

COMPLETE streets



MAY 2016

HOWELL BRANCH ROAD CASE STUDY | CASSELBERRY, SEMINOLE COUNTY, FLORIDA



Prepared for:



Prepared by:



CONTENTS

Study Background	1
Corridor Selection	2
Existing Conditions	3
User Needs and Opportunities	7
Complete Streets Design Elements	9
Recommendations	12
Improvements Map	12
Typical Sections	13
Improvement Details	16
Next Steps	17
Cost Estimate	17

STUDY BACKGROUND

MetroPlan Orlando is developing a policy that establishes regional Complete Streets goals and builds support for implementing Complete Streets projects on local and state roadways.

MetroPlan Orlando's Complete Streets Task Force assisted in the development of the draft policy, which defines Complete Streets as:

“Complete Streets are planned, designed, constructed, operated, and maintained to safely and comfortably accommodate people of all ages and ability, including pedestrians, cyclists, transit users, motorists, and freight and service operators.”

The draft policy and its implementation tools seek to incorporate “Complete Streets” thinking into the region’s transportation investments.

As part of the policy development process, MetroPlan Orlando conducted a series of case studies to highlight strategies for incorporating Complete Streets design principles into local projects. They identify viable opportunities for implementing the policy’s goals and provide guidance to local partners.

Each case study corridor was selected to show specific teachable elements of Complete Streets design and implementation.



Looking west along Howell Branch Rd near Banyon Tree Circle

SELECTED CORRIDORS

1. Orange Center Boulevard (Orlando, FL) - Lane reduction and enhanced bicycle accommodations to support community redevelopment
2. Columbia Avenue (Kissimmee, FL) - Enhanced bicycle and pedestrian accommodations to support future transit investment
3. Howell Branch Road (Seminole County, FL) - Improve bicycle and pedestrian facilities on large suburban arterial

The recommendations shown in this report present design concepts for Howell Branch Road. The ideas presented have not been discussed with local residents and any modifications to the roadways should include public engagement and additional analysis before proceeding to design or construction.



Looking east along Howell Branch Rd near Lake Ann Lane

CORRIDOR SELECTION

MetroPlan Orlando's planning area of Orange, Osceola, and Seminole Counties is nearly 3,000 square miles. An analysis of land use and transportation characteristics identified roads ready for a Complete Streets study.

The land use analysis identified areas where multimodal travel is in most demand. The transportation analysis identified corridors that would most benefit from Complete Streets investments by answering three questions:

1. How well will it address safety issues?
2. How well will it support existing infrastructure?
3. How compatible is the street for complete streets improvements?

No one criteria determined that an area is suitable, but overall, multiple criteria highlighted viable areas and corridors for Complete Streets projects.

Howell Branch Road from N Lakemont Ave to Eastbrook Blvd (shown below) ranked highly in the land use (7 out of 8 screening criteria) and transportation analyses (5 out of 11 screening criteria). The following land use and transportation characteristics were seen along the corridor, the combination of which cause it to be a good candidate corridor:

LAND USE ANALYSIS

- High Transportation Disadvantaged Index (measure of populations that have historically had significant unmet transportation needs)
- High employment density
- Medium-high population density
- Supportive future land uses
- Within 2 miles of high activity transit stop
- Within 2 miles of public park
- Within 0.5 mile of multiple educational institutions

TRANSPORTATION ANALYSIS

- Lack of bike facility
- High pedestrian and bicycle crash frequency
- High vehicle crash frequency
- Accommodates transit service
- Low heavy truck activity (less than 5%)

This corridor presents a unique opportunity to illustrate how Complete Streets improvements can support investment and balance needs along a corridor with moderately high volumes and speeds.

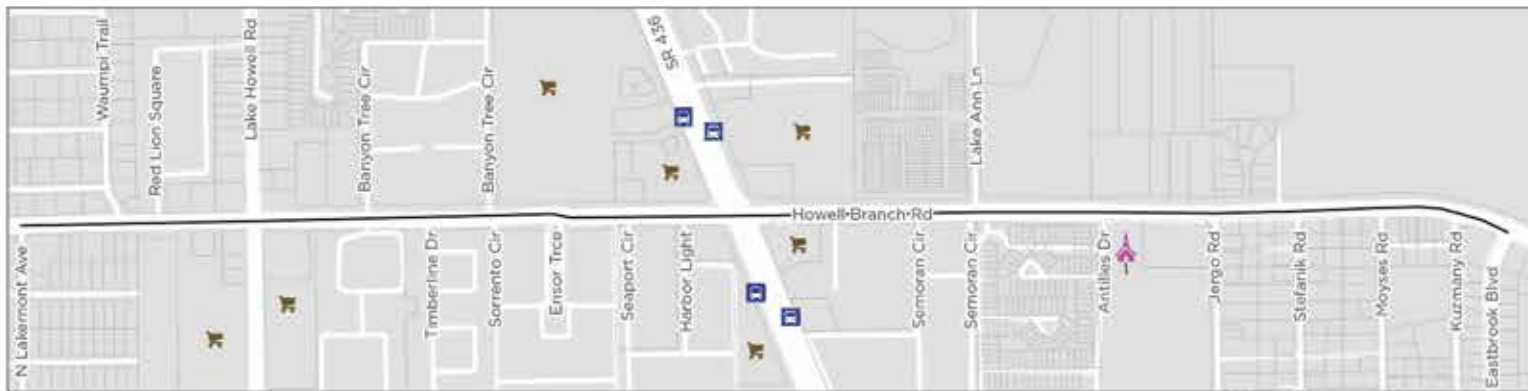


EXISTING CONDITIONS

An existing conditions analysis improved understanding of the specific issues and opportunities along the study corridor. The maps below identify existing pedestrian generators, transit, existing and future land use, vehicular traffic, crashes, and pedestrian and bicycle facilities.

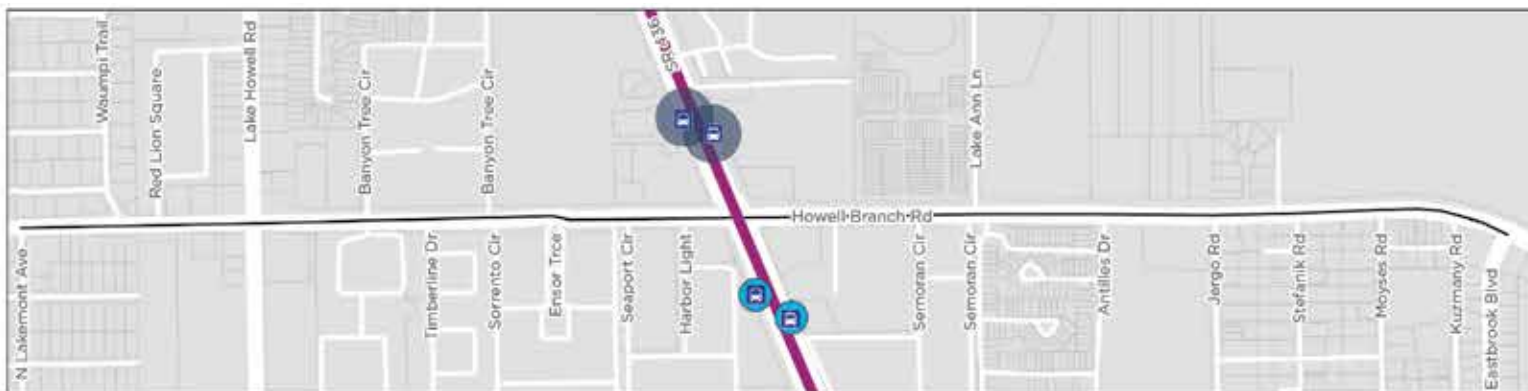
Pedestrian Generators: The corridor consists of many pedestrian generators including several multi-family residential complexes, a church, 4 bus stops, and multiple retail shopping centers.

Transit: There are no LYNX routes along Howell Branch Rd. However, Link 436S crosses Howell Branch Rd at SR 436 and has 4 bus stops within 600 feet of the study corridor with moderate boarding and alighting activity (the most active stops experience 65-70 passengers/day).



Source: Lynx, Google Maps, KAI

Pedestrian Generators



Source: Lynx

Transit



Existing Land Use: The study corridor is surrounded by predominantly multi-family residential and retail activities. Retail uses are primarily located in all four corners of the SR 436 intersection. Large blocks of multi-family residential and retail complexes comprise most of the parcels east of Waumpi Trail and west of Antilles Dr. On either end of the corridor, parcels are smaller and are composed of single-family residential land uses.

Future Lane Use: Most of the corridor will maintain its existing land uses. Some minor changes are planned in the western portion of the corridor, switching to medium density residential instead of its existing retail designation.

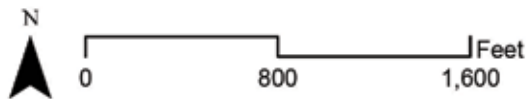
Additionally, an assisted living facility will be constructed in the northeast corner of the Lake Ann Ln intersection and a planned development is proposed north of Howell Branch Rd in the eastern portion of the corridor.



Source: Seminole County and City of Casselberry



Source: Seminole County and City of Casselberry



Average Annual Daily Traffic (AADT) & Directional Design Hourly Volume (DDHV):

Based on 2015 Seminole County data, the highest vehicle volumes along the study corridor are west of Lake Howell Rd with an AADT of 30,100 and DDHV of 1,490. According to the City of Casselberry Comprehensive Plan, the adopted LOS standard is LOS D. This suggests that the roadway is currently operating at LOS C or better (based on FDOT Generalized Service Volume Tables).

Posted Speed: The posted speed limit is 40 MPH. A statistically accurate spot speed study was not conducted; however, during the field review on March 21, 2016, some vehicles were observed to be traveling at 45-50 MPH.

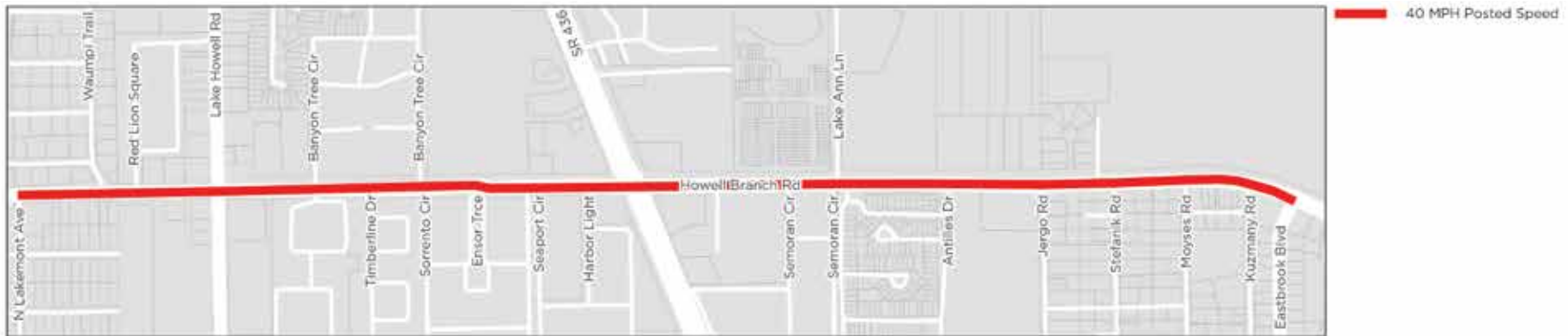
Crash History: Crash data between August 2012 and July 2015 (3 years) shows that a majority of crashes occurred at signalized intersections with the largest number of crashes occurring at the SR 436 intersection (268 crashes). In addition, detailed bicycle and pedestrian crash data for August 2010-July 2015 showed that a fatality occurred on SR 436 south of Howell Branch Rd when a pedestrian crossed at an unsignalized location. Also, approximately 80% of bicycle crashes occurred on the sidewalk with bicyclists traveling in the opposite direction of traffic.

Pedestrian and Bicycle Facilities: Continuous sidewalks are present but there are no bike lanes along the entire length of the corridor. Many bicyclists ride on the sidewalk. The Kewannee Trail is about 1 mile to the north of the study area along Lake Howell Rd.



Source: FDOT

AADT & DDHV (2015)



Source: Google Maps and KAI

Posted Speed





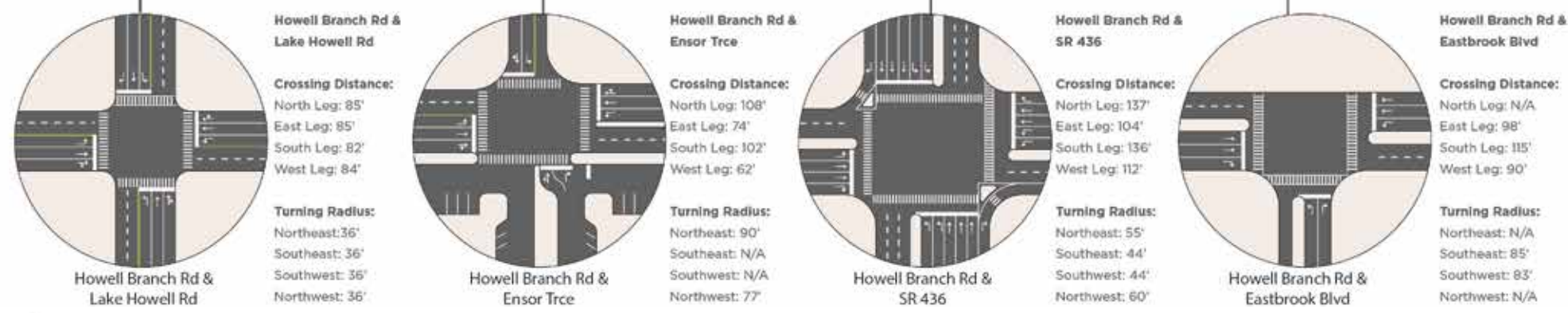
- # Intersection Crashes
- Segment Crash: Property Damage Only (PDO)
- Segment Crash: Injury
- 🚲 Bicycle Crash: Injury
- 🚶 Pedestrian Crash: Injury

Source: Signal Four Analytics

Crash History (Aug 2012 to July 2015)



Source: Google Maps



Pedestrian and Bicycle Facilities + Signalized Intersections

USER NEEDS AND OPPORTUNITIES

A design workshop with the City of Casselberry and Seminole County staff on March 31, 2016 provided information on the project context and redevelopment occurring along the corridor. The existing conditions analysis and design workshop were synthesized into six overall user needs and opportunities. Possible Complete Streets improvements for Howell Brand Rd include the following:

PEDESTRIAN

Need: The many pedestrian generators and attractors include multi-family complexes and shopping centers, particularly surrounding the SR 436 intersection. Between Lakemont Ave and SR 436, the sidewalks are close to fast moving traffic causing an uncomfortable pedestrian environment in some cases. ARTPLAN analysis suggests the Pedestrian LOS is LOS D along the corridor. There is a need to provide a safe and comfortable environment along and across the corridor for pedestrians.

Opportunity: Complete Streets improvements should enhance pedestrian safety through a reduction in vehicular speeds and medians at locations where mid-block pedestrian activity is anticipated or documented. Intersections should be completed with appropriate ADA compliant ramps and crosswalks on all corners of the intersection within the urban context. Also, look to minimize crossing length and curb return radii, where possible.

Next Steps: Conduct pedestrian counts at signalized intersections and mid-block high pedestrian activity areas, conduct a corridor pedestrian crash analysis, and evaluate potential of decreasing vehicle speeds.



Pedestrian crossing Casselberry Commons entrance



High vehicle speeds and a narrow grass strip cause uncomfortable pedestrian environment

BICYCLE

Need: There are no bike lanes along the corridor. This causes many bicyclists to use the sidewalk and, as seen in the crash data, 11 of 14 bicyclist crashes occur at driveways, sidewalks, or crosswalks where the bicyclist was traveling against traffic. ARTPLAN analysis suggests the Bicycle LOS is LOS E.

Opportunity: Design improvements should include the accommodation of safe travel for bicyclists, providing connections to surrounding land uses and the planned bike network, including the Kewannee Trail via Lake Howell Rd. Recommendations include decreasing vehicle speeds to provide a more comfortable biking environment.

Next Steps: Conduct a corridor bicycle crash analysis and an evaluation of a connection to the Kewannee Trail.

TRANSIT

Need: There is no transit along the corridor but a LYNX route passes through the SR 436 intersection. The transit stops to the north and south of the corridor are more than 500 feet from the nearest crossing opportunity.

Opportunity: Consideration should be given to relocating bus stops near safe pedestrian crossing opportunities.

Next Steps: Evaluation of bus stop placement based on surrounding land uses and safe pedestrian crossing opportunities.



Lack of pedestrian curb ramp at Casselberry Commons entrance



Many bicyclists use the sidewalk

VEHICULAR

Need: As seen by the moderately high traffic volumes, Howell Branch Rd. needs four travel lanes to adequately serve the region. However, wide cross sections, high speeds (over 45 MPH), and large curb radii make the pedestrian and cyclist environment uncomfortable, and should be addressed. Also, the large number of crashes at SR 436 suggest that safety improvements are needed at this location.

Opportunity: In order to enhance pedestrian and bicyclist safety and comfort, it is recommended that the design speed be set at 35 MPH. Complete Streets improvements should include traffic calming roadway design features that encourage vehicle travel at 35 MPH.

Next Steps: Confirm desired design speed along the roadway, include traffic calming elements, conduct a travel time and delay analysis, and a corridor safety study, with a focus on reducing crashes at the SR 436 intersection.

FREIGHT

Need: Heavy truck percentages along the corridor are low, ranging from 2% to 3%. The driveway accessing the truck aisle of Casselberry Commons has a small turn radius and shows signs of tire overtracking.

Opportunity: Complete Streets improvements should consider design that accommodates a typical delivery bus (WB-52) vehicle.

Next Steps: Confirm design vehicle for corridor.

COMMUNITY REDEVELOPMENT

Need: There are four vacant parcels and some parcels under development permits along Howell Branch Rd. In order to accommodate a shared use path or cycle track improvements between Lake Howell Rd and SR 436, County Right of Way on the north side of the roadway must be reclaimed.

Opportunity: There is an opportunity for Complete Streets improvements to capture, support, and encourage development momentum in the area. County-owned land that is currently used for retail and multi-family uses on the north side of the roadway between Lake Howell Rd and SR 436 can be utilized for enhanced pedestrian and bicycle facilities.

Next Steps: Leverage future development activity near Eastbrook Blvd by seeking public-private partnership for implementation of Complete Streets elements. It should also be confirmed there is additional ROW between Lake Howell Rd and SR 436.



The wide roadway cross section encourages high vehicle speeds



Additional Seminole County ROW on the north side of the roadway

COMPLETE STREETS DESIGN ELEMENTS

Each roadway is unique, and should respond to the user context. A complete street may include sidewalks, bike lanes, special bus lanes, comfortable and accessible public transportation stops, frequent and safe crossings opportunities, median islands, accessible pedestrian signals, curb extensions, narrow travel lanes, roundabouts, landscaping, lighting, and many other features. These elements address users that operate within all realms of the cross section - cartway zone, buffer zone, and sidewalk zone.

There are a number of nationally recognized design manuals and guidebooks that present the design characteristics for complete streets and how these characteristics should relate to their environment. In all, they share a common understanding that designing for the comfort and safety of the most vulnerable users will better serve the safety of everyone. A commonly used, yet not exhaustive, list of innovative Complete Streets elements is provided below based on cross section realm.

CARTWAY ZONE

Design Speed: Vehicular travel speed has a measured impact on comfort and safety for pedestrians and bicyclists. With increased vehicular speeds comes increased difficulty for pedestrians to cross roadways. Faster speeds increase the force with which a vehicle strikes a pedestrian, leading to more severe injuries and less likelihood of survival. Many design guidelines for Complete Streets recommend roadway posted speeds be set between 20 mph to 35 mph. Many design guidelines also stipulate that the design speed of the roadway should equal the posted speed. Geometric design elements, such as horizontal and vertical curves, block length, and vehicular lane widths should reinforce that posted speed. The chart to the right notes that faster vehicle speeds increase the likelihood of fatalities during a crash.

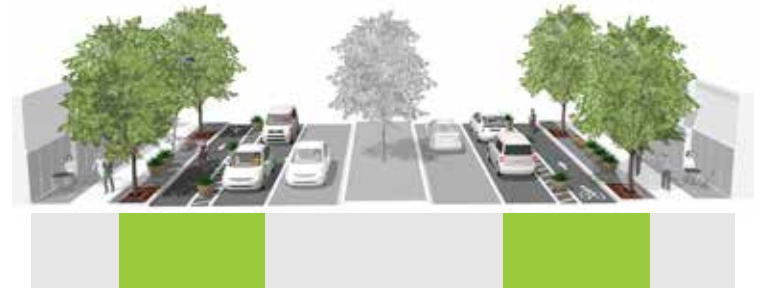
Roadway Width: Wider streets experience higher average and 85th percentile speeds than narrow streets. As street widths widen, accidents per mile increase. Wider streets act as barriers to pedestrian travel, making it difficult to cross the roadway. The number of travel lanes and the width of the travel lanes impact the roadway width.

Raised Medians: Raised medians provide a refuge for pedestrians crossing the roadway, allowing someone to negotiate one direction of travel at a time. These commonly include landscaping to increase comfort for pedestrians.

Pedestrian Connectivity: Sufficient opportunity for safe and comfortable pedestrian access along and across a roadway can be accomplished through the use of well-marked pedestrian crosswalks at intersections and mid-block crossings that include rectangular rapid flashing beacons. In urban contexts, crossing opportunities could be spaced as frequent as every 300-660 feet.



Cartway Zone



Buffer Zone



Sidewalk Zone

Miles per Hour	Probability of Fatality
20	5%
30	37-45%
40	85%

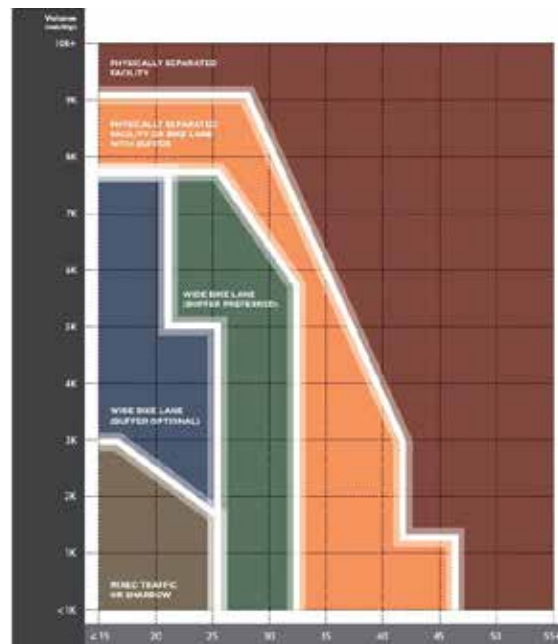
Faster vehicle speeds decrease likelihood of survival. Credit: United Kingdom Department of Transportation, 1987. "Killing Speeds and Saving Lives." London, England.

Curb Extensions: Curb extensions decrease the overall width of the roadway and can serve as a visual cue to drivers to slow down. Curb extensions encompass several different treatments including mid-block traffic calming, horizontal deflections, and on-street parking lane bulb-outs.

Other Traffic Calming Elements: Speed control elements manage speeds and reinforce safe, pedestrian-friendly speeds. These elements include speed humps, speed tables/raised intersections, speed cushions, and raised in-pavement crosswalk lights. The elimination of excessive right-turn deceleration lanes can encourage slower speeds along the roadway.

BUFFER ZONE

Bicycle Facility: Different levels of bicycle accommodation can be used for different target groups of bicycle users. The “interested but concerned” (approximately 45% of cyclists according to a Portland State University



*Bicycle facilities at different speeds and volumes
Source: Montgomery County Bicycle Planning Guidance, 2014*

study) group requires additional levels of separation at lower traffic volumes and speeds than have traditionally been provided. The chart below helps identify what types of facilities are preferred by different bicycle users. Shared lane markings (“sharrows”) are recommended for use on roadways with low speeds (<30 mph) and low volumes (<3,000 veh/day). Separated bicycle facilities including buffered bike lanes, shared use paths and cycle tracks are generally recommended for speeds above 30 mph and 8,000 veh/day. Inclusion of vertical



*Buffered bike lanes
Photo Credit: NACTO*



*Two-way cycle track
Photo Credit: NACTO*

separation elements in the buffer enhances comfort and further alerts drivers of the potential presence of bicyclists.

Landscape Buffer: Horizontal separation from the roadway by use of trees and street furniture adds to pedestrian comfort and sense of safety.

Street Trees: Street trees provide much needed shade a vertical barrier from traffic, which increase pedestrian safety and comfort along a roadway.

Pedestrian Improvements: Pedestrian signage is a low cost improvement that can help increase driver awareness. These include “Stop Here for Pedestrians” signs (coupled with stop bar) and other pedestrian signage. In addition, Leading Pedestrian Intervals (LPI) can enhance pedestrian comfort and safety at signalized intersections.



*Bus shelter
Photo Credit: NACTO*



*Example use of “Stop Here for Pedestrians” sign
Photo Credit: pedbikesafe.org*

SIDEWALK ZONE

Pedestrian Accessibility Improvements: Pedestrian accessibility features such as ADA-compliant curb ramps, well-marked crosswalks, and audible pedestrian signals should be included in any roadway modifications.

Driveway/Sidewalk Considerations: Sidewalks should remain at one level and less than 1:12 cross slope when crossing a driveway, making it easier for people with wheelchairs walking aids to navigate. Curb radii should be “right-sized” to allow for shortest viable pedestrian crossing width and slower speeds.

Wide Sidewalks: Wide sidewalks (6-7' in residential areas, 8-12' in commercial and downtown areas) allow for more pedestrian maneuverability and comfort. Appropriate sidewalk width depends on the adjacent uses and intensity of uses.

Pedestrian-Scale Lighting: Pedestrian-scale lighting is important to safety as it illuminates pedestrians on the sidewalk and in the crosswalks.

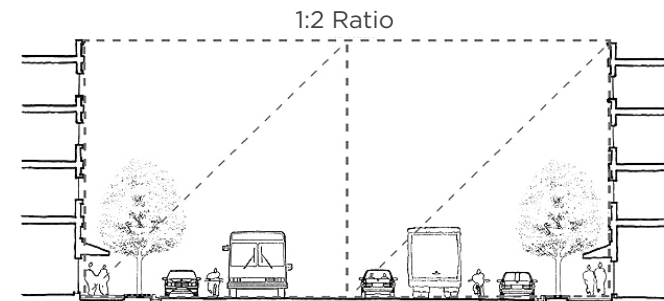
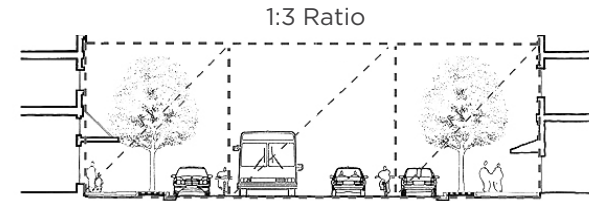
Street Furniture: The use of street furniture, including benches, utility poles, and bollards, can be helpful to establish a more defined pedestrian space outside of the roadway curb and can increase pedestrian comfort.

Bike Parking: Bike parking can encourage and support the biking environment in the area, providing designated space within the sidewalk zone to store bikes.



Right-sized curb radius and ADA Pedestrian Directional Ramps
Photo Credit: KAI

Level sidewalks with short driveway ramps.
Image Credit: KAI



Building height to width ratio between 1:3 and 1:2 create a human scale that is comfortable for pedestrians and gives a sense of enclosure to a street .
Photo Credit: Community, Design + Architecture.

Building Placement: Building placement and street enclosure is important to reinforce safe speeds and pedestrian comfort. Design guidance suggests that a maximum 1:3 height-to-width ratio is acceptable for providing a sense of enclosure. Wherever possible, local zoning codes should include small setbacks to encourage 1:3 or lower ratio.

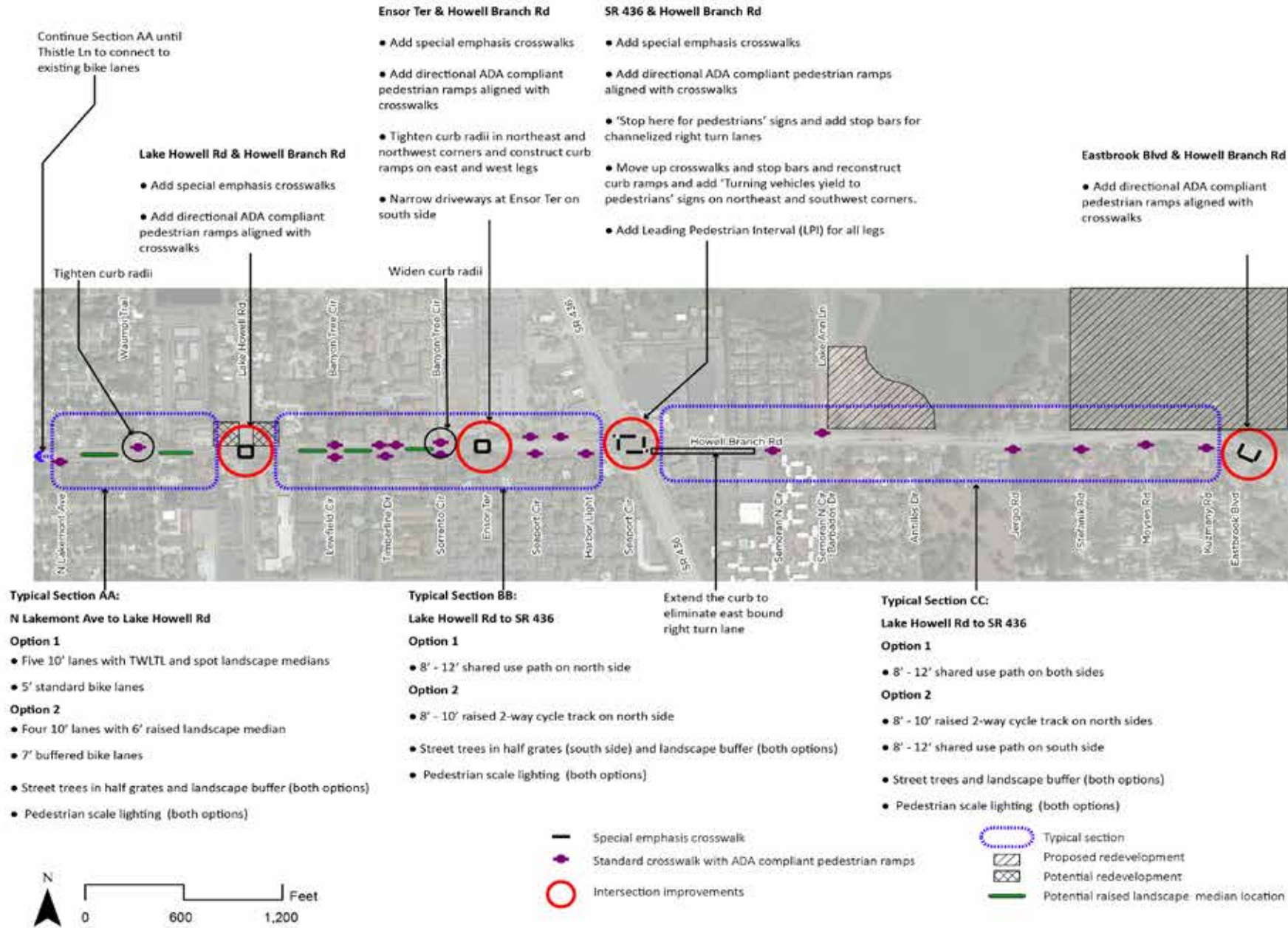


Bike Parking and Pedestrian-scale street lighting
Photo Credit: NACTO

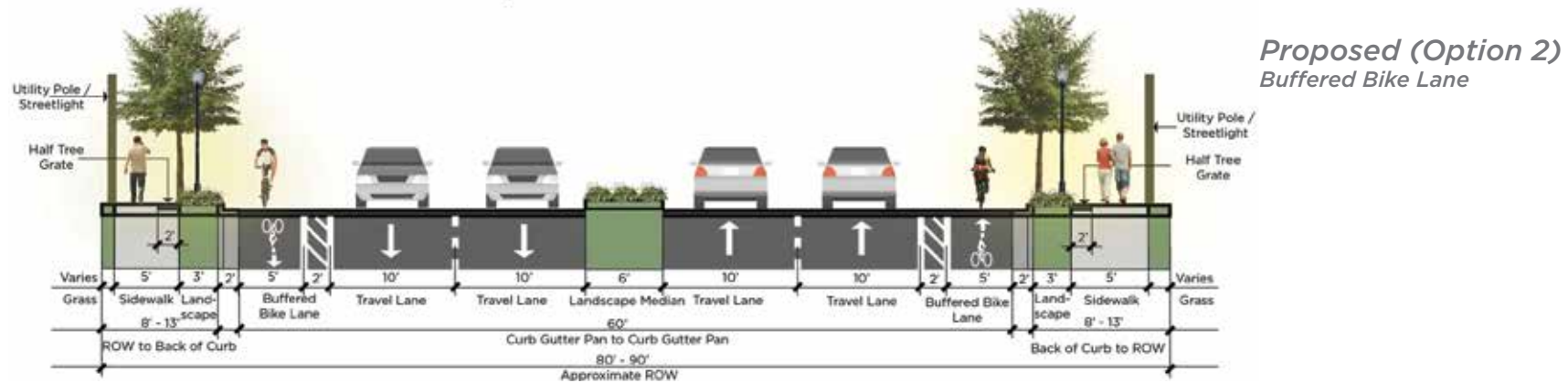
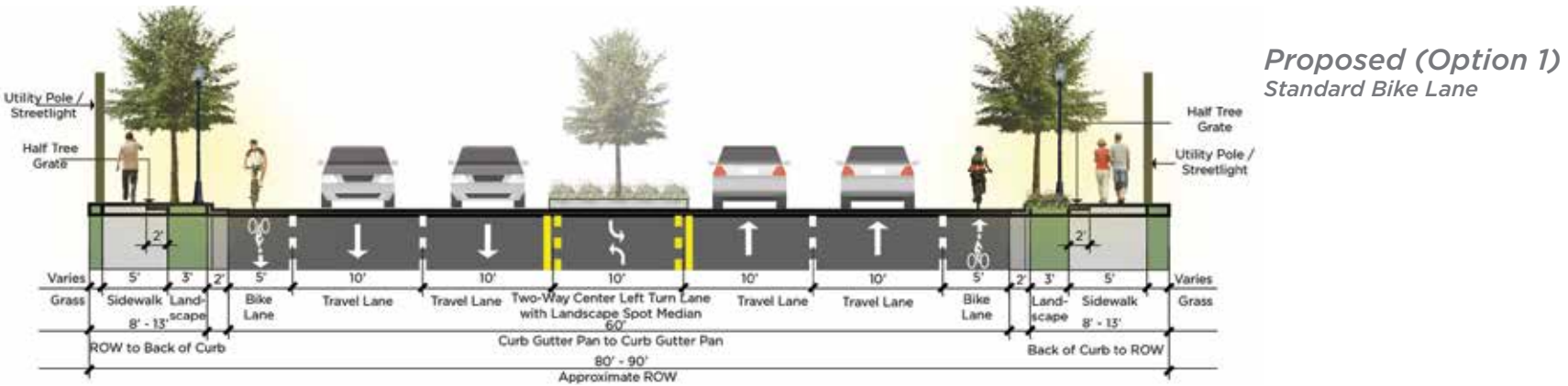
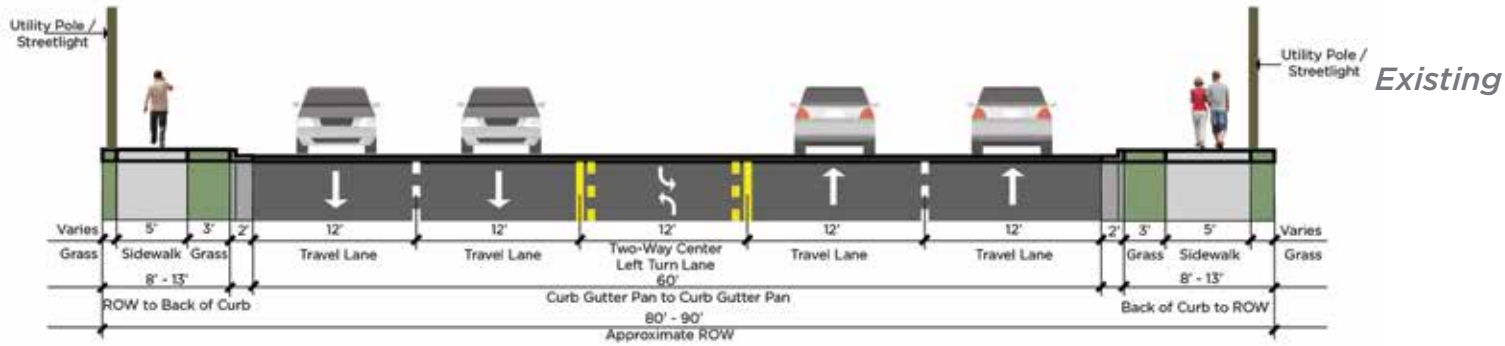
Pedestrian Amenities
Photo Credit: Gerding Edlen, ASLA

RECOMMENDATIONS

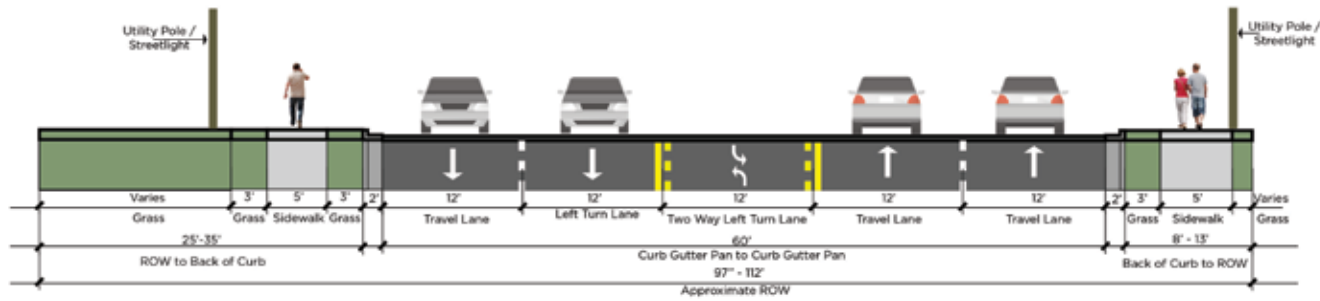
IMPROVEMENTS MAP



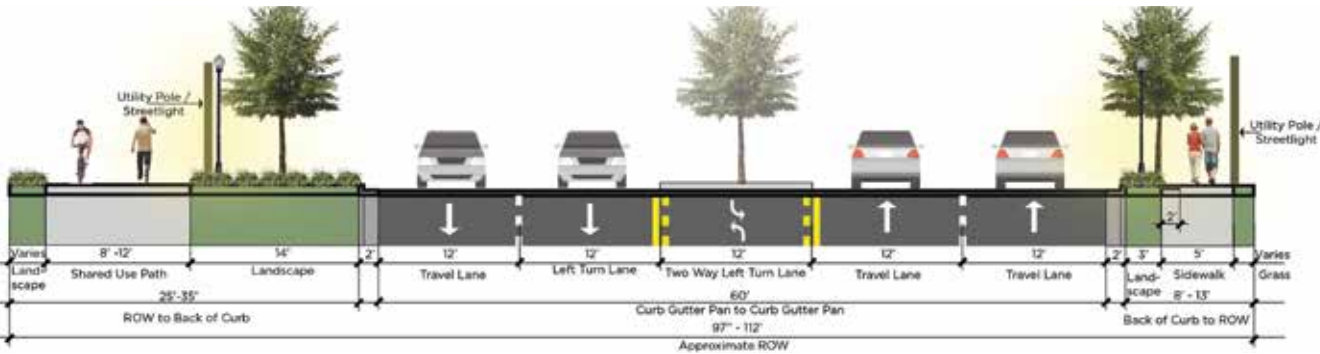
TYPICAL SECTION AA: N LAKEMONT AVE TO LAKE HOWELL RD



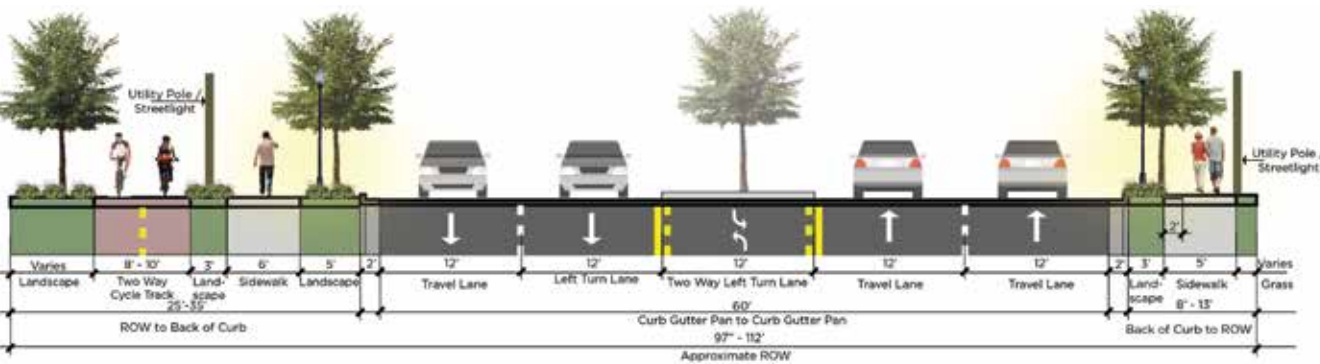
TYPICAL SECTION BB: LAKE HOWELL RD TO SR 436



Existing

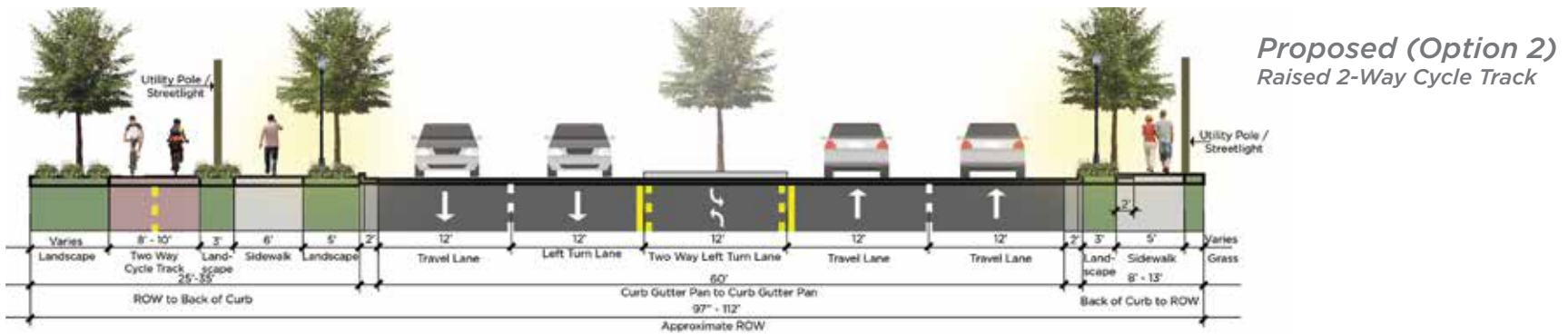
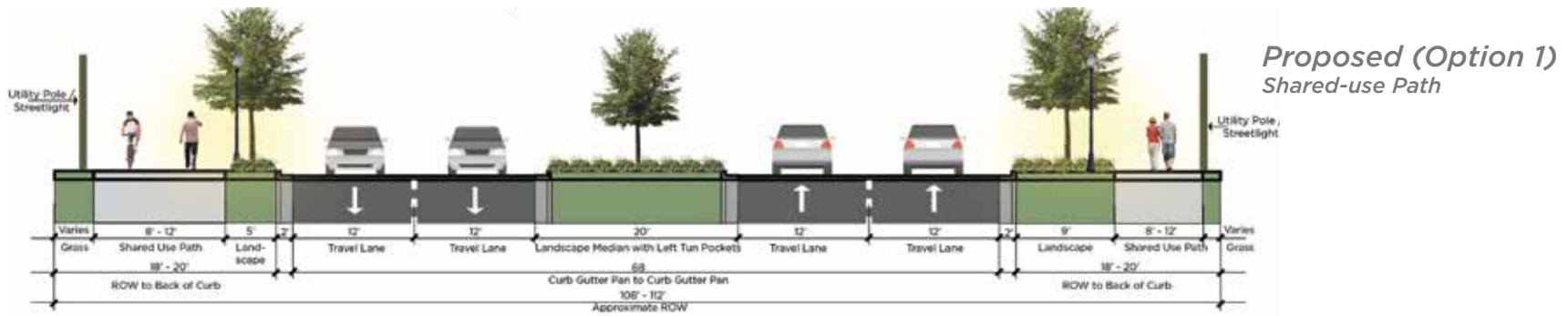


Proposed (Option 1)
Shared-use Path

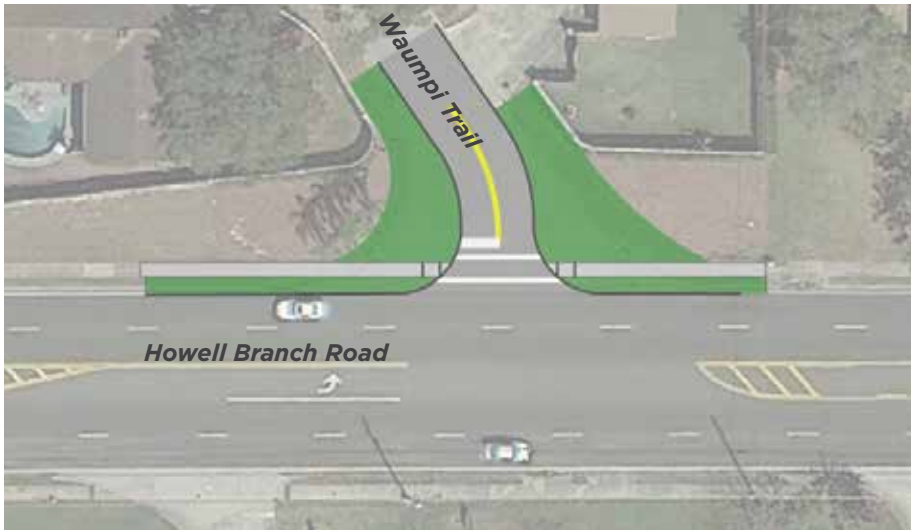


Proposed (Option 2)
Raised 2-Way Cycle Track

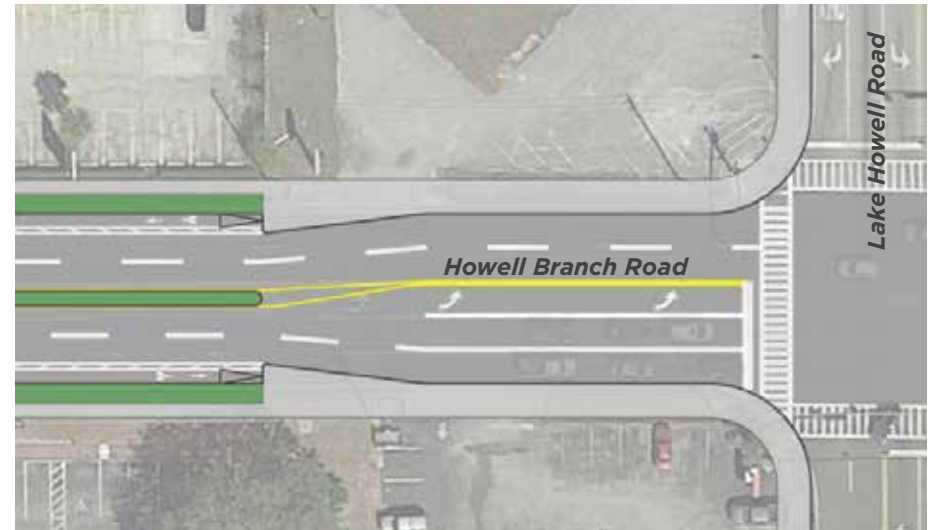
TYPICAL SECTION CC: SR 436 TO EASTBROOK BLVD



IMPROVEMENT DETAILS



Detail of curb radii tightening at Waumpi Trail to decrease pedestrian crossing distance from 85 ft to 30 ft



Detail of buffered bike lane transition to shared-use path at Lake Howell Road



Detail of intersection modifications at Ensor Terrace/Casselberry Commons entrance to decrease pedestrian crossing distances on the north and south legs and construct curb ramps for all crosswalks

NEXT STEPS

The recommendations shown in this report present design concepts for Complete Streets and have not been discussed with local residents. It is recommended that Seminole County and the City of Casselberry evaluate the improvements and their cost to investigate next steps. Future projects should include public engagement and additional analysis before proceeding to design or construction. Because of this and the additional next steps needed to advance a full set of Complete Streets improvements, a Multi-modal Corridor Planning Study is also recommended for this corridor. This study could include many of the next steps identified in the User Needs and Opportunities section of this report.

These recommendations are intended to be a list of implementable Complete Streets solutions, some of which can be accomplished in the short-term. Where possible, improvements should be coordinated with development projects along the corridor. It is acknowledged that occasionally, local governments do not have the resources to accomplish all Complete Streets improvements along a corridor at one time. If the City or County were to advance this project, a two-phased approach could provide an incremental process for funding these projects:

Phase I could include a Multi-modal Corridor Planning Study and, beyond that, improvements such as lane re-striping, bike lane additions, and special emphasis intersection crosswalk markings. In addition, the shared-use path (Option 1) or cycle track (Option 2) could be included in this phase along with the installation of directional ADA-compliant ramps.

Phase II could include all other Complete Streets improvements along the corridor consisting of enhanced pedestrian lighting, street trees and landscaping, and landscaped spot medians.

COST ESTIMATE

Quantity calculations were used to create planning level cost estimates for all potential Phase I and II improvements identified in this report. Area 8 (includes Seminole County) and Statewide 12-month average (March 1, 2015 to February 29, 2016) pay item costs were used for all estimations. These pay item lists can be found in Appendix A.

Each improvement was evaluated for the following costs: project engineering, stormwater quality, maintenance of traffic, and roadway mobilization. A contingency of 30% was applied to provide a more conservative estimate of potential costs, recognizing the planning-level magnitude of this exercise. The cost estimate values should be revised during the planning and design phase for improvements that are chosen for implementation. It assumes there to be no drainage, utility, ROW, stormwater, or existing traffic signal modifications needed and bus stop/shelter modification costs were assumed to be funded by other parties.

PHASE I ESTIMATED COST (2016 DOLLARS)

Multimodal Corridor Planning Study **\$150,000**

Striping/buffered bike lane:	\$46,000
Cycle track/shared-use path	\$348,000
ADA/Intersection enhancements	\$85,000
Engineering and construction support:	\$57,000

Total Phase I Construction Cost: \$536,000

PHASE II ESTIMATED COST (2016 DOLLARS)

Pedestrian lighting:	\$1,404,000
Street Trees/landscaping:	\$612,000
Spot medians/curb reconstruction:	\$221,000
Engineering and construction support:	\$268,000

Total Phase II Construction Cost: \$2,506,000

Total Estimated Cost: \$3,042,000

APPENDIX A

Howell Branch Road - Lakemont Ave to Lake Howell Road - Phase I

Casselberry, Seminole County, Florida

MetroPlan Orlando



Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley

Date: April 18, 2016

	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 1: ADA/INTERSECTION ENHANCEMENTS						
4	0522-1	Concrete Sidewalk and Driveways, 4"	SY	400	\$15.53	\$6,212.00
5		Concrete Sidewalk Removal	SY	100	\$14.00	\$1,400.00
6	0527-2	Detectable Warnings	SF	80	\$30.57	\$2,445.60
SUBTOTAL ADA/INTERSECTION ENHANCEMENTS						\$ 10,058
SECTION 2: RE-STRIPING						
7	0711-15101	Thermoplastic, STD-OP, White, Solid 6"	GM	0.11	\$4,152.03	\$456.72
8	0711-15131	Thermoplastic, STD-OP, White, Skip 6"	GM	0.44	\$1,434.84	\$631.33
9	0711-15102	Thermoplastic, STD-OP, White, Solid, 8"	GM	0.74	\$5,675.12	\$4,199.59
10	0711-11123	Thermoplastic, STD, White, Solid, 12"	LF	865.00	\$2.26	\$1,954.90
11	0711-11125	Thermoplastic, STD, White, Solid, 24"	LF	113.00	\$4.21	\$475.73
12	0711-15201	Thermoplastic, STD-OP, Yellow, Solid 6"	GM	0.43	\$4,158.27	\$1,788.06
13	0711-11141	Thermoplastic, STD, White, DOT Guide, 6"	GM	0.18	\$2,205.00	\$396.90
14	0711-11160	Thermoplastic, STD, White, Message	EA	8.00	\$122.97	\$983.76
15	0711-11170	Thermoplastic, STD, White, Arrow	EA	2.00	\$61.07	\$122.14
16	0711-17	Thermoplastic, Remove	SF	3,615.00	\$2.69	\$9,724.35
SUBTOTAL RE-STRIPING						\$ 20,733
SECTION 3: MINOR ITEMS						
22		Subtotal Sections 1-2	LS	5%	\$ 1,539.55	\$ 1,539.55
SUBTOTAL MINOR ITEMS						\$ 1,540
SECTION 4: ROADWAY MOBILIZATION						
23		Subtotal Sections 1-2	LS	2%	\$ 615.82	\$ 615.82
SUBTOTAL ROADWAY MOBILIZATION						\$ 616
SECTION 5: ROADWAY MAINTENANCE OF TRAFFIC (MOT)						
24		Subtotal Sections 1-2	LS	2%	\$ 615.82	\$ 615.82
SUBTOTAL ROADWAY MOT						\$ 616

Howell Branch Road - Lakemont Ave to Lake Howell Road - Phase I

Casselberry, Seminole County, Florida

MetroPlan Orlando



Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley					Date: April 18, 2016		
	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
SECTION 6: STORMWATER QUALITY / POLLUTION PREVENTION							
25		Subtotal Sections 1-2	LS	3%	\$ 923.73	\$ 923.73	
SUBTOTAL STORMWATER QUALITY						\$ 924	
ESTIMATED CONSTRUCTION COSTS						\$ 34,486	
30% CONTINGENCY						\$ 10,350	
TOTAL ESTIMATED CONSTRUCTION COSTS						\$ 44,836	
ENGINEERING AND CONSTRUCTION SUPPORT							
26		Project Engineering	LS	6%	\$ 2,690	\$ 2,690	
27		Construction Support / Construction Management	LS	6%	\$ 2,690	\$ 2,690	
TOTAL ESTIMATE ENGINEERING AND CONSTRUCTION SUPPORT COSTS						\$ 5,380	
TOTAL PROJECT COST						\$ 50,216	

Howell Branch Road - Lake Howell Road to SR 436 - Phase I

Casselberry, Seminole County, Florida

MetroPlan Orlando



Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley

Date: April 18, 2016

	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 1: ROADWAY - SHARED USE PATH						
1	0522-1	Concrete Sidewalk and Driveways, 4"	SY	2,645	\$15.53	\$41,076.85
2		Concrete Sidewalk Removal	SY	1,390	\$14.00	\$19,460.00
SUBTOTAL ROADWAY - SHARED USE PATH						\$ 60,537
SECTION 2: ADA/INTERSECTION ENHANCEMENTS						
3	0522-1	Concrete Sidewalk and Driveways, 4"	SY	500	\$15.53	\$7,765.00
4		Concrete Sidewalk Removal	SY	500	\$14.00	\$7,000.00
5	0527-2	Detectable Warnings	SF	380	\$30.57	\$11,616.60
6	0520-1-10	Concrete Curb and Gutter, TP F	LF	175	\$16.72	\$2,926.00
7	0700-1-11	Single Post Sign, F&I GM, <12 SF	EA	4	\$305.13	\$1,220.52
SUBTOTAL ADA/INTERSECTION ENHANCEMENTS						\$ 29,308
SECTION 3: RE-STRIPING						
8	0711-11123	Thermoplastic, STD, White, Solid, 12"	LF	1,780.00	\$2.26	\$4,022.80
9	0711-11125	Thermoplastic, STD, White, Solid, 24"	LF	550.00	\$4.21	\$2,315.50
10	0711-17	Thermoplastic, Remove	SF	3,000.00	\$2.69	\$8,070.00
SUBTOTAL RE-STRIPING						\$ 14,408
SECTION 4: MINOR ITEMS						
11		Subtotal Sections 1-3	LS	5%	\$ 2,185.80	\$ 2,185.80
SUBTOTAL MINOR ITEMS						\$ 2,186
SECTION 5: ROADWAY MOBILIZATION						
12		Subtotal Sections 1-3	LS	2%	\$ 874.32	\$ 874.32
SUBTOTAL ROADWAY MOBILIZATION						\$ 874
SECTION 6: ROADWAY MAINTENANCE OF TRAFFIC (MOT)						
13		Subtotal Sections 1-3	LS	2%	\$ 874.32	\$ 874.32
SUBTOTAL ROADWAY MOT						\$ 874

Howell Branch Road - Lake Howell Road to SR 436 - Phase I

Casselberry, Seminole County, Florida

MetroPlan Orlando



Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley					Date: April 18, 2016		
	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
SECTION 7: STORMWATER QUALITY / POLLUTION PREVENTION							
14		Subtotal Sections 1-3	LS	3%	\$ 1,311.48	\$ 1,311.48	
SUBTOTAL STORMWATER QUALITY						\$ 1,311	
ESTIMATED CONSTRUCTION COSTS						\$ 109,499	
30% CONTINGENCY						\$ 32,850	
TOTAL ESTIMATED CONSTRUCTION COSTS						\$ 142,349	
ENGINEERING AND CONSTRUCTION SUPPORT							
15		Project Engineering	LS	6%	\$ 8,541	\$ 8,541	
16		Construction Support / Construction Management	LS	6%	\$ 8,541	\$ 8,541	
TOTAL ESTIMATE ENGINEERING AND CONSTRUCTION SUPPORT COSTS						\$ 17,082	
TOTAL PROJECT COST						\$ 159,430	

Howell Branch Road - SR 436 to Eastbrook Ave - Phase I

Casselberry, Seminole County, Florida

MetroPlan Orlando



Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley

Date: April 18, 2016

	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 1: SHARED USE PATH/8' SIDEWALK						
1	0522-1	Concrete Sidewalk and Driveways, 4"	SY	9,550	\$15.53	\$148,311.50
2		Concrete Sidewalk Removal	SY	4,200	\$14.00	\$58,800.00
SUBTOTAL SHARED USE PATH						\$ 207,112
SECTION 2: ADA/INTERSECTION ENHANCEMENTS						
3	0522-1	Concrete Sidewalk and Driveways, 4"	SY	264	\$15.53	\$4,099.92
4		Concrete Sidewalk Removal	SY	264	\$14.00	\$3,696.00
5	0527-2	Detectable Warnings	SF	240	\$30.57	\$7,336.80
SUBTOTAL ADA/INTERSECTION ENHANCEMENTS						\$ 15,133
SECTION 3: MINOR ITEMS						
6		Subtotal Sections 1-2	LS	5%	\$ 756.64	\$ 756.64
SUBTOTAL MINOR ITEMS						\$ 757
SECTION 4: ROADWAY MOBILIZATION						
7		Subtotal Sections 1-2	LS	2%	\$ 302.65	\$ 302.65
SUBTOTAL ROADWAY MOBILIZATION						\$ 303
SECTION 5: ROADWAY MAINTENANCE OF TRAFFIC (MOT)						
8		Subtotal Sections 1-2	LS	2%	\$ 302.65	\$ 302.65
SUBTOTAL ROADWAY MOT						\$ 303

Howell Branch Road - SR 436 to Eastbrook Ave - Phase I

Casselberry, Seminole County, Florida

MetroPlan Orlando



Engineer's Opinion of Probable Cost - Concept Study

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	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 6: STORMWATER QUALITY / POLLUTION PREVENTION						
9		Subtotal Sections 1-2	LS	3%	\$ 453.98	\$ 453.98
SUBTOTAL STORMWATER QUALITY						\$ 454
ESTIMATED CONSTRUCTION COSTS						\$ 224,060
30% CONTINGENCY						\$ 67,220
TOTAL ESTIMATED CONSTRUCTION COSTS						\$ 291,280
ENGINEERING AND CONSTRUCTION SUPPORT						
10		Project Engineering	LS	6%	\$ 17,477	\$ 17,477
11		Construction Support / Construction Management	LS	6%	\$ 17,477	\$ 17,477
TOTAL ESTIMATE ENGINEERING AND CONSTRUCTION SUPPORT COSTS						\$ 34,954
TOTAL PROJECT COST						\$ 326,234

Howell Branch Road - Lakemont Ave to Lake Howell Road - Phase II



MetroPlan Orlando

Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley				Date: April 18, 2016		
	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 1: ROADWAY - SPOT MEDIANS/WAUMPI TRAIL MODIFICATIONS						
1		Removal of Existing Pavement	SY	730	\$10.00	\$7,300.00
2	0520-1-10	Concrete Curb and Gutter, Type F	LF	145	\$16.72	\$2,424.40
3	0520-2-4	Concrete Curb, Type B	LF	1,725	\$14.50	\$25,012.50
SUBTOTAL ROADWAY - SPOT MEDIANS/WAUMPI TRAIL						\$ 34,737
SECTION 2: LIGHTING/UTILITIES						
4		Pedestrian Light Pole - Acorn Style - F&I All Components	EA	16	\$10,000.00	\$160,000.00
SUBTOTAL LIGHTING/UTILITIES						\$ 160,000
SECTION 3: LANDSCAPING						
5		Landscaped Area	SF	11,461	\$2.50	\$28,652.50
9		Small Canopy Trees	EA	37	\$300.00	\$11,100.00
7		Irrigation	LS	10%	\$28,250.00	\$28,250.00
8		Prepared Soil Layer, Finish Soil, 12"	SY	475	\$5.85	\$2,778.75
SUBTOTAL LANDSCAPING						\$ 70,781
SECTION 4: MINOR ITEMS						
9		Subtotal Sections 1-3	LS	5%	\$ 13,275.91	\$ 13,275.91
SUBTOTAL MINOR ITEMS						\$ 13,276
SECTION 5: ROADWAY MOBILIZATION						
10		Subtotal Sections 1-3	LS	2%	\$ 5,310.36	\$ 5,310.36
SUBTOTAL ROADWAY MOBILIZATION						\$ 5,310
SECTION 6: ROADWAY MAINTENANCE OF TRAFFIC (MOT)						
11		Subtotal Sections 1-3	LS	2%	\$ 5,310.36	\$ 5,310.36
SUBTOTAL ROADWAY MOT						\$ 5,310

Howell Branch Road - Lakemont Ave to Lake Howell Road - Phase II



MetroPlan Orlando

Engineer's Opinion of Probable Cost - Concept Study

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	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
SECTION 7: STORMWATER QUALITY / POLLUTION PREVENTION							
12		Subtotal Sections 1-3	LS	3%	\$ 7,965.54	\$ 7,965.54	
SUBTOTAL STORMWATER QUALITY						\$ 7,966	
ESTIMATED CONSTRUCTION COSTS						\$ 297,380	
30% CONTINGENCY						\$ 89,220	
TOTAL ESTIMATED CONSTRUCTION COSTS						\$ 386,600	
ENGINEERING AND CONSTRUCTION SUPPORT							
13		Project Engineering	LS	6%	\$ 23,196	\$ 23,196	
14		Construction Support / Construction Management	LS	6%	\$ 23,196	\$ 23,196	
TOTAL ESTIMATE ENGINEERING AND CONSTRUCTION SUPPORT COSTS						\$ 46,392	
TOTAL PROJECT COST						\$ 432,992	

Howell Branch Road - Lake Howell Road to SR 436 - Phase II

Casselberry, Seminole County, Florida

MetroPlan Orlando



Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley

Date: April 18, 2016

	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 1: LIGHTING/UTILITIES						
1		Pedestrian Light Pole - Acorn Style - F&I All Components	EA	34	\$10,000.00	\$340,000.00
SUBTOTAL LIGHTING/UTILITIES						\$ 340,000
SECTION 2: LANDSCAPING						
2		Landscaped Area	SF	30,810	\$2.50	\$77,025.00
3		Small Canopy Trees	EA	67	\$300.00	\$20,100.00
4		Irrigation	LS	10%	\$28,250.00	\$28,250.00
SUBTOTAL LANDSCAPING						\$ 125,375
SECTION 3: MINOR ITEMS						
5		Subtotal Sections 1-2	LS	5%	\$ 23,268.75	\$ 23,268.75
SUBTOTAL MINOR ITEMS						\$ 23,269
SECTION 4: ROADWAY MOBILIZATION						
6		Subtotal Sections 1-2	LS	2%	\$ 9,307.50	\$ 9,307.50
SUBTOTAL ROADWAY MOBILIZATION						\$ 9,308
SECTION 5: ROADWAY MAINTENANCE OF TRAFFIC (MOT)						
7		Subtotal Sections 1-2	LS	2%	\$ 9,307.50	\$ 9,307.50
SUBTOTAL ROADWAY MOT						\$ 9,308

Howell Branch Road - Lake Howell Road to SR 436 - Phase II

Casselberry, Seminole County, Florida

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Engineer's Opinion of Probable Cost - Concept Study

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	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
SECTION 6: STORMWATER QUALITY / POLLUTION PREVENTION							
8		Subtotal Sections 1-2	LS	3%	\$ 13,961.25	\$ 13,961.25	
SUBTOTAL STORMWATER QUALITY						\$ 13,961	
ESTIMATED CONSTRUCTION COSTS						\$ 521,220	
30% CONTINGENCY						\$ 156,370	
TOTAL ESTIMATED CONSTRUCTION COSTS						\$ 677,590	
ENGINEERING AND CONSTRUCTION SUPPORT							
9		Project Engineering	LS	6%	\$ 40,655	\$ 40,655	
10		Construction Support / Construction Management	LS	6%	\$ 40,655	\$ 40,655	
TOTAL ESTIMATE ENGINEERING AND CONSTRUCTION SUPPORT COSTS						\$ 81,311	
TOTAL PROJECT COST						\$ 758,901	

Howell Branch Road - SR 436 to Eastbrook Ave - Phase II

Casselberry, Seminole County, Florida

MetroPlan Orlando



Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley

Date: April 18, 2016

	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 1: ROADWAY - SR 436 ACCEL LANE REMOVAL						
1	0520-1-10	Concrete Curb and Gutter, Type F	LF	275	\$16.72	\$4,598.00
2		Removal of Existing Pavement	SY	215	\$10.00	\$2,150.00
SUBTOTAL ROADWAY - SR 436 ACCEL LANE REMOVAL						\$ 6,748
SECTION 2: RE-STRIPING						
3	0711-15101	Thermoplastic, STD-OP, White, Solid, 6"	GM	0.01	\$4,583.76	\$45.84
4	0711-11141	Thermoplastic, STD, White, DOT Guide, 6"	GM	0.01	\$2,205.00	\$22.05
5	0711-17	Thermoplastic, Remove	SF	20.00	\$2.69	\$53.80
SUBTOTAL RE-STRIPING						\$ 122
SECTION 3: LIGHTING/UTILITIES						
6		Pedestrian Light Pole - Acorn Style - F&I All Components	EA	58	\$10,000.00	\$580,000.00
SUBTOTAL LIGHTING/UTILITIES						\$ 580,000
SECTION 4: LANDSCAPING						
7		Landscaped Area	SF	61,600	\$2.50	\$154,000.00
8		Small Canopy Trees	EA	118	\$300.00	\$35,400.00
9		Irrigation	LS	10%	\$28,250.00	\$28,250.00
10		Prepared Soil Layer, Finish Soil, 12"	SY	215	\$5.85	\$1,257.75
SUBTOTAL LANDSCAPING						\$ 218,908
SECTION 5: MINOR ITEMS						
11		Subtotal Sections 1-4	LS	5%	\$ 40,288.87	\$ 40,288.87
SUBTOTAL MINOR ITEMS						\$ 40,289
SECTION 6: ROADWAY MOBILIZATION						
12		Subtotal Sections 1-4	LS	2%	\$ 16,115.55	\$ 16,115.55
SUBTOTAL ROADWAY MOBILIZATION						\$ 16,116
SECTION 7: ROADWAY MAINTENANCE OF TRAFFIC (MOT)						
13		Subtotal Sections 1-4	LS	2%	\$ 16,115.55	\$ 16,115.55
SUBTOTAL ROADWAY MOT						\$ 16,116

Howell Branch Road - SR 436 to Eastbrook Ave - Phase II

Casselberry, Seminole County, Florida

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	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
SECTION 8: STORMWATER QUALITY / POLLUTION PREVENTION							
14		Subtotal Sections 1-4	LS	3%	\$ 24,173.32	\$ 24,173.32	
SUBTOTAL STORMWATER QUALITY						\$ 24,173	
ESTIMATED CONSTRUCTION COSTS						\$ 902,471	
30% CONTINGENCY						\$ 270,750	
TOTAL ESTIMATED CONSTRUCTION COSTS						\$ 1,173,221	
ENGINEERING AND CONSTRUCTION SUPPORT							
15		Project Engineering	LS	6%	\$ 70,393	\$ 70,393	
16		Construction Support / Construction Management	LS	6%	\$ 70,393	\$ 70,393	
TOTAL ESTIMATE ENGINEERING AND CONSTRUCTION SUPPORT COSTS						\$ 140,786	
TOTAL PROJECT COST						\$ 1,314,007	



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