COMPLETE streets

NOVEMBER 2016

ORANGE CENTER BLVD | CASE STUDY | ORLANDO, ORANGE COUNTY FLORIDA

Prepared for:

metroplan orlando
A REGIONAL TRANSPORTATION PARTNERSHIP

Prepared by:

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

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

Next Steps 16

Cost Estimates 16

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.

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 comfort and safety and retrofit bicycle facility on large suburban arterial

The recommendations shown in this report present design concepts for Orange Center Boulevard. 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 Orange Center Blvd from Doby Avenue intersection

Looking west along Orange Center Blvd near City of Orlando Sports Complex

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.

Orange Center Blvd from Goldwyn Avenue to Tampa Avenue (shown below) ranked high in the land use and transportation evaluation. The following land use and transportation characteristics were seen along the corridor:

LAND USE ANALYSIS

- High Transportation Disadvantaged Index (measure of populations that have historically had significant unmet transportation needs)
- Medium 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

- Bike facility gap
- High pedestrian and bicycle crash frequency
- Low heavy truck activity (less than 5%)
- Accommodates high frequency transit service
- Posted speed of 35 mph or less
- Relatively low vehicular traffic volume (less than 20,000 veh/day)

EXISTING CONDITIONS

An existing conditions analysis enabled 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 along the corridor.

Pedestrian Generators: The corridor consists of many pedestrian generators due to its existing mixed land use pattern and bus route. There are multi-family residential complexes, single family houses, three churches, three schools, 14 bus stops, and multiple retail shopping centers within the study area.

Transit: Link 319 runs along Orange Center Blvd and has 14 bus stops along the study corridor with moderate boarding and alighting activity (the most active stops experience 21-60 passengers/day). Links 20 and 303 run along John Young Pkwy and intersect with Orange Center Blvd.

Source: Lynx, Google Maps, KAI

Pedestrian Generators

- Bus Stop
- Bus Stop with Shelter
- Church
  1. Christ Dominion Church
  2. Washington Shores Church of Christ
  3. Mt. Sinai Seventh-day Adventist Church
- School
  4. Mount Sinai Junior Academy
  5. Orange Center Elementary School
  6. Jones High School
- George Barker Park
- Shopping Center
- Study Corridor

Source: Lynx

Transit

- Bus Stop
- Bus Stop with Shelter
- Bus Route

Total Daily Boardings + Alightings
(Oct - Dec 2014)

- 1 - 5
- 6 - 10
- 7 - 20
- 21 - 60

N

0 800 1,600 Feet

Existing Land Use: The study corridor is surrounded by multi-family and single family residential land uses. Some retail uses are clustered around intersections of S Goldwyn Ave and S Tampa Ave. Churches and schools are located west of Ohio Ave. Between S Tampa Ave and Rio Grande Ave, the City of Orlando Sports Complex is on the north side while industrial uses, including the Mears Motor Coach facility, occupy properties on the south.

Future Land Use: Most of the corridor will maintain its existing land uses in the future. A couple of properties on the south side between S Goldwyn Ave and S John Young Pkwy have been re-designated as commercial from their current multifamily uses. A major multi-family residential redevelopment project is planned at the recently demolished Washington Shores village on north side of Orange Center Blvd between Ohio Ave and S Tampa Ave.

Source: Orange County

Existing Land Use

Source: City of Orlando

Future Land Use

Average Annual Daily Traffic (AADT) & Directional Design Hourly Volume (DDHV): Based on 2014 FDOT data, the study corridor recorded 6,500 AADT and 310 DDHV between S Goldwyn Ave and S Tampa Ave, and 7,900 AADT and 380 DDHV between S Tampa Ave and Rio Grande Ave. According to the City of Orlando Comprehensive Plan, the LOS standard for this roadway is LOS E. This data suggest that the roadway is currently operating at LOS C or better and has excess vehicular capacity (based on FDOT Generalized Service Volume Tables).

Posted Speed: The study corridor is currently posted at 35 MPH and has three school zones at the intersections of S John Young Pkwy, Ohio Ave, and Rio Grande Ave.

Crash History: Crash data between August 2012 and July 2015 (3 years) shows that a majority of crashes occurred at signalized intersections. One bicycle property damage crash and two pedestrian injury crashes were recorded at S Goldwyn Ave, S John Young Pkwy, and S Rio Grande Ave.

Pedestrian and Bicycle Facilities: A sidewalk gap exists on the small triangular parcel between S Tampa Ave and W Gore St. Substandard and disconnected 4' wide bike lanes are present between Cookman Ave and W Gore St. According to the City of Orlando Primary Bicycle Routes Study, two north-south off-street bike paths are planned on the ends of the corridor traveling along John Young Pkwy and Tampa Ave.

Source: FDOT

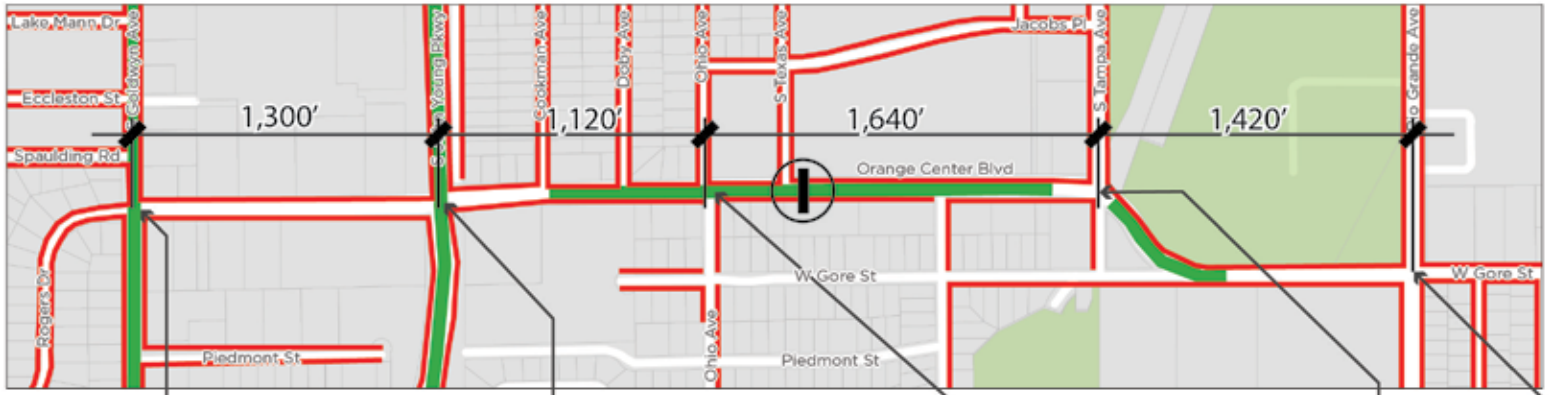
AADT & DDHV (2014)

Source: Google Maps and KAI

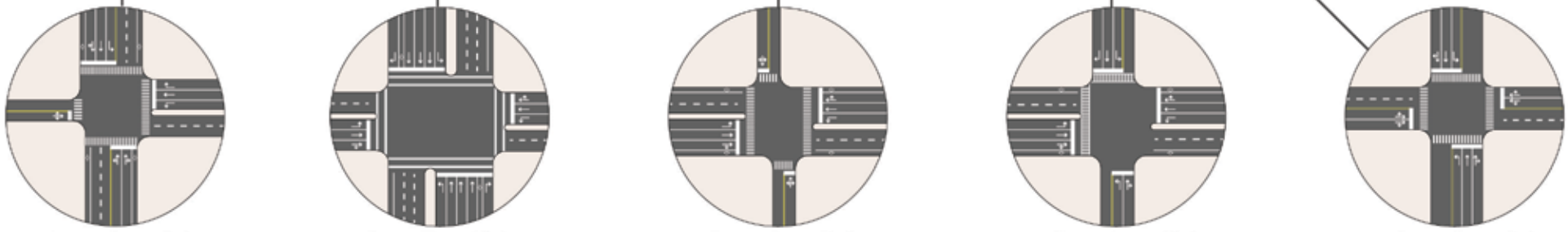
Posted Speed and School Zones

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 City of Orlando staff on March 8, 2016 provided additional information of 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.

PEDESTRIAN

Need: There is a need to provide a safe and comfortable environment along the corridor for pedestrians. There are many pedestrian generators and attractors including Jones High School and Orange Center Elementary School, and well-used bus stops where pedestrians frequently cross mid-block.
Opportunity: Complete Streets improvements can increase safe crossing opportunities in key pedestrian areas and reduce vehicular speeds for enhanced pedestrian safety.
Next Steps: Conduct pedestrian counts at signalized intersections and mid-block high pedestrian activity areas in addition to a corridor pedestrian crash analysis.

BICYCLE

Need: The bicycle facilities along Orange Center Blvd are substandard - with 4' bike lanes along most of the corridor and no bike facilities in some locations. This causes many bicyclists to use the sidewalk.
Opportunity: Design improvements should include the accommodation of safe travel for bicyclists, providing connections to surrounding land uses and the planned bike network. Recommendations include reducing vehicle speeds to provide a more comfortable biking environment.
Next Steps: Conduct a corridor bicycle crash analysis.

TRANSIT

Need: The corridor is served well by transit and should continue to be served by bus in the future.
Opportunity: Bus stops should be improved to enhance accessibility and should be located near safe pedestrian crossing opportunities.
Next Steps: Corridor-level analysis of bus stop accessibility and placement based on surrounding land uses and safe pedestrian crossing opportunities.

Substandard bike lanes

Lift Orlando proposed development site

Non ADA compliant pedestrian curb ramp

No directional curb ramps and faded markings

VEHICULAR

Need: Orange Center Blvd. is in need of resurfacing due to roadway cracking and deterioration. As seen by the traffic volumes, excess vehicular capacity is available along the corridor.
Opportunity: In order to enhance pedestrian and bicyclist safety, it is recommended that the design speed be set at 30 mph.
Next Steps: Program resurfacing of Orange Center Blvd in the near future and include Complete Streets elements as part of the project and conduct traffic study to further justify lane reduction.

FREIGHT

Need: Heavy vehicle percentages are moderately high due to the presence of the Mears Motor Coach facility between Tampa Ave and Rio Grande Ave.
Opportunity: Complete Streets improvements should consider design that accommodates a typical charter bus (WB-52) vehicle.
Next Steps: Incorporate freight mobility components into analysis.

COMMUNITY REDEVELOPMENT

Need: Multiple vacant and underutilized parcels along Orange Center Blvd.
Opportunity: Lift Orlando has proposed the Villages at West Lakes development between Ohio Ave and Tampa Ave. In addition, vacant and underutilized parcels exist just east of Goldwyn Ave and between Texas Ave and Rio Grande Ave. There is an opportunity for Complete Streets improvements to capture, support, and encourage redevelopment momentum in the area.
Next Steps: Collaborate with Lift Orlando and other local champions to coordinate Complete Streets projects/improvements with redevelopment. Leverage development activity by seeking public-private partnership for implementation of Complete Streets elements.

Bus shelter west of Tampa Ave

Vacant land east of Tampa Ave

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 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

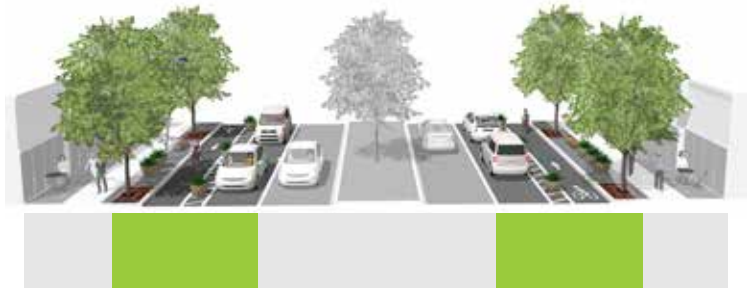
Design Speed: Vehicular travel speed has a measured impact on comfort and safety for pedestrians and bicyclists. With increased vehicular speeds comes increased difficulty for pedestrians to cross roadways. Faster speeds increase the force with which a vehicle strikes a pedestrian, leading to more severe injuries and less likelihood of survival. Many design guidelines for Complete Streets recommend 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.

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 also 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 neighborhood contexts, crossing opportunities could be spaced every 300-660 feet.

Cartway Zone



Buffer Zone

Sidewalk Zone

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

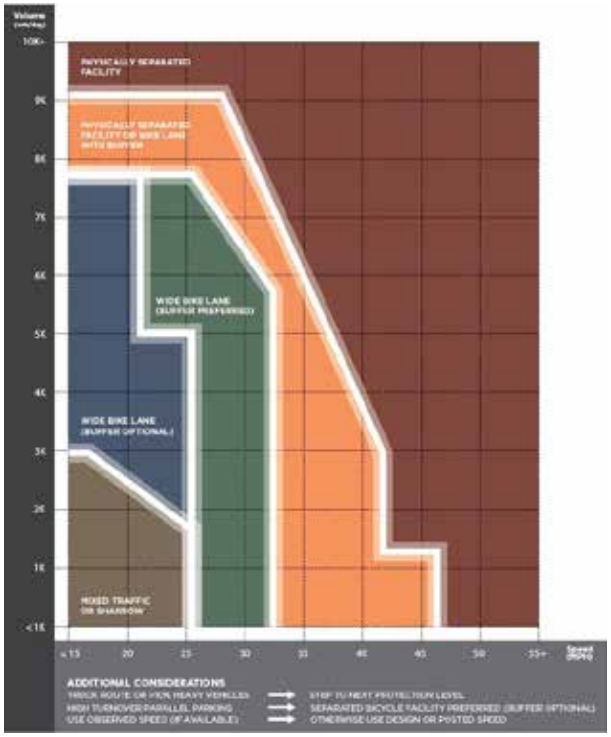
Faster vehicle speeds decrease likelihood of survival.
Credit: United Kingdon Department of Transportation, 1987. "Killing Speeds and Saving Lives." London, England.

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 different treatments including traffic calming, horizontal deflections (chicanes), transit stops, 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, and speed cushions.

BUFFER ZONE

Bicycle Facility: Different levels of bicycle accommodation can be used for different target groups of 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 lane, shared use paths and cycle tracks - are recommended for speeds above 35 mph and 8,000 veh/day (see table below for more details). These facilities tend to encourage the "interested but concerned" group of cyclists to use the bike facility. Inclusion of vertical separation elements in the buffer such as planters, delineators, or raised curb enhance bicyclist comfort and further alerts drivers to bicyclists.



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

Pedestrian Refuge Island
Photo Credit: Bruce Landis,FHWA

Use of green bike lane at driveways
Photo Credit: Safe Mountain View Blog

Parking: On-street parking serves as a buffer for pedestrians and supports local commercial uses along the roadway.

Landscape Buffer: Horizontal separation from the roadway by use of trees and street furniture add to pedestrian comfort and sense of safety. Keeping the curb line and drainage feature same as existing can significantly cut down on final cost.

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

Bus Shelters: Bus shelters are commonly used at high boarding and alighting stops and enhance the transit experience by providing shade and shelter. They should be strategically placed near pedestrian crossing opportunities and designed using accessible pedestrian guidelines.

Bus shelter
Photo Credit: NACTO

Landscape buffer
Photo Credit: NACTO

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.

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.

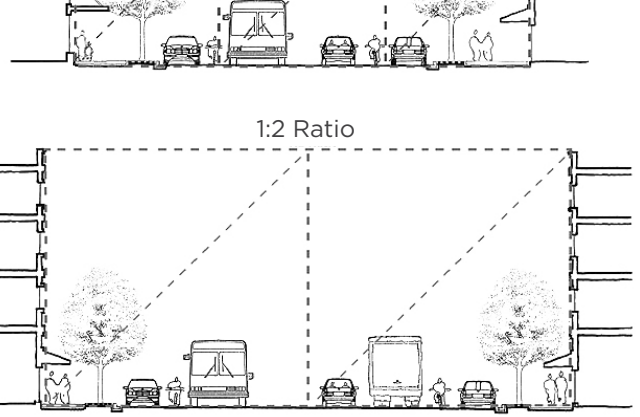
Pedestrian-Scale Lighting: Pedestrian-scale lighting is important to pedestrian safety as it illuminates pedestrians on the sidewalk and in the crosswalks.

Street Furniture: The use of street furniture - including benches, newspaper kiosks, 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 a designated space within the sidewalk zone to store bikes.

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.

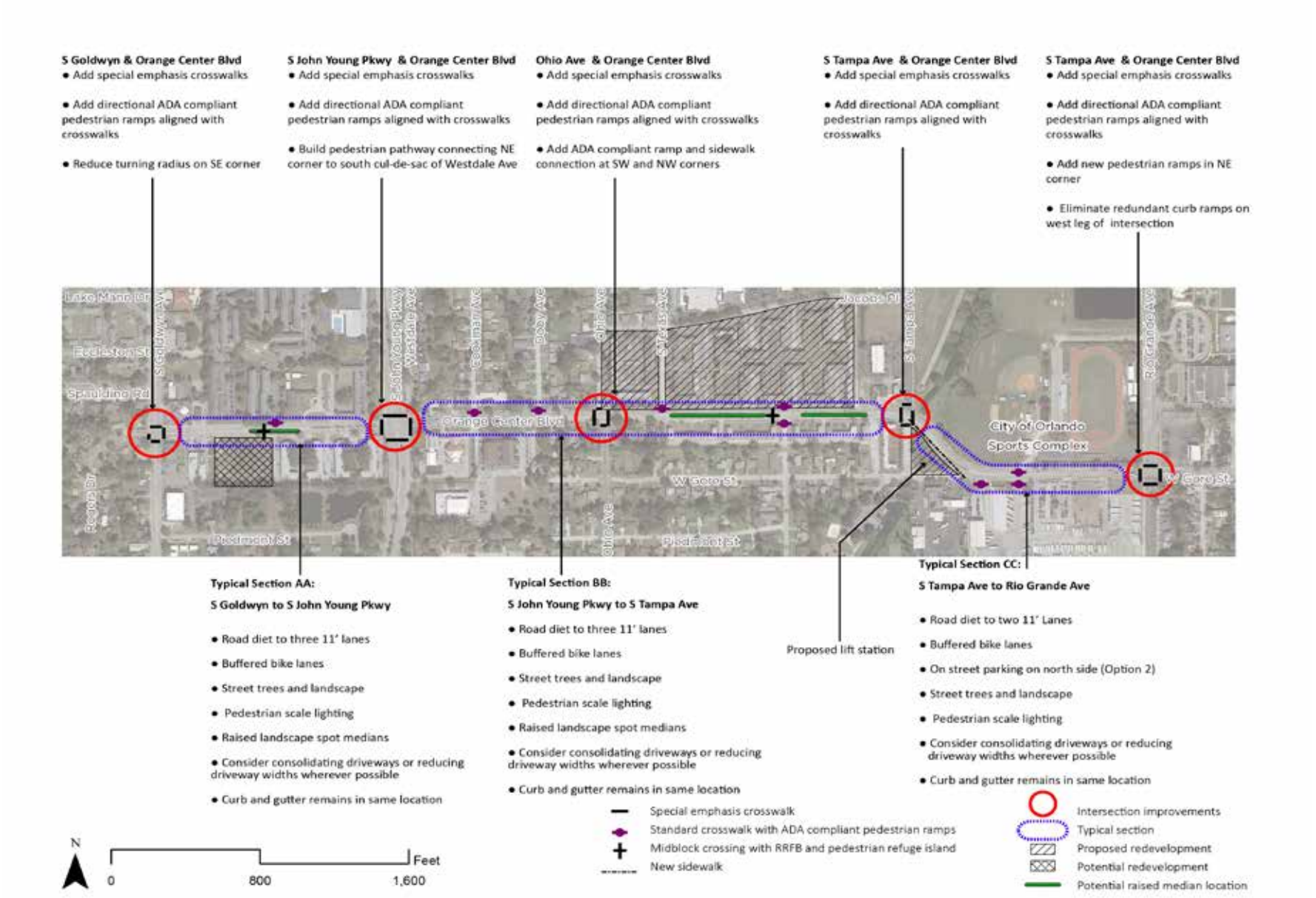
Building Placement: Building placement and street enclosure is important to reinforce safe speeds and pedestrian comfort. Design guidance suggests that a maximum 1:3 height-to-width ratio is acceptable for providing a sense of enclosure. Wherever possible, local zoning codes should include small setbacks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

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

Pedestrian Amenities
Photo Credit: Gerding Edlen, ASLA

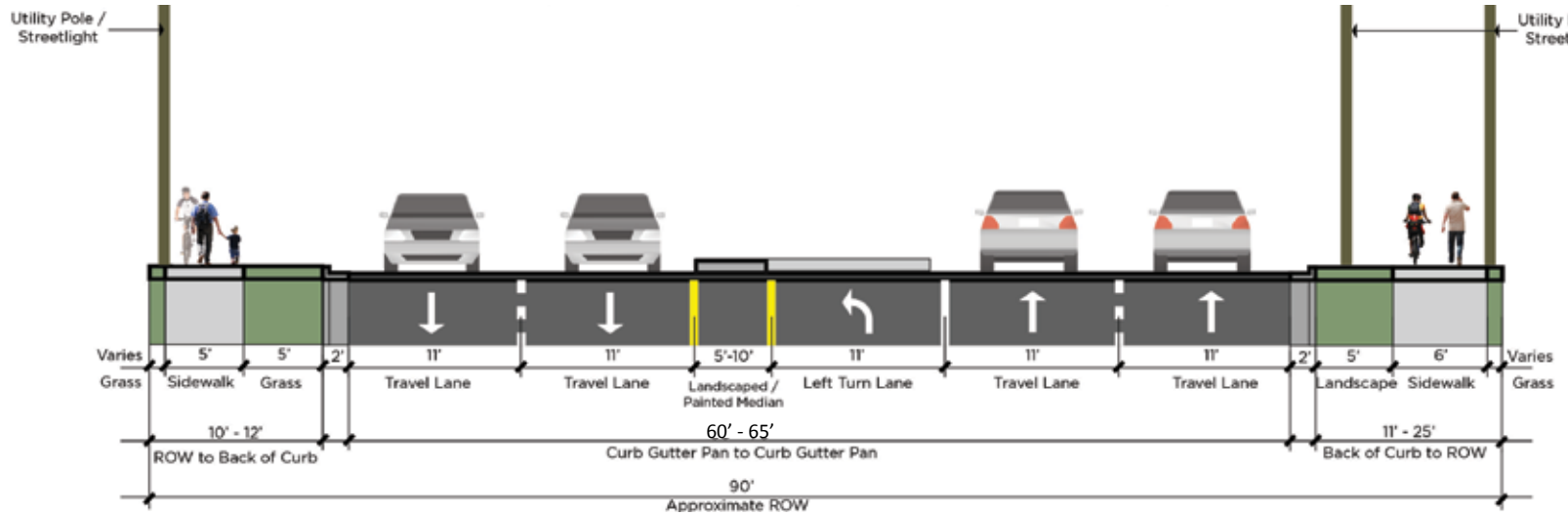
RECOMMENDATIONS

IMPROVEMENTS MAP

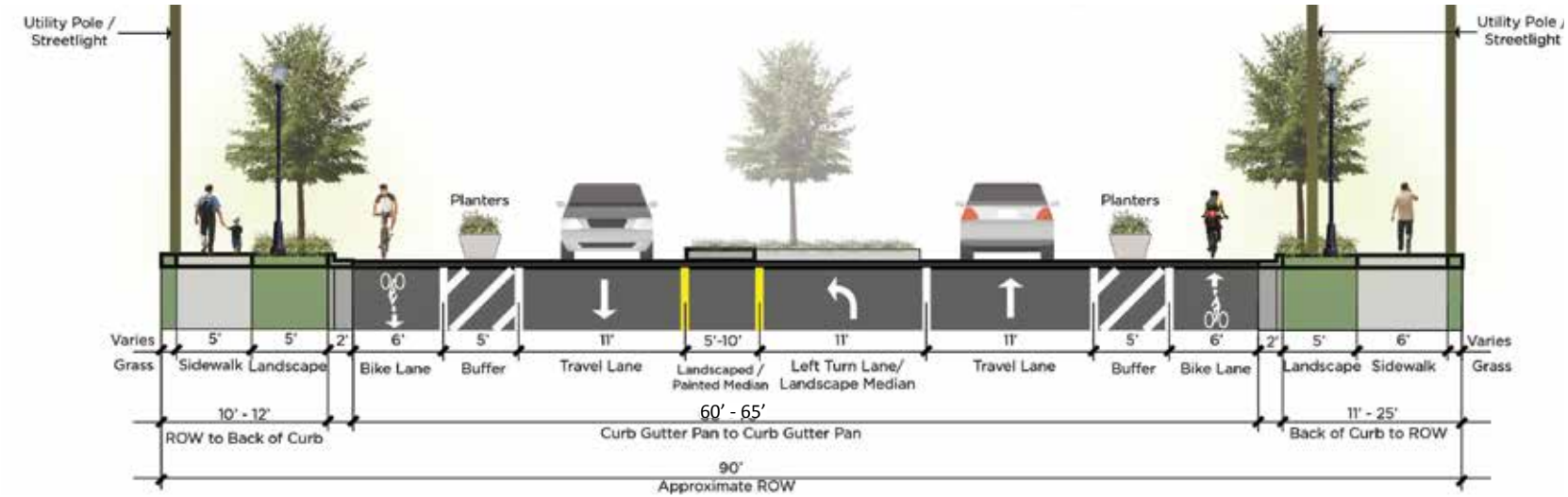


TYPICAL SECTION AA: S GOLDWYN AVE TO S JOHN YOUNG PKWY

Existing

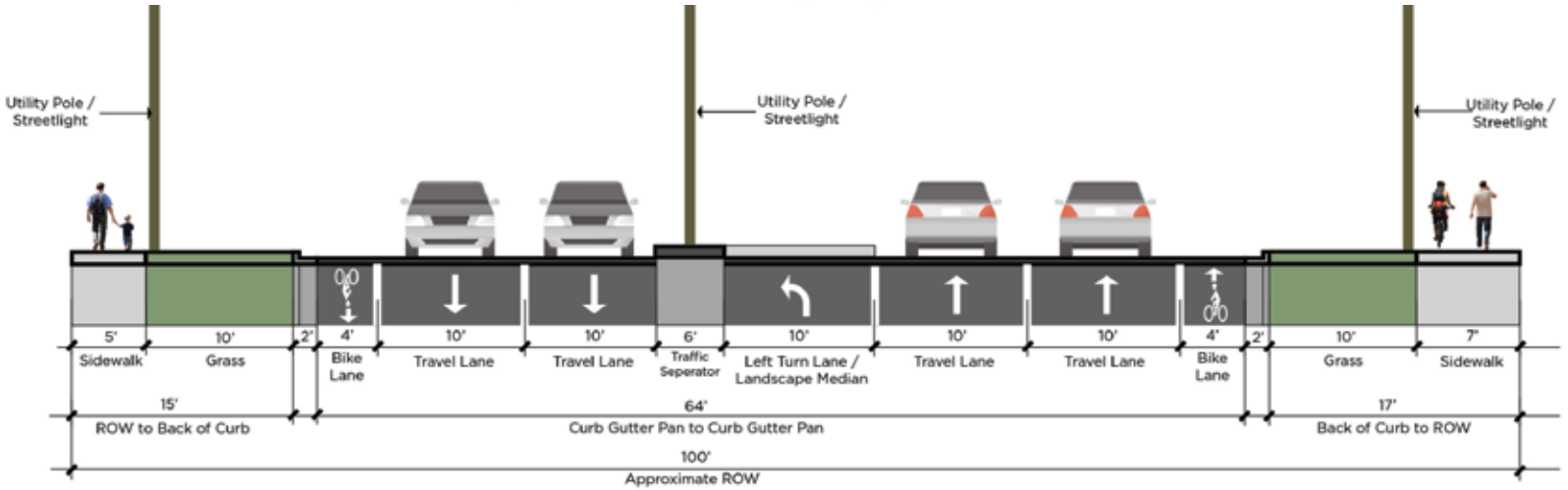


Proposed

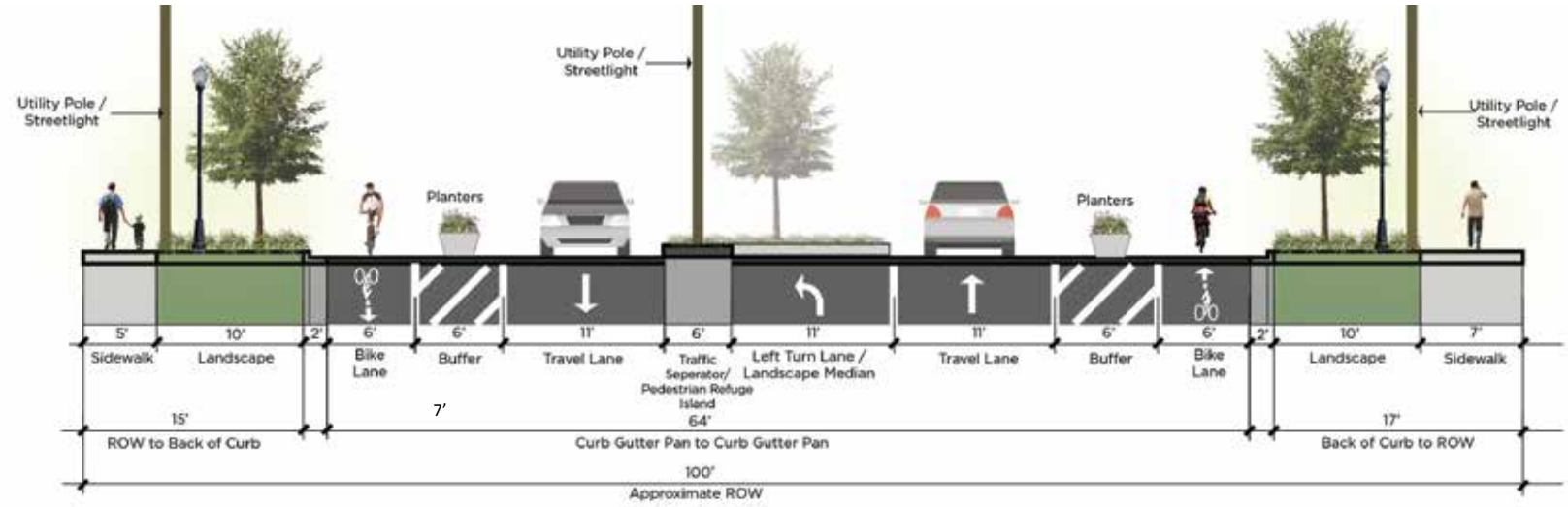


TYPICAL SECTION BB: JOHN YOUNG PKWY TO S TAMPA AVE

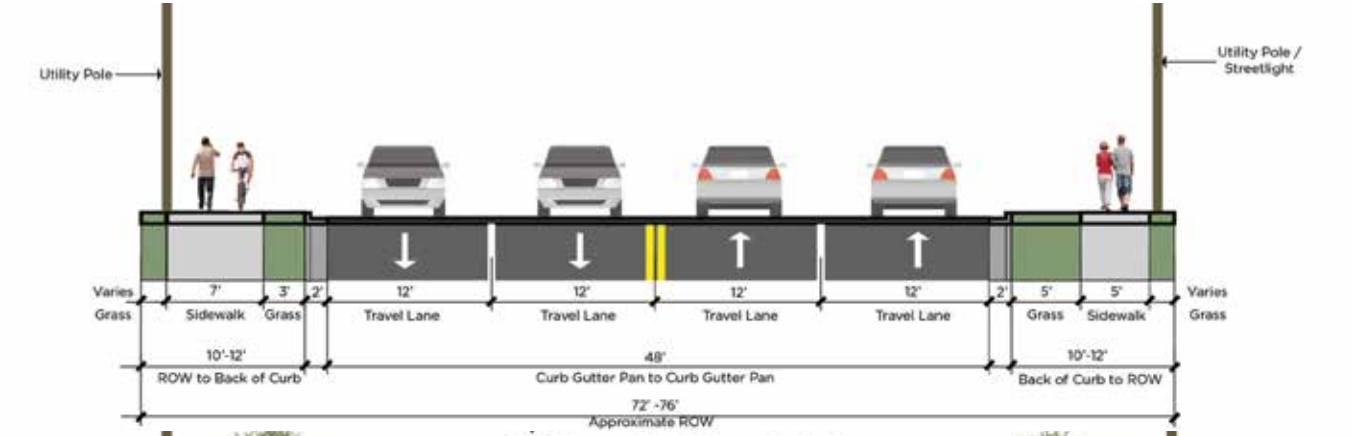
Existing



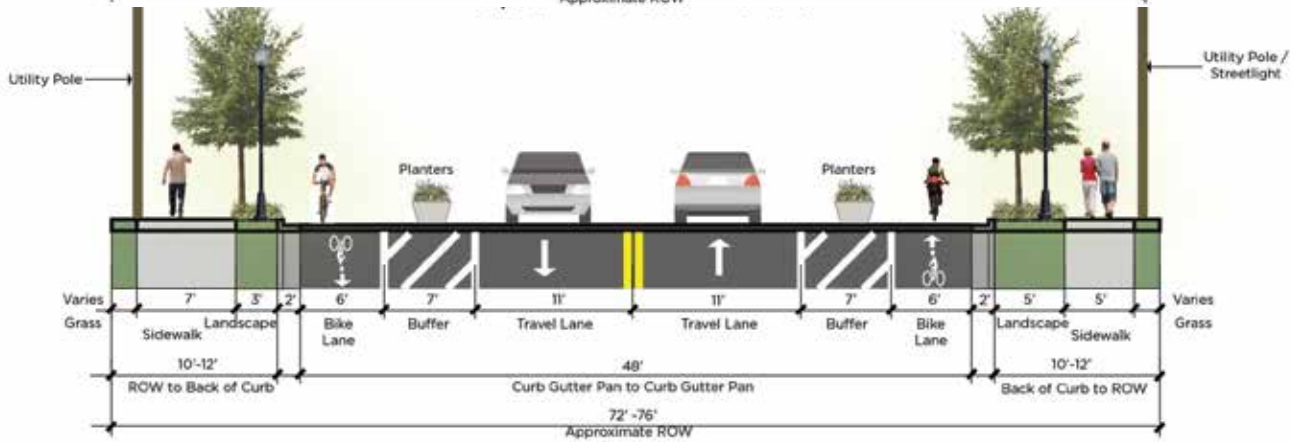
Proposed



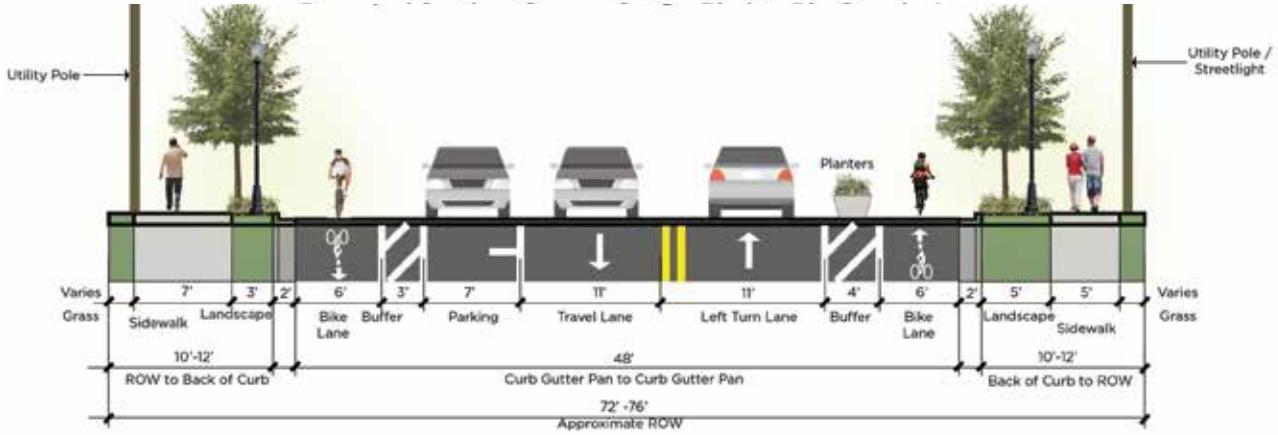
TYPICAL SECTION CC: S TAMPA AVE TO RIO GRANDE AVE



Existing



Proposed (Option 1)



Proposed (Option 2)
On Street Parking on North

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 the City of Orlando evaluate the improvements and their cost to investigate next steps. Most improvements should include public engagement and additional analysis before proceeding to design or construction.

These recommendations are intended to be a list of easily implementable Complete Streets solutions that 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 of Orlando were to advance this project, a two-phased approach could provide an incremental process for funding these projects:

Phase I could include improvements coordinated with regular maintenance. The lane reduction striping (including parking), bike lane additions, and special emphasis intersection crosswalk markings could be implemented during this phase. In addition, the installation of directional ADA-compliant ramps could be included. These improvements can be implemented in the short-term. This approach is commonly used by agencies to leverage maintenance projects.

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

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 Orange 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 design phase for improvements that are chosen for implementation.

PHASE I ESTIMATED COST (2016 DOLLARS)

Roadway pavement rehabilitation:	$1,539,000
Lane reduction/buffered bike lane:	$103,000
ADA/Intersection enhancements:	$42,000
Engineering and construction support:	$212,000
Total Estimated Phase I Cost:	**$1,900,000**

PHASE II ESTIMATED COST (2016 DOLLARS)

Pedestrian lighting:	$988,000
Street Trees/landscaping:	$404,000
Mid-block crosswalks/landscaped medians:	$56,000
Additional sidewalk connections:	$23,000
Engineering and construction support:	$162,000
Total Estimated Phase II Cost:	**$1,633,000**

Total Estimated Project Cost: $3,533,000

APPENDIX A

Orange Center Blvd - Phase I

Orlando, Orange County, Florida

MetroPlan Orlando

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley				*Date: March 29, 2016*		
	PAY ITEM	**DESCRIPTION**	**UNIT**	**TOTAL QUANTITY**	**UNIT PRICE**	**TOTAL COST**
		SECTION 1: ROADWAY				
2	0327-70-5	Milling Exist Asph Pavt, 2" Avg Depth	SY	356,207	$2.01	$715,976.07
3	337-7-22	Asph Conc FC, Inc Bit, FC-5, PG 76-22, PMA	TN	1,649	$129.69	$213,884.75
4	337-7-41	Asph Conc FC, Traffic B, FC-12.5, PG 76-22	TN	2,749	$92.32	$253,750.75
		SUBTOTAL ROADWAY				**$ 1,183,612**
		SECTION 2: ADA/INTERSECTION ENHANCEMENTS				
5	0522-1	Concrete Sidewalk and Driveways, 4"	SY	1,000	$15.53	$15,530.00
	0527-2	Detectable Warnings	SF	540	$30.57	$16,507.80
		SUBTOTAL ADA/INTERSECTION ENHANCEMENTS				**$ 32,038**
		SECTION 3: SIGNING AND MARKING				
7	0711-15101	Thermoplastic, STD-OP, White, Solid 6"	GM	0.44	$4,152.03	$1,826.89
8	0711-15102	Thermoplastic, STD-OP, White, Solid 8"	GM	3.80	$5,812.97	$22,089.29
9	0711-15131	Thermoplastic, STD-OP, White, Skip 6"	GM	0.15	$1,434.84	$215.23
0	0711-11123	Thermoplastic, STD, White, Solid, 12"	LF	3,300.00	$2.26	$7,458.00
	0711-11124	Thermoplastic, STD, White, Solid, 18"	LF	7,900.00	$3.02	$23,858.00
	0711-11125	Thermoplastic, STD, White, Solid, 24"	LF	2,200.00	$4.21	$9,262.00
	0711-15201	Thermoplastic, STD-OP, Yellow, Solid 6"	GM	1.46	$4,158.27	$6,071.07
	0711-15202	Thermoplastic, STD-OP, Yellow, Solid 8"	GM	0.25	$6,016.93	$1,504.23
	0711-11224	Thermplastic, STD, Yellow, Solid, 18"	LF	550.00	$3.13	$1,721.50
	0711-11160	Thermoplastic, STD, White, Message	EA	27.00	$122.97	$3,320.19
	0711-11170	Thermoplastic, STD, White, Arrow	EA	36.00	$61.07	$2,198.52
		SUBTOTAL SIGNING AND MARKING				**$ 79,525**
		SECTION 4: MINOR ITEMS				
14		Subtotal Sections 1-3	LS	10%	$ 11,156.27	$ 11,156.27
		SUBTOTAL MINOR ITEMS				**$ 11,156**
		SECTION 5: ROADWAY MOBILIZATION				
15		Subtotal Sections 1-3	LS	3%	$ 3,346.88	$ 3,346.88
		SUBTOTAL ROADWAY MOBILIZATION				**$ 3,347**

Orange Center Blvd - Phase I

Orlando, Orange County, Florida

MetroPlan Orlando

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley				*Date: March 29, 2016*		
	PAY ITEM	**DESCRIPTION**	**UNIT**	**TOTAL QUANTITY**	**UNIT PRICE**	**TOTAL COST**
		SECTION 6: ROADWAY MAINTENANCE OF TRAFFIC (MOT)				
16		Subtotal Sections 1-3	LS	3%	$ 3,346.88	$ 3,346.88
		SUBTOTAL ROADWAY MOT				**$ 3,347**

Orange Center Blvd - Phase I

Orlando, Orange County, Florida

MetroPlan Orlando

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley				*Date: March 29, 2016*		
	PAY ITEM	**DESCRIPTION**	**UNIT**	**TOTAL QUANTITY**	**UNIT PRICE**	**TOTAL COST**
		SECTION 7: STORMWATER QUALITY / POLLUTION PREVENTION				
18		Subtotal Sections 1-3	LS	5%	$ 5,578.14	$ 5,578.14
		SUBTOTAL STORMWATER QUALITY				**$ 5,578**
					ESTIMATED CONSTRUCTION COSTS	**$ 1,318,602**
					30% CONTINGENCY	**$ 395,590**
					TOTAL ESTIMATED CONSTRUCTION COSTS	**$ 1,714,192**
		CAPITAL SUPPORT COSTS				
19		Project Engineering	LS	6%	$ 1,714,192	$102,860.00
20		Construction Support / Construction Management	LS	5%	$ 1,714,192	$85,710.00
					TOTAL ESTIMATE CAPITAL SUPPORT COSTS	**$ 188,570**
					TOTAL PROJECT COST	**$ 1,902,762**

Orange Center Blvd - Phase II

Orlando, Orange County, Florida

MetroPlan Orlando

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Engineer's Opinion of Probable Cost - Concept Study

Prepared By: Brandon W. Kelley				*Date: March 29, 2016*		
	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
		SECTION 1: ROADWAY				
1	0520-1-7	Concrete Curb & Gutter, Type E	LF	1,000	$13.43	$13,430.00
2	0522-1	Concrete Sidewalk and Driveways, 4"	SY	275	$15.53	$4,270.75
		SUBTOTAL ROADWAY				**$ 17,701**
		SECTION 2: SIGNING AND MARKING				
3	0711-11123	Thermoplastic, STD, White, Solid, 12"	LF	260.00	$2.26	$587.60
4	0711-11125	Thermoplastic, STD, White, Solid, 24"	LF	150.00	$4.21	$631.50
5	0654-2-21	Rect Rapid Flash Beacon, F&I, Single	EA	8.00	$5,200.00	$41,600.00
		SUBTOTAL SIGNING AND MARKING				**$ 42,819**
		SECTION 3: LIGHTING/UTILITIES				
6		Pedestrian Light Pole - Acorn Style - F&I All Components	EA	76	$10,000.00	$760,000.00
		SUBTOTAL LIGHTING/UTILITIES				**$ 760,000**
		SECTION 4: LANDSCAPING				
7		Landscaped Area	SF	95,000	$2.50	$237,500.00
8		Small Canopy Trees	EA	150	$300.00	$45,000.00
9		Irrigation	LS	10%	$28,250.00	$28,250.00
		SUBTOTAL LANDSCAPING				**$ 310,750**
					ESTIMATED CONSTRUCTION COSTS	**$ 1,131,270**
					30% CONTINGENCY	**$ 339,390**
					TOTAL ESTIMATED CONSTRUCTION COSTS	**$ 1,470,660**
		CAPITAL SUPPORT COSTS				
10		Project Engineering	LS	6%	$ 1,470,660	$88,240.00
11		Construction Support / Construction Management	LS	5%	$ 1,470,660	$73,540.00
					TOTAL ESTIMATE CAPITAL SUPPORT COSTS	**$ 161,780**
					TOTAL PROJECT COST	**$ 1,632,440**


metroplan orlando
A REGIONAL TRANSPORTATION PARTNERSHIP