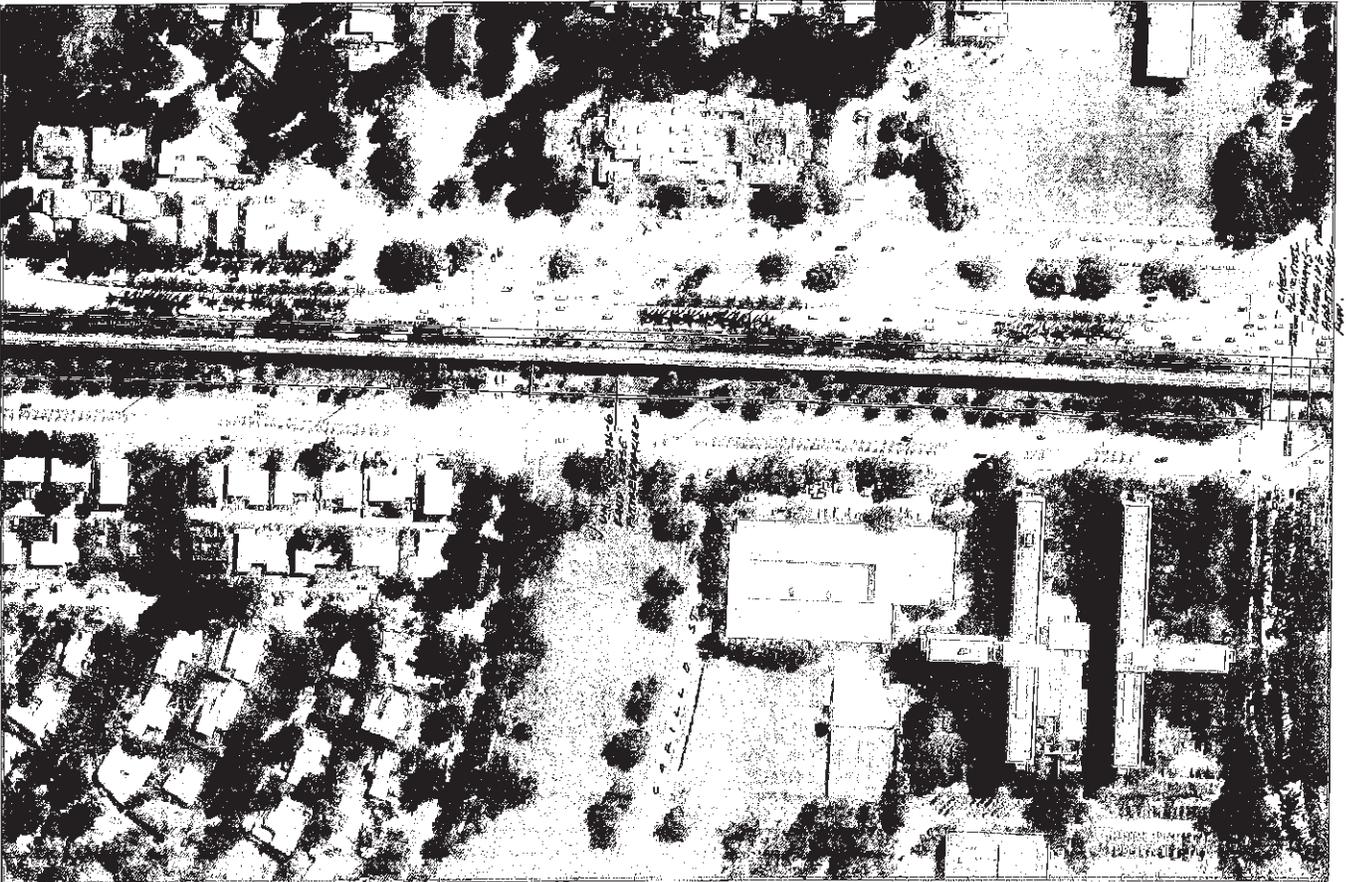
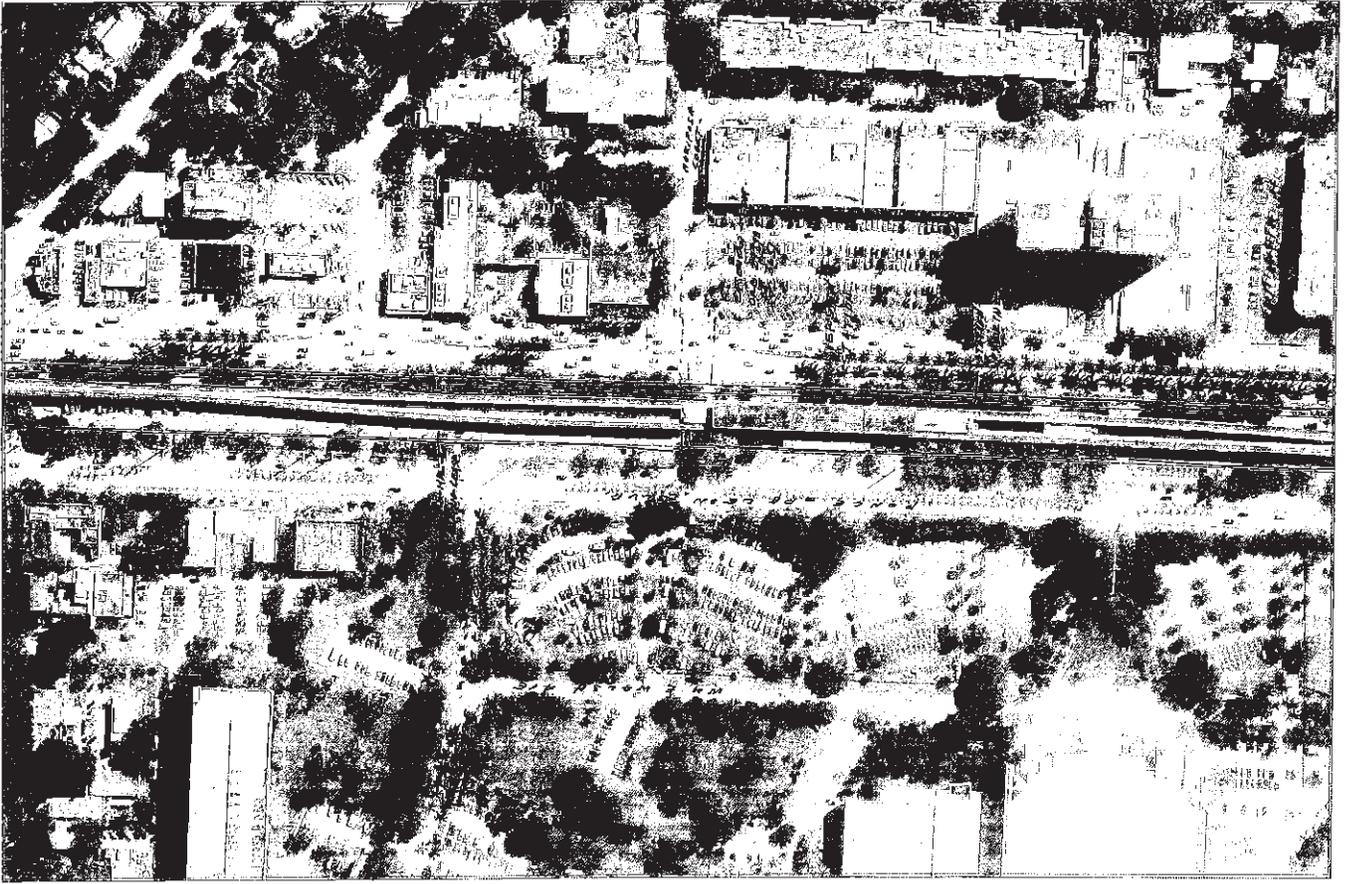
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4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MDRP & MDT

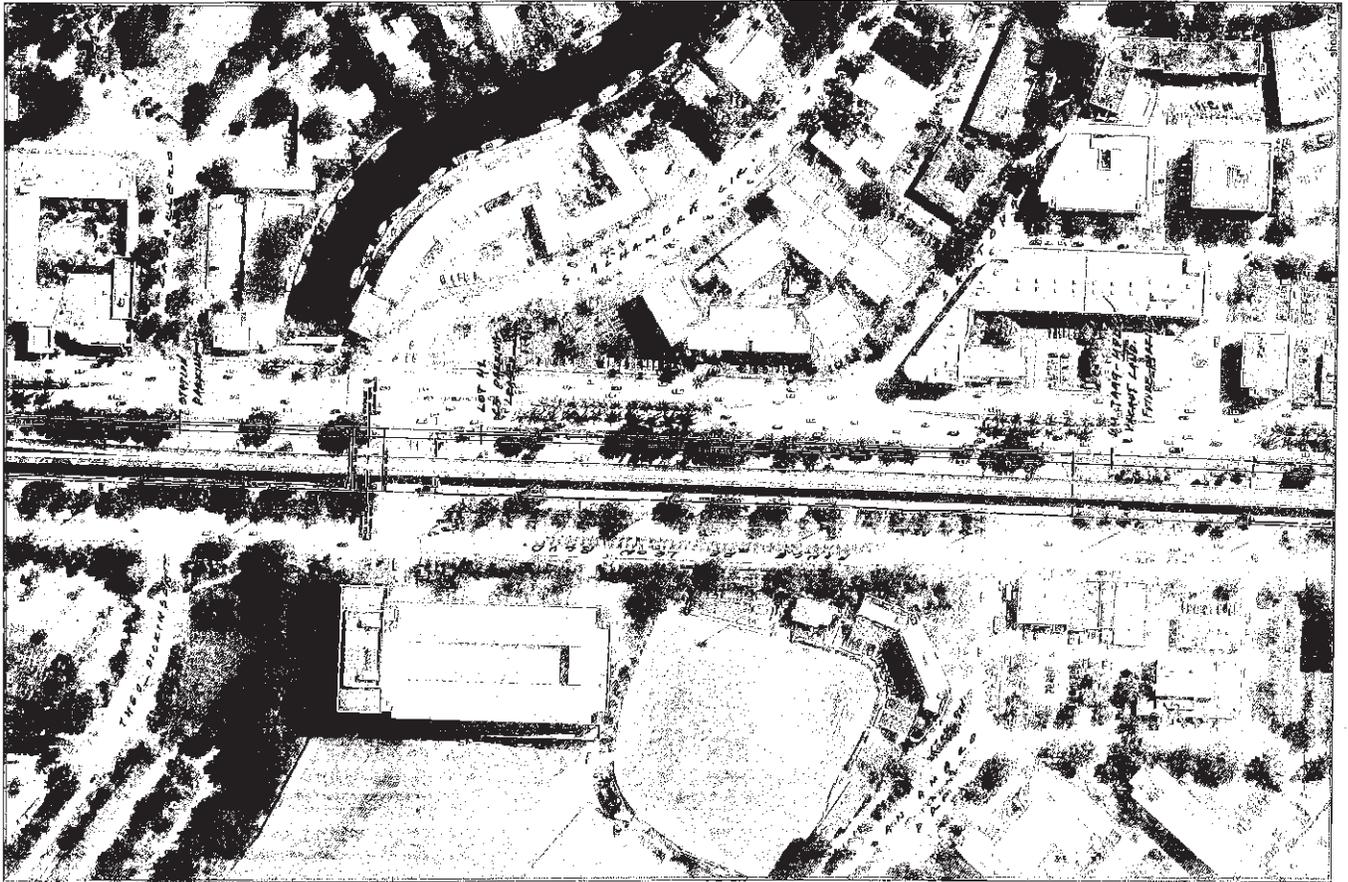
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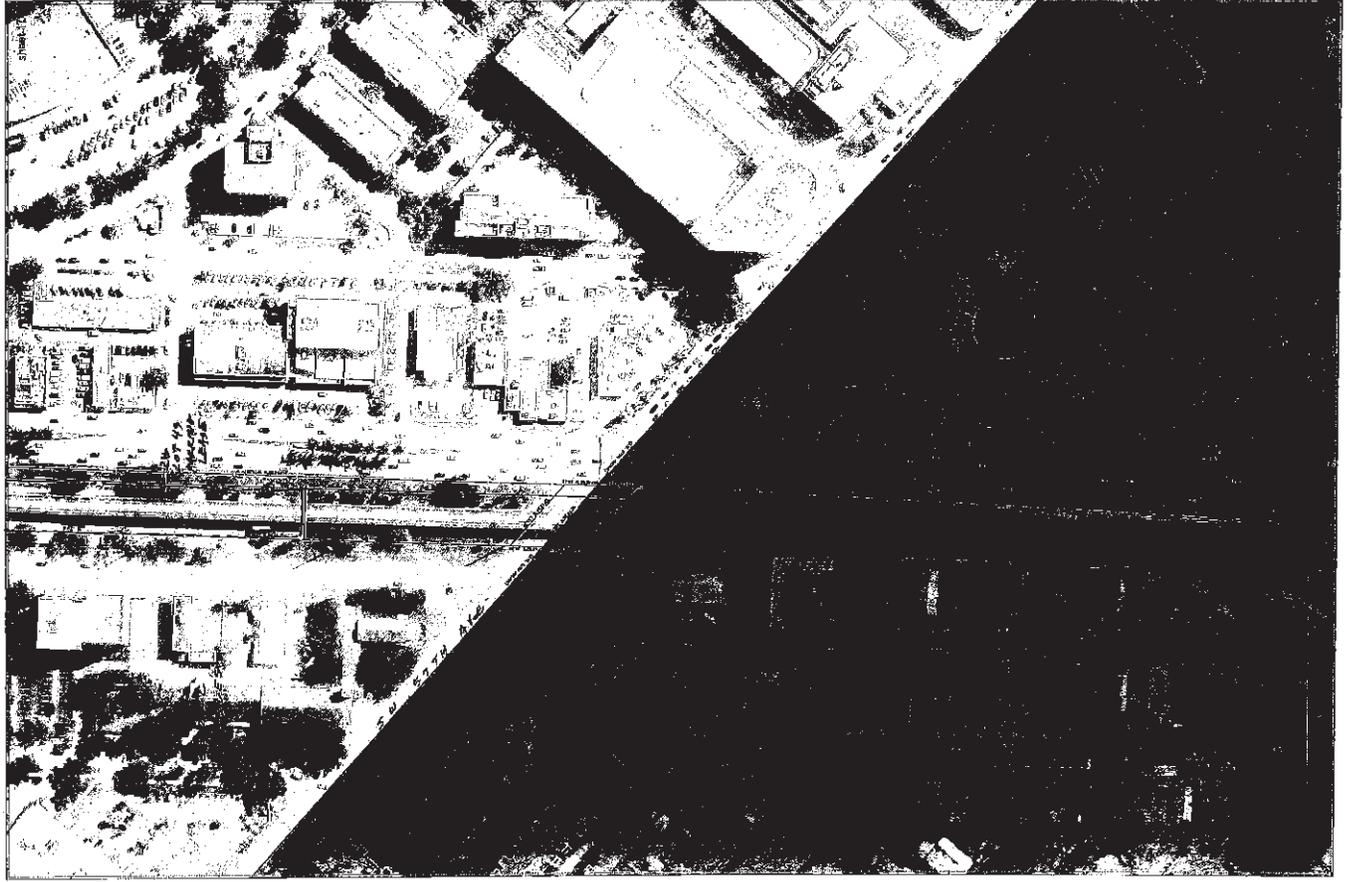
4.4 MDT LEASE INFORMATION
 * DRAWINGS PROVIDED BY MDRP & MDT

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4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MDRP & MDT



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4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MDPR & MDT

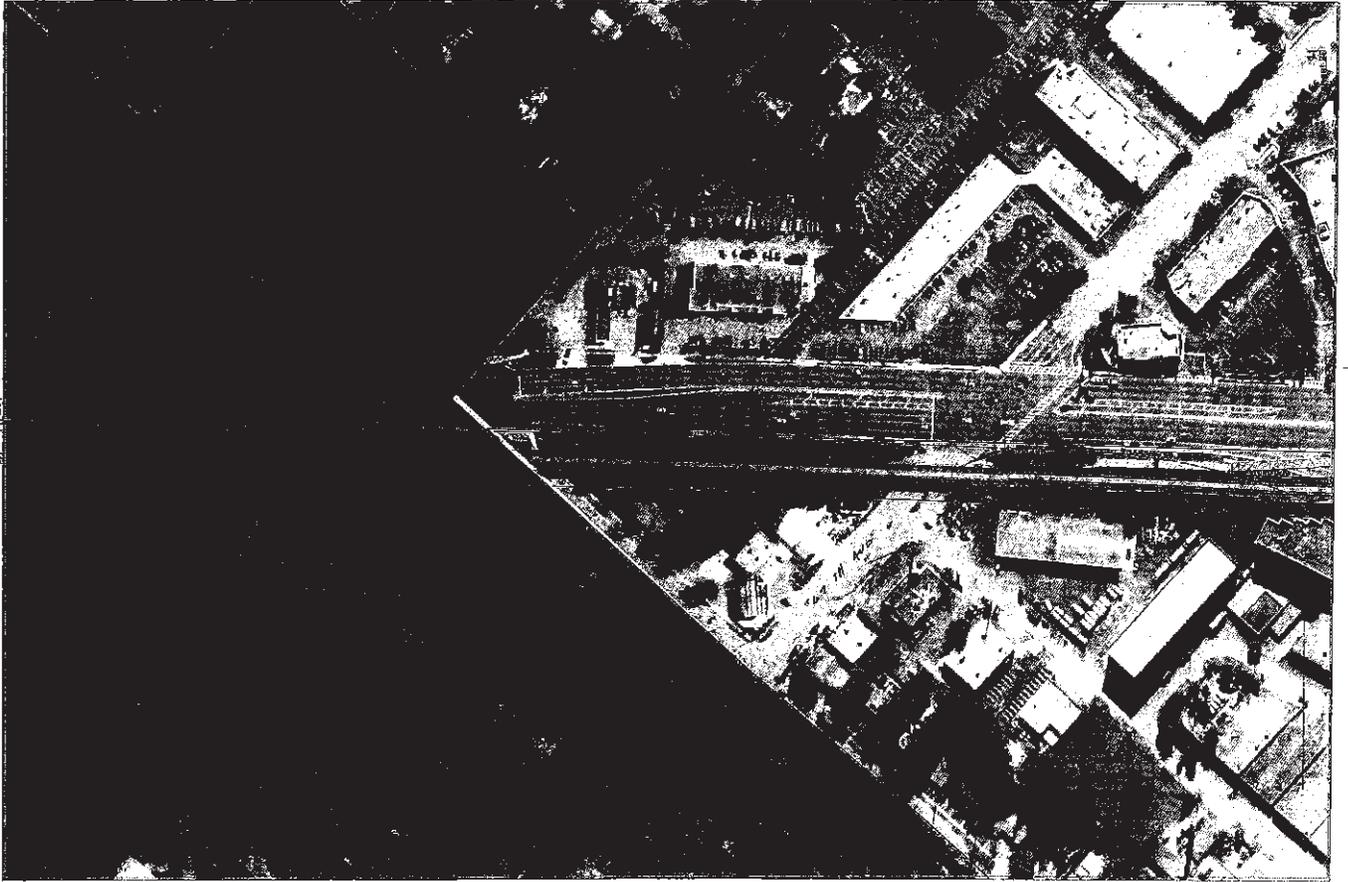


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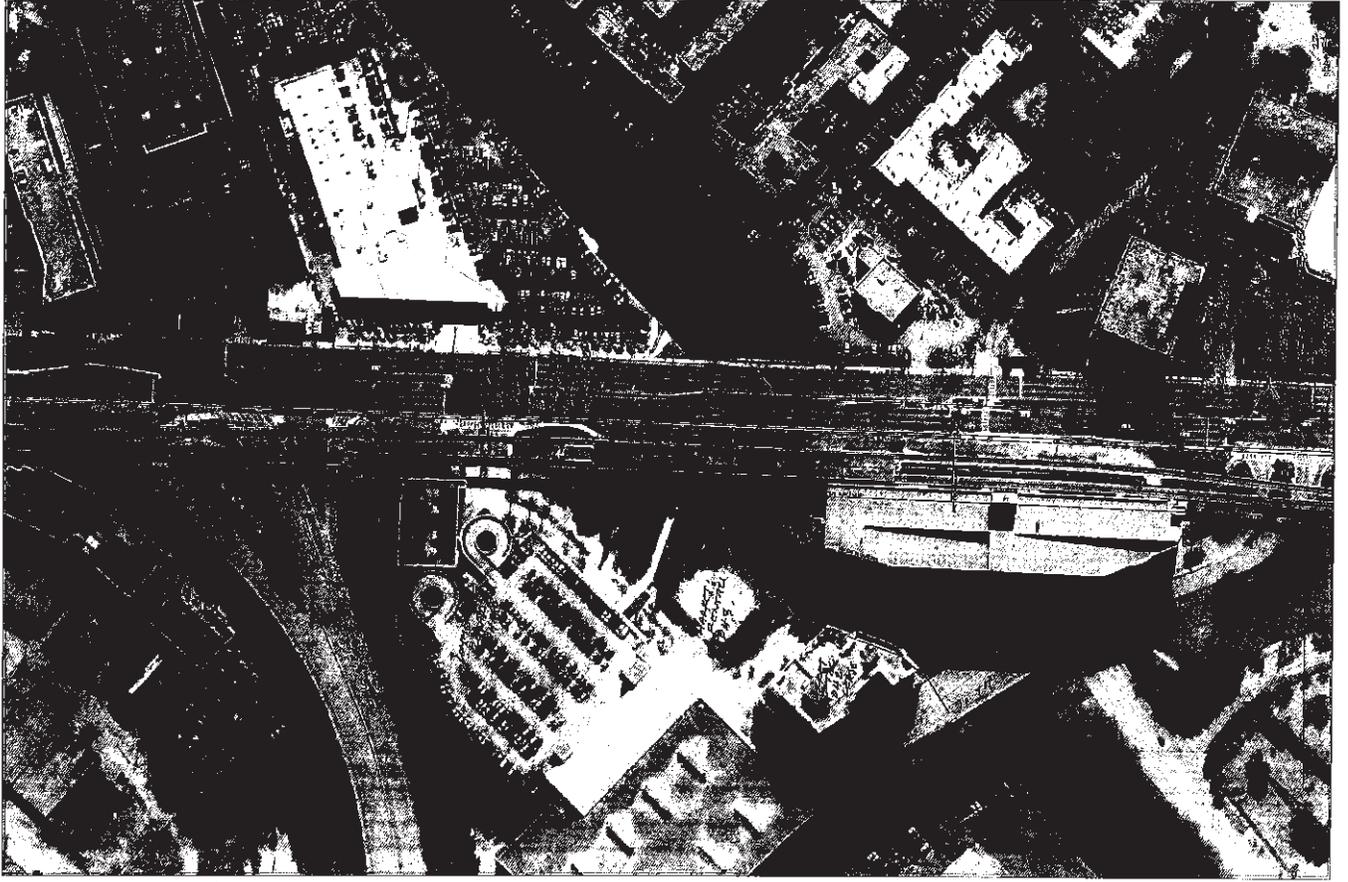


4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MDPR & MDT

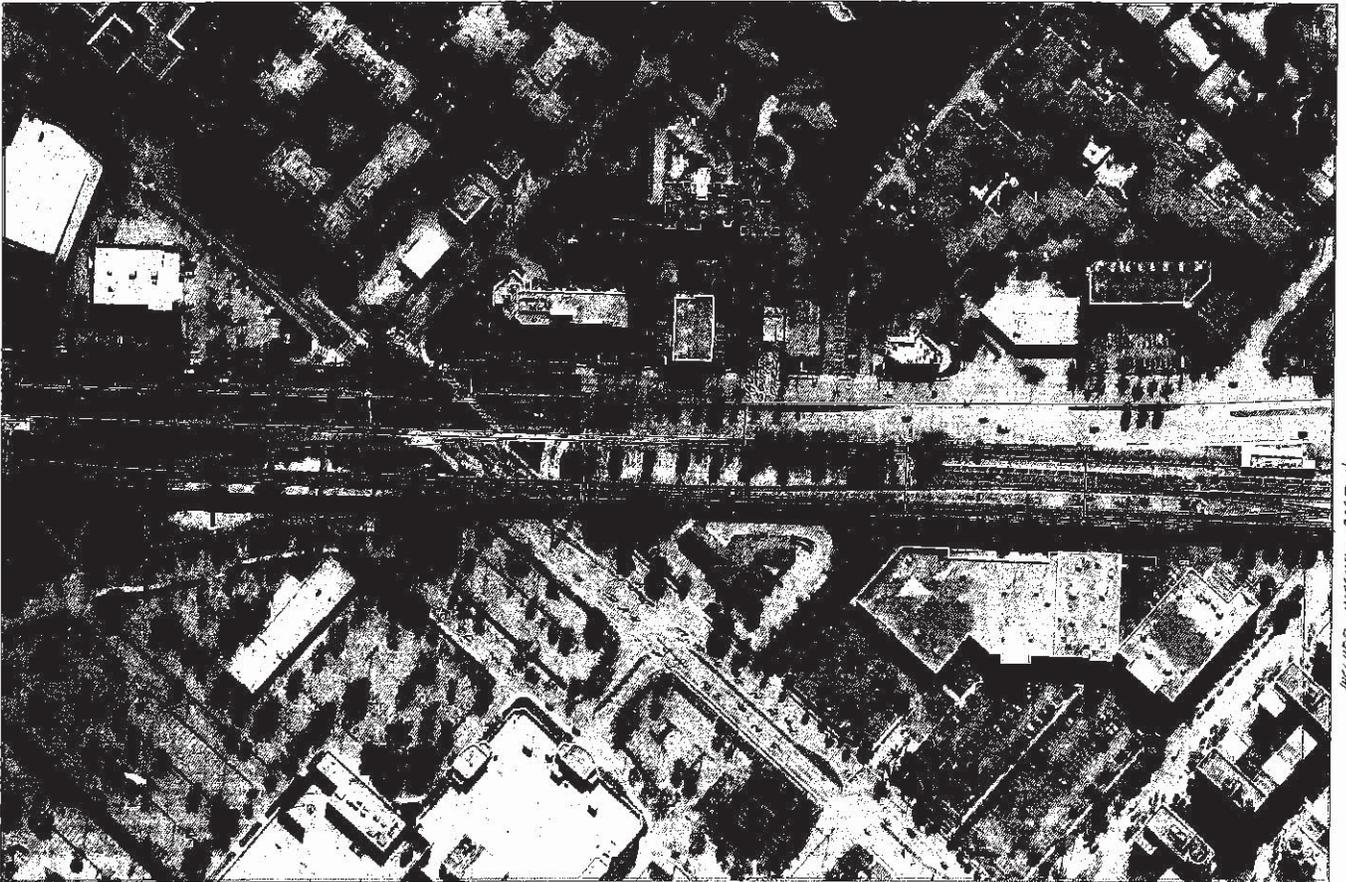
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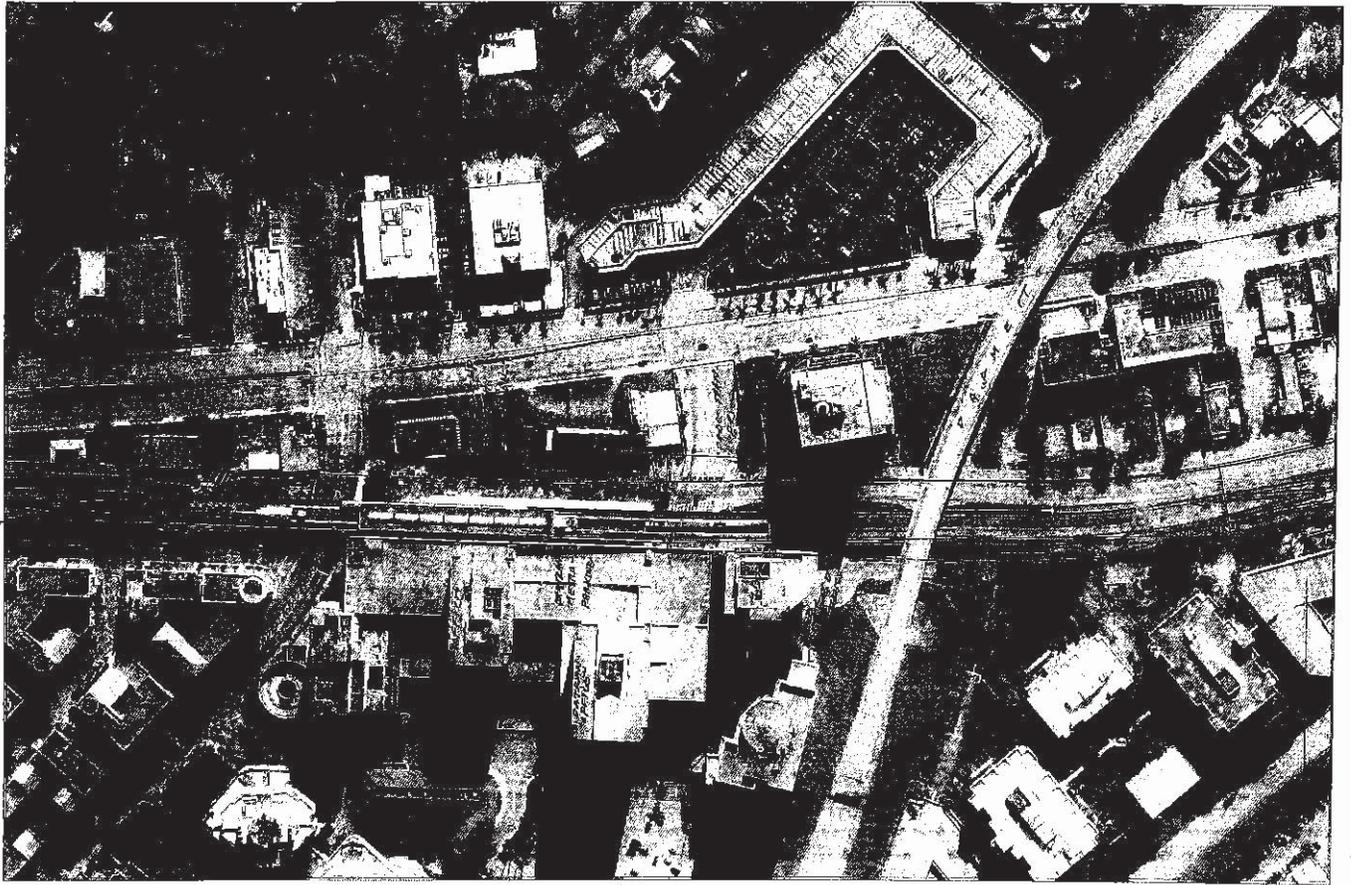
214



4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MIDPR & MDT



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4.4 MDT LEASE INFORMATION
* DRAWINGS PROVIDED BY MDRP & MDT



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4.5 AGENCY AND PUBLIC COMMENT LOG

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