

Orange Avenue

CORRIDOR PLANNING STUDY



CORRIDOR MANAGEMENT PLAN



Prepared For:



FDOT District Five
Planning Office
133 South Semoran Boulevard
Orlando, FL 32807

November 2014



CORRIDOR MANAGEMENT PLAN

SR 527 (Orange Avenue)
From Pineloch Avenue to Anderson Street



Prepared For:
FDOT District Five

Planning Office
133 South Semoran Boulevard
Orlando, FL 32807

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Chapter 1

Executive Summary

1 THE ORANGE AVENUE CHALLENGE

Orange Avenue is an important part of the downtown Orlando community as it serves as a link to move both people and goods through downtown Orlando to the neighborhoods and industrial businesses south of town. Orange Avenue has historical significance as well, being one of the first north/south thoroughfares in the early days of the City of Orlando. Orange Avenue is on the state highway system (SR 527) from the southern project limit to Gore Street, and is in the City of Orlando jurisdiction from Gore Street to the northern project limit.

As an important economic spine, Orange Avenue has recently experienced a robust phase of redevelopment in the Downtown South neighborhood. Orange Avenue/SR 527 has been the subject of various previous studies and Visioning Plans conducted to improve conditions along this corridor. The studies, conducted by the City of Orlando (*Orange/Michigan Vision Plan – 2007*, *South Downtown Vision Plan*

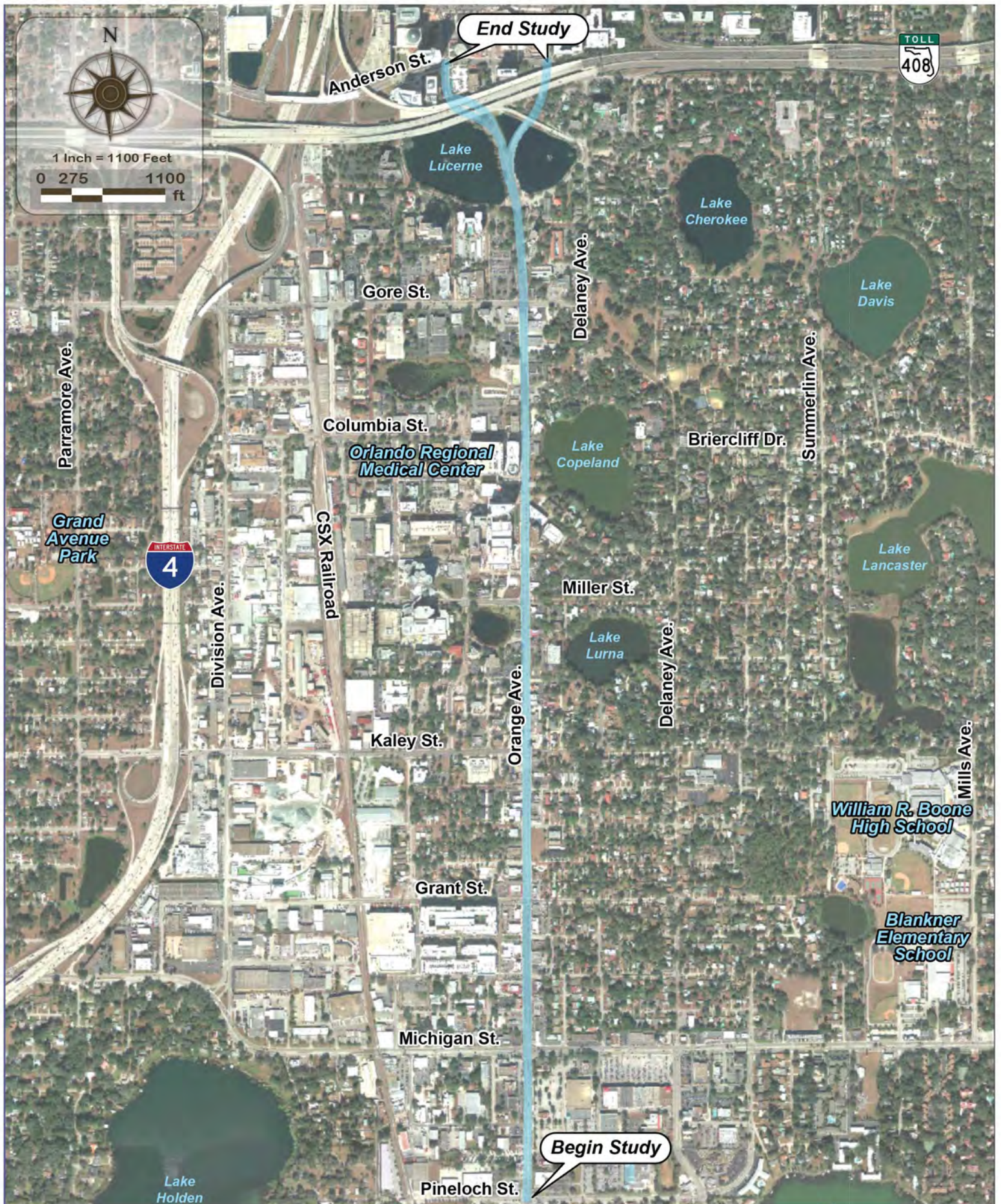


– 2008), by LYNX (*South LYMMO Corridor Alternatives Analysis (AA) Report - 2012*), and by Orlando Health (*Planning Vision - 2012*) have focused on Orange Avenue from Michigan Avenue to north of Orlando Regional Medical Center (ORMC). With the expansion and development of major employment and retail centers in this area such as ORMC and South of Downtown Orlando (SODO), and the opening of the new SunRail station, these planning studies outlined appropriate guidelines and development goals for the SODO neighborhood.

The purpose of this Corridor Planning Study is to identify a series of context sensitive solutions along Orange Avenue that will promote a holistic approach to transportation projects identified to support the community defined vision for the future. The study limits are from Pineloch Avenue to Anderson Street (Figure 1).

Taking the previous planning efforts by the City of Orlando, LYNX, Orlando Health, and others into consideration, local stakeholders such as public agency partners, local business owners, local residents, and representatives from ORMC, were engaged in an effort to gain consensus on the issues and opportunities facing the Orange Avenue corridor. The result of this collaboration was the development of the following guiding principles to provide focus for this study:

1. Enhance multi-modal mobility
2. Provide a functional transit element that serves all users
3. Improve safety for all modes
4. Provide consistency within the corridor (aesthetics, roadway geometry, access management philosophy)



Study Area

Orange Avenue Corridor Planning Study - Pineloch Ave. to Anderson St.



Figure 1

5. Establish interagency support for a plan that allows for development and implementation of transportation solutions that leverage public and private investment and maximize return and minimize implementation timelines

After a review of the existing conditions, identification of the issues and opportunities of the corridor, development of the guiding principles, and gaining consensus on the purpose and need, a series of potential improvements were identified. Through a process of collaborative consensus building and coordination the conceptual improvement alternatives were refined to a recommended alternative. This alternative incorporates the following features:

- Enhanced pedestrian facilities
- Enhanced transit support infrastructure
- Safety improvements for all modes such as reduced speed, enhanced pedestrian and transit facilities, and consistent roadway geometry
- Enhanced aesthetics by creating curb extensions, implementing street trees in tree wells, and providing decorative pedestrian crossings
- An implementation strategy with the City of Orlando to support continued economic and development goals

As part of the recommendations of this study, alternative impacts and cost estimates have also been evaluated and presented. The recommended alternative is proposed as a corridor wide improvement project consisting of potential spot improvements that may be implemented separately from the corridor wide project. These spot improvements consist of intersection geometry modifications at three (3) study area intersections, and a proposed bus pull out.

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Chapter 2

A Collaborative Effort

2 A COLLABORATIVE EFFORT

In order to gain a clear consensus on the issues facing the Orange Avenue Corridor, a stakeholder outreach program was conducted. Along with local residents and volunteers, the attendees included local agency staff, FDOT personnel and members of Downtown South that included local businesses and organizations. The stakeholder outreach program gave insight to concerns and available opportunities within the corridor that exist to better serve its various users. Throughout the study, the following events were held to encourage stakeholder input:

- Agency Kick-off Meeting
- Downtown South Neighborhood Improvement District (NID) Advisory Committee Meeting
- Downtown South Board of Directors Meeting
- Project Visioning Team Bus Tour
- Project Visioning Team Meetings
- Downtown South Coffee Club Presentation
- Coordination with the City of Orlando
- Coordination with LYNX
- Alternatives Public Meeting



2.1 The Project Visioning Team

A Project Visioning Team (PVT) was created in an effort to gather feedback throughout the study process from the local users of the corridor. The PVT members contributed with identifying the issues and opportunities of the corridor, the purpose and need, and the guiding principles. The following PVT meetings were held:



PVT Bus Tour – This bus tour and field review was held on April 13, 2013 and attended by the study team, FDOT staff, City of Orlando staff, and the PVT. The purpose of this was to use the existing transit services, complete field observations, and discuss known issues. Following the tour a survey was completed by all tour attendees regarding the priorities, key issues, desired elements, and identifying the main users of the corridor.

PVT/Stakeholder Workshop – This workshop was held on May 1, 2013 and formatted into four individual group sessions, each lasting 45 minutes. During each session, attendees were presented with a brief overview of the

project and a summary of the key issues as identified by the study team. A handout was distributed and collected at the end of the meeting, where PVT members were then asked to provide input on the purpose and need, key issues, and the guiding principles.

PVT Alternatives Development Meeting – The purpose of this meeting, held on August 6, 2013, was to present the guiding principles developed from the previous PVT meeting feedback, and to begin identifying desired elements for alternatives development. The meeting was divided into two individual sessions, each lasting one hour and 30 minutes. A typical section tool developed by the study team was distributed to the attendees, who were asked to create ideal typical sections for Orange Avenue while staying within the existing 80 foot right-of-way. The various concepts were documented by the study team for further consideration.

PVT Recommended Alternative Meeting – This meeting was held on August 27, 2014; the purpose of this meeting was to provide a debriefing of the alternatives public meeting and to present and explain the recommended alternative. Questions and comments were taken from the PVT members.

Meeting summaries and comments received are located in Appendix A: Comments and Coordination.

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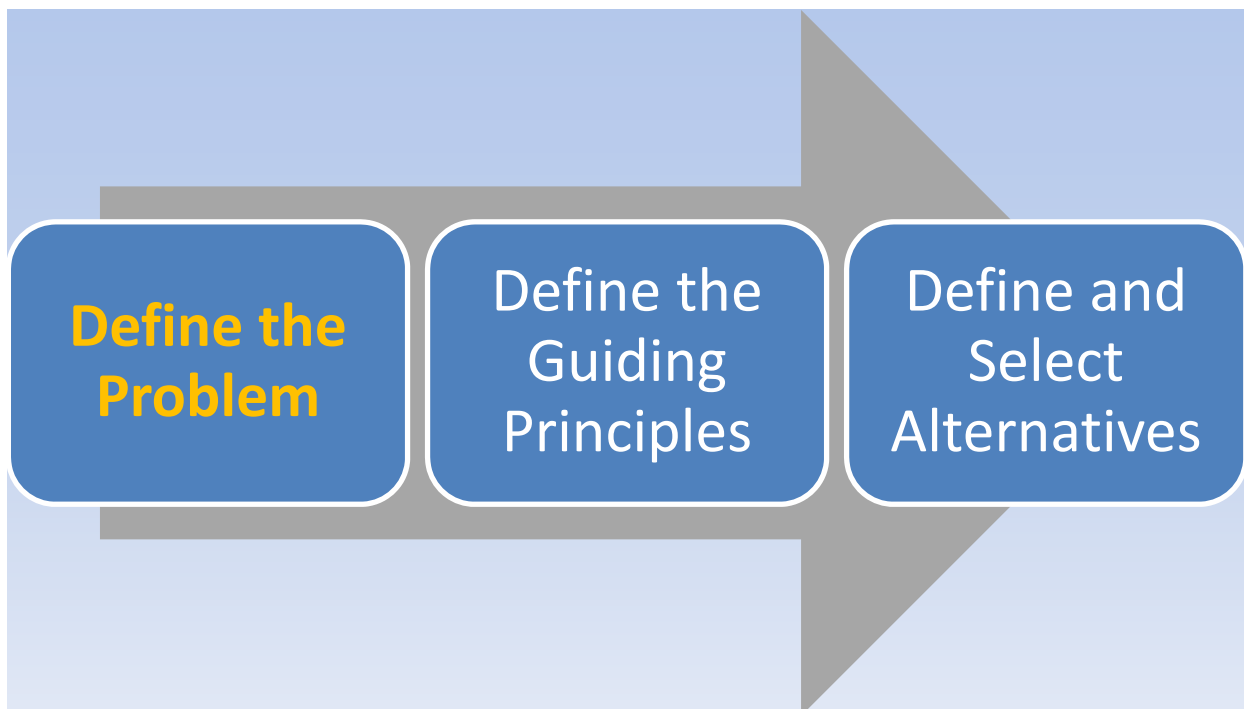


Chapter 3

Understanding the Problem

3 UNDERSTANDING THE PROBLEM

In order to effectively develop context sensitive solutions for a Corridor Planning Study, it is essential to define the purpose and need for the plan. The elements affecting context sensitive solutions are community values, mobility, and safety, all of which play a direct role in developing the purpose and need. Orange Avenue/SR 527 is a unique and diverse corridor containing residential, commercial, medical, and industrial characteristics within the study boundary. An inventory of stakeholder input, existing conditions, and review of the issues and opportunities identified for the corridor were conducted to help develop an understanding of the problems existing in the corridor.



An *Existing Conditions Report* was created to document the current condition and physical characteristics of the corridor, any proposed or in-process improvements/developments within the study area were included. The information collected and presented in the *Existing Conditions Report*, along with the input gathered from initial stakeholder outreach program events, illustrates the following described issues and opportunities identified for improvement on the corridor.

3.1 Issues & Opportunities

Based on information collected for the *Existing Conditions Report* and through stakeholder outreach, issues and opportunities were identified along the project corridor. These include the following elements:

- Safety (number of crashes, location specifics, and fatalities)
 - Pedestrian accommodation
 - Left turn movements
 - Median treatments
 - Sight distance issues
 - Emergency vehicle operations
- Consistency
 - Speed limits
 - Typical sections (lane width, median treatments, pedestrian facilities)
 - Aesthetics (streetscape, location of sidewalk)
- On-street parking (consistency, utilization)
- Traffic Congestion (travel times, signal operations)
- Transit (stop locations, logistics, safety, operations, LYNX expansion route, Sunrail and Amtrak interface)
- Planning Efforts & Unification along the corridor
- Technical Aspects (roadway geometry, maintenance issues)
- Physical Constraints (80 ft. right-of-way, existing land use is developed, setbacks and easements)
- Interagency Coordination/Collaboration
- Bicycle and Pedestrian Circulation
- Access Management (spacing and number of driveways, left turn movements, and median modifications)
- Aesthetics

Problem Definition

How can we provide improved multi-modal facilities for local and regional trips, and improve safety on this important Principle Arterial? How can we enhance aesthetics and support the development goals of the neighborhood through transportation improvements?

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Chapter 4

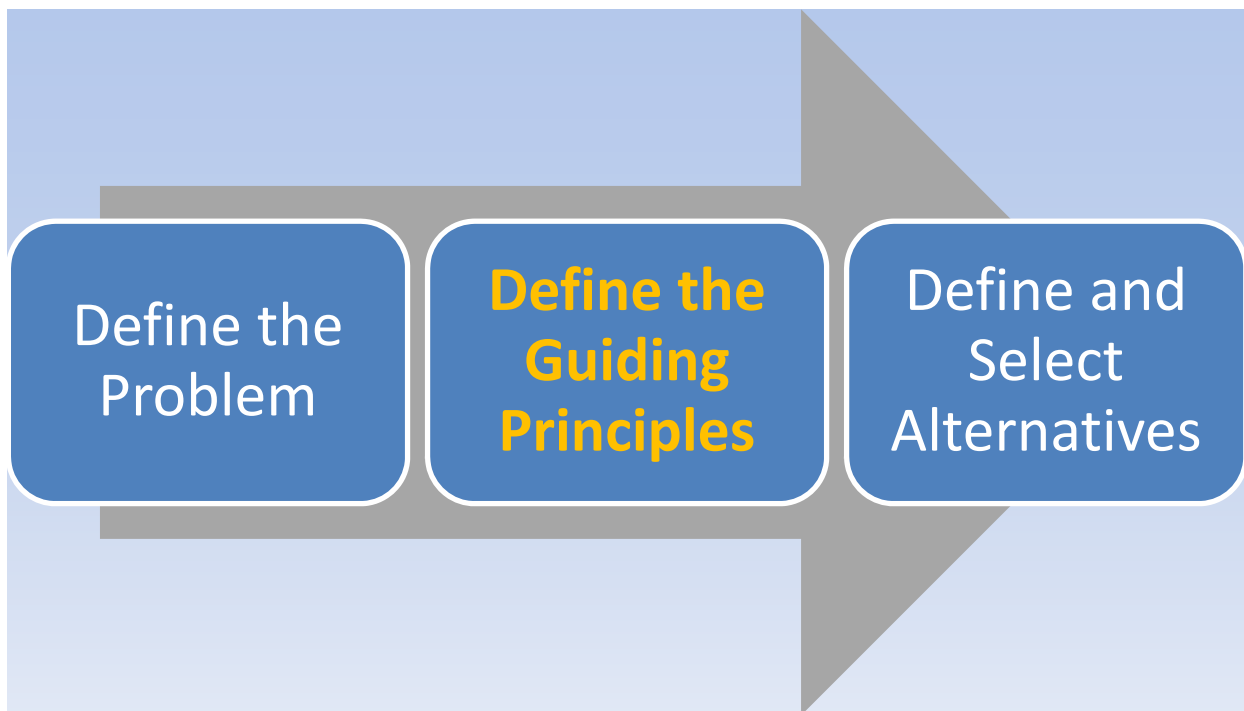
The Guiding Principles

4 THE GUIDING PRINCIPLES

4.1 Guiding Principles Development

A set of Guiding Principles for the corridor were established based on the data collected, input from stakeholders, and observations in the field. These guiding principles address the following elements:

- Corridor Vision
- Desired Role
- Major Users



- Corridor Vision and Role

Corridor Vision: To be an urban main street neighborhood, have a “Park Once” atmosphere, to be bike and pedestrian friendly, and to encourage local transit use.

Major users of the corridor:

- Commuters
- Local Residents
- Employment Centers (ORMC, SODO)
- ORMC patients/patrons
- Business patrons

Desired Role of Orange Avenue: *To provide a context-sensitive transportation facility that serves all users while supporting the desired corridor characteristic and vision.*

▪ Guiding Principles

The following Guiding Principles were developed based on the Corridor Vision, desired role, and the major users, identified by the study team and the PVT members:

- A. Enhance multi-modal mobility and access while accommodating regional traffic
- B. Provide a functional transit element that serves a wide array of users (commuters, shopping/business patrons, employment centers)
- C. Improve safety for all modes
- D. Provide consistency within the corridor (aesthetics, roadway geometry, access management philosophy)
- E. Establish interagency support for a plan that allows for development and implementation of transportation solutions that leverage public and private investment and maximize return and minimize implementation timelines

4.2 Purpose and Need

Purpose Statement: *To provide a safe and efficient multi-modal transportation corridor that serves a wide array of users while providing and enhancing livability consistent with the future vision for the area.*

Needs Statement: *Improving multi-modal mobility, consistency, and safety is necessary because the corridor experiences high crash frequencies as well as current and future demand from non-vehicular modes such as pedestrians and transit users.*

Multi-modal/context-sensitive enhancements to the corridor support a lower-speed environment with improved aesthetics and increased walkability to improve safety and foster future economic development. This is reinforced by the following data and observations within the existing corridor:

- Approximately 650 crashes within the 2-mile corridor in the five years between 2007 and 2012 with three fatalities involving cyclists and pedestrians
- Inconsistent roadway elements (lane widths, median left turn treatments, pedestrian facilities, on-street parking placement/utilization)
- Inconsistent speeds (40 MPH from Pineloch Avenue to Grant Street, 35 MPH from Grant Street to Kaley Avenue, and 30 MPH from Kaley Avenue to Anderson Street)
- Traffic congestion (high travel times, close signal spacing, and necessary signal timing adjustments and maintenance)
- Inconsistent aesthetics/landscape treatments (relationship to sidewalk placement)
- Transit issues (stop locations/placements/utilization/logistics/type of facilities)
- Need for coordination of planning initiatives with multiple agencies (City of Orlando, LYNX, FDOT, Orange County)

4.3 Measures of Success

The measures of success developed based on the guiding principles and the purpose and need are outlined below in Tables 1 - 5. These measures represent the evaluation criteria to compare alternative solutions proposed by the planning study.

Table 1 – Guiding Principle A: Measures of Success - Mobility

Enhance multi-modal mobility and access while accommodating regional traffic.	
Objectives	Measures of Success
Increase ease of transit use	Proximity of transit stops to land uses served
Provide for bicycle/pedestrian use	Accommodations for bicycles added to corridor
	More consistent pedestrian facilities
Improve operational deficiencies	Reduced intersection delay (Level of Service)
	Reduced travel time
	Reduced queuing at critical intersections
	Increased system throughput

Table 2 – Guiding Principle B: Measures of Success - Transit

Provide a functional transit element that serves a wide array of users (commuters, shopping/business patrons, employment centers).	
Objectives	Measures of Success
Improve transit vehicle operations at stop locations, reduce vehicle/transit conflicts and delay to through traffic	Decreased drive times
	Decreased angle/side-swipe/rear-end crashes around transit stops
Improve stop proximity to uses (to better serve user needs)	Closer proximity to pedestrian cross-walks
	Closer proximity to pedestrian generators
Identify strategies to encourage “park once” philosophy	Increased “in-corridor” transit trips/ridership
	Decreased “in-corridor” vehicular trips (before/after parking assessment in parking lots)
Increase access/service to corridor destinations	Synopsis of uses
	ORMC staff survey

Table 3 – Guiding Principle C: Measures of Success - Safety

Improve safety for all modes.	
Objectives	Measures of Success
Target higher crash locations and identify opportunities to improve	Reduced number of crashes
Identify and improve factors contributing to safety (sight distance, driveway location/spacing, obstructions, on-street parking locations and configuration)	Reduced number of mid-block crashes
Eliminate bus/vehicle conflicts at bus stops	Reduction in crashes around bus stop locations
Identify pedestrian and improved crossing distances	Reduced pedestrian crossing distance

Table 4 – Guiding Principle D: Measures of Success - Consistency

Provide consistency within the corridor (aesthetics, roadway geometry, access management philosophy).	
Objectives	Measures of Success
Provide consistency in roadway geometry.	Reduced typical section inconsistency within corridor
	Reduced # of typical sections
Provide consistency in aesthetic elements (foster coordination between FDOT and City of Orlando)	Continuity of appearance
	Increased length of continuous aesthetic elements
	Reduced # of different treatments
Identify predominate left turn movements	Reduced number of median/head-on collisions
	Reduced length of two-way-left-turn lanes
	Implementation of new access management treatments (median, dedicated left turn pockets)

Table 5 – Guiding Principle E: Measures of Success – Agency support

Establish interagency support for a plan that allows for development and implementation of transportation solutions that leverage public and private investment and maximize return and minimize implementation timelines.	
Objectives	Measures of Success
Buy-in from agency partners	Letter of support/ endorsement of plan
FDOT acceptance/endorsement of plan	“Sign-off” from internal FDOT departments on details of the plan
Commitment from funding partners (public and private)	Committed dollars/partners advanced
	# of partners/participants
Leverage funding to maximize return on investment	Identified opportunities for FDOT-implemented elements
Prioritize improvements to minimize implementation timeline/maximize value	Identified high priority projects based on, lower cost and greatest impact
	List of projects from the recommended alternative/timeline/responsible party
	An implementation strategy (result of study)

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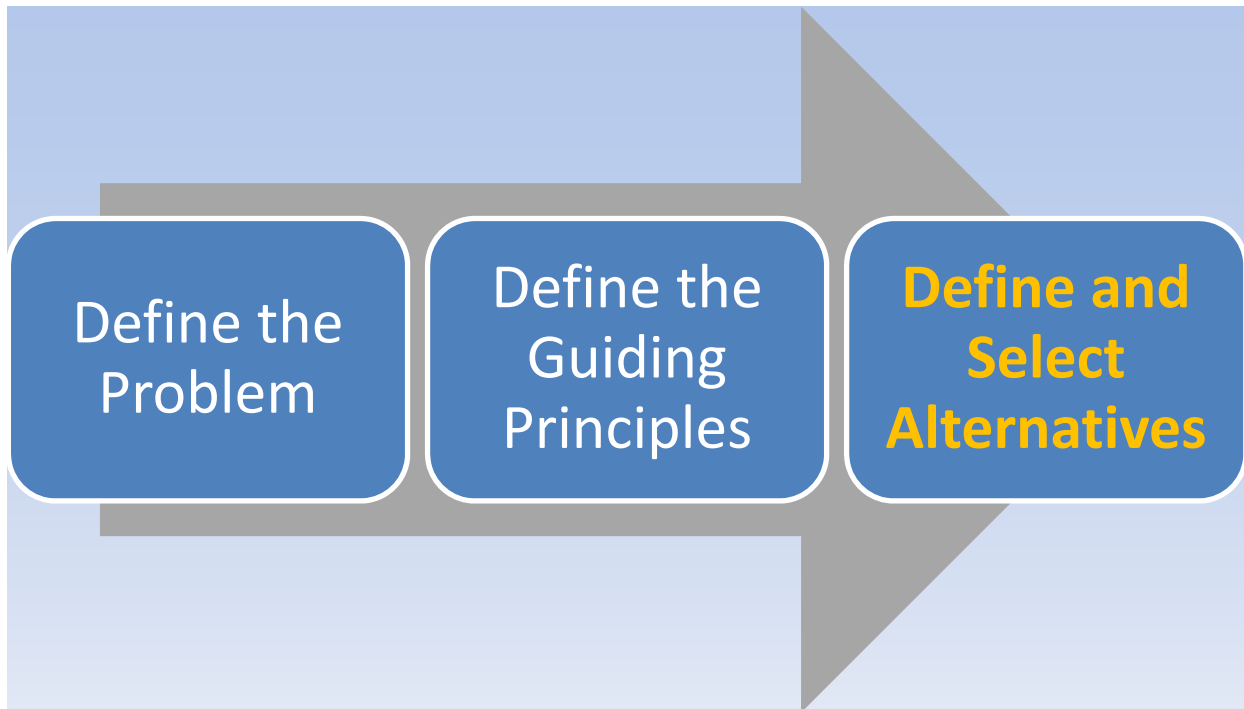


Chapter 5

Alternatives Development

5 ALTERNATIVES DEVELOPMENT

Based on a clear understanding of the problem and on the guiding principles established for the Orange Avenue Corridor Study, future conditions of the corridor were evaluated to determine alternatives to address the problems and principles.



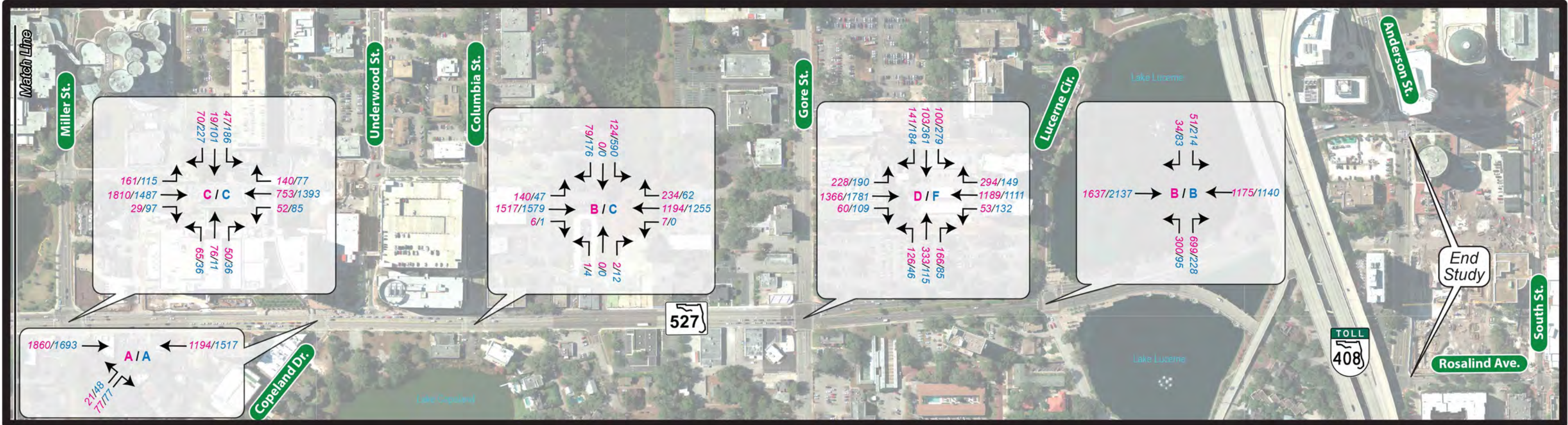
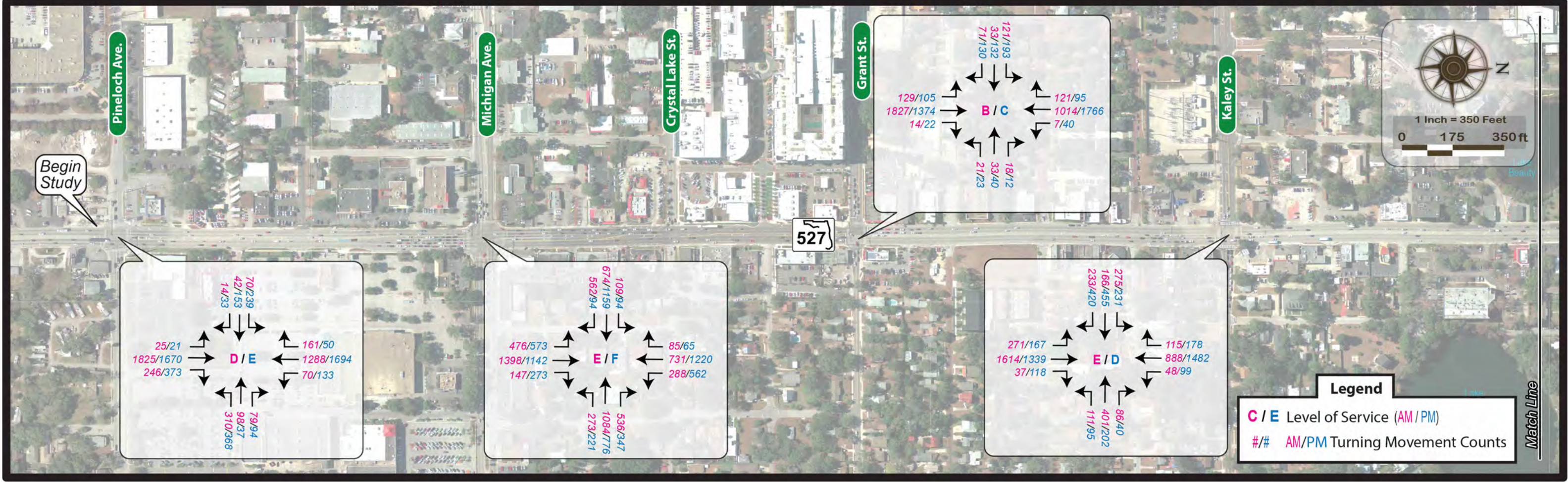
5.1 Baseline Future Conditions Assessment

An assessment of future conditions was conducted for Orange Avenue and the intersections within the study area. This analysis consisted of 2030 Future Year intersection analysis using Synchro 8 software, with the recommended alternative improvements incorporated. Future year volumes were based on a 1% annual growth rate supported by the 2030 OUATS model, provided in Appendix B. Future year 2030 intersection volumes and level-of-service (LOS) are illustrated in Figure 2. LOS F was found at the Orange Avenue/Michigan Avenue and Orange Avenue/Gore Street intersections. All other intersections are at LOS E or better. Synchro reports for future conditions at all intersections along the corridor are included in Appendix C.

5.2 Basic Alternative

A basic alternative was developed to address the identified basic problems for Orange Avenue and provide simple short term and less expensive solutions. Elements of this alternative included:

- Signal retiming based on projected future volumes
- Restriping for 10 foot lane-width consistency
- Enhanced pedestrian crosswalks (such as stamped concrete or brickwork)



5.3 Ultimate Alternative

An ultimate alternative was developed to build upon the basic alternative and provide more involved improvement concepts that require additional engineering analysis, funds, and time to implement. This alternative includes the concepts developed in the basic alternative and the following additional concepts:

- Curb extensions in order to provide consistent 10 foot travel lane widths and enhanced pedestrian facilities (wider sidewalks)
- Preservation of existing and additional on-street parking
- Increased curb radii and realigned pedestrian crosswalks at some intersection locations
- Intersection geometry modifications (such as additional dedicated turn lanes)
- Bus pull outs where possible
- Relocation and consolidation of underused bus stop locations
- Access management with the addition of mountable raised median and/landscaped median in some locations
- Placement of tree wells when possible

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Chapter 6

Recommended Alternative

6 RECOMMENDED ALTERNATIVE

6.1 Ultimate Alternative

Based on feedback from agency partners, the Project Visioning Team, and public meeting comments received, the basic alternative was deemed insufficient and more substantial improvements were desired, therefore the ultimate alternative has been selected as the recommended alternative. The following presents the improvement strategies intended to address the issues and opportunities identified on the corridor.

- Lane Width Consistency

The existing lane widths of the right hand lane in each direction vary throughout the corridor, ranging from 10 feet to 18 feet. This inconsistency is both aesthetically and operationally undesirable. Implementing consistent 10 foot travel lanes will provide for safety through improved driver expectations and serve to reduce vehicular speeds and enhance pedestrian safety.

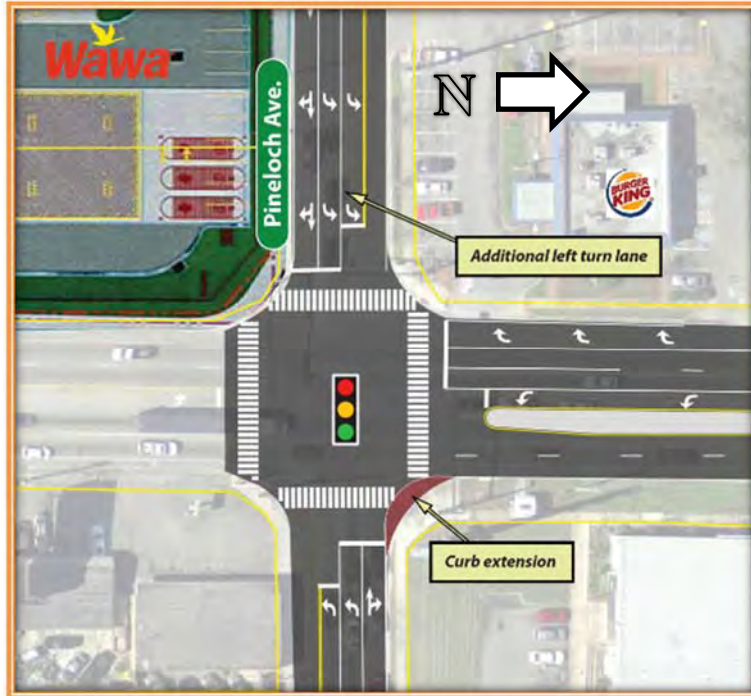
Curb extensions, a reconstruction of the curb line, are proposed in various locations where the existing outside lane is in excess of 10 feet. This will create the narrower lane widths with the added benefit of defining on street parking, and providing wider pedestrian facilities.

- Parking Accommodations

A strong interest from both stakeholders and the public was shown to preserve as much of the existing on-street parking as was possible. Many members of the public and business owners pointed out that in some instances, this on-street parking is part of the limited parking available to certain businesses and was necessary for deliveries. Therefore on-street parking was preserved or added whenever possible if the location did not negatively impact the operations and safety of the roadway. Some on-street parking locations are proposed to be implemented and defined by curb extensions. There are approximately 135 existing on-street parking spaces and the recommended alternative proposes 107 on-street parking spaces.

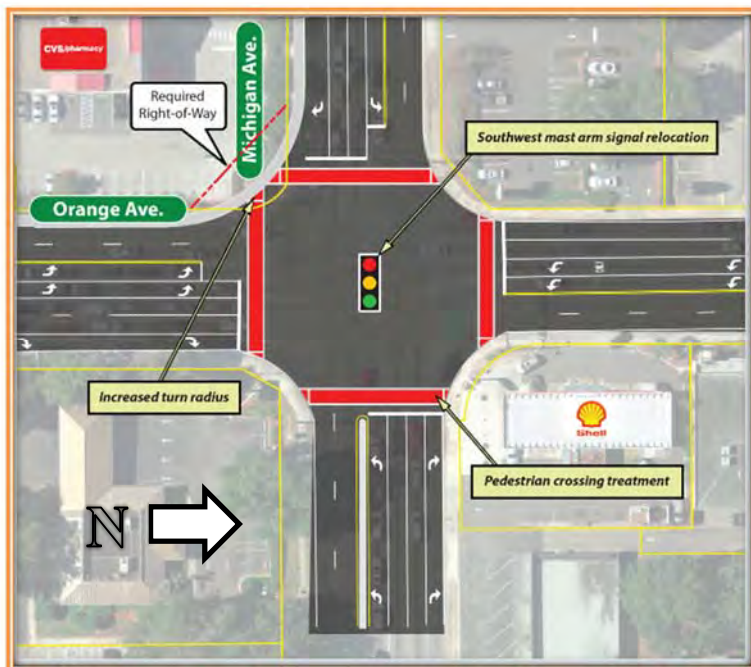
- Intersection Improvements

There are a number of significant signalized intersection within the study area on Orange Avenue. Some provide access to local collector roads and I-4, large residential areas, or major area shopping developments and ORMC. Based on the projected volume growth and future intersection operations, spot improvement strategies such as lane reconfiguration and signal timing modifications are proposed as part of the recommended alternative. The intersections and the associated recommended improvements are illustrated on the following pages.



Orange Avenue/Pineloch Avenue –
 Addition of eastbound left turn lane to accommodate a high volume of eastbound left turning heavy truck movements. Decrease turn radii with a curb extension for westbound to northbound right turns from Pineloch Avenue to Orange Avenue. This geometry modification will not require additional right-of-way.

Figure 3 – Recommended Alternative: Orange Avenue/Pineloch Avenue Intersection



Orange Avenue/Michigan Street -
 Increase southwest corner curb radius to accommodate eastbound right turning heavy truck movements. The mast arm on the southwest corner will need to be relocated because of the increased curb radius. This improvement will require right-of-way acquisition and utility relocations on the southwest corner of the intersection. In addition, pedestrian crosswalk treatment would be added to all four legs of the intersection.

Figure 4 – Recommended Alternative: Orange Avenue/Michigan Avenue Intersection

Orange Avenue/Miller Street - Addition of eastbound left turn lane to accommodate a high volume of peak hour left turn movements anticipated with ORMC development. The existing on-street parking would be defined by striping and added curb extension. In addition, pedestrian crosswalk treatment would be added to all four legs of the intersection.

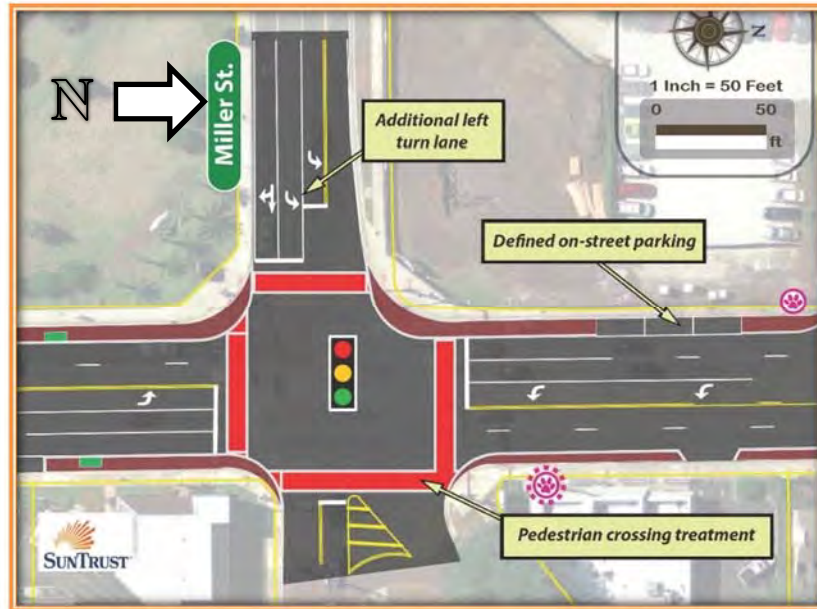


Figure 5 – Recommended Alternative: Orange Avenue/Miller Street Intersection

In addition to intersection lane configuration modifications, intersection geometry enhancements are proposed at several unsignalized intersections and include the following updates:

- Increased curb radii to accommodate turning movements
 - Realigned pedestrian crosswalks to provide straight and reduced distance of pedestrian crossings on Orange Avenue
 - Enhanced pedestrian crossing treatments at side streets (such as stamped concrete and/or brick work)
- Bicycle and Pedestrian Accommodations

As illustrated in the *Existing Conditions Report*, there are currently sidewalks located on both sides of Orange Avenue through the study area with some locations as narrow as 5 feet wide. There are no existing on-street bicycle accommodations from Pineloch Avenue to Lucerne Circle provided. Enhanced pedestrian facilities will be provided with the following strategies:

- Curb extensions
- Tree wells where possible
- Enhanced pedestrian crossing treatments (such as stamped concrete and/or brick work)
- Realigned pedestrian crossings at intersections where curb radii are adjusted (this will provide crossings more perpendicular to Orange Avenue)

There are currently no bicycle facilities provided on Orange Avenue. Interest has been expressed by the public for bicycle facilities on Orange Avenue in the form of a shared use path, dedicated bike lanes, or (at the least) sharrows (travel lanes marked indicating shared right-of-way with bicyclists) on the roadway. The potential for implementing 4 foot bike lanes along the length of the corridor was explored by the study team, however, based on the varying typical section of the corridor and the constrained right-of-way, adding continuous bike lanes for the corridor is not feasible. Specifically, constraints exist at the following locations:

- The Orange Avenue/Michigan Avenue intersection – the right-of-way line on Orange Avenue is currently at the edge of the sidewalk
- Locations where on street parking is desired on both sides of Orange Avenue

In order to provide facilities for bikes, the study team identified multiple reasonable alternate routes parallel to Orange Avenue as potential bike routes. All of the routes illustrated in Figure 6 provide a north-south connection between the existing bicycle facilities on Orange Avenue south of Pineloch Avenue and north of Lucerne Circle.

- Access Management Modifications

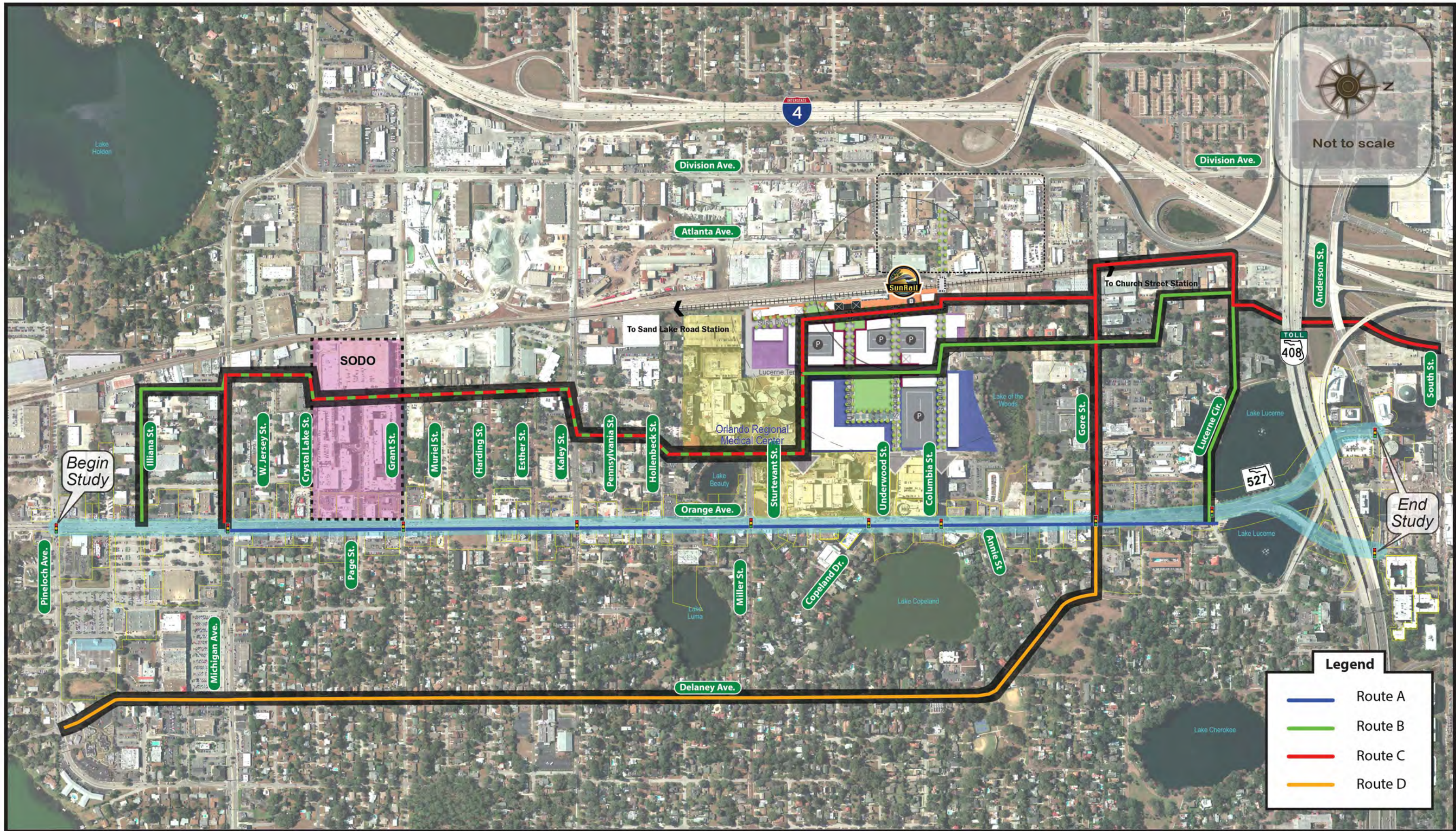
The existing typical section for Orange Avenue from Pineloch Avenue to Gore Street includes a bi-directional center turn lane ranging in width from 11 to 12 feet. There are locations along the corridor where the addition of a median may serve as a safety measure and provide for traffic calming. There has been public interest shown in applying landscaped and/or mountable raised-island medians at certain locations to improve corridor aesthetics, to restrict left turns at high-crash locations, and to provide pedestrians a median refuge when crossing Orange Avenue. The following criteria must be met for the implementation of access management measures:

- Reasonable access via either U-turn, side street, or shared access to all locations
- The ability to provide safe U-turn clearance at a nearby left turn location
- Medians will not restrict or interfere with emergency vehicle access

- Transit Facility Enhancements

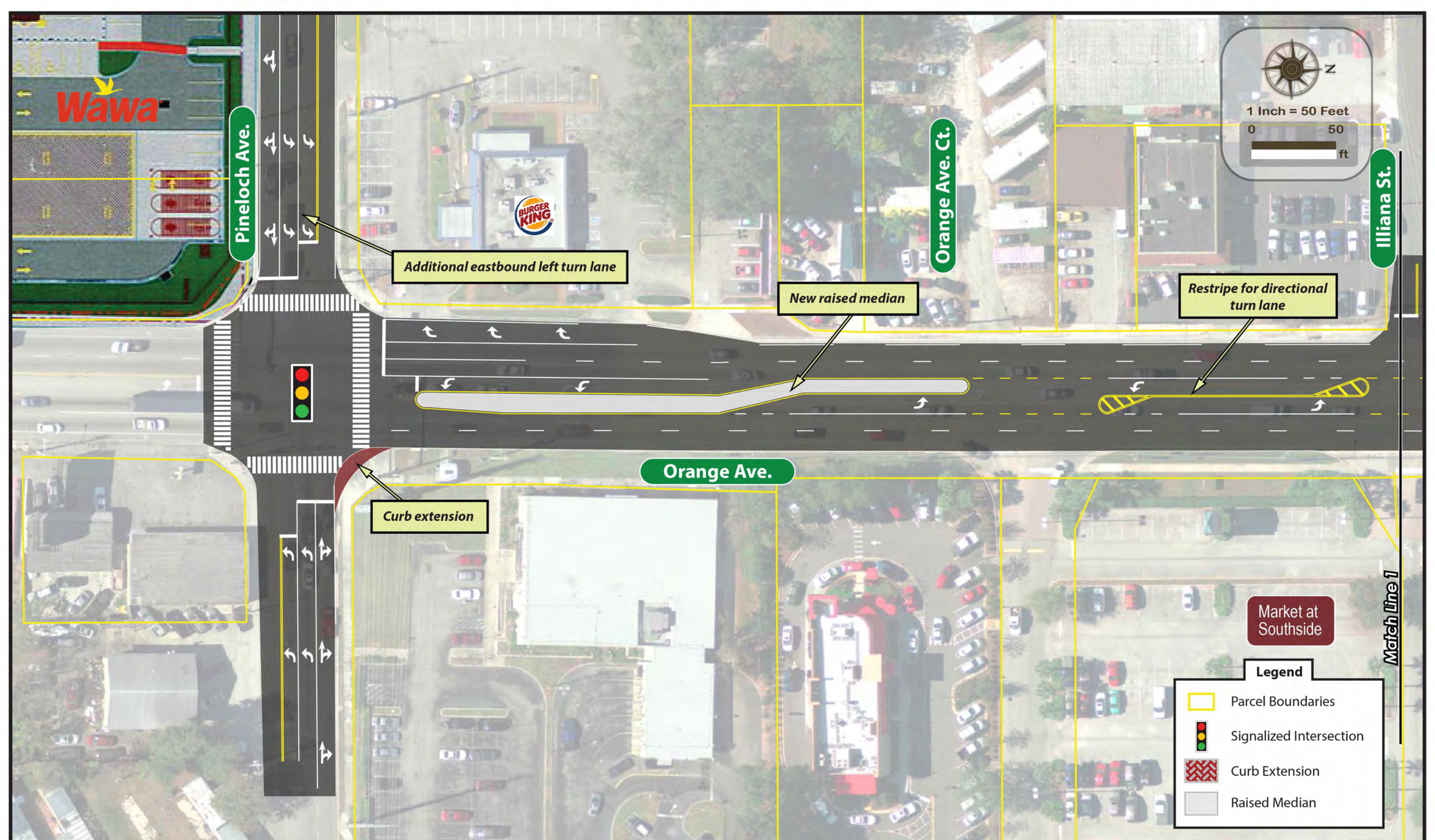
As presented by the Existing Conditions Report, this corridor experiences a high volume of daily transit users. Instances for transit modifications were identified along the corridor and consist of the following elements:

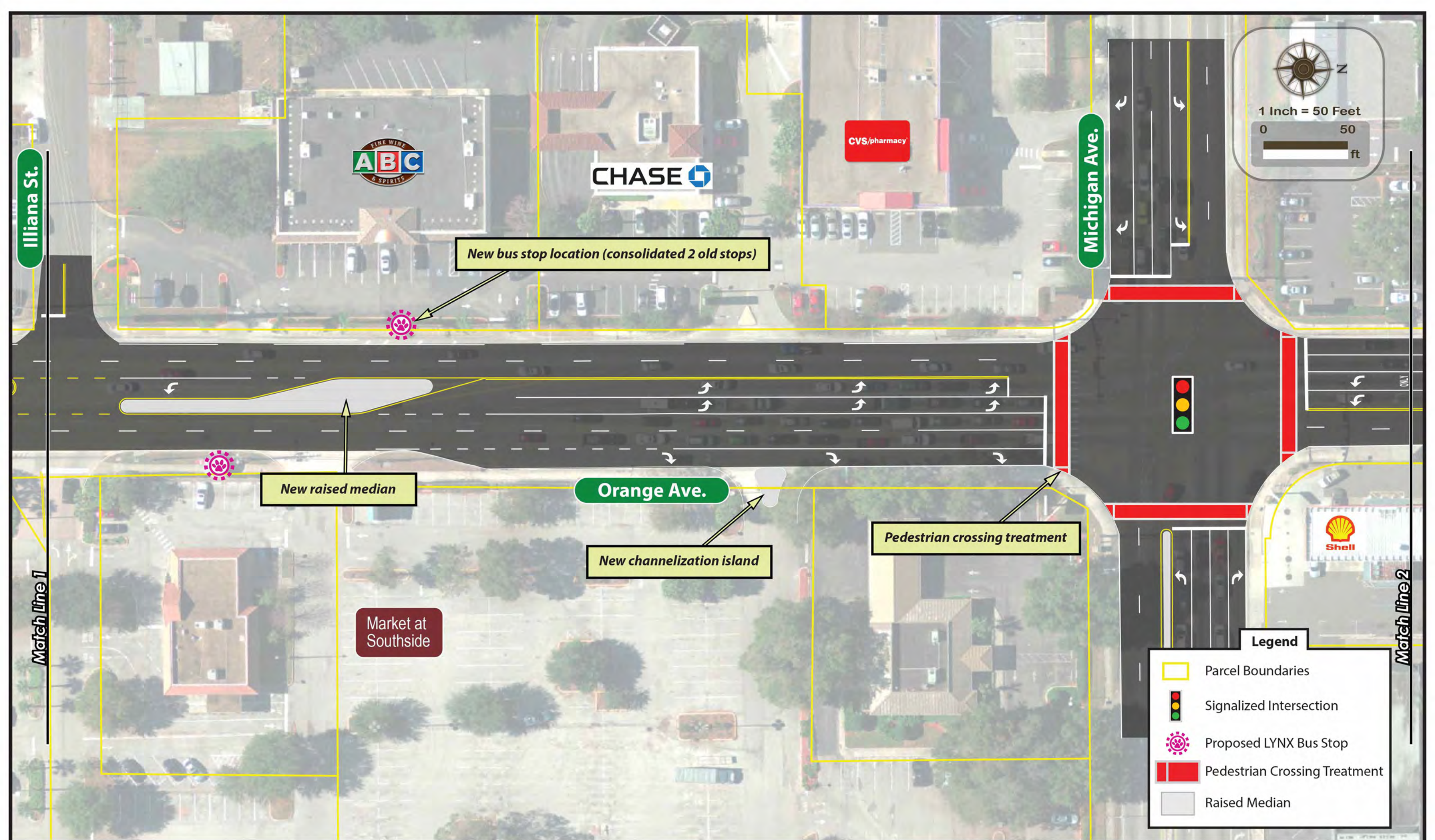
- Consolidated Bus Stop Locations – Based on the transit use patterns, there are existing bus stop locations with low or zero daily ridership averages. These underutilized stop locations were consolidated with nearby higher volume stop locations while maintaining a reasonable distance between bus stop locations.

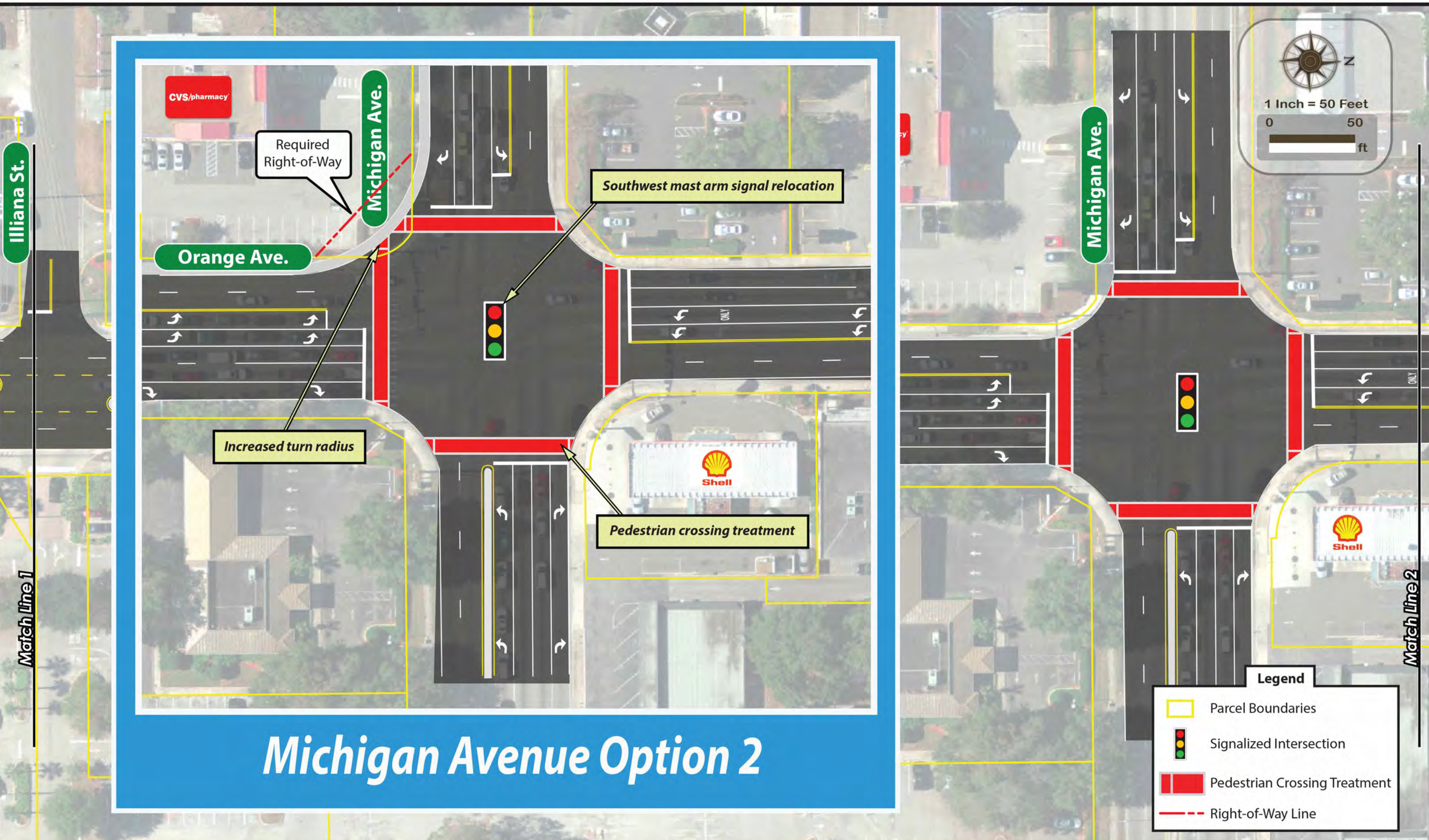


- Bus Bays/Pullouts – Currently, all transit stop locations on Orange Avenue utilize the through traffic lanes to allow passengers to board and alight. With the frequency of the stop locations and headway time between routes, this causes some significant delays for through traffic. Where appropriate, bus bays/pullouts are implemented in right turn lanes or created by the proposed curb extensions.
- BAT (Business Access and Transit – lanes shared by busses traveling through an intersection and vehicles turning right at the intersection or into business driveways) lanes at select intersections – One south bound dedicated bus queue jump lane is proposed at the Orange Avenue/Kaley Avenue intersection by utilizing the right turn lane.

The recommended improvements are shown in Figures 7 – 19.

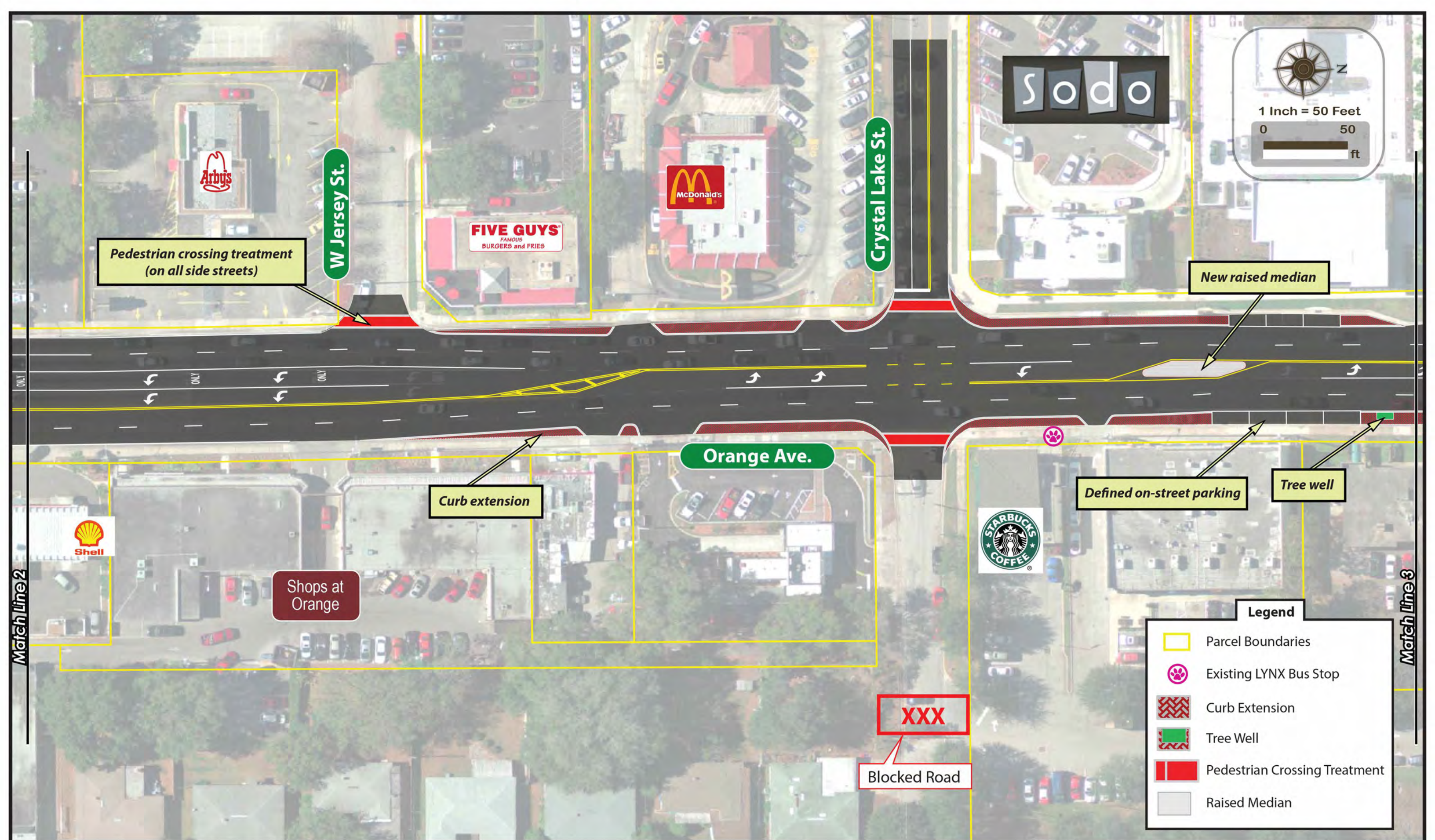






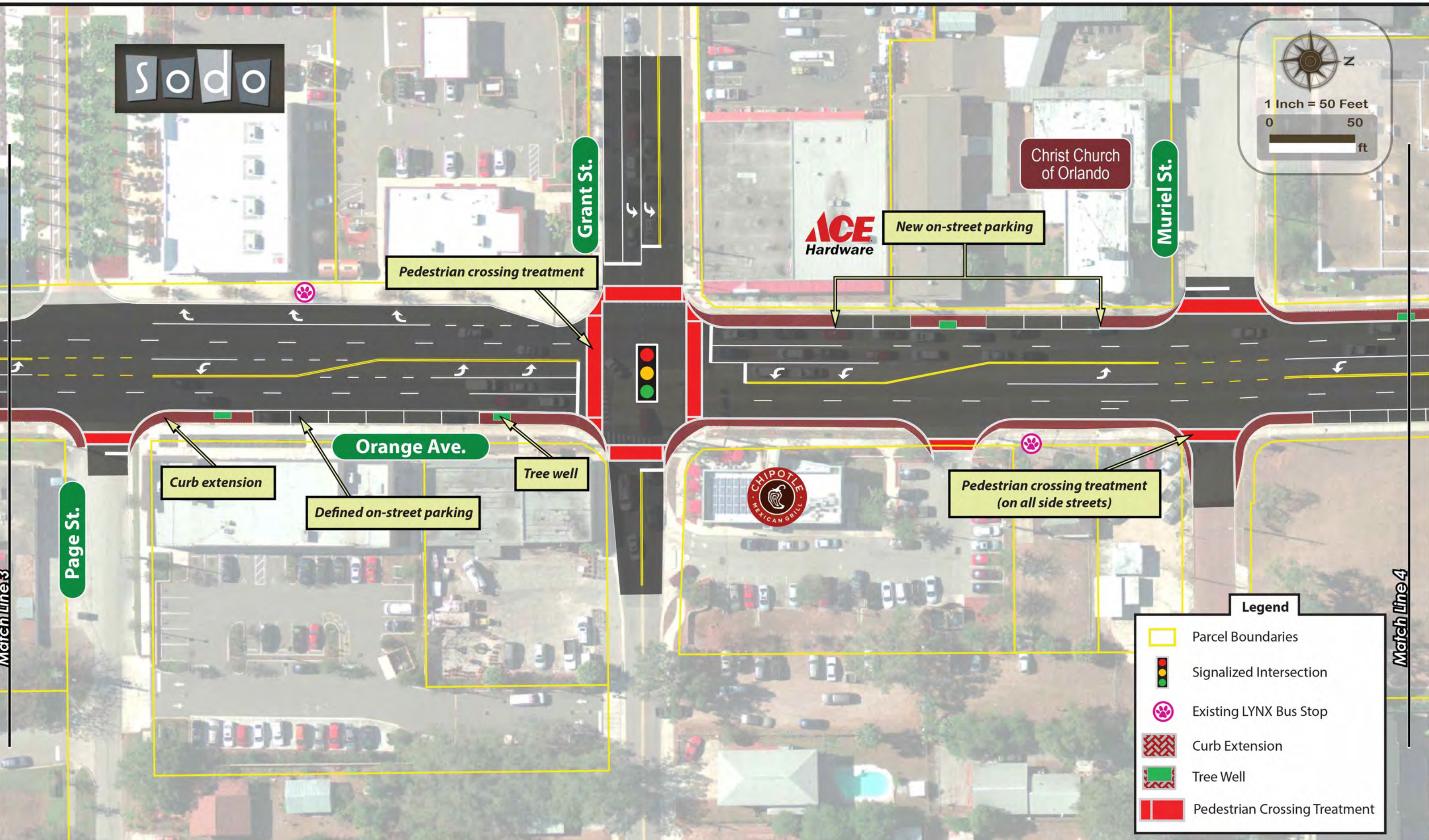
Michigan Avenue Option 2







1 Inch = 50 Feet
0 50 ft



Match Line 3

Match Line 4

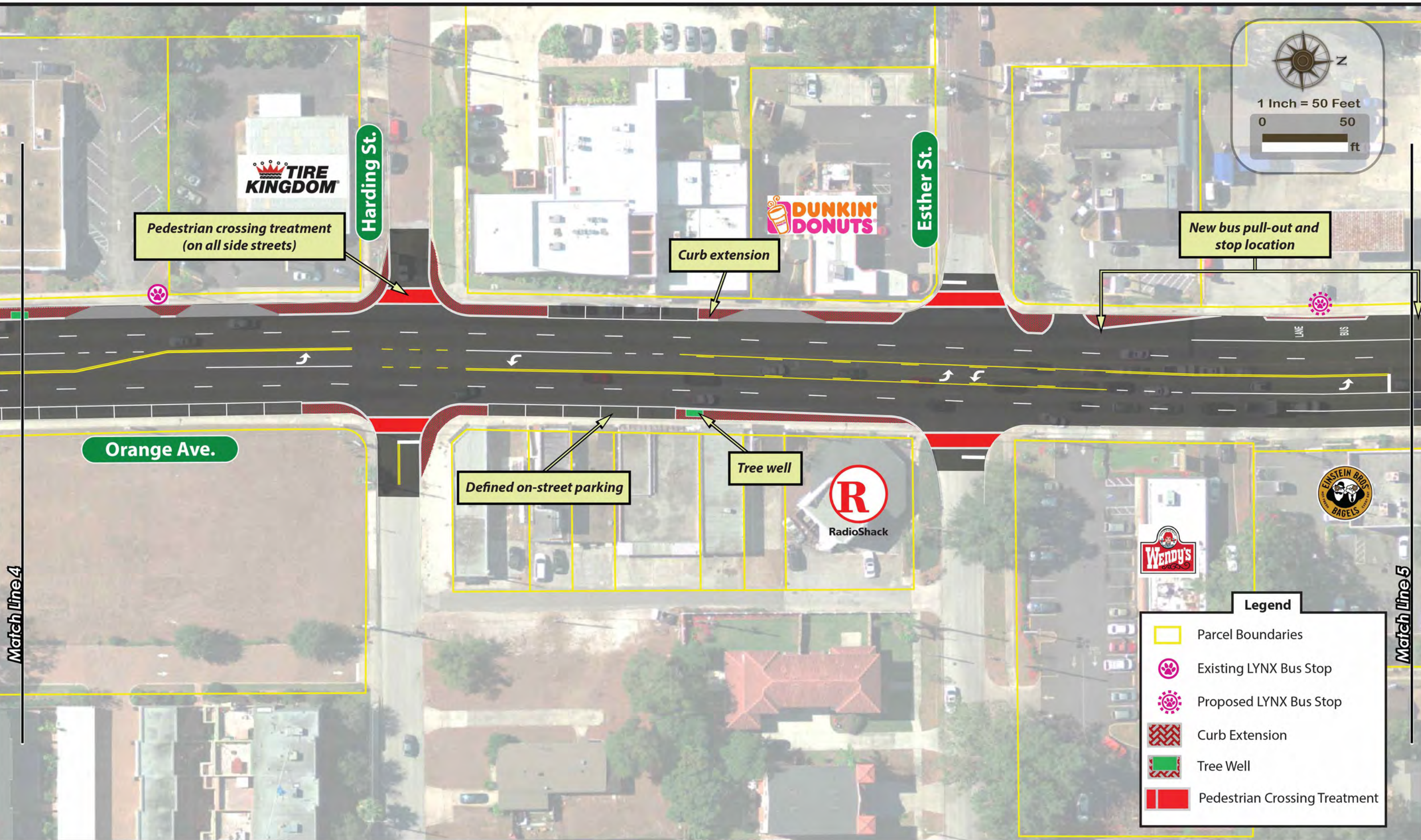


Recommended Alternative - Page St. to Muriel St.

Orange Avenue Corridor Planning Study - Pineloch Ave. to Anderson St.



Figure 11



Legend	
	Parcel Boundaries
	Existing LYNX Bus Stop
	Proposed LYNX Bus Stop
	Curb Extension
	Tree Well
	Pedestrian Crossing Treatment

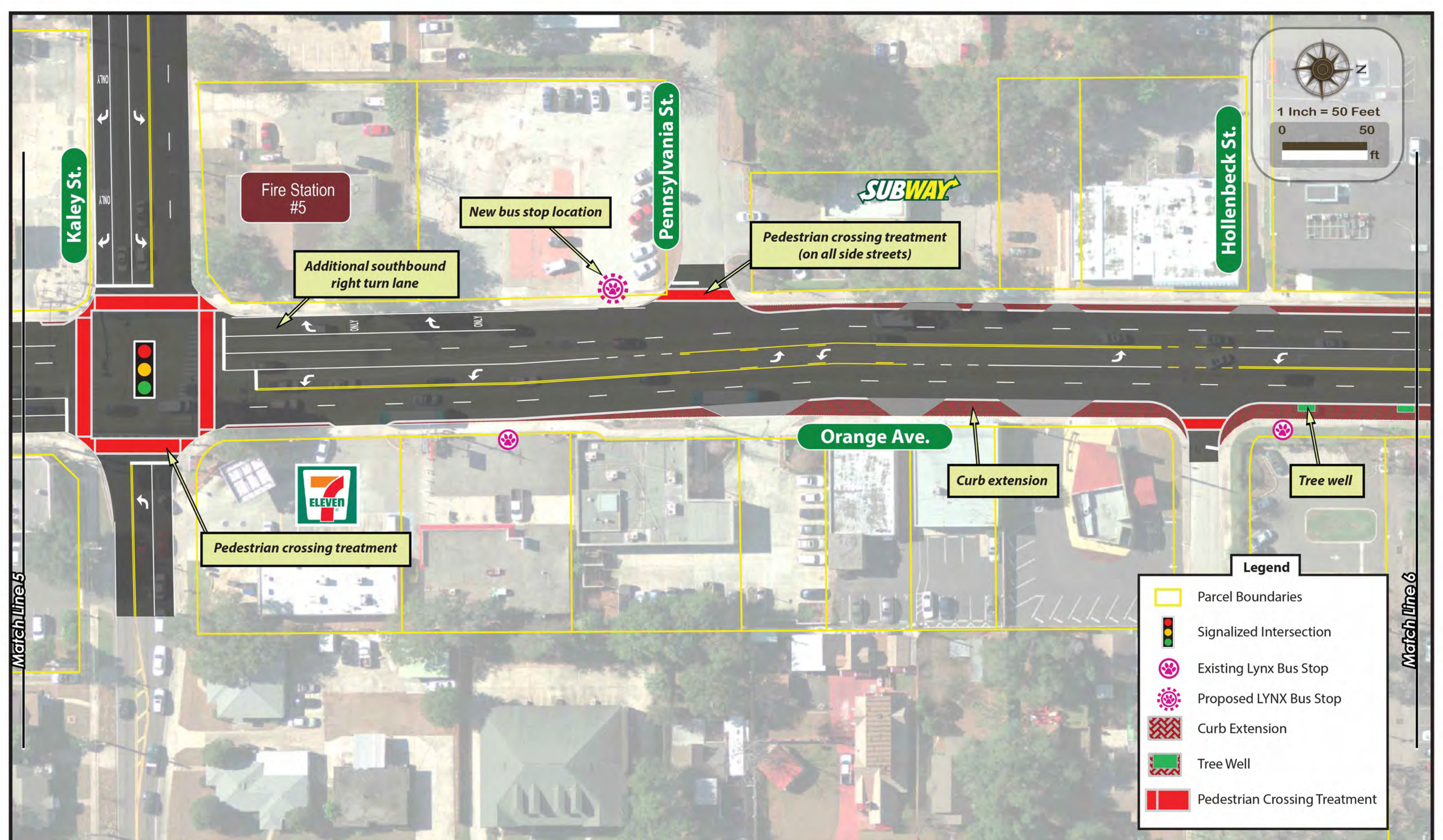


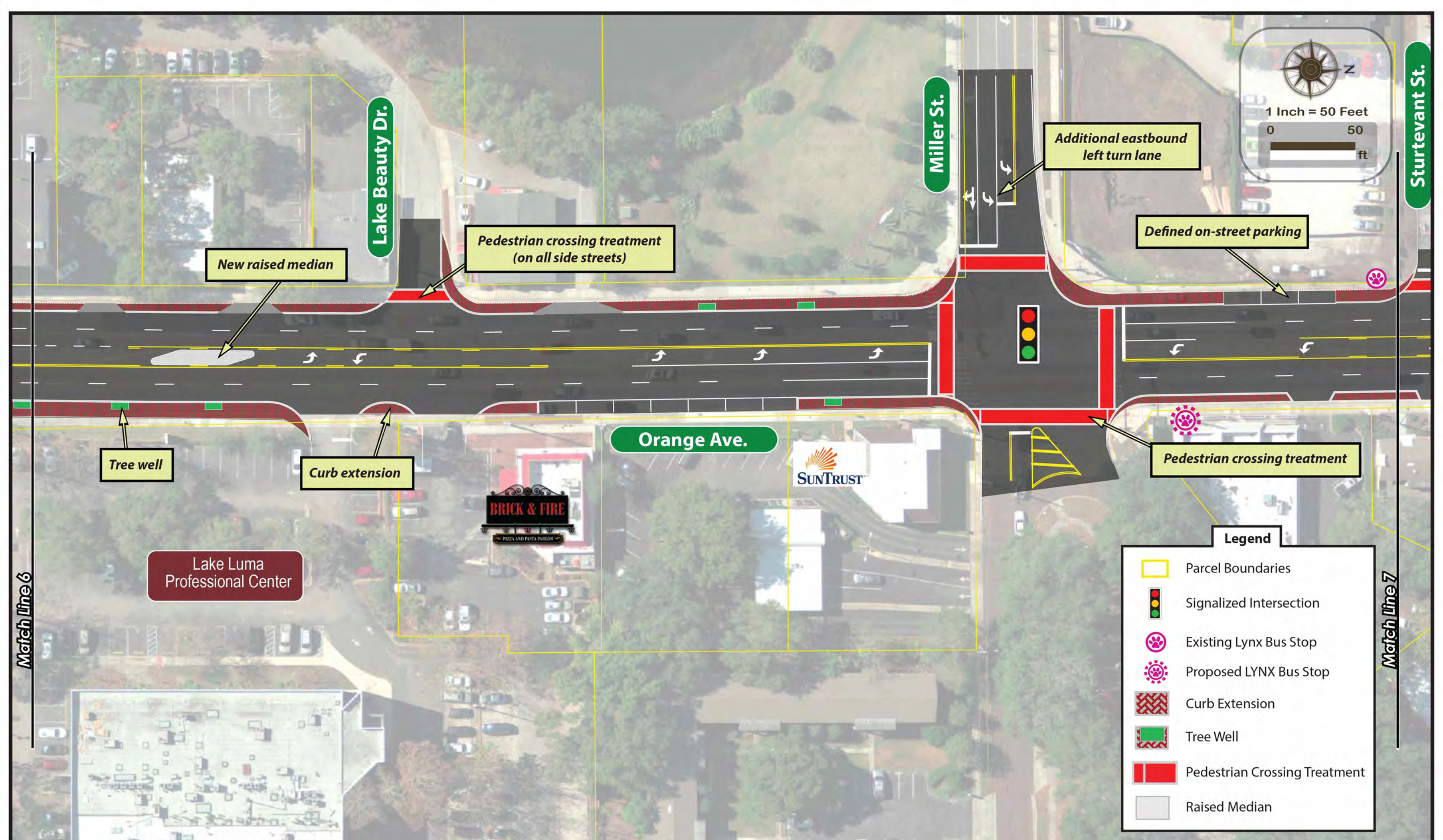
Recommended Alternative - Harding St. to Esther St.

Orange Avenue Corridor Planning Study - Pineloch Ave. to Anderson St.



Figure 12





Match Line 6

Match Line 7

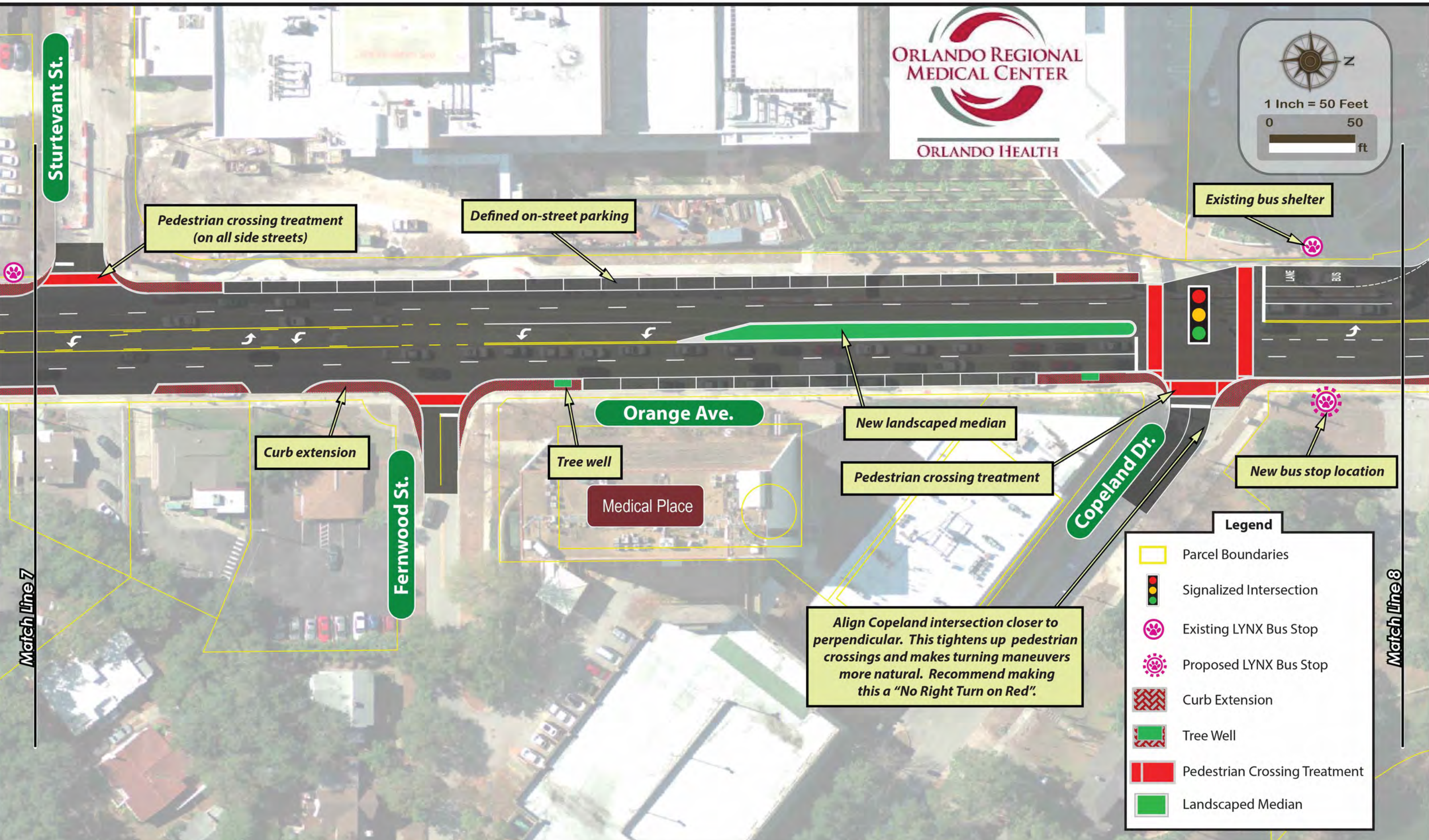
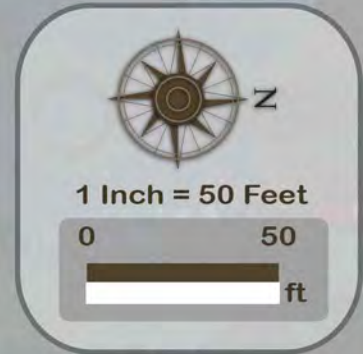


Recommended Alternative - Lake Beauty Dr. to Sturtevant St.

Orange Avenue Corridor Planning Study - Pineloch Ave. to Anderson St.



Figure 14



Pedestrian crossing treatment
(on all side streets)

Defined on-street parking

Existing bus shelter

Curb extension

Tree well

Medical Place

New landscaped median

Pedestrian crossing treatment

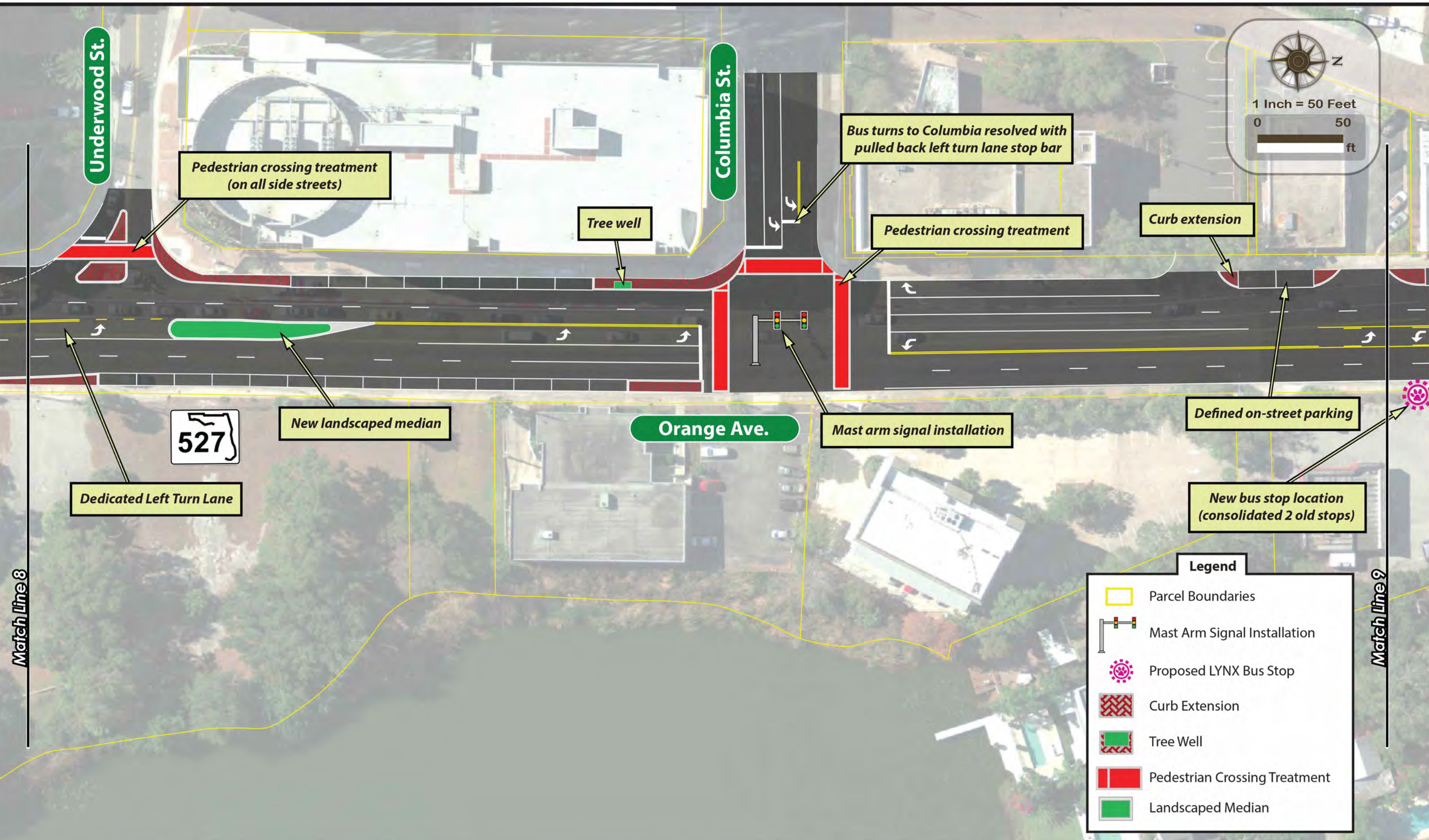
New bus stop location

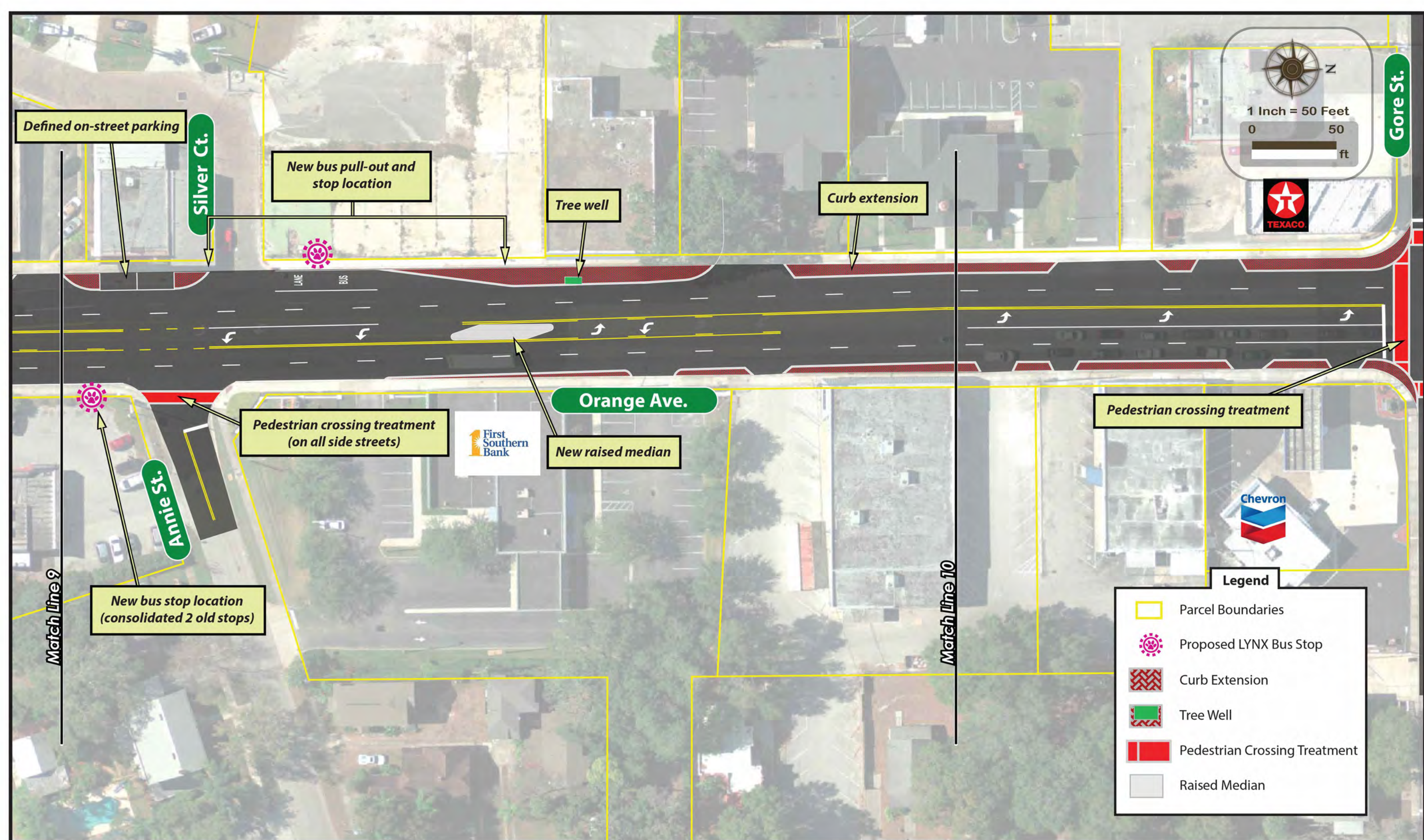
Align Copeland intersection closer to perpendicular. This tightens up pedestrian crossings and makes turning maneuvers more natural. Recommend making this a "No Right Turn on Red".

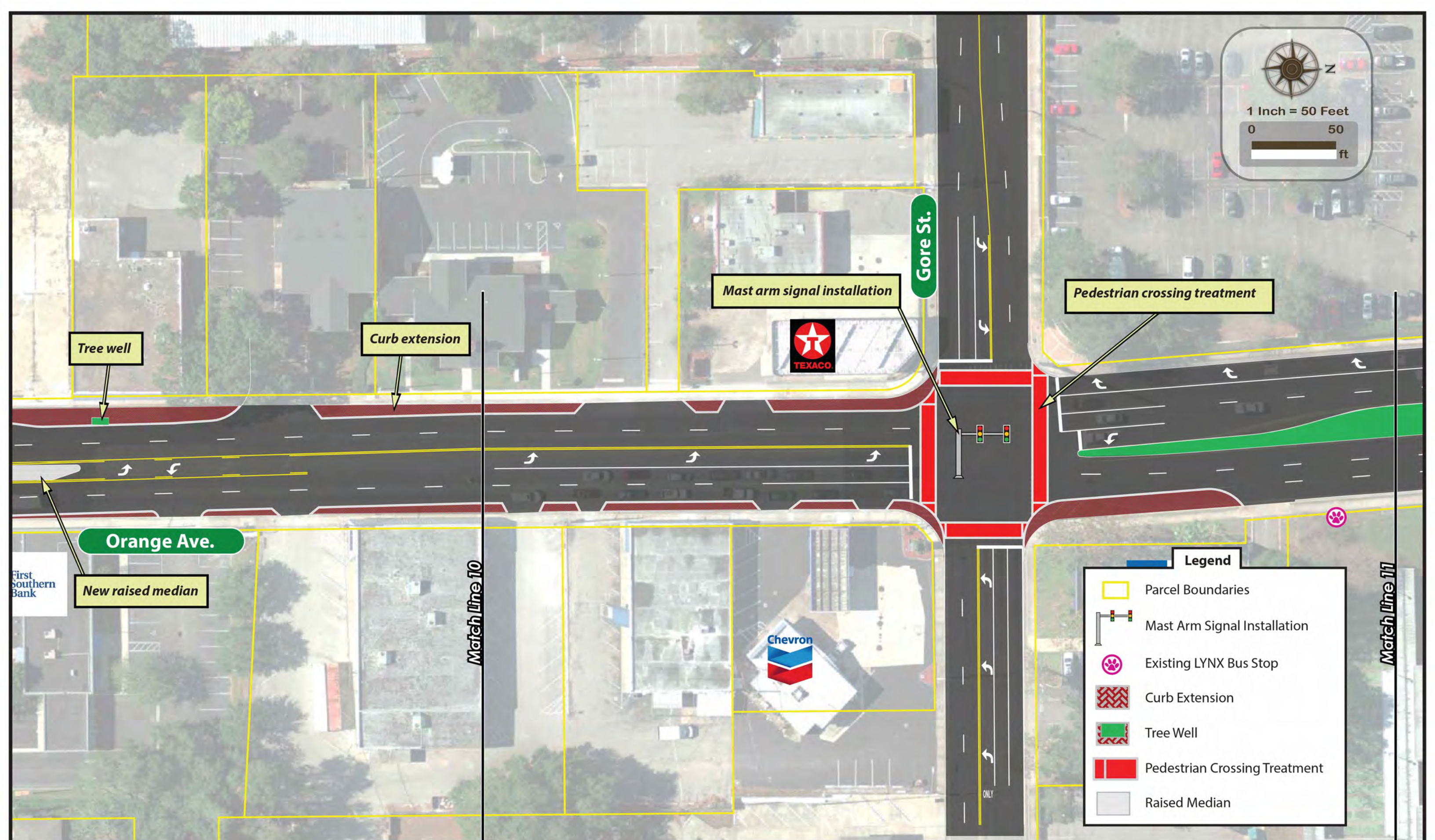
Legend

- Parcel Boundaries
- Signalized Intersection
- Existing LYNX Bus Stop
- Proposed LYNX Bus Stop
- Curb Extension
- Tree Well
- Pedestrian Crossing Treatment
- Landscaped Median









Legend	
	Parcel Boundaries
	Mast Arm Signal Installation
	Existing LYNX Bus Stop
	Curb Extension
	Tree Well
	Pedestrian Crossing Treatment
	Raised Median

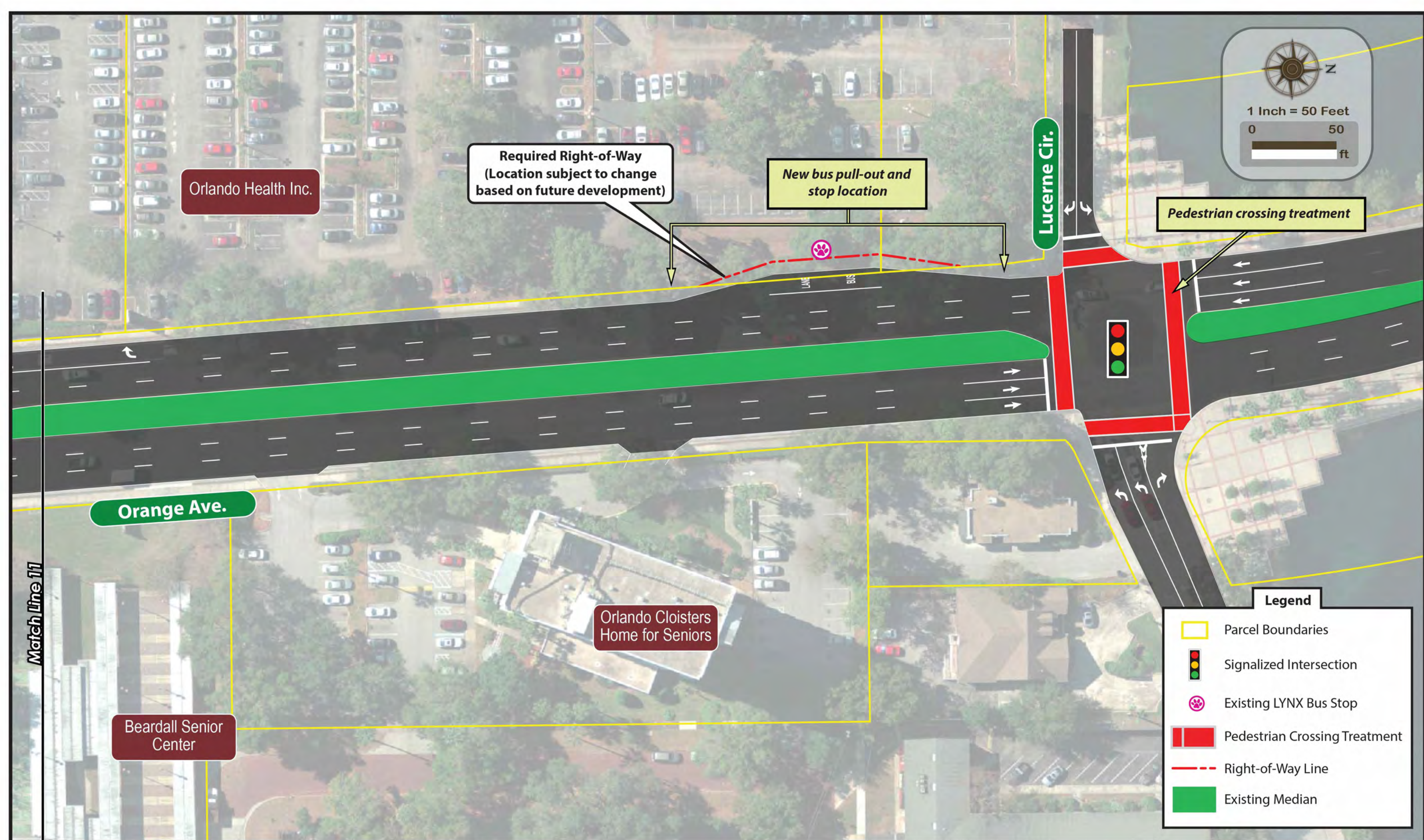


Recommended Alternative - Gore St.

Orange Avenue Corridor Planning Study - Pineloch Ave. to Anderson St.



Figure 18



6.2 Utility and Right-of-Way Impacts

The only utility and right-of-way impacts anticipated for the recommended alternative are at the two proposed spot improvements, a turning radius modification at the Orange Avenue/Michigan Avenue intersection (Figure 20) and a proposed south bound bus bay between Lucerne Circle and Gore Street (Figure 21). The estimated right-of-way to be acquired for the turning radius modification and the new bus bay are presented in Table 6. Right-of-way estimates were prepared by the FDOT District Five Right-of-Way Office for the property acquisition for these spot improvements.



Figure 20 – Right-of-way requirements for the Orange Avenue/Michigan Avenue Intersection

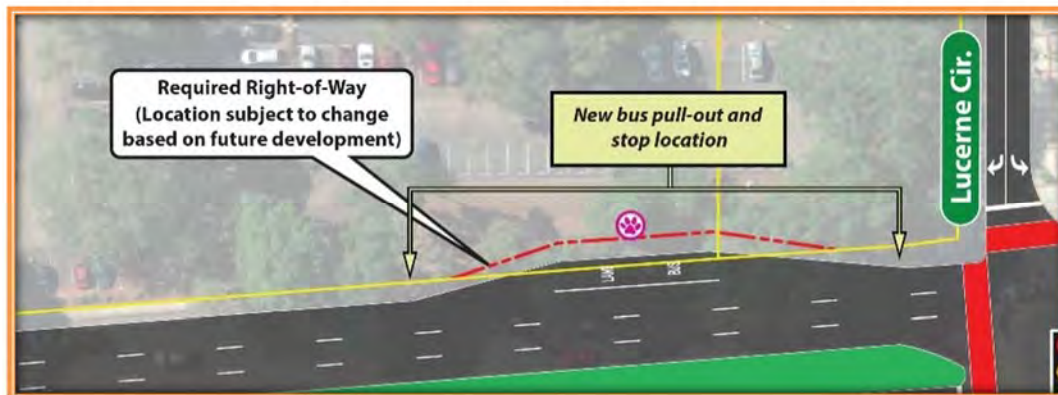


Figure 21 – Right-of-way requirements for the Lucerne Circle Bus Bay

A Sunshine One Ticket was created to locate utilities existing within the study area, and the facility owners were contacted to provide location and approximate cost information on the facilities. More research will be required to determine the exact location of any existing facilities on the southeast corner of the Orange Avenue/Michigan Avenue intersection due to lack of response to requests for information.

6.3 Cost Estimates

Cost estimates associated with the recommended alternative were developed using the FDOT Long Range Estimates (LRE) System. The estimated construction cost for the recommended alternative is \$2.8 million. The LRE report is included in Appendix D. Elements of the recommended alternative cost estimate include:

- Complete mill & resurface
- New sidewalk
- Additional curb and gutter for all curb extensions
- Drainage costs associated with all curb extensions
- Two signal upgrades to mast arm
- Stamped crosswalks
- Additional medians and pedestrian refuges

The final design component includes all of the elements required to develop a set of contract design plans, permits and bid documents to be utilized by a contractor to construct the recommended improvements. Design costs are initially estimated at approximately 25% of the construction cost, however, a detailed design scope of work and associated anticipated design fee is currently being developed by the FDOT.

Right-of-way acquisition cost estimates were prepared for the two locations indicated. The total anticipated right-of-way cost is \$2.23 for 925 and 2,180 square feet for the Lucerne Circle Bus Bay and Michigan Avenue Intersection Improvement, respectively.

Other cost components that have been included in this estimate are construction engineering & inspection and a contingency calculated as 8% and 20%, respectively, of the construction cost. The total planning level cost estimate for the recommended alternative is approximately \$6.51 million. Table 6 presents the cost estimate by component.

Table 6 – Planning Level Cost Estimates

Cost Component	Cost
Final Design	\$700,000
Right-of-Way Acquisition	\$2,230,000
Construction	\$2,800,000
Contingency	\$560,000
Construction Engineering & Inspection	\$220,000
Total Cost	\$6,510,000

Orange Avenue

CORRIDOR PLANNING STUDY



Chapter 7

Working Toward the Corridor Vision & Next Steps

7 WORKING TOWARD THE CORRIDOR VISION & NEXT STEPS

The implementation plan is intended to outline the process and actions that will aid in the development and transportation planning decisions to achieve the corridor vision. This is intended to identify tasks, processes and agreements necessary to advance the proposed improvement projects. Elements of the recommended alternative can be accomplished as spot improvements and are discussed in Section 7.1 below; however the ultimate improvement concept is proposed to be completed as a single project.

7.1 Potential Spot Improvements

Intersection improvement strategies proposed by the recommended alternative have the potential to be implemented independently of the entire corridor improvement recommendation. These include the following:

- The Orange Avenue/Pineloch Avenue intersection – Additional eastbound left turn lane and modifications to the southbound stop bar location to accommodate for the reduced turning radius. This spot improvement will not require any additional right-of-way or utility relocation, only milling and resurfacing.
- The Orange Avenue/Michigan Avenue intersection – Modification of the southeast curb radius to accommodate eastbound right turning heavy trucks. This potential improvement will require the purchase of right-of-way on the southwest corner of the intersection, and the relocation of multiple utilities. It may be beneficial to procure the right-of-way needed in order to move this improvement into the design phase when funds become available.
- The Orange Avenue/Miller Street intersection – Additional eastbound left turn lane and modifications to the southbound stop bar location to accommodate for the reduced turning radius. This spot improvement will not require any additional right-of-way or utility relocation, only milling and resurfacing.

Spot improvement strategies may be implemented based on available funding or as a part of localized improvements associated with redeveloped properties. Improvements constructed within the portion of the study area that are in FDOT jurisdiction (south of Gore Street) will require a Local Funding Agreement (LFA) or a Joint Participation Agreement (JPA) depending on the nature of the funding. Certain improvements, such as landscaping, streetscaping, decorative pavement, etc., constructed within the FDOT jurisdiction may also require that a maintenance agreement be secured.

7.2 Ultimate Improvements - Next Steps

The infrastructure improvements included in the recommended ultimate alternative include substantial restriping of the pavement throughout the project area to establish lane-width consistency as well as for the curb line, parking, turn lane, and intersection reconfigurations. Comprehensive restriping of the corridor requires milling and resurfacing for all road pavements within the project limits. The project also includes aesthetic improvements such as landscaping and streetscaping. The City of Orlando has indicated that there is some potential funding from the Neighborhood Improvement District (NID) that may be committed to

constructing the ultimate alternative and the City has notified the FDOT that they are willing to contribute funds if the project is programmed. A Joint Participation Agreement (JPA) between the City of Orlando and the FDOT may be required.

Certain elements of the recommended improvements, such as the bus pull-out south of Lucerne Avenue, require additional right-of-way. The City of Orlando will continue coordination with property owners as redevelopment occurs to secure right-of-way for improvements. Additional sidewalk widening and landscape/streetscape enhancements may be accomplished with the cooperation of property owners as parcels are redeveloped.

A detailed scope of services is being prepared by the FDOT for the ultimate improvements, from which a refined design cost is to be developed. As the funding for the design phase and the construction phase for this project is programmed, additional coordination will be required to ensure that all potential improvements are included and that the required right-of-way is in place at the time of construction. All commitments for project funding, administration and maintenance for both the City and the State portions of the roadway must be established in a LFA or JPA.

Orange Avenue

CORRIDOR PLANNING STUDY



Appendix A

Comments and Coordination

MEMORANDUM OF MEETING

Meeting Date: February 21, 2013 (Thursday) **DRMP Project #:** 09-0840.007

Project: Orange Avenue Corridor Planning Study

Subject: Agency Kick-off Meeting

Meeting Location: City Hall, Orlando

Attendees: See attached sign in sheet

Reported By: Melissa Gross, Greg Moore, Lisa Lanman, and Russell Strimple – DRMP

Distributed On: August 1, 2014

A summary of the discussion conducted at the above referenced meeting is provided below. This memorandum reflects the author's account of meeting events and is intended for project team purposes only. Any questions, revisions or additions should be directed to the author within five (5) business days of receipt.

DISCUSSION ITEMS

Overview of Relevant Previous Studies

- DRMP staff provided an overview of previously conducted Planning studies, Orange/Michigan Vision Plan, Downtown South Vision Plan, Orlando Health Plan, and South LYMMO AA Report. This included a brief explanation on DRMP's impression of the relevant aspects of each study to the Orange Ave CPS.

Discussion and Feedback from Agency Members

- It was discussed that Amtrak may not be considered a stakeholder for the purposes of the study
- Jason Burton suggested we attend the upcoming Downtown South NID and Downtown South Board Meetings
- An ongoing improvement project was discussed, this would involve the segment of Division Street from Michigan Street to Gore Street, this is going to Design/Build.

Stakeholder Contacts suggested by city staff:

- ORMC – Carl Hodges and Pete Sechler and Todd Summer (AECOM), Bill Hindin, Linda Chaplin
- Wadeview Park Neighborhood Association – Standing meeting w/city, Mark James
- Southern Oaks Homeowners Association – Kristi Camera
- Lake Copeland Neighborhood Association – DT South Mainstreet

- Lake Holden Property Owners Association – Dianna McGreson
- Lake Cherokee Neighborhood Association/Lake Cherokee Condo Association – Richard Hippo

Next Steps / Action Items

- It was agreed that a bus tour of the study area should be conducted with Lynx, city staff, DRMP staff, and FDOT staff. The target date for this was late March / early April; DRMP will coordinate and schedule the half-day tour.
- DRMP will coordinate with Jason Burton to get on the March 13th South Downtown NID meeting and the March 14th South Downtown Board meeting agendas.
- DRMP will research the details of the Division Street improvement project and how it relates to the Orange Avenue CPS
- The Draft Public Involvement Plan has been completed and was distributed to attendees for review/comment
- The Existing Conditions Summary is under development and will be submitted in early to mid March

Downtown South NID Advisory Meeting

Orange Avenue Corridor Planning Study From Pineloch Avenue to Anderson Street



Date: March 13, 2013

At: Orlando City Hall, 2nd Floor Veterans Conference Room
9:00 AM – 10:00 AM

1. **DSNID Meeting Business** – There was a discussion about the final draft of the Safe Neighborhood Improvement Plan being prepared by VHB Miller Sellen. A copy of the draft will be requested from the City.
2. **DRMP Introductions and Presentation** – Greg Moore (DRMP) presented a brief presentation to introduce the study, where there study area is, the purpose of the study, and some of the goals of the Study. An open discussion or Q/A session followed and the Board members comments and questions are paraphrased in the order they occurred below.
3. **Feedback and Discussion Topics**
 - a. Speed was expressed as something to be considered for future planning. The desire seems to be for lower posted speeds that are consistent throughout the corridor to be more compatible with bicycle/pedestrian activity and a more “walkable” environment that is consistent with other planning efforts.
 - b. The topic of traffic calming was presented as a desire to reduce the speeds on Orange Ave.
 - c. Interest was shown in developing a realistic implementation plan.
 - d. Interest in how the FDOT’s study will consider SunRail and the expansion of existing transit service / Lynx plans for Lymmo expansion into this corridor.
 - e. The FDOT’s initiatives regarding the Statewide Intermodal System (SIS) were explained in context of the potential opportunities for state funding of projects along the SIS connector roadways that include Columbia Street, and portions of Sligh Avenue, and Division Street.

-
- f. The desire of the committee is that this study will help provide a guideline for review of future development in the area, and help set the state for streamlining the implementation / approval process through FDOT for future projects for which funding can be identified.

Downtown South Board Meeting Summary

Orange Avenue Corridor Planning Study

From Pineloch Avenue to Anderson Street



Date: March 14, 2013

At: Old Florida National Bank Building 918 S. Orange Ave, Orlando, 32806; 2nd Floor Board Room

5:00 PM – 6:30 PM

1. Downtown South Board Business

2. **DRMP Introductions and Presentation** – Greg Moore (DRMP) presented a brief presentation to introduce the study, where there study area is, the purpose of the study, and some of the goals of the Study. An open discussion or Q/A session followed and the Board members comments and questions are paraphrased in the order they occurred below.

3. Feedback and Discussion Topics

- a. Orlando Brewery Owner asked if Atlanta Ave was a SIS facility. With assistance from City staff, Mr. Moore provided clarification of which streets were part of the SIS (Columbia from Orange to Sligh, Sligh in vicinity of the Amtrak / SunRail station, and a portion of Division Street.
- b. A discussion was held involving the purpose of the Corridor Planning Study and its primary objectives.
- c. Will the study consider the Orange/Michigan Plan of a “park once” Main Street district in regards to sidewalks?
 - Would this involve larger sidewalks?
 - Sidewalks being further from the street?
 - Providing a buffer between the street and sidewalk?
- d. Is more on street parking or smaller lanes to accommodate wider sidewalks being considered?
- e. An interest was shown in placing more of the existing utilities underground if possible as part of the overall plan.
- f. Existing drainage issues were mentioned with specific reference to the “Orange Ave Dip”. Mr. Moore indicated that this consideration would be

- part of the study and that additional follow-up would be conducted with FDOT regarding the status of any planned/programmed projects that may be slated to address localized issues.
- g. Will this study/plan include streetscaping plans? The CPS can facilitate the communication and coordination regarding this issue, and evaluate the potential for these and other aesthetic elements to be incorporated as part of the overall Corridor Management Plan. It is understood that the Department does not fund such amenities, but that a framework could be developed to help streamline future approvals to help facilitate the implementation of “pre-approved” concepts that meet the Department’s criteria with respect to preservation of sight-distance and other safety and operational considerations.
 - h. It was expressed that an important goal of the DS Board is to beautify the corridor as well.
 - i. How does this move forward from here?
 - j. Is the purpose of the plan to incorporate more parking, lanes of traffic, or more sidewalks?
 - k. What is FDOT trying to achieve, what is their ultimate goal?
 - l. Is FDOT trying to become more urban friendly?
 - m. Compared with what happened in College Park on Edgewater, will Orange Ave’s jurisdiction be turned over to the City?
 - n. Time the Lights!!! (Expressed dissatisfaction with the signal timing) It was noted that this corridor was retimed as recently as mid last year and that specific issues should be communicated to the study team for consideration and further coordination with the City and FDOT as needed to formulate a plan of action for addressing specific concerns.
 - o. Is there another corridor that will be used as a reference or model for this one? It was explained that every corridor is unique, but that project history and examples of what has worked and not worked in other locations will also be taken into consideration.
 - p. Are medians practical on Orange Ave? Some favorable opinion was expressed that they could provide pedestrian safety, and aesthetic value.
 - q. As a result of the study, will there be a master plan and cost estimate? The ultimate goal of the CPS is a *Corridor Management Plan* that will include these elements, and provide the building blocks for future improvements to be developed, likely in stages with immediate-term, near-term, and longer term elements.
 - r. The point was brought up that the corridor is a boundary of the Main Street district and the goal isn’t just to get people through the area but to bring them to the area as a destination.
 - s. Interest in traffic calming measure to reduce speeds in the corridor.

-
- t. The board believes that slower speeds are beneficial for their businesses and walkability of the area.
 - u. How will a standard typical section on the entire street effect the existing roadway? Will lanes be reduced or right of way purchased?
 - v. What is FDOT's motivation for this study now?
 - w. Would there be any reason for the SD Board to be protective? Example was giving of keeping their banners displayed.
 - x. Has a BRT route been considered?
 - y. Jason Burton expressed that the Orange Avenue Corridor is the #1 priority on the City's improvement list and #3 for the region.
 - z. Is Division being considered and alternative to alleviate Orange Ave traffic?
 - aa. Strong opinion against widening Orange.
 - bb. Asked about the cause of delays experienced north of Gore traveling NB and if it was related to the very wide right lane.
 - cc. Signal timing was brought up again as being dissatisfactory.
- 4. Board members were invited to participate in the Project Visioning Team. Cards were collected from those who showed an interest and a list of those individuals is attached.**

Data Collection Needs

MAPPING AND GIS DATA:

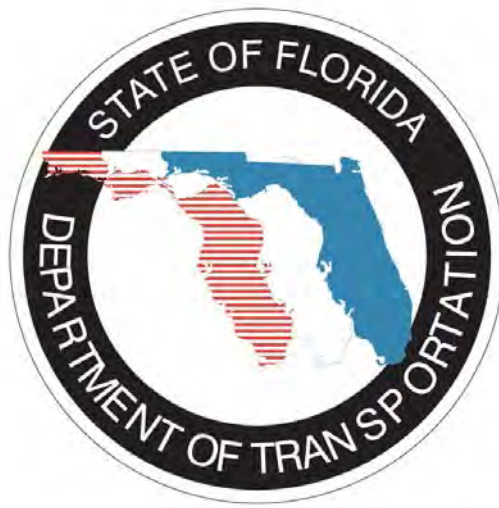
- Parcel level existing land use (including tax data information) - Collected
- Future land use & Zoning – GIS
- Roadways (including functional class/speed limits/number of lanes) - Collected
- FDOT and/or City R/W Maps
- Bicycle and pedestrian facilities (existing and proposed) - Collected
- City and county boundaries - Collected
- Planned and Programmed transportation projects: FDOT, Local, County
- Aerial Photography (Currently showing 2012)
- PUDs and DRIs within proximity of the study area
- Existing and proposed transit routes and stops - Collected
- Schools, parks, community centers - Collected

OTHER DATA:

- Traffic data available for Orange Ave/Anderson St intersections
- Crash data for Orange Ave between Gore St and Anderson St

Stakeholder List

1. City of Orlando
2. Orlando Regional Medical Center
3. LYNX
4. FDOT
5. MetroPlan Orlando
6. Downtown South Neighborhood Improvement District Advisory Council
7. Downtown South Committees
 - Design
 - Economic Restructuring
 - Organization
 - Promotions
8. Amtrak
9. SunRail
10. Neighborhood Associations
 - Wadeview Park Neighborhood Association
 - Southern Oaks Homeowners Association
 - Lake Copeland Neighborhood Association
 - Lake Holden Property Owners Association
 - Lake Cherokee Neighborhood Association Lake Cherokee Condo Association
 - Copeland Oaks Condominium Association



Orange Avenue Visioning Team Bus Tour Summary

Date/Time: April 13, 2013; 8:30 AM – 12:30 PM

Purpose: Orange Avenue Bus Tour and Stakeholder Interview

Attendees: Heather Garcia – FDOT, Richard Nasrawy – FDOT, Laura Minns – LYNX, David Ausherman – Orange County, Myra Monreal – City of Orlando, Jason Burton – City of Orlando, Holly Stenger – City of Orlando, John Rhoades – City of Orlando, Lauren Martin – City of Orlando, Pauline Eaton – City of Orlando, Jeremy Crowe – City of Orlando, Mary Hurley – Pineloch Property Management, John Cheek – Orlando Brewing/Downtown South, Holly Vanture – Downtown South, Greg Moore – DRMP, Lisa Lanman - DRMP, Russell Strimple – DRMP, Melissa Gross - DRMP

In conjunction with the Orange Avenue Corridor Planning and Project Development Study, the Florida Department of Transportation conducted a Bus Tour of the study area with the Orange Avenue Project Visioning Team. The purpose of this was to better understand the existing conditions and true nature of the corridor, to interact on issues related to past and future planning within the roadway corridor, and to collaborate on the central issues surrounding corridor needs and the future visioning and for the corridor improvement.

Tour Agenda

Met at 200 Orange Ave/SunTrust Plaza and took the LYNX 7

Tour Segment 1 – The Visioning Team rode LYNX 7 from SunTrust Plaza to the bus stop south of Gore Street. Ridership was observed to be strong coming out of Downtown and several members of the group stood for this first riding segment.

Walking Segment 1 – The group exited the bus at Old Florida National Bank south of Gore Street and walked to ORMC to observe an area south of Gore Street that is typically congested and the location of the “Orange Ave Dip.” Heather Garcia of FDOT indicated that a project to provide a profile improvement to address the “dip” is in design currently and will be let for construction in May 2013. A group discussion was held regarding the existing sidewalks, typical section of Orange Ave, and on-street parking in the segment of roadway.

Tour Segment 2 - The Visioning Team boarded the LYNX 11 bus at the ORMC stop and exited again at the stop between Kaley Avenue and Grant Street. Ridership was again observed to be strong on this link.

Walking Segment 2 – After a brief coffee break at Dunkin Donuts, the team discussed the existing parking and typical section of this segment. It was noted that as part of the Visioning Plan for Downtown South, some desire was expressed for introducing a median to better-manage access within this section in particular. Bulb-outs at select cross street locations were also discussed as a way to narrow the width of the outside travel lane and reduce speeds.

A stop was made at Muriel Street to discuss the location of two fatalities that have occurred at this location over the last five years. The group continued on to the Chipotle Restaurant where more discussion was held about different setbacks and existing streetscapes implemented by newer development in the area. Discussion was held on the placement of sidewalks and planter strips, and the associated permitting/maintenance responsibility challenges that are involved.

The tour continued down Orange Avenue with stops at the Starbucks and SODO to discuss various design elements and roadway typical sections. City staff noted that the five foot tree wells and expanded sidewalk in front of Banco Popular and T-Mobile is located off the FDOT right-of-way in an easement. Just south of this location where the sidewalk is on FDOT right-of-way, there is a grassed separation between the curb and sidewalk due to permitting challenges. As a result there is an inconsistent look throughout this part of the corridor. It was also noted that the Downtown South organization has banners with local business sponsors on many of the light fixtures along Orange Avenue.

The team crossed Michigan Avenue to observe pedestrian conditions at the intersection before continuing south to Pinloch Avenue. The setback and typical section was discussed in regards to the east side of Orange Avenue between Michigan Avenue and Pinloch Avenue where the sidewalk has the greatest setback in this area. The group crossed to the southwest corner of the Orange Avenue/Pinloch intersection to the future Wawa Gas Station site. A discussion of the effects to Pinloch Avenue and the location of the Orange Avenue access was discussed.

The group then observed the streetscaping and sidewalk layout at the new Applebee's restaurant in the Southside Shopping Plaza.

The tour was concluded at Peach Valley Café, where the team held discussions on observations of the day and filled out individual Orange Avenue Poll Questionnaires. Group discussions and the Poll Questionnaire results are summarized below.

Walking Segment Discussion Notes:

- *Laura Minns from Lynx: LYMMO ridership on Orange Avenue. 50% of ridership along whole corridor goes to study? LYMMO alternatives analysis - FTA new starts program funding requires 50% of the BRT route to be in dedicated lanes. Anticipate 10k riders a day with projections at 11k riders. From Magnolia south to Columbia. Hospital to hospital connection is paramount.*
- *Jeremy Crowe: (City of Orlando) Lake Copeland. Drainage concerns once widening or adding in LYNX/ LYMMO service. Asked him to make note of big concerns. Look for key points in questionnaire.*
- *Holly Vanture (program manager, Downtown South): tire kingdom curb drop off. Concerns about falling off curb into traffic. Fix! 3x3 planter on sidewalk. In front of Bank United there is new 8 ft sidewalk. Is there room for planter?*
- *Concerns and comments are right along with plans.*

- *John Creek, Orlando Brewing: parking is always an issue.*
- *The Dunkin Donuts Drive thru exit is observed as dangerous, no sight distance.*
- *Speculation over the cause of the two fatalities at Muriel Street, possible mid-block crossing to residential neighborhood? Jeremy Crowe pointed out the signal spacing on Orange Avenue in this segment is standard 1/4 mile.*
- *Mary: Orange Avenue Applebee's. Where we are standing used to be a drive isle in parking lot. They did planter and flipped through isle so that there was no loss of parking spots.*
- *Once Wawa is built intersection Pineloch / Orange will fail. Concerns for over capacity. Orange and McCoy as well.*
- *Jason (City of Orlando): freight consists of toll roads and highways in all of Orange County. Semi-trucks have hard time turning. Make Orange Avenue more freight friendly; make obvious to turn off Michigan. You can get freight dollars since it's in SIS.*
- *On and off corner to Michigan. Issue on how much freight is on Orange at that location.*
- *Chipotle issue: this site was one of first redevelopments of Orange Avenue. Having ample streets scape is to advantage of Chipotle but is only a site and not whole block of redevelopment so proved to be problematic.*
- *Elevation problem gets worse as you go south on Orange Avenue.*
- *If unable to acquire R/W easement is ok. As long as FDOT is first on ownership.*
- *Laura: Starbucks used to be a Wendy's. At Crystal Lake. 4 buses that come through every hour. Elevation gets eroded. Manager is very cooperative. Unable to put shelter due to minimum requirement of 8 feet.*

Orange Avenue Poll Questionnaire Results:

1. Please rank in order of importance 1 – 3, 1 being the highest priority, what you think are the most important goals for Orange Avenue: Decreased Congestion, Improved Safety, and Supporting Economic Development. Reported in number of polls listing the goals as priority #1, #2, and #3:
 - 6 – Improved Safety #1
 - 4 – Supporting Economic Development #1
 - 1 – Improved Streetscape #1
 - 3 – Improved Safety #2
 - 3 – Decreased Congestion #2
 - 3 – Supporting Economic Development #2
 - 1 – Calming Traffic
2. What do you see as the Key issue(s) on Orange?
 - Agency Developer Coordination
 - Reduce Speeds/Increase Capacity
 - Too narrow/small sidewalks, too many curb-cuts, utility conflicts

-
- *Uneven sidewalks*
 - *Trying to obtain consistency in the development process that involves coordination/communication between all interested parties (i.e. FDOT, County, City, Developers, NIDs, etc.)*
 - *Minimalistic pedestrian features and inconsistent sidewalk widths*
 - *No access management due to continuous left turn lane*
 - *Slowing traffic so businesses can be seen/noticed*
 - *Making the corridor seen more user friendly for businesses and restaurants*
Offering additional transportation options like LYMMO all the way to downtown
 - *Context sensitive improvements to support a more pedestrian environment that encourages ongoing redevelopment*
 - *Lack of sidewalk space/buffers for pedestrians*
 - *Dedicated bus lanes*
 - *Improvement to intersections*
 - *Uniformity in lane width*
 - *Road to be a re-designed to be “friendlier” to pedestrians*
 - *On-street parking*
 - *Cyclists*
 - *Keeping freight from traveling north of Michigan Avenue*
3. Check any desired elements of the roadway:
- *More On-Street Parking – 5*
 - *Less On-Street Parking – 0*
 - *Landscaping – 7*
 - *Mid-block crosswalks – 3*
 - *Bus-stop enhancements – 7*
 - *Raised medians – 3*
 - *Other: wider sidewalks, “sense of place”, enhanced intersections, public transit priority at signals, improved streetscape*
4. Who do you believe the main users of Orange Avenue are?
- *Freight - 4*
 - *Commuters - 7*
 - *Local Residents - 7*
 - *Transit users - 3*
 - *Business Patrons - 5*
 - *Emergency vehicles - 3*

-
- *Orlando Heath Campus patrons - 6*
 - *Pedestrian/Bicyclists - 4*
 - *Employment Centers (Southgate, SODO, Orlando Health, etc.) - 7*
 - *Other: NONE*
5. Additional Comments:
- *Enhance gateway elements*
 - *Coordinate with the stakeholders within the NID as to the desired elements for the District*
 - *Improve ADA accessibility*
 - *Don't forget about the planned BRT within the corridor*
 - *Please consider: context sensitive design, keep on-street parking, bulb-outs at intersections, street trees, outdoor seating, street furniture and outdoor seating, banners and area branding options*
 - *The selected cross section needs to strike a balance between vehicles, transit, pedestrians, local, and regional users*
 - *Maintain a consistent 4-lane with a median vehicle section with enhancements building onto that section*
 - *Examine options for re-use (such as shopping center drive lane)*

END OF SUMMARY

This summary was prepared by Melissa Gross and Greg Moore of DRMP, and are provided as a summary (not verbatim) for use by the project team. The comments do not reflect FDOT's concurrence. Please review and send comments, via e-mail: mgross@drmp.com so they can be finalized for the files.



Orange Avenue Stakeholder Workshop Summary

Orange Avenue Corridor Planning Study



Date/Time: May 1, 2013; 2:00 PM – 6:00 PM

Purpose: Orange Avenue Corridor Study Stakeholder Workshop

In conjunction with the Orange Avenue Corridor Planning and Project Development Study, the Florida Department of Transportation conducted a Stakeholder Workshop. Those in attendance from the study team were:

Greg Moore, DRMP
Melissa Gross, DRMP
Russell Strimple, DRMP

Heather Garcia, FDOT
Myra Monreal, City of Orlando

The purpose of the workshop was to gather input from stakeholders within the study area, to have interaction with the stakeholders on issues and opportunities within the roadway corridor, and to collaborate on the vision and surrounding corridor needs for the corridor improvement.

The workshop was divided into four individual sessions, each lasting 45 minutes beginning on the hour, with a 15 minute transition time between meetings. The agenda for each session was as follows:

1. **Introductions**
2. **Workshop Objectives** – An overview of the purpose of the workshop and the desired information to be collected was given
3. **Summary of Key Issues** – A summary of the key issues of the corridor as understood by FDOT and DRMP staff was presented.
 - a. Safety
 - b. Corridor Consistency
 - c. On-Street Parking
 - d. Traffic Congestion
 - e. Transit
 - f. Planning Efforts
 - g. Technical Aspects
 - h. Physical Constrains
 - i. Interagency Coordination/Collaboration

(A handout with these issues was provided to the participants for their input. Additional space was provided on the handout for them to provide additional information.)



4. **Corridor Needs/Guiding Principles** – Subsequent to discussion of the key issues and agreed upon, the corridor needs and guiding principles were discussed. Participants were asked to agree/disagree or provide additional comment in regards to the Guiding Principles developed by FDOT and DRMP staff as provided below.
- a. Enhance multi-modal mobility and access while accommodating regional traffic
 - b. Provide a functional transit element that serves a wide array of users.
 - c. Improve safety for all modes.
 - d. Provide consistency within the corridor.
 - e. Establish interagency support for a plan that allows for development and implementation of transportation solutions that leverage public and private investment and maximize return and minimize implementation timelines.

(These Guiding principles were included on the handout in table format and the Objectives and Measure of Success Columns where space is provided for participants to include any comments or concerns they may have.)

5. **Next Steps** – During each session, comments, suggestions, and concerns raised by the stakeholder participants were recorded to be included as part of the study.

Session 1 Attendees

Name	Organization	Email
Jason Burton	City of Orlando	jason.burton@cityoforlando.net
Alyson Bass	Old Florida National Bank	abass@oldfnb.com
Greg Morrison	Morrison Realty	gmorrison@morrisoncre.com
Stewart Boggs	LYNX	sboggs@golynx.com
Jon Toothman	Radio Shack	jtoothman@bellsouth.net
Pete Clarke	Orange County Commissioner District One	peter.clarke@ocfl.net
Kevin Behan	Commissioner Clarke's aid	kevin.behan@ocfl.net
Elliott Jamison	Lee & Associates	ejamison@lee-associates.com
Laura Minns	LYNX	lminns@golynx.com
Buck Miller	Velocity Films	buck@velocityfl.com



Session 1 Comments:

<p>Laura Minns</p>	<ul style="list-style-type: none"> • There is currently a locally preferred alternative on this corridor which goes around Market at Southside. • Commented that Orange Ave is a huge barrier for pedestrians as there are long delays at intersections and it is dangerous crossing the roadway. • Inquired if Orange Avenue is a freight corridor.
<p>Jim Ward</p>	<ul style="list-style-type: none"> • Really focusing on area between facets to curb or is it right of way to right of way? What is rough right of way? Answer: right of way to right of way and is 80 feet from Pinloch to Gore and 100 feet from Gore to Anderson • Asked if you could borrow from lane widths for streetscape elements? It could be an option depending on lane width.
<p>Commissioner Clarke:</p>	<ul style="list-style-type: none"> • What is the consideration for a pedestrian bridge over Orange Ave as a crossing when SunRail arrives? Answer: That kind of solution is further down the study process.
<p>Jon Toothman:</p>	<ul style="list-style-type: none"> • Have there been extensive studies done on the impact of bringing people to the area and are there any solutions from those studies? Answer: There have been a number of planning studies, including some work done by ORMC that focus on the future economic growth and the incorporation of the future SunRail stop.
<p>Jason Burton</p>	<ul style="list-style-type: none"> • The City doesn't view SunRail as traffic reliever, but rather as a method to support area development. • There is a Square Dance (aka known as a pedestrian scramble or diagonal crossing) at Lucerne Circle. The local residents were surveyed on their priorities for most corridors in regards to streetscape/pedestrian, transit, or infrastructure strategy. Pedestrian safety/walkability and streetscape are usually at the top of the list.
<p>Buck Miller</p>	<ul style="list-style-type: none"> • Inquired about pedestrian tunnels. • Expressed that there is a desire of nearby residents wanting to bike and walk. Stated that bike racks have already been installed. When improvements such as wider sidewalks, more pedestrian/bike facilities, less/more enough parking, would welcome any improvements that to get patrons to this area.
<p>Stuart Boggs</p>	<ul style="list-style-type: none"> • Suggesting looking at trips instead of vehicles. • How do we get to LYMMO, bike sharing, and bike racks to support one another? Suggested conducting a pedestrian/bike audit. • Made a suggestion to implement a Square Dance crossing (aka known as a pedestrian scramble or diagonal crossing). Also suggested synchronizing the signals throughout the corridor.
<p>Greg Morrison:</p>	<ul style="list-style-type: none"> • Inquired about the status and location of the LYMMO project? Laura Minns and Myra Monreal responded that the project isn't funded yet, but it is ready for project development. They stated that it was critical for us because we don't want to impact the corridor and preclude any transit solution.



	<ul style="list-style-type: none"> Suggested adding to the Guiding Principles and take existing businesses into account.
Elliot Jamison:	<ul style="list-style-type: none"> Inquired about the balance between trees and blocking visibility.
Heather Garcia/FDOT	<ul style="list-style-type: none"> From FDOT perspective, there is limited funds to support streetscaping but FDOT will work to help.

What are some of the things that you see as a problem that we haven't discussed?

Jon Toothman	<ul style="list-style-type: none"> Asked about what can be done to slow traffic which would lend to a more pedestrian friendly atmosphere, leading to business growth, leading to area economic health. Greg Moore pointed out that the existing parking isn't utilized.
Buck Miller	<ul style="list-style-type: none"> Stated that he found on-street parking unsafe.
Jim Ward	<ul style="list-style-type: none"> Pinching visual space generally slows down traffic, maybe a landscape item instead of unused parking. Narrower curb radii and it will speed up pedestrian crossing time also.
Jason Burton	<ul style="list-style-type: none"> Hoping design speed changes up to at least Michigan. Wanted to consider a consistent speed limit north of Michigan which would change sight distance and curb radii requirements.
Laura Minns	<ul style="list-style-type: none"> Pedestrians will feel safer with lower vehicle speeds. Love the wide section in front of hospital and old Checkers restaurant. Orange Avenue is not a pleasant street to walk on as it feels confining and it is difficult to pass on sidewalk for pedestrians and bike.
County	<ul style="list-style-type: none"> Asked if underground utilities were possible? Orange County is running into the problem of putting utilities under the road, puts on the curb then denies trees on top. Limiting flexibility on streetscaping. Undergrounding utilities is a local agency decision.

Session 2 Attendees

Mary Sekac	First Green Bank	msekac@firstgreenbank.com
Ruth Hamberg	RH Landscaping Architecture & Urban Design	rhamberg@bellsouth.net
David Ausherman	Orange County	david.ausherman@ocfl.net
Alice Burden	Resident/Volunteer	aburden@hotmail.com
Karl Hodges	ORMC	Karl.hodges@orlandohealth.com
Bill Kercher	ORMC consulting team	bill.kercher@wckplanning.com

Session 2 Comments:

Karl Hodges	<ul style="list-style-type: none"> Is this study being done in coordination with the City? Answer: Yes. What other issues came up in the first group? Answer: Brief overview of comments from session 1 were discussed. Safety issues need to be discussed. What conversations are happening to reduce traffic on Orange Avenue?
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	<ul style="list-style-type: none"> • When does the dip in the road issues come into play? Answer: Construction activities should begin this summer. Go to www.CFLRoads.com for more information. Would like to coordinate our construction with the upcoming dip construction. • What is the process, when is the study finished? Who is the deliverable given to and what is it? Is there an expectation that there will be funding? Answer: 12 month study, a Corridor Management Plan will be developed for the FDOT. The hope is that some of the recommendations will be funded with push buttons and/or improvement grants that the city can apply for. • If done right, there is huge economic development potential. • It's not a long walk to downtown; if it were a more pleasant walk, more people would use it. ORMC has planned to redevelop property on the northwest corner of Gore to mixed use.
Alice Burden	<ul style="list-style-type: none"> • Would like to see more intersection treatments like those at the Orange Ave/Lucerne Circle intersection. This idea needs to be implemented at all major intersections. • Would like the parking meters in front of ORMC to be 4hrs long. • Is there anything Downtown South can do to encourage the decision makers to bring the money to this area and recommend alternatives that come from this study? Myra Monreal/Heather Garcia: Contact your commissioner and MetroPlan.
Ruth Hamberg	<ul style="list-style-type: none"> • Are we looking at parking demand studies? Answer: We do not have and do not plan on conducting a parking demand study at this time. • The Downtown South design committee is interested in a design for Orange Avenue not to be just a through road but to create an attractive destination, to make a statement of public space, and create corridor identity. • Wanted access to the district and to brand it. There are many access management issues with too many driveways and side streets. Safety issues exist with all of the driveways. • Would like to see a walkable city block grid. Stated that the area north of Gore Street has very pleasant trees and landscaping features. Asked if using oak trees was possible. • Would like to see integration of water quality improvement measures to help filter runoff. Wants team to consider green street ideas and slower speeds.
General Comment	<ul style="list-style-type: none"> • Discussed on-street parking and the opinion of most people that it is unsafe. Also talked about the desire for a consistent and lower speed limit.
Myra Monreal	<ul style="list-style-type: none"> • FDOT can help identify projects, the City can apply for enhancement grants, and people supporting any project will help the ranking. Through this study if things rise to the top the City will apply for an enhancement grant.
Heather Garcia	<ul style="list-style-type: none"> • Every project needs a champion and strategy for funding.
David Ausherman	<ul style="list-style-type: none"> • A lot is going on in this corridor with SunRail and whatnot.
Bill Kercher	<ul style="list-style-type: none"> • What happens to the water and drainage now? Where does it go? Answer: Some goes to West Orange County, some goes to local ponds and lakes. Will have to consult our Basin Maps.



	<ul style="list-style-type: none"> • Can we get a signal at Underwood because the new hospital front door will be on Underwood? We'll trade the Copeland signal for the Underwood signal.
Bill Kercher and Karl Hodges	<ul style="list-style-type: none"> • We are in support of the streetscape currently in place north of Gore Street for safety reasons, for traffic calming, to provide a pedestrian island, and aesthetically. ORMC would trade having on-street parking for that streetscape or in support of a bike lane on the outside of the parking. We want slower speeds. Boone will be extended south and would like an east/west connector to connect Orange Ave and the Boone extension somewhere between Gore and Lucerne.

Session 3 Attendee:

Shelia Ratliff	Classic Renovations	sheratliff@gmail.com
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Session 3 Comments:

Heather Garcia	<ul style="list-style-type: none"> • Due to the high crash rate, safety is an important issue. • There was an emphasis today that we need to look at other movements besides vehicles; there's a need to move people in other ways.
Shelia Ratliff	<ul style="list-style-type: none"> • Likes on-street parking. She finds it scary but still uses it. She is in support of bike lanes. Easy access bike parking along the corridor would encourage more people to use it. • Will there be the continuous turn lane in the middle? She's in support of access management and suggested that we consider medians with some landscaping to be more visually appealing. A certain amount of traffic congestion is expected, but it would be nicer if the view was better while stuck in traffic. Have seen things being done in the past with no planning and don't want that to happen again. • More pedestrian signage and higher crosswalk visibility would be good. • Could Division be an alternate route to alleviate Orange Ave? What kind of water management would be necessary? Answer: That is a concept that will be considered, City of Orlando has currently got improvements for Division in the design phase.

Session 4 Attendee:

Joseph Waddell	Heery Design	jwaddell@heery.com
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Session 4 Comments:

General	<ul style="list-style-type: none"> • General discussion on the high crash rates including the location and types of crashes occurring. • Discussion about inconsistencies of various elements on the corridor.
Joe Waddell	<ul style="list-style-type: none"> • Is a resident but doesn't use Orange Avenue. Congestion keeps speeds slow. The worst problem is congestion and backup.



	<ul style="list-style-type: none"> • <i>Is Division and option as an alternate route to Orange Avenue? Answer: That is a concept that will be considered, City of Orlando has currently got improvements for Division in the design phase. At Grant Street, the east bound left turn phase is very short and doesn't serve the whole queue all the time.</i> • <i>Only crosses Orange on foot or bike when absolutely necessary as it's not safe.</i> • <i>Streetscaping is great, but if it interferes with the utilities there is no point, it would have to be ripped up.</i>
Myra Monreal	<ul style="list-style-type: none"> • <i>Most of the pedestrian and bike trips are "slicing the Orange" and do not travel north/south on Orange, but cross east/west.</i>
Greg Moore	<ul style="list-style-type: none"> • <i>Stated that a previous interest was expressed on the April 9th bus tour about moving the utilities underground on Orange Avenue from Michigan Street to Grant Street.</i>

Stakeholder Handout Comments and Results

The following information was distributed to the workshop participants in order to gain consensus on the main issues and goals for the Orange Avenue Corridor Study. The bold and italicized text are the responses and comments provided in response.

1.0 Key Issues (Please agree/disagree/elaborate)

1. Safety (# crashes/ location specifics/ fatalities)
 - On-Street parking utilization
 - Sight distance issues
 - Emergency vehicle operations
2. Consistency
 - Speeds
 - Typical sections (lane width, median treatments, pedestrian facilities)
 - The look of the corridor/aesthetics (treatments, location of sidewalk)
3. On-Street Parking (consistency, utilization,)
4. Traffic Congestion (travel times, signal operations)
5. Transit (stop locations/logistics/safety/operations/LYNX expansion route/Sunrail and Amtrak interface)
6. Planning Efforts & Unification along corridor for consistent vision/"park once"
7. Technical Aspects (Engineering/Maintenance issues)
8. Physical Constraints (80' R/W, Existing land use is developed, setbacks/easements)
9. Interagency Coordination/Collaboration

10. ***Decent Streetscape – Placement***
11. ***Walking/Biking***
12. ***Left turn lane on Grant Westbound @ Chipotle***
13. ***Way Fining***
14. ***Pedestrian/Bike circulation along and across corridor***
15. ***Dedicated transit lanes (explore potential)***
16. ***Bike share/parking***
17. ***Speed is the key, traffic travels faster than posted. 35mph is best traffic mover***
18. ***Add multi modal, rail and local***
19. ***Access management***



20. **Speeding; too many driveways, lack of turn lane, median**
21. **Uncomfortable for peds & bikes**
22. **Ugly – overhead wires and signals, pollution runoff**
23. **Decrease curb radii**
24. **Speed reduction, lanes too wide**
25. **Wider sidewalks and streetscapes**
26. **Where are innovative bike lane alternatives?**

2.0 Guiding Principles

2.1 Guiding Principles Development

2.1.1 What is the Vision of the Corridor? (Please agree/disagree/elaborate)

Urban main street neighborhood, “Park Once” atmosphere, Bike/Pedestrian friendly, and to encourage transit.

“Context Sensitive” important

2.1.2 Who are the main users of the Corridor? (Please agree/disagree/elaborate)

1. Commuters
2. Local Residents
3. Employment Centers
4. ORMC Patients/Patrons
5. Business Patrons

6. **Students**
7. **Retirees**
8. **Transit and SunRail users**

2.1.3 What is the desired role of Orange Ave? (Please agree/disagree/elaborate)

Provide a context-sensitive transportation facility that serves all users while preserving the corridor characteristic and vision.

Provide a context-sensitive transportation facility that serves all users while supporting further urbanization of the corridor.

Implement streetscape plans – drop power lines – widen sidewalks – foliage (grass) separating traffic from pedestrians.

2.1.4 Guiding Principles (Please agree/disagree/elaborate)

- A. Enhance multi-modal mobility and access while accommodating regional traffic.
- B. Provide a functional transit element that serves a wide array of users (commuters, shopping/business patrons, employment centers).
- C. Improve safety for all modes.

Everyone is a pedestrian – some safety improvements for one mode may conflict with other modes

- D. Provide consistency within the corridor (aesthetics, roadway geometry, access management philosophy)



- E. Establish interagency support for a plan that allows for development and implementation of transportation solutions that leverage public and private investment and maximize return and minimize implementation timelines.
- F. **Think in terms of trips and not in terms of cars**
- G. **Business**
- H. **Take existing business interest into account**
- I. **Speed is key – traffic travels far too fast for pedestrians – lanes – traffic calming devices – increase walkability, possible mid-block crosswalks – allowing pedestrians greater mobility**
- J. **Business interest**
- K. **Sunrail pedestrian connectivity**
- L. **Esthetics – establish a brand for the district**
- M. **Green the street – trees to clean the air, fight heat and shade effect**

2.2 Purpose & Need

2.2.1 Purpose Statement: (Please agree/disagree/elaborate)

Provide a safe and efficient multi-modal transportation corridor that serves a wide array of users while providing and enhancing livability consistent with the future vision for the area.

FDOT received unanimous concurrence on the Purpose Statement.

2.2.2 Needs Statement: (Please agree/disagree/elaborate)

Enhancing mobility, consistency, and safety as necessary to support economic development, and assist planning initiatives and multi-modal mobility.

FDOT received unanimous concurrence on the Needs Statement.

Known issues identified with the corridor that support this need include:

- Approximation 650 crashes within the 2-mile corridor in the 5 year between 2007 and 2012 with 3 fatalities involving bikes and pedestrians
- Inconsistent roadway elements (lane widths, median left turn treatments, pedestrian facilities, on-street parking placement/utilization)
- Inconsistent speeds (40 MPH Pinloch Ave to Grant St, 35 MPH Grant St to Kaley Ave, 30 MPH Kaley Ave to Anderson St.)
- Traffic Congestion (high travel times, signal spacing, maintenance)
- Inconsistent Aesthetics/Landscape treatments (relationship to sidewalk placement)
- Transit Issues (stop locations/placements/ utilization/logistics/type of facilities)
- Opportunities for coordination of planning initiatives with multiple agencies (City of Orlando, LYNX, FDOT, Orange Co)



2.3 Measures of Success

Guiding Principles	Objectives	Measures of Success	
	Increase ease of transit use.	Proximity of transit stops to land uses served	
	Provide for bicycle/pedestrian use.	Accommodations for bicycles added to corridor Accommodations for safe pedestrian movements along and across the corridor	
		More consistent pedestrian facilities	
	Identify opportunities to improve operational deficiencies. Not so much traffic operations – equalize the modes, transit, bike, and pedestrian.	Intersection delay reduction (LOS)	
		Travel time reduction For transit and pedestrian	
		Reduced queuing at critical intersections	
		System throughput	
	B	Improve transit vehicle operations at stop locations, reducing vehicle/transit conflicts and delay to thru traffic.	Decreased drive times
			Decreased angle/side-swipe/rear-end crashes around transit stops
			Driver feedback/perception of operating conditions (before/after)
Improve stop proximity to uses to better serve user needs.		Closer proximity to pedestrian cross-walks Closer proximity to identified pedestrian paths (that contribute neighborhood trips to the corridor). Consider bus ops in terms of solutions and far side stops preferred.	
Identify strategies to encourage “park once” philosophy.		Increased “in-corridor” transit trips/ridership	
		Decreased “in-corridor” vehicular trips (before/after parking assessment in parking lots)	



	Increase access/service to corridor destinations	Synopsis of uses
		ORMC staff survey
C	Target higher crash locations and identify opportunities to improve.	Overall reduced crash rates <i>Pedestrian and bike safety!!</i>
	Identify configuration factors to safety concerns (sight distance, driveway location/spacing, obstructions, on-street parking locations and configuration)	Reduction in mid-block crashes
	Eliminate bus/vehicle conflicts at bus stops.	Reduction in crashes around bus stop locations
	Evaluate and identify pedestrian crossing distances.	Reduction in crossing widths <i>Implementation of innovative signalized pedestrian crossings at key locations</i> <i>Education/outreach solutions</i>
D	Provide consistency in roadway geometry.	Increased length(s) of consistent typical sections
		Reduced # of typical sections
	Provide consistency in aesthetic elements (foster coordination with FDOT and COL) <i>High level street lighting</i>	Continuity in appearance <i>But differentiate the identity of the Downtown South district.</i>
		Increased length of continuous aesthetic elements
		Reduced # of different treatments
	Identify predominate left turn movements,	Reduction of median/head on collisions
		Reduction in length of two-way-left-turn lanes
Implementation of new access management treatments (median, dedicated left turn pockets)		
E	Buy-in from agency partners	Letter of support/ endorsement of plan



	FDOT acceptance/endorsement of plan	"Sign-off" from internal groups "FEDEX" on details of the plan
	Commitment from funding partners (public and private)	Committed dollars/partners advanced
		# of partners/participants
	Leverage funding to maximize return on investment	10 opportunities for FDOT-implemented elements
	Prioritize improvements to minimize implementation timeline/maximize value	Lower cost + Big Impact = High Priority
		List of Prospects/timeline/responsible party
		Creation of an implementation strategy (result of study) Parking = revenue for maintenance/ops Dedicated lanes = state of good repair money = maintenance
General Comments	Slow speeds, arrow travel lanes, wide sidewalks, trees, bike lanes can go on side streets parallel if needed.	

END OF SUMMARY

This summary was prepared by Melissa Gross and Greg Moore of DRMP, and are provided as a summary (not verbatim) for use by the project team. The comments do not reflect FDOT's concurrence. Please review and send comments, via e-mail: mgross@drmp.com so they can be finalized for the files.



Project Visioning Team Workshop Summary

Orange Avenue Corridor Planning Study



Date/Time: August 6, 2013; 3:00 PM – 6:00 PM

Purpose: Orange Avenue Corridor Study PVT Workshop

In conjunction with the Orange Avenue Corridor Planning and Project Development Study, the Florida Department of Transportation conducted a Project Visioning Team Workshop. Those in attendance from the study team were:

Greg Moore, DRMP
Melissa Gross, DRMP
Nikki Doyle, DRMP

Heather Garcia, FDOT
Mike Adamson, DRMP

The purpose of the workshop was to gather input from the Project Visioning Team on the vision and surrounding corridor needs for the corridor improvement.

The workshop was divided into two individual sessions, each lasting one hour and 30 minutes. The agenda for each session was as follows:

1. **Introductions**
2. **Project Update / Progress to Date**
3. **Workshop Objective**– An overview of the purpose of the workshop and the desired information to be collected was given
 - a. Spot Improvements – Consist of specific location improvements such as transit stop locations and types, intersection improvements
 - b. Linear Improvements – Consist of corridor wide improvements such as consistent typical sections, median treatments and access management, bike lanes, on-street parking.
4. **Presentation of the Typical Section Tool**
5. **Typical Section Brainstorming**
6. **Typical Section Overview (Review of Top Typical Section Layouts)**
7. **Next Steps / Transition to the next group** – During each session, comments, suggestions, and concerns raised by the stakeholder participants were recorded to be included as part of the study.



Session 1 Attendees:

Name	Organization	Email
Jason Burton	City of Orlando	jason.burton@cityoforlando.net
Mary Sekac	First Green Bank	msekac@firstgreenbank.com
John Cheek	Orlando Brewing / DS	john@orlandobrewing.com
Stewart Boggs	LYNX	sboggs@golynx.com
Charlotte Manley	Kimco Realty/SODO Property Owners	cmanley@kimcorealty.com
Ruth Hamberg	Green Town Planning / DS	rhamberg@bellsouth.net
Karl Hodges	ORMC	Karl.hodges@orlandohealth.com
Pete Sechler	AECOM	Pete.schler@aecom.com
Laura Minns	LYNX	lminns@golynx.com
David Ausherman	Orange Co Planning	David.ausherman@ocfl.net
Fabian Dela Espriella	City of Orlando	Fabian.delaespriella@cityoforlando.com
Alex Trauger	MetroPlan	atrauger@metroplanorlando.com
Pauline Eaton	City of Orlando	Pauline.eaton@cityoforlando.net

Session 1 Comments:

Pete Sechler	<ul style="list-style-type: none"> <i>I commute on this corridor, use the businesses, I'm representing Orlando Health, but I'm also a resident; want to point out that long term accessibility for the hospital is a big economic engine for the area.</i> <i>We have to consider the vision for Orange. Does this consider the larger network and future land uses? How does this relate to Division?</i> <i>Division is much more significant now that 5 years ago.</i>
Ruth Hamberg	<ul style="list-style-type: none"> <i>Some goals for the corridor are; branding, creating a positive image, being sensitive to pedestrians, provide safe crossings, to create a pedestrian / transit destination, pedestrian safety and comfort, and to sacrifice speed and volume to be a local destination.</i> <i>We need to consider moving curbs at some intersections</i>
Charlotte	<ul style="list-style-type: none"> <i>I would like to see FDOT implement some traditional neighborhood features</i> <i>Is it a freight corridor because we allow it or because it has to be?</i>
Heather	<i>Then provided a quick overview of the purpose and needs statements, along with the guiding principles.</i>
Alex Trauger	<ul style="list-style-type: none"> <i>This is a multimodal corridor, we need to be aware of freight transit within the corridor because it is necessary to support the economy, especially in relation to the hospital and SODO.</i>
Fabian Delaespriella	<ul style="list-style-type: none"> <i>Freight could use Division</i>
Laura Minns	<ul style="list-style-type: none"> <i>This is a great transit corridor, but pedestrian friendliness is lacking, wider sidewalks and narrower streets are needed. We want a more main street feeling. Many building accesses are not directly on the street for pedestrians, but located in the back or side near parking.</i>



	<ul style="list-style-type: none"> • Potential new station areas may be required for new BRT route, signal priority, dedicated lanes... there is an issue making the turn on to Columbia for busses. • Bus stop has to be located at a curb for the boarding and alighting. Consider a shared bike bus lane.
Stewart Boggs	<ul style="list-style-type: none"> • Medians can be pedestrian refuges • There are potential conflicts with bulb outs for trucking. • Have seen layouts such as; travel lane, parking lane, bike lane, curb, then sidewalk
General Comments	<ul style="list-style-type: none"> • On street parking is not need on both sides of the corridor • Slow traffic down with alternating parking on both sides of the corridor • Bike lanes were generally not popular with the group • Implement bulb outs with colored concrete where possible • Keep lighting along corridor consistent • Provide more street furnishings • Use splitter islands • The city would like 15 ft easements for furnishings • Keep landscape, furnishing strip, and sidewalks consistent • Add as many trees as possible • On street parking will slow traffic down but with a median traffic is perceived to increase in speed • Keep on street parking in front of ORMC • Consider dedicated transit lanes or on street parking • Consider a center bus lane with timed signals for turning movement • Parking was brought into question.... Is it needed and is it used? • Lynx is considering consolidation of stops that are closely spaced or infrequently used • Consider on street parking from Gore to Lucerne

Session 2 Attendees:

Shelia Ratliff	Classic Renovations / DS / Resident	sheratliff@gmail.com
Buck Miller	Velocity Films / DS	buck@velocityfl.com
Joe Waddell	Heery Design / DS	jwadell@heery.com
Holly Vanture	DS	holly@downtownsouthorlando.org

Session 2 Comments:

Buck Miller	<ul style="list-style-type: none"> • Want to see bike lanes, if not on both sides of the street, then perhaps on one side? • I use the on street parking and bike the corridor. • I would like to see some of the full access between Michigan and Pineloch stay open, one provides a back way to west bound Michigan by ABC and the entrance on the east side of Orange to Chick-fil-a and Publics should stay open.
Shelia Ratliff	<ul style="list-style-type: none"> • Medians create a safe place for crossing pedestrians and is visually appealing. Will add to the main street atmosphere. • I do use the on street parking and I parallel park.



<p>Holly Vanture</p>	<ul style="list-style-type: none"> • Making lanes smaller will force traffic to move slower. • Will the FDOT reduce the speed limit to 30 or 35 MPH? • I use on street parking but do not parallel park, I only pull in when there is a large opening. • There is concern that ORMC is creating a self-contained community around the hospital and SunRail, which will detract from local businesses. • By closing off some access to businesses, traffic may be routed through neighborhoods and that would be a big issue with those residents.
<p>Joe Waddell</p>	<ul style="list-style-type: none"> • There are locations where on street parking can be removed and some where it can stay.
<p>General Comments</p>	<ul style="list-style-type: none"> • In favor of more narrow medians and small median sections • Would generally like to keep as much on street parking as feasible • Would like bike lanes in at least one direction • Does not support multi-use path idea on this corridor • A city overlay is already in place, but is purchase of additional right of way realistic to add more sidewalk? Will it happen? • Benefits of a bidirectional center turn lane outweigh the negative / risks • Want the lowest speed possible • Would bike lanes be used? • Consider the land uses (retail / Commercial on west, residential / commercial on east), place parking where needed in front of retail • Look into the use of "Sharrows" • Some businesses can provide off street parking behind the building • Removing parking in more narrow areas would be acceptable • Don't add parking more parking, only keep existing • Look into a parking study • Consider design plans for Division Street • Pedestrian Survey?? • Not supportive of on street parking from Gore to Lucerne, not anticipated to be used

Typical Section Tool Results

Below are images illustrating the typical sections that the Project Visioning Team created using our Typical Section Tool.

Typical Section 1: 15.5' Center Median with Left Turn Bay





Typical Section 2: 15.5' Center Median w/ Left Turn Bay and Sidewalk Green Space Easements



Typical Section 3: Center Dedicated Bus Lane



Typical Section 4: 8' Median w/One Sided On-Street Parking



Typical Section 5: 15.5' Median w/Center Left Turn Bay and One Sided On-Street Parking





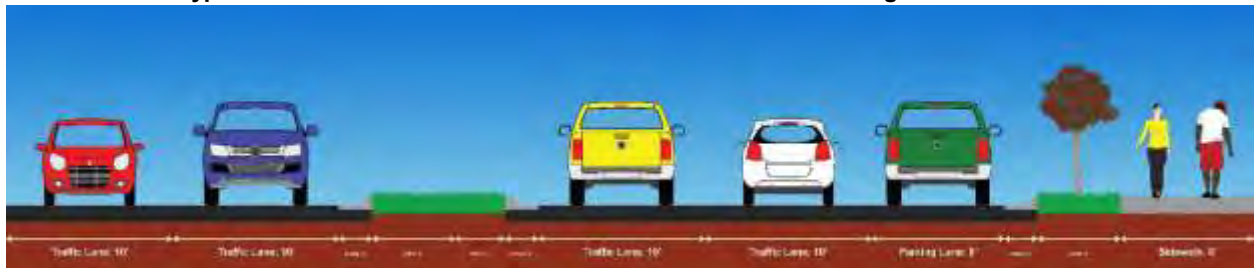
Typical Section 6: 11' Center Turn Lane w/Dual Sided On-Street Parking



Typical Section 7: 15.5' Median w/One Sided Bike Lane



Typical Section 8: 15.5' Median w/ One Sided On-Street Parking and 8' Sidewalk



Typical Section 9: 9' Median w/One Sided On-Street Parking and Bike Lane





Typical Section 10: 15.5' Median w/12' Bus Bay



END OF SUMMARY

This summary was prepared by Melissa Gross and Greg Moore of DRMP, and are provided as a summary (not verbatim) for use by the project team. The comments do not reflect FDOT's concurrence. Please review and send comments, via e-mail: mgross@drmp.com so they can be finalized for the files.



Downtown South Coffee Club Meeting Summary

Orange Avenue Corridor Planning Study



Date/Time: October 16, 2013; 8:00 AM – 9:00 AM

Purpose: Downtown South Monthly Coffee Club Meeting Presentation

In conjunction with the Orange Avenue Corridor Planning and Project Development Study, the study team presented an update and overview of the study to the October 16th Downtown South Coffee Club Meeting. Those in attendance from the study team were:

Greg Moore, DRMP
Melissa Gross, DRMP
Nikki Doyle, DRMP

The purpose of the presentation was to inform Downtown South members of the ongoing study, the public involvement and progress to date, and to announce the next steps and the scheduled Public Alternatives Meeting. In addition, any persons whom have not been involved in the Project Visioning Team to date and would like to participate were invited to submit their information.

An open house began at 8:00 AM, followed by the Corridor Study presentation at 8:30 AM. Attendees were invited to ask question and comment throughout the presentation. The presentation was concluded at approximately 9:00 AM and was followed by some individual questions and discussions. A summary of question asked and discussions held during and before the presentation are provided below:

Meeting Attendees (Sign-in Sheets Also Attached):

Name	Organization	Email
Holly Vanture	Downtown South (DS)	holly@downtownsouthorlando.org
Pete Clark	Orange County Commissioner	Pete.clark@ocfl.net
Kevin Behan	Asst. to Commissioner Clark	kevin.behan@ocfl.net
Shelia Ratliff	Classic Renovations / DS / Resident	sheratliff@gmail.com
Phillip Diamond	Carlton Fields Law Firm	pdiamond@carltonfields.com
Tracy Wiley	Lawton Printers	tracy@lawtonprinters.com
Charlotte Manley	Kimco Realty/SODO Property Owners	cmanley@kimcorealty.com
Josephine Carey	MP Advertising	jcarey@mpadvertising.com
Daniel Fay	Seaboard Neumann	4oilmandan@gmail.com
Derek States	States Technologies	derekstates@gmail.com
Mike Cherry	J. Robinson Group	mdeancherry@gmail.com
Rich Crotty	Richard Crotty Consulting Group	Rcrotty@rccgfl.com
Molly Delahunty	Richard Crotty Consulting Group	mdelahunty@rccgfl.com
Christina Almanzar	Richard Crotty Consulting Group	ccalmanzar@rccgfl.com



Rainey Lane	Keller Williams	Rain1028@gmail.com
Tara Munoz	O-Town Tan	tara@otown.com
Andy & Alison Ray	Valencia College / Away Design	Aray@valenciacollege.edu
Thomas Kirk	Dr. Jacks	Not provided
Drew Phillips	Crossman & Co.	dphillips@crossmanco.com
Catherine Randall	Orlando Family Magazine	Catherine@orlandomagazine.com

Comments and Questions:

Phillip Diamond	<ul style="list-style-type: none"> • Are curb extensions planned or possible for any intersections? • Have mid-block crossings been considered? • Expressed an interest in participating in the Project Visioning Team and the study in general after the presentation.
Greg Moore (in response to Mr. Diamond)	<i>Yes, curb extensions will be considered where appropriate with approval from FDOT. Also, we are also looking at potential for locations where a mid-block crossing may be appropriate. With this and all potential treatments, we just have to be sure that we adhere to current safety and design criteria.</i>
Dr. Jack Guy	<ul style="list-style-type: none"> • Expressed an interest in mid-block crossings also.
Josephine Carey	<ul style="list-style-type: none"> • Will bike paths be considered? • Can bike lanes be integrated on the existing sidewalk? • It's ashamed that bike paths are not being considered for this roadway considering the trend of city to become more bike friendly, especially in conjunction with the upcoming Sunrail Station.
Greg Moore (in response to Ms. Carey)	<p><i>Bike lanes and bicycle/pedestrian mobility in general have been considered throughout the study process. However, through the evaluation we have found that providing bicycle lanes along this section of Orange Avenue is a particular challenge. Bicycle lanes need to be continuous / consistent throughout the corridor, which would require additional right-of-way at the major intersections, as well as elimination of most or all of the existing on-street parking.</i></p> <p><i>Based on feedback received from agency partners and the Project Visioning Team, the general consensus is that bike lanes are not a priority on this corridor given the availability of nearby parallel routes such as Delaney that are more bicycle-friendly. It was also noted that most serious cyclists would actually prefer to bike in the traffic lanes along this section of Orange Avenue, particularly if speeds could be reduced, which is being considered as part of this study.</i></p>

END OF SUMMARY

This summary was prepared by Melissa Gross and Greg Moore of DRMP, and are provided as a summary (not verbatim) for use by the project team. Please provide any comments or revisions within five business days, via e-mail: mgross@drmp.com. After this time, the summary will be incorporated into the project files.



Public Meeting Summary

Date/Time: November 19, 2013; 5:00 PM – 7:00 PM
Project: Orange Avenue Corridor Planning Study
Location: Beardall Senior Center, Orlando, Florida
Subject: **Alternatives Public Meeting**

The purpose of this memorandum is to provide an overview of the Alternatives Public Meeting conducted for the Orange Avenue Corridor Planning Study.

The meeting was held on Tuesday, November 19, 2013 at the Beardall Senior Center from 5:00 pm to 7:00 pm to seek input from the public, present and explain the purpose of the project, the study process, and conceptual alternatives.

1. Public Notice

The meeting was advertised in advanced through several methods including:

- November 7th edition of *Florida Weekly Administration*
- Direct mail notifications to approximately 730 property owners
- Notification letters and emails to approximately 100 state and local elected and appointed public officials and other agencies
- Legal advertisement in the October 10th and November 7th edition of the *Orlando Sentinel*
- Press release to local media outlets
- Announcements through the *Downtown South* Organization

Public notices documents are included in Appendix A.

2. Format

The meeting began at 5:00 pm and was conducted in an open house format. Throughout the meeting, FDOT staff and members of the study team were on hand to discuss the project and answer questions. A handout was provided to attendees. Several boards were on display for review including a regional overview map, a goals and objectives board, a roadway cross section board, aerial boards depicting the project concepts, and the Lucerne exhibit concept board. In addition to the full aerial boards were roll plots of the project concepts. The handout and all display boards were posted to the project website.

A presentation was given at approximately 6:00 pm, and included content related to the topics listed below. The presentation slides were posted to the project website to provide the public with access to this content, which included the topics listed below.



- An overview of the project including an explanation of limits, purpose and needs, planning history, and public outreach
- Alternative development with an explanation of curb restrictions
- Conceptual alternatives
- A review of next steps and comment period
- Contact Information

Following the presentation that lasted approximately 35 minutes, the Consultant Project Manager fielded questions from the audience regarding a range of issues that included details on the planned configuration of the future Orange Avenue (provisions for on-street parking, bicycle & pedestrian mobility, aesthetic treatments, and others) as well as the anticipated timeline and funding considerations for the potential implementation of future improvements. Participants were also encouraged to provide written comments using the comment forms provided at the sign-in table. A summary of the comments received at the meeting and during the comment period that followed is included in this summary in Section 5.

3. Attendance

Approximately 57 members of the public attended the meeting, along with 5 public officials, one FDOT staff member, and 5 members of the study team. Sign in sheets are located in Appendix B.

4. Display/Materials

Informational materials available at the public hearing included a project handout and a blank comment form with contact information. The handout included a project overview, project location map, alternatives summary, and a table highlighting the study area issues, goals, and objectives. All of the display boards were posted to the CFLRoads web page hosted by the FDOT in the days following the meeting. This site is located at the address posted below, and includes these and other materials related to the study effort:

- [http://cflroads.com/project/241152-1/Orange Avenue SR 527 Corridor Planning Study North](http://cflroads.com/project/241152-1/Orange_Avenue_SR_527_Corridor_Planning_Study_North)
- A regions study area map
- A roadway cross section board
- Alternative 1: Basic Alternative Board
- Alternative 2: Ultimate Alternative Board
- Lucerne Circle Exhibit Board
- Study Area Issues and Goals & Objectives
- Roll plots of both Alternative 1 and 2

A PowerPoint Presentation was shown to the public during the formal presentation. Copies of the Existing Condition Report were also on display. Copies of these materials are included in Appendix C.

5. Summary of Public Comments

A comment form was developed to record written comments and questions. A total of 11 comment forms were received at the public meeting, followed by 15 additional comments during the comment period until November 26, 2013. The following sections provide an overview of the public input received during the meeting and over the comment period that followed.



Written Comments Received at the Alternatives Public Meeting

Written comments collected at the Alternatives Public Meeting are listed below in the following section. Copies of all written comments received are included in Appendix D.

Comment #1

Doug Huhn - Parking spaces on Orange Ave in front of 1100 S. Orange Ave should remain. Currently there are 2 parking spots.

Comment #2

Mike Wadley - This corridor needs more pedestrian enhancements such as wider sidewalks on both sides of Orange Avenue with landscaping to provide shade and make it more inviting for pedestrians.

The designs presented are more representative of a typical FDOT road project. It should be designed as a "people" space as well as a travel way for vehicles.

The hospital, with the SunRail station, begs for a more urban streetscape section. This area is also a special planning district that will include housing and office. This should generate a large demand for pedestrian travel ways.

Good start. Need more design input on aesthetics and how to make it happen. These plans fall short of achieving purpose of "enhancing livability."

Comment # 3

Jim Collahan, Grande Condo Resident - Lymm route to SunRail Amtrak

As a resident of the Grande Condominium some of our residents might use it if they could catch it both directions without walking to Orange Ave/City Hall.

Having to walk to City Hall/Orange Ave reduces usage for 3 reasons:

1. Too hot in summer
2. Would get soaked in rain
3. Awkward if you have briefcase, book bag, or heavy computer.

Comment #4

Barbra Hogan -

1. Additional cross walks between Orlando Health Hospital and Michigan Ave.
2. Additional street parking on Orange Ave.

Comment #5

Clete Huhn, Local Business Owner - Parking spaces should not be deleted in front of 1100 S. Orange (Dental office – these spaces 2 or 3) needed for delivery and short term parking for patients.

Comment #6



Alice Huhn, Local Business Owner -

1. Please have the intersection at Orange Ave at McDonalds evaluated for traffic flow. There is a lot of congestion there, cars crossing two lanes to turn north cars turning right to Orange Ave, then crossing two lanes to enter left turn to Michigan etc!!
2. I do not see that selected median treatment is necessary on Orange Avenue from Gore to Pineloch. All lanes are needed for a smooth traffic flow!!!!

Comment #7

Alice Burden, Downtown South Member - Please Please Please

1. Continue intersection at Orange/Lucerne all the way down Orange Ave. Do not need painted ones like Mills.... These intersections are used all day long – SODO apartments to Chipotle – Hospital intersections – Gore/ Orange – lots of pedestrian traffic!
2. Remove asphalt from Delaney – brick streets no medians – too narrow of street for them – residents want brick (disinformation that residents do not want brick streets) can have letters sent if needed.
3. Want Ultimate Alternative Plan!

Comment #8

Eliza Harris - Reduction in midblock crossings is not a goal, it's a wish. Unless you mean by adding more traffic lights. Unless you mean by adding more traffic lights.

The goal should be to make more safe crossings

- Maximize on street parking in long term for redevelopment
- Short term and long term strategy (i.e. paint today, move curbs tomorrow).
- Edges, sidewalks more important than medians
- When through traffic is maxed out (now) focus on increasing cross-traffic (perhaps more lights). This is important for bikes which use minor streets.

Goal should be economic vitality not capacity. Recommend adding no more turn lanes – increases pedestrian crossing distance, unsafe. Transit is less important than walkability. Walkability is a precondition for transit. Speed consistency is not necessarily desirable. Context-sensitive. Reduction in severity not number of crashes.

Good things in goals:

- Lower design speed
- Shorter crossing distances
- Increased space between travel and sidewalk
- Narrower lanes bus shelters, on street parking
- Bump outs (consider temporary painted (solid) as interim condition like New York Pavement to Plazas)

Decrease curb radii to slow cars, decrease crossing distance.

Shade near places where pedestrians wait to cross.

Outside study area:

- Bike lane at Rosalind/Anderson is dangerous. Heavy right turn movement. Consider "bike box." Right on red rarely successful during rush hour. Maybe no right on red during rush.



Comment #9

Need to have traffic (cars) be able to turn left on Orange and go North from Silver Court instead of going to Columbia.

Comment #10

Jim Callahan - Problem: Pedestrians jaywalking especially at night to hospital

1. Need additional crosswalk between medical plaza and hospital. Make sure the crossings are extra striped and fully lit up at night.
2. Need to eliminate on street parking across street from hospital
3. Need to use additional lane to create median barrier, not only to separate cars but to prevent pedestrians from making random jaywalking crossings.

Comment #11

Ruth Hamberg, Downtown South Member - Slow Design. 10' lanes ok. Brown areas should be landscaped not pavement.

Prefer Alternative 2 with major upgrades: Complete Streetscapes!

Gateway intersection Pinloch / Orange – Straighten out x walks. Need better pedestrian environment along Orange Ave. Wider sidewalks, street trees, better more attractive lights, on-street parking where it fits. More signalized crosswalks – every 300' +/- . Consolidate and eliminate driveways and create cross access driveways to connect between lots midblock to side street. Need to emphasize Illiana with a signal and crosswalk to create a main entrance for Publix. Lynx stop there – need transit access. No Lynx stop at CVS at Orange and Michigan. SoDo/Page and/or Crystal Lake needs “on demand” signal and crosswalk across Orange. Now it’s a mess! Straighten out x walk at Grant and Orange. Consolidate driveway at the Tire Kingdom and eliminate one. Need another signal/x walk between Grant and Kaley: too far. Need to underground overhead utilities along entire corridor. Lynx stop should be on the downstream side of stoplight/crosswalks. Kaley straighten x walk. No “suicide lane” turn lane north of Kaley. Limit turns at Hollenbeck due to jog from east to west. Miller Street – put landscape divided landscaped divider on east side of intersection. Straighten crosswalk to be right angle not angled. North of Miller on Orange – east side eliminate driveway because business already have cross access – at least in part; will be full eventually. Need bump out in front of Orlando Health main intersection with signal at Copeland – bump out on both sides – Lynx stop can fit shelter, better ped crossing safer and shorter. Plus opportunity for landscape. Decrease radii at right turn out at Underwood – full stop and need x walk stripes. Maybe take out the free flow right in right out. Need bump outs at Columbia – the west side block is extremely short of parking. Restore on street parking on this block. Why the Lynx stop pull off at Silver Court. Widen the parkway and plant trees – rather than paint stripes. This is a large block on west side. Plan cross access behind (future) buildings connecting parking lots to Columbia and Gore. Close excess driveways. No suicide center turn lane – make it a median and turn lanes at selected mid-block access. Property access should be from side streets because buildings will be all in a main street pattern up to the sheet with no rent setback – Pedestrian oriented urban form. Better streetscape treatments at Orange / Gore as Gateway to Downtown South. Use landscape as bio-retention of stormwater – “green streets” like in Portland, OR.



To say the curbs are too expensive to remove is too short – sighted. The Downtown South district is re-developing, becoming much more intense and urban with a main street urban form – The design of the street can't be driven by the need to move as many cars as possible as fast as possible. That is not realistic. The district is a destination. The primary function of a roadway within an urban destination is to access the business. The area must become multimodal with a much higher emphasis on transit and pedestrians. In order for more people to use transit, the ped experience must be pleasant, convenient, and safe. Landscape must not be considered just a full on amenity but a tool for mitigating the island affect, pollution, provide shade, slow and clean stormwater, streetscape is critical in creating district branding. This project should have a higher emphasis on urban design looking holistically with the redevelopment of the district.

We need a treatment that is far above the standard treatment. Slow the speeds to max 30. The DTS NID can help fund upgrades.

Bikes can ride in the travel lanes or on side streets.

Don't need U-turn opportunities. People can turn at side streets to turn around and head the other direction.

Comments received via mail or email following the meeting

Written comments were received during the comment period via mail and email to the project study steam and are listed below in the following section.

Comment #1

Chris Johnston – Suggested the use of pedestrian bridges to help reduce the conflict between cars and people.

Comment #2

Katherine V – Expressed the opinion that the problem of SR 527 is regional and not just within the study limits and that the greater problem is south of Pineloch Avenue. It was suggested that northbound truck traffic be required (via signage) to use Oak Ridge to access eastbound I-4 and only local delivery trucks travel north of Oak Ridge on Orange Avenue. She pointed out that Oak Ridge was recently upgraded to handle truck traffic that is currently underutilized. She requested that FDOT work with the City of Edgewood to improve the intersections of Holden and Gatlin on Orange Avenue. It was suggested that removing curbs and widening sidewalks to accommodate both bikes and pedestrians in protected lanes would encourage more users to walk and bike. Lastly it was suggested that all bus stops be redesigned as pull-outs / bus bays.

Comment #3

Shirley Wright, Local Resident – Expressed opposition to concrete medians and the reduced access as a result of them. Conway Road was used as an example of medians requiring too frequent U-turns and unsafe conditions. Are pedestrian bridges a better use of money? It



was suggested that measures could be taken to make pedestrian bridges more aesthetically pleasing by using foliage and drip irrigation. It was stressed that pedestrian crossings would be particularly helpful in the Sodo and Orange Ave/Michigan Street intersection area.

Comment #4

Paul Straubinger, Straubinger Inc. - On behalf of Straubinger, Inc., the property owner of 1737 S. Orange Avenue we have concerns with some of the plans we saw at the Public Meeting yesterday evening.

One of the conceptual plans proposes a full median in front of our driveway; the only means of ingress and egress to the surface parking for four (4) business. After speaking with Greg we were informed that DRMP did not realize that this was the only means of ingress and egress to the parking lots for the business occupying space at 1737 and 1743 S. Orange Avenue. It would be a perilous environment for vehicles trying to enter these parking lots approaching from the north to make a U-turn anywhere.

The said buildings are very old, very close to the ROW, and share a very blind driveway between the two buildings, whereby it is impossible for a driver leaving said parking lots to see around the corner onto the sidewalk without their vehicle sticking into and usually entirely across the sidewalk located between the road and parcels. Since there is substantial excess area in the east traffic lane in front these addresses we request that measures are taken to provide a buffer between pedestrians on the said sidewalk and vehicles leaving (or entering) these properties.

Please feel free to call me or email to discuss further; I welcome you go come out to meet onsite to visualize this concern.

Comment #5

Frank Vertolli, RFV Holdings and Net Conversion LLC - My business partner Ryan Fitzgerald and I are the property owners of 1743 S. Orange Avenue (RFV Holdings). We also operate our business Net Conversion LLC out of this same location. We wanted to share some provide feedback and share concerns with some of the plans shared at the Public Meeting yesterday.

1) One of the conceptual plans proposes a full median in front of our driveway. This driveway is the only means of ingress and egress to the surface parking for our business as well as for the neighboring building 1737 S Orange Avenue owned by Staubinger, Inc. The median would restrict access and also create a perilous environment for vehicles trying to enter these parking lots when approaching from the north as there isn't a nearby location to make a u turn.

2) The building is very old, very close to the right of way, and share a very blind driveway between the two buildings, whereby it is impossible for a driver leaving said parking lots to see around the corner onto the sidewalk and up Orange Avenue in either direction until their vehicle is sticking out across the sidewalk. Since there is substantial excess area in northbound traffic lane in front of these addresses we request that measures be taken to provide a buffer between pedestrians on the said sidewalk and vehicles leaving (or entering) these properties.

Please feel free to call or email us to discuss further. We appreciate your attention and look forward to your consideration in these matters. A visit to the site to get a more complete understanding of the challenges would be ideal.

Comment #6

Kevin Hunsicker, Black & Veatch Corporation - Has there been consideration of bicycle lanes? I don't see them in the plan. I saw a comment that there isn't a lot of bicycle traffic,



but that is probably because it is too dangerous due to lack of design for bicycle safety, not because there isn't a need.

While making this corridor safer is paramount, I believe the fact that this is the major thoroughfare the design should be for a speed limit of 35 mph.

Comment #7

Greg Wilson, Pineloch Management Corporation - An objection to the proposed restricting of two accesses to the Markets at Southside to right in right out was raised by Pinloch Management Corporation.

Comment #8

Bob Woodbery – Has Orange County offered to partner and consider upgrades from Pineloch to Holden? This would be a good time to include this section of road in the overall strategic plan. Improvement would foster new business opportunities, especially when pedestrian traffic is enhanced.

Comment #9

Donna Davis, Local Resident – Expressed a disappointment that notifications were not sent out to more residents. Described Kaley as a high pedestrian path for school children and pointed out that it is already heavily congested during rush hour and was concerned that adding a northbound right turn lane would encourage more traffic to use Kaley.

Comment #10

Ian Sikonia, City of Orlando Transportation Planning – Bicycle infrastructure is not addressed in the alternatives presented and it is suggested that any bike lanes or Sharrows not include in the proposed development be presented in an alternate route. The SR 414 PD&E Study was given as an example of how to present this. It was also requested that locations for bike racks be included on the corridor. Presentation of the transition between proposed bike facilities for the southern study and the northern study were requested to demonstrate bike facility consistency. Can analysis of mid-block pedestrian crossings be analyzed in the study? It was pointed out that the Metroplan Prioritized project list shows an enhancement grant application for a mid-block crossing on this segment of Orange Ave and is listed number 29 on the list, proposed for between Kaley St and Grant St.

Comment #11

Phil Diamond, Carlton Fields Law Firm – Stated that Orange Ave has the opportunity to be a pedestrian friendly gateway into the city, but sidewalks are currently narrow and too close to travel lanes. Distance between travel lanes and sidewalks is desirable. Crossing Orange is difficult, islands or medians would improve crossing Orange and bring more retail and restaurant business to the west side of Orange. Improving the area will encourage locals to walk and use Sunrail.

Comment #12

Myra Monreal, City of Orlando Transportation Planning –

1. Need to show how we are addressing bicycle lanes. Per our growth management plan,



2. Was a dedicated bus lane considered throughout the corridor versus block by block? A portion of the corridor is the designated LPA for the future potential South LYMMO Expansion.
3. While many of the recommended intersection improvements fix a single localized problem, what is the plan or big idea for the entire corridor as a whole? Are we trying to provide a consistent typical section? Is that typical section vehicular based?
4. Pedestrian mobility. Is the intent to direct pedestrian to signalized crossings? Is that practical when the attractor (where they want to go) are not located at a signalized intersection? Would turn lanes with landscape medians throughout the corridor provide a pedestrian refuge? Maybe pedestrians would be better served to cross Orange Avenue away from major intersections such as Orange/Michigan? For example, Crystal Lake is a pedestrian oriented street.
5. Pedestrian mobility. Should right turns on red be limited in areas of increased pedestrian activity (such as Orange/Grant)?
6. Traffic congestion. Are we reducing vehicular delay or pedestrian delay?

Comment #13

Rebecka Fox, Rebecka Fox Design – E-mail received November 26th indicating that the “Basic option” does not do enough to satisfy the safety and aesthetic needs for Orange Ave in the Downtown South District. The inquiry indicates that a “full overhaul” of the area is needed to effectively address the transportation issues, and expressed favor for more median treatments / elimination of the center two-way left turn lane, as well as more on-street parking. Desire for more green space / medians in front of the hospital in particular.

Comment #14

Mike Beale, BishopBeale – Received telephone inquiry on December 17th regarding the project. Returned call and left voice message for the individual on 12/27 ... awaiting call back.



Comment #15

Anonymous – Go with Alternative 2. Raised medians w/landscaping. Ask Businesses to share access, and cross access when possible. Bus stops are a problem, and have another public meeting for update.

Individual Comments/ Discussions Noted During Public Meeting

The following is a summary of questions / comments presented during the question and answer session following the presentation and via individual conversations with study team members.

Comment #1

The speeds are too high on Orange Avenue. What can be done about this and how can this be enforced?

Comment #2

What considerations are being given for bike lanes? Does the FDOT require every road to have bike lanes?

Comment #3

Are roundabouts a possibility? To replace some of the larger intersections? The roundabouts on Delaney Avenue are not “real” roundabouts.

Comment #4

Concern was expressed by property owners over losing the existing on-street parking in front of their business at 1100 S. Orange Avenue. These spots are used by delivery trucks and customers.

Comment #5

Is there a way to limit left turns exiting McDonalds?

Comment #6

General comment stressing the importance of a “walkable main street” atmosphere and the importance of landscaping in complete street design.

Comment #7

Can we have a pedestrian bridge or bridges?

Comment #8

Are there any opportunities to have mid-block crossings?



Comment #9

General comment on how well the FDOT constructed the improvement to correct the Orange Ave "dip".

Comment #10

Concern about Silver Court businesses with the proposed curb outs and two parking spots between them.

END OF SUMMARY

This summary was prepared by Nikki Doyle, Melissa Gross, and Greg Moore of DRMP, and are provided as a summary (not verbatim) for use by the project team. The comments do not reflect FDOT's concurrence. Please review and send comments, via e-mail: mgross@drmp.com so they can be finalized for the files.



Project Visioning Team Workshop Summary

Orange Avenue Corridor Planning Study



Date/Time: August 27, 2014; 4:00 PM – 5:30 PM

Purpose: Orange Avenue Corridor Study PVT Workshop

In conjunction with the Orange Avenue Corridor Planning and Project Development Study, the Florida Department of Transportation conducted the final Project Visioning Team Workshop. Those in attendance from the study team were:

Ben Faust, DRMP
Melissa Gross, DRMP

Heather Garcia, FDOT
Nikki Doyle, DRMP

The purpose of the workshop was to present and explain the study's Recommended Alternative. Roll plots of the Recommended Alternative were provided and a presentation was given. Questions and comments were taken during the presentation. The presentation included the following items:

1. **Project Overview**
2. **Key Issues**
3. **Purpose & Need**
4. **Alternatives Public Meeting** – a debrief on what happened at the meeting
5. **Recommended Alternative** – a 13 slide breakdown of the recommended alternative with callouts of improvements
6. **Next Steps**
7. **Contact**

Attendees:

Name	Organization	Email
Jason Burton	City of Orlando	jason.burton@cityoforlando.net
John Cheek	Orlando Brewing/Downtown South	john@orlandobrewing.com
Charlotte Manley	Kimco Realty/SODO Property Owners	cmanley@kimcorealty.com
Ruth Hamberg	Green Town Planning/Downtown South	rhamberg@bellsouth.net
David Ausherman	Orange County Planning	David.ausherman@ocfl.net
Buck Miller	Velocity Films/Downtown South	buck@velocityfl.com
Greg Wilson	Pineloch Management Corporation	greg@pineloch.com



Comments

Responses

<p>What is the advantage of the curb extension at Pineloch Avenue? Does it really help pedestrians?</p>	<ul style="list-style-type: none"> - Discuss of pedestrian safety and vision of corridor. Curb extensions at intersections provides shorter crosswalk distances for pedestrians. - Discussion of vision for the corridor and the transition starting at Pineloch Avenue with bulb outs.
<p>This alternative restricts the SBL to Numero Unos.</p>	<ul style="list-style-type: none"> - This is existing.
<p>Was on street parking lost or gained?</p>	<ul style="list-style-type: none"> - Some was taken away and some was added. Gains/losses were based on utilization and necessity.
<p>There needs to be a light at the McDonalds with crosswalks.</p>	<ul style="list-style-type: none"> - This location would not meet the necessary signal spacing standards or mid-block crossing standards.
<p>Why is southbound right turn (SBR) lane into SODO so wide?</p>	<ul style="list-style-type: none"> - The SBR turn lane also serves as a bus stop/bus bay.
<p>Why are some driveways closed?</p>	<ul style="list-style-type: none"> - This study does not propose closing any driveways.
<p>Why put a pedestrian refuge near Lake Beauty?</p>	<ul style="list-style-type: none"> - To provide a safe zone for pedestrians given the long section with no crosswalks.
<p>Why is eastbound lane (EBL) at Miller Street set back so far?</p>	<ul style="list-style-type: none"> - To provide clearance for the northbound lane (NBL) vehicles (including large trucks for hospital deliveries).
<p>The chevron area on Miller Street should be landscaped</p>	<ul style="list-style-type: none"> - The City of Orlando (City) would need to make this accommodation.
<p>Are these the only locations for tree wells?</p>	<ul style="list-style-type: none"> - These are planning concepts. The design scope can be prepared to require that landscape fully considered along the corridor.
<p>What type of landscaping will be provided?</p>	<ul style="list-style-type: none"> - TFDOT provides low maintenance landscape. - The City will have to coordinate for upgraded landscaping. - Comment from City: The trees from I-4 will be relocated to the City's choice of locations.
<p>Are there no bike lane accommodations?</p>	<ul style="list-style-type: none"> - The local agencies and stakeholders decided that identifying a different route would be a safer and more effect alternative to bike lanes on the study corridor.

END OF SUMMARY

This summary was prepared by Nikki Doyle of DRMP, and is provided as a summary (not verbatim) for use by the project team. The comments do not reflect FDOT's concurrence. Please review and send comments, via e-mail: ndoyle@drmp.com so they can be finalized for the files.

Orange Avenue

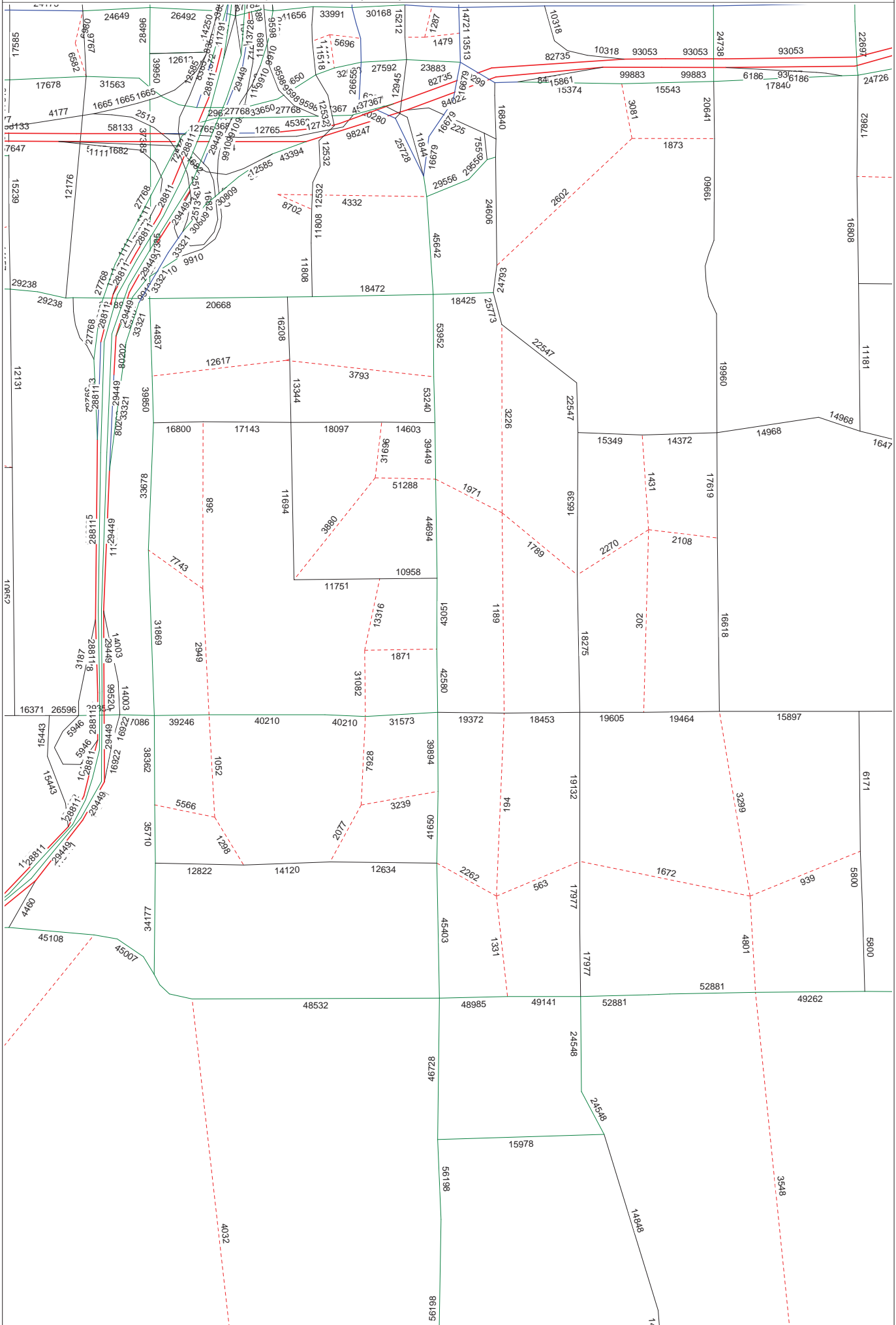
CORRIDOR PLANNING STUDY



Appendix B

OUATS Model Plots

Transportation Mobility Analysis for the Sand Lake Road SunRail Station



Orange Avenue

CORRIDOR PLANNING STUDY



Appendix C

Future Year Sychro Reports

SR 527 Corridor Planning Study
 1: Orange AV & W Pineloch Av/E Pineloch AV



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖		↖↗	↖		↖	↖↗		↖	↖↗	↖
Volume (vph)	58	35	12	257	81	65	21	1511	206	58	1066	133
Satd. Flow (prot)	3433	1792	0	3433	1738	0	1770	3476	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	1792	0	3433	1738	0	1770	3476	0	1770	3539	1583
Satd. Flow (RTOR)		9			22			14				170
Lane Group Flow (vph)	69	56	0	306	173	0	25	2043	0	69	1269	158
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												2
Detector Phase	3	8		7	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	15.0	38.0		15.0	42.0		15.0	34.0		15.0	37.0	37.0
Total Split (s)	15.0	38.0		20.0	43.0		15.0	97.0		15.0	97.0	97.0
Total Split (%)	8.8%	22.4%		11.8%	25.3%		8.8%	57.1%		8.8%	57.1%	57.1%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.0		4.0	3.0		3.0	2.0		3.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	0.0
Total Lost Time (s)	5.5	5.0		6.0	5.0		5.0	4.0		5.0	4.0	6.0
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	10.9	18.7		16.8	22.3		10.2	103.9		13.4	112.7	110.7
Actuated g/C Ratio	0.06	0.11		0.10	0.13		0.06	0.61		0.08	0.66	0.65
v/c Ratio	0.31	0.27		0.90	0.70		0.24	0.96		0.50	0.54	0.15
Control Delay	79.3	58.7		102.8	76.0		81.0	43.3		81.1	11.5	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	79.3	58.7		102.8	76.0		81.0	43.3		81.1	11.5	0.9
LOS	E	E		F	E		F	D		F	B	A
Approach Delay		70.1			93.1			43.8			13.6	
Approach LOS		E			F			D			B	
Queue Length 50th (ft)	38	49		~195	164		27	1095		74	285	2
Queue Length 95th (ft)	66	92		#300	242		62	#1447		m93	m415	m11
Internal Link Dist (ft)		867			1023			1024			1248	
Turn Bay Length (ft)	190			250			100			171		125
Base Capacity (vph)	222	355		339	405		111	2129		140	2345	1089
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.31	0.16		0.90	0.43		0.23	0.96		0.49	0.54	0.15

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 92 (54%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96

SR 527 Corridor Planning Study
 2: Orange AV & W Michigan ST/E Michigan ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	558	465	226	897	444	394	1157	122	238	605	70
Satd. Flow (prot)	1770	3539	1583	1770	*3000	1583	2938	3539	1583	2938	3483	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	2938	3539	1583	2938	3483	0
Satd. Flow (RTOR)			180			128						
Lane Group Flow (vph)	107	664	553	269	1067	528	469	1377	145	283	803	0
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	
Permitted Phases			8			4			6			
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	20.0	7.0	7.0	20.0	
Minimum Split (s)	15.5	41.5	15.0	15.0	38.0	15.0	15.0	39.5	15.0	15.0	38.5	
Total Split (s)	17.6	44.6	38.0	33.0	60.0	22.0	38.0	70.4	33.0	22.0	54.4	
Total Split (%)	10.4%	26.2%	22.4%	19.4%	35.3%	12.9%	22.4%	41.4%	19.4%	12.9%	32.0%	
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5	4.0	4.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	4.5	3.5	4.0	4.5	3.5	4.0	4.0	2.5	4.5	4.0	2.5	
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	
Total Lost Time (s)	7.5	5.5	6.0	7.0	5.0	6.0	7.0	4.5	6.0	7.0	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	
Act Effct Green (s)	10.1	39.1	70.6	26.0	55.0	76.0	31.0	65.9	97.4	15.0	49.9	
Actuated g/C Ratio	0.06	0.23	0.42	0.15	0.32	0.45	0.18	0.39	0.57	0.09	0.29	
v/c Ratio	1.02	0.82	0.73	1.00	1.10	0.68	0.88	1.00	0.16	1.09	0.79	
Control Delay	167.7	71.3	20.7	123.7	112.4	32.7	54.2	46.6	9.8	125.4	42.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	167.7	71.3	20.7	123.7	112.4	32.7	54.2	46.6	9.8	125.4	42.1	
LOS	F	E	C	F	F	C	D	D	A	F	D	
Approach Delay		58.0			91.4			45.7			63.8	
Approach LOS		E			F			D			E	
Queue Length 50th (ft)	~126	373	205	304	~706	359	301	~816	65	~209	485	
Queue Length 95th (ft)	#264	451	297	#504	#846	504	m314	m#905	m55	#327	550	
Internal Link Dist (ft)		7901			1808			1248			1264	
Turn Bay Length (ft)	160		175	360		205	265		325	305		
Base Capacity (vph)	105	813	762	270	970	778	535	1371	906	259	1022	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.02	0.82	0.73	1.00	1.10	0.68	0.88	1.00	0.16	1.09	0.79	

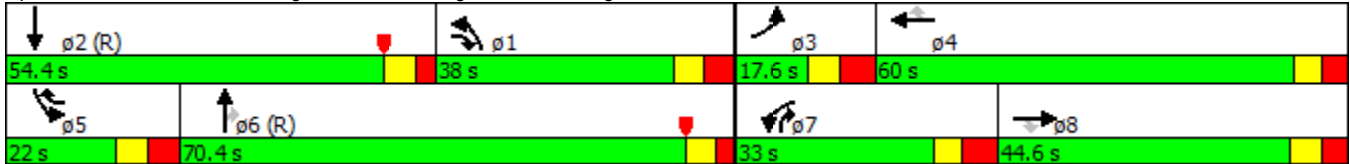
Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 76 (45%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10

SR 527 Corridor Planning Study 2: Orange AV & W Michigan ST/E Michigan ST

Intersection Signal Delay: 65.0
 Intersection Capacity Utilization 101.6%
 Analysis Period (min) 15
 * User Entered Value
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Orange AV & W Michigan ST/E Michigan ST



SR 527 Corridor Planning Study
 3: Orange AV & W Grant ST/E Grant ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	27	59	17	27	15	107	1512	12	6	839	100
Satd. Flow (prot)	3433	1671	0	0	1772	0	1770	3359	0	1770	3308	0
Flt Permitted	0.950				0.874		0.950			0.109		
Satd. Flow (perm)	3433	1671	0	0	1571	0	1770	3359	0	203	3308	0
Satd. Flow (RTOR)		64			9			1			11	
Lane Group Flow (vph)	119	102	0	0	70	0	127	1813	0	7	1117	0
Turn Type	Prot	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases	3	8			4		1	6			2	
Permitted Phases				4						2		
Detector Phase	3	8		4	4		1	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		20.0	20.0	
Minimum Split (s)	15.0	36.5		36.5	36.5		15.0	44.0		29.0	29.0	
Total Split (s)	15.0	52.0		37.0	37.0		25.0	118.0		93.0	93.0	
Total Split (%)	8.8%	30.6%		21.8%	21.8%		14.7%	69.4%		54.7%	54.7%	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5		3.5	3.5		2.5	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0		-2.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	10.4	28.8			13.9		19.4	131.7		107.8	107.8	
Actuated g/C Ratio	0.06	0.17			0.08		0.11	0.77		0.63	0.63	
v/c Ratio	0.57	0.30			0.51		0.63	0.70		0.05	0.53	
Control Delay	88.5	26.8			77.5		93.0	5.6		8.1	6.0	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	88.5	26.8			77.5		93.0	5.6		8.1	6.0	
LOS	F	C			E		F	A		A	A	
Approach Delay		60.0			77.5			11.3			6.0	
Approach LOS		E			E			B			A	
Queue Length 50th (ft)	67	37			66		127	65		1	70	
Queue Length 95th (ft)	105	93			121		m131	m910		m2	128	
Internal Link Dist (ft)		807			703			1264			1264	
Turn Bay Length (ft)	260						85			120		
Base Capacity (vph)	212	513			307		227	2602		128	2101	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.56	0.20			0.23		0.56	0.70		0.05	0.53	

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 32 (19%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70

SR 527 Corridor Planning Study

3: Orange AV & W Grant ST/E Grant ST

Intersection Signal Delay: 14.1
 Intersection Capacity Utilization 89.5%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: B
 ICU Level of Service E

Splits and Phases: 3: Orange AV & W Grant ST/E Grant ST



SR 527 Corridor Planning Study
 4: Orange AV & W Kaley ST./E Kaley ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	228	137	193	92	332	71	224	1336	31	40	735	95
Satd. Flow (prot)	1770	1863	1583	1770	*1600	0	1770	3352	0	1770	3362	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1814	0	1770	3352	0	1770	3362	1583
Satd. Flow (RTOR)			230		6			2				157
Lane Group Flow (vph)	271	163	230	109	479	0	267	1627	0	48	875	113
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									2
Detector Phase	3	8	8	7	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	15.0	37.5	37.5	15.0	39.0		15.0	31.5		15.0	35.0	35.0
Total Split (s)	28.0	51.0	51.0	24.0	47.0		38.0	80.0		15.0	57.0	57.0
Total Split (%)	16.5%	30.0%	30.0%	14.1%	27.6%		22.4%	47.1%		8.8%	33.5%	33.5%
Yellow Time (s)	3.5	3.5	3.5	3.0	3.0		4.0	4.0		3.5	3.5	3.5
All-Red Time (s)	2.5	3.0	3.0	3.0	3.0		4.0	2.5		3.5	2.5	2.5
Lost Time Adjust (s)	0.0	-2.0	-2.0	0.0	-2.0		0.0	-2.0		0.0	-2.0	0.0
Total Lost Time (s)	6.0	4.5	4.5	6.0	4.0		8.0	4.5		7.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.0	49.5	49.5	15.0	43.0		30.0	78.5		7.8	53.0	51.0
Actuated g/C Ratio	0.13	0.29	0.29	0.09	0.25		0.18	0.46		0.05	0.31	0.30
v/c Ratio	1.18	0.30	0.37	0.70	1.17		0.86	1.05		0.59	0.83	0.19
Control Delay	177.9	49.5	6.9	97.9	152.8		109.8	63.8		106.2	51.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	177.9	49.5	6.9	97.9	152.8		109.8	63.8		106.2	51.2	6.0
LOS	F	D	A	F	F		F	E		F	D	A
Approach Delay		87.1			142.6			70.3			48.8	
Approach LOS		F			F			E			D	
Queue Length 50th (ft)	~361	143	0	120	-629		289	-1056		55	260	6
Queue Length 95th (ft)	#557	218	70	190	#868		#451	#1196		m#100	368	40
Internal Link Dist (ft)		802			953			1264			1256	
Turn Bay Length (ft)	175			90			170			90		
Base Capacity (vph)	229	542	624	187	409		312	1548		83	1048	584
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	1.18	0.30	0.37	0.58	1.17		0.86	1.05		0.58	0.83	0.19

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 164 (96%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.18

SR 527 Corridor Planning Study
 5: Orange Av/Orange Avenue & W Miller ST./E Miller ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↗			↔		↖	↕↔		↖	↕↔	
Volume (vph)	39	16	58	54	63	41	133	1498	24	43	823	116
Satd. Flow (prot)	3433	1643	0	0	1767	0	1770	3532	0	1770	3472	0
Flt Permitted	0.950				0.854		0.950			0.950		
Satd. Flow (perm)	3433	1643	0	0	1535	0	1770	3532	0	1770	3472	0
Satd. Flow (RTOR)		69						2			13	
Lane Group Flow (vph)	46	88	0	0	188	0	158	1812	0	51	1117	0
Turn Type	Prot	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	3	8			4		1	6		5	2	
Permitted Phases				4								
Detector Phase	3	8		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		7.0	20.0	
Minimum Split (s)	15.0	41.0		36.0	36.0		15.0	39.5		15.0	38.5	
Total Split (s)	15.0	51.0		36.0	36.0		29.0	104.0		15.0	90.0	
Total Split (%)	8.8%	30.0%		21.2%	21.2%		17.1%	61.2%		8.8%	52.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0		-1.5	-1.0		-1.0	-1.0	
Total Lost Time (s)	3.5	4.0			4.0		5.0	5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	10.7	39.2			27.7		20.8	108.9		9.6	95.5	
Actuated g/C Ratio	0.06	0.23			0.16		0.12	0.64		0.06	0.56	
v/c Ratio	0.21	0.20			0.76		0.73	0.80		0.52	0.57	
Control Delay	77.8	15.3			86.5		83.0	15.3		125.1	5.0	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	77.8	15.3			86.5		83.0	15.3		125.1	5.0	
LOS	E	B			F		F	B		F	A	
Approach Delay		36.8			86.5			20.8			10.2	
Approach LOS		D			F			C			B	
Queue Length 50th (ft)	25	16			201		184	311		59	70	
Queue Length 95th (ft)	48	63			291		m172	m290		111	214	
Internal Link Dist (ft)		797			923			1256			828	
Turn Bay Length (ft)	250						105			140		
Base Capacity (vph)	232	504			288		249	2263		102	1956	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.20	0.17			0.65		0.63	0.80		0.50	0.57	

Intersection Summary
 Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 17 (10%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80

SR 527 Corridor Planning Study
6: Orange Avenue & Copeland Dr



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	17	64	1540	0	0	988
Satd. Flow (prot)	1770	1583	3539	0	0	3539
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	3539	0	0	3539
Satd. Flow (RTOR)		42				
Lane Group Flow (vph)	20	76	1833	0	0	1176
Turn Type	NA	custom	NA			NA
Protected Phases			2			2
Permitted Phases	4	4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0			20.0
Minimum Split (s)	35.0	35.0	29.0			29.0
Total Split (s)	37.0	37.0	133.0			133.0
Total Split (%)	21.8%	21.8%	78.2%			78.2%
Yellow Time (s)	3.0	3.0	3.5			3.5
All-Red Time (s)	3.0	3.0	2.5			2.5
Lost Time Adjust (s)	-2.0	0.0	-2.0			-2.0
Total Lost Time (s)	4.0	6.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max			C-Max
Act Effct Green (s)	11.8	9.8	150.2			150.2
Actuated g/C Ratio	0.07	0.06	0.88			0.88
v/c Ratio	0.16	0.58	0.59			0.38
Control Delay	75.8	55.0	0.7			1.3
Queue Delay	0.0	0.0	0.1			0.3
Total Delay	75.8	55.0	0.8			1.6
LOS	E	E	A			A
Approach Delay	59.3		0.8			1.6
Approach LOS	E		A			A
Queue Length 50th (ft)	21	37	6			43
Queue Length 95th (ft)	52	95	24			6
Internal Link Dist (ft)	836		828			484
Turn Bay Length (ft)						
Base Capacity (vph)	343	323	3126			3126
Starvation Cap Reductn	0	0	204			1175
Spillback Cap Reductn	0	2	190			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.06	0.24	0.63			0.60

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 44 (26%), Referenced to phase 2:NBSB, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59

SR 527 Corridor Planning Study

6: Orange Avenue & Copeland Dr

Intersection Signal Delay: 2.9

Intersection LOS: A

Intersection Capacity Utilization 64.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Orange Avenue & Copeland Dr



SR 527 Corridor Planning Study
 7: Orange Avenue & Columbia ST./DriveWay



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔			↔↔		↔	↔↔		↔	↔↔	
Volume (vph)	103	0	65	1	0	2	116	1256	5	6	988	194
Satd. Flow (prot)	3433	1583	0	0	1668	0	1770	3536	0	1770	3451	0
Flt Permitted	0.950				0.984		0.950			0.173		
Satd. Flow (perm)	3433	1583	0	0	1668	0	1770	3536	0	322	3451	0
Satd. Flow (RTOR)		423			99						17	
Lane Group Flow (vph)	123	77	0	0	3	0	138	1501	0	7	1407	0
Turn Type	Split	NA		Split	NA		Prot	NA		Perm	NA	
Protected Phases	3	3		4	4		1	6				2
Permitted Phases										2		
Detector Phase	3	3		4	4		1	6		2		2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		20.0	20.0	
Minimum Split (s)	35.0	35.0		35.0	35.0		15.0	32.0		37.0	37.0	
Total Split (s)	35.0	35.0		35.0	35.0		21.0	100.0		79.0	79.0	
Total Split (%)	20.6%	20.6%		20.6%	20.6%		12.4%	58.8%		46.5%	46.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	2.5		2.5	2.5	
Lost Time Adjust (s)	-2.0	-2.0			-2.0		-1.5	-1.0		-1.0	-1.0	
Total Lost Time (s)	4.0	4.0			4.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		C-Max	C-Max	
Act Effct Green (s)	13.5	13.5			9.0		20.9	144.9		119.0	119.0	
Actuated g/C Ratio	0.08	0.08			0.05		0.12	0.85		0.70	0.70	
v/c Ratio	0.45	0.15			0.02		0.64	0.50		0.03	0.58	
Control Delay	79.7	0.6			0.0		71.5	9.0		3.4	2.9	
Queue Delay	0.0	0.0			0.0		0.0	0.3		0.0	0.0	
Total Delay	79.7	0.6			0.0		71.5	9.3		3.4	2.9	
LOS	E	A			A		E	A		A	A	
Approach Delay		49.3			0.0			14.5			2.9	
Approach LOS		D			A			B			A	
Queue Length 50th (ft)	68	0			0		137	242		0	46	
Queue Length 95th (ft)	103	0			0		206	733		m1	64	
Internal Link Dist (ft)		752			638			484			1088	
Turn Bay Length (ft)	280						130			110		
Base Capacity (vph)	626	634			385		219	3014		225	2421	
Starvation Cap Reductn	0	0			0		0	715		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.20	0.12			0.01		0.63	0.65		0.03	0.58	

Intersection Summary

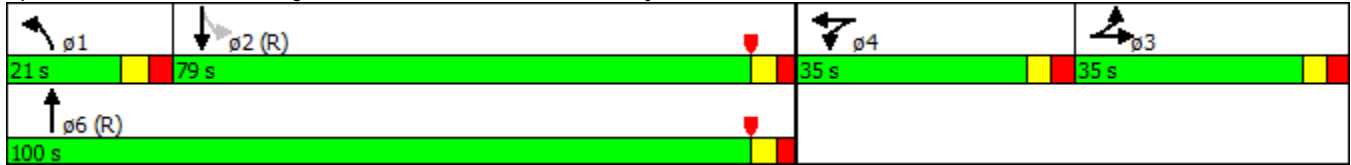
Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 156 (92%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64

SR 527 Corridor Planning Study

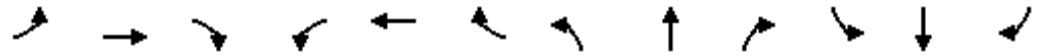
7: Orange Avenue & Columbia ST./DriveWay

Intersection Signal Delay: 11.6
 Intersection LOS: B
 Intersection Capacity Utilization 78.6%
 ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Orange Avenue & Columbia ST./DriveWay



SR 527 Corridor Planning Study
 8: Orange Avenue & W Gore ST/E Gore ST



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	85	117	104	276	137	189	1131	50	44	984	243
Satd. Flow (prot)	1593	2908	0	1593	3026	0	1593	3166	0	1593	3185	1425
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1593	2908	0	1593	3026	0	1593	3166	0	1593	3185	1425
Satd. Flow (RTOR)		139			47			4				185
Lane Group Flow (vph)	99	240	0	124	491	0	225	1406	0	52	1171	289
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												2
Detector Phase	3	8		7	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	15.0	39.5		15.0	43.5		15.0	31.0		15.0	37.0	37.0
Total Split (s)	19.0	40.5		22.0	43.5		34.0	92.5		15.0	73.5	73.5
Total Split (%)	11.2%	23.8%		12.9%	25.6%		20.0%	54.4%		8.8%	43.2%	43.2%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	2.5		3.5	2.5	2.5
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0		-1.0	-2.0		-1.0	-2.0	-2.0
Total Lost Time (s)	5.5	4.5		5.5	4.5		5.5	4.0		6.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	13.1	29.5		15.9	32.3		28.4	96.9		10.4	76.6	76.6
Actuated g/C Ratio	0.08	0.17		0.09	0.19		0.17	0.57		0.06	0.45	0.45
v/c Ratio	0.80	0.39		0.83	0.80		0.85	0.78		0.54	0.82	0.39
Control Delay	117.7	26.5		114.3	69.4		108.8	15.1		106.2	36.1	5.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	117.7	26.5		114.3	69.4		108.8	15.1		106.2	36.1	5.4
LOS	F	C		F	E		F	B		F	D	A
Approach Delay		53.2			78.4			28.0			32.6	
Approach LOS		D			E			C			C	
Queue Length 50th (ft)	110	51		138	253		242	301		55	647	33
Queue Length 95th (ft)	#216	92		#253	308		#404	377		#127	319	38
Internal Link Dist (ft)		1092			1228			1088			827	
Turn Bay Length (ft)	85			185			245			50		
Base Capacity (vph)	126	725		154	730		279	1806		99	1436	743
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.79	0.33		0.81	0.67		0.81	0.78		0.53	0.82	0.39

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 104 (61%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85

SR 527 Corridor Planning Study

8: Orange Avenue & W Gore ST/E Gore ST

Intersection Signal Delay: 39.4
 Intersection Capacity Utilization 88.0%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Orange Avenue & W Gore ST/E Gore ST



SR 527 Corridor Planning Study
 9: Orange Avenue & S Lucerne CR



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘		↗	↗↘		↗		↑↑↑			↑↑↑	
Volume (vph)	42	0	28	248	0	579	0	1355	0	0	973	0
Satd. Flow (prot)	1593	0	1425	2357	0	1425	0	4577	0	0	4577	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1593	0	1425	2357	0	1425	0	4577	0	0	4577	0
Satd. Flow (RTOR)			96			618						
Lane Group Flow (vph)	50	0	33	295	0	689	0	1612	0	0	1158	0
Turn Type	custom		custom	custom		custom		NA			NA	
Protected Phases								6			2	
Permitted Phases	7		7	4		4						
Detector Phase	7		7	4		4		6			2	
Switch Phase												
Minimum Initial (s)	7.0		7.0	7.0		7.0		20.0			20.0	
Minimum Split (s)	42.5		42.5	42.0		42.0		30.5			26.5	
Total Split (s)	42.5		42.5	42.0		42.0		44.5			44.5	
Total Split (%)	25.0%		25.0%	24.7%		24.7%		26.2%			26.2%	
Yellow Time (s)	3.0		3.0	3.0		3.0		3.5			3.5	
All-Red Time (s)	3.5		3.5	3.0		3.0		2.5			2.5	
Lost Time Adjust (s)	-2.0		-2.0	-2.0		-2.0		-2.0			-2.0	
Total Lost Time (s)	4.5		4.5	4.0		4.0		4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None		None	None		None		C-Max			C-Max	
Act Effct Green (s)	13.7		13.7	37.8		37.8		108.8			108.8	
Actuated g/C Ratio	0.08		0.08	0.22		0.22		0.64			0.64	
v/c Ratio	0.39		0.16	0.56		0.86		0.55			0.40	
Control Delay	82.1		1.7	61.4		19.0		8.5			18.0	
Queue Delay	0.0		0.0	0.0		0.0		0.0			0.0	
Total Delay	82.1		1.7	61.4		19.0		8.5			18.0	
LOS	F		A	E		B		A			B	
Approach Delay								8.5			18.0	
Approach LOS								A			B	
Queue Length 50th (ft)	54		0	206		75		112			212	
Queue Length 95th (ft)	101		0	227		246		330			370	
Internal Link Dist (ft)		462			539			827			351	
Turn Bay Length (ft)			90			200						
Base Capacity (vph)	356		393	596		822		2928			2928	
Starvation Cap Reductn	0		0	0		0		0			0	
Spillback Cap Reductn	0		0	0		0		0			0	
Storage Cap Reductn	0		0	0		0		0			0	
Reduced v/c Ratio	0.14		0.08	0.49		0.84		0.55			0.40	

Intersection Summary

Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 123 (72%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
 Natural Cycle: 160
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86

SR 527 Corridor Planning Study

9: Orange Avenue & S Lucerne CR

Intersection Signal Delay: 18.2
 Intersection Capacity Utilization 95.4%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service F

Splits and Phases: 9: Orange Avenue & S Lucerne CR

↓ ø2 (R)	↙ ø7	↘ ø4	🚶 ø8
44.5 s	42.5 s	42 s	41 s
↑ ø6 (R)			
44.5 s			

SR 527 Corridor Planning Study
 1: Orange AV & W Pineloch Av/E Pineloch AV

8/18/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔		↔↔	↔		↔	↕↔		↔	↕↕	↔
Volume (vph)	198	127	27	305	31	78	17	1382	309	110	1402	41
Satd. Flow (prot)	3433	1814	0	3433	1663	0	1770	3444	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	1814	0	3433	1663	0	1770	3444	0	1770	3539	1583
Satd. Flow (RTOR)		5			63			23				152
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	236	183	0	363	130	0	20	2013	0	131	1668	49
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												2
Detector Phase	3	8		7	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	15.0	38.0		15.0	42.0		15.0	34.0		15.0	37.0	37.0
Total Split (s)	19.0	38.0		23.0	42.0		15.0	101.0		18.0	104.0	104.0
Total Split (%)	10.6%	21.1%		12.8%	23.3%		8.3%	56.1%		10.0%	57.8%	57.8%
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.0		4.0	3.0		3.0	2.0		3.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	0.0
Total Lost Time (s)	5.0	4.5		5.5	4.5		5.0	4.0		5.0	4.0	6.0
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	27.8	24.9		17.5	15.2		9.8	98.7		19.9	114.4	112.4
Actuated g/C Ratio	0.15	0.14		0.10	0.08		0.05	0.55		0.11	0.64	0.62
v/c Ratio	0.45	0.72		1.09	0.66		0.21	1.06		0.67	0.74	0.05
Control Delay	72.0	87.2		147.2	55.7		86.3	77.4		82.8	13.9	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	72.0	87.2		147.2	55.7		86.3	77.4		82.8	13.9	0.0
LOS	E	F		F	E		F	E		F	B	A
Approach Delay		78.7			123.1			77.5			18.4	
Approach LOS		E			F			E			B	
Queue Length 50th (ft)	132	205		~247	78		23	~1384		157	314	0
Queue Length 95th (ft)	180	286		#360	152		56	#1509		m166	m310	m0
Internal Link Dist (ft)		867			1023			1024			1248	
Turn Bay Length (ft)	190			250			100			171		125
Base Capacity (vph)	529	341		333	396		101	1898		195	2248	1045
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.45	0.54		1.09	0.33		0.20	1.06		0.67	0.74	0.05

Intersection Summary

Cycle Length: 180
 Actuated Cycle Length: 180
 Offset: 139 (77%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow

SR 527 Corridor Planning Study
 1: Orange AV & W Pineloch Av/E Pineloch AV

8/18/2014

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 59.5

Intersection LOS: E

Intersection Capacity Utilization 99.7%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

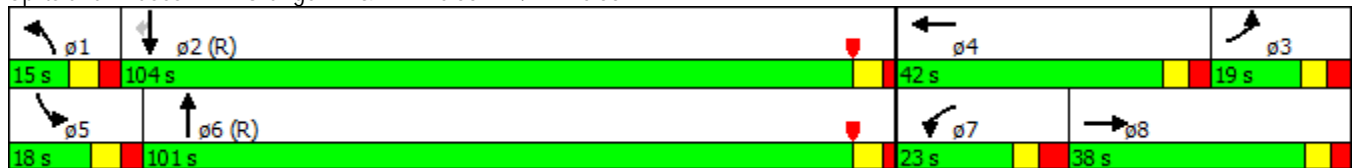
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Orange AV & W Pineloch Av/E Pineloch AV



SR 527 Corridor Planning Study
2: Orange AV & W Michigan ST/E Michigan ST

8/18/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	959	324	183	642	287	474	945	226	465	1010	54
Satd. Flow (prot)	1770	3539	1583	1770	*3000	1583	2938	3539	1583	2938	3511	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	2938	3539	1583	2938	3511	0
Satd. Flow (RTOR)			121			121						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	93	1141	386	218	764	342	564	1125	269	553	1266	0
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	
Permitted Phases			8			4			6			
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	20.0	7.0	7.0	20.0	
Minimum Split (s)	15.5	41.5	15.0	15.0	38.0	15.0	15.0	39.5	15.0	15.0	38.5	
Total Split (s)	20.6	56.0	35.0	26.0	61.4	35.0	35.0	63.0	26.0	35.0	63.0	
Total Split (%)	11.4%	31.1%	19.4%	14.4%	34.1%	19.4%	19.4%	35.0%	14.4%	19.4%	35.0%	
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5	4.0	4.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	4.5	3.5	4.0	4.5	3.5	4.0	4.0	2.5	4.5	4.0	2.5	
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	
Total Lost Time (s)	7.5	5.5	6.0	7.0	5.0	6.0	7.0	4.5	6.0	7.0	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	
Act Effct Green (s)	12.8	50.5	79.0	19.0	56.7	90.7	28.0	58.5	83.0	28.0	58.5	
Actuated g/C Ratio	0.07	0.28	0.44	0.11	0.32	0.50	0.16	0.32	0.46	0.16	0.32	
v/c Ratio	0.74	1.15	0.51	1.17	0.81	0.40	1.23	0.98	0.37	1.21	1.11	
Control Delay	113.5	135.0	16.2	184.9	64.7	18.7	159.0	51.9	17.9	148.7	103.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	113.5	135.0	16.2	184.9	64.7	18.7	159.0	51.9	17.9	148.7	103.3	
LOS	F	F	B	F	E	B	F	D	B	F	F	
Approach Delay		105.4			72.6			78.1			117.1	
Approach LOS		F			E			E			F	
Queue Length 50th (ft)	110	-829	147	-305	441	157	-491	648	144	-477	-904	
Queue Length 95th (ft)	#204	#970	216	#490	526	240	m#475	m611	m148	m#614	#1051	
Internal Link Dist (ft)		7901			1808			1248			1264	
Turn Bay Length (ft)	160		175	360		205	265		325	305		
Base Capacity (vph)	128	992	762	186	945	857	457	1150	729	457	1141	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.73	1.15	0.51	1.17	0.81	0.40	1.23	0.98	0.37	1.21	1.11	

Intersection Summary
 Cycle Length: 180
 Actuated Cycle Length: 180
 Offset: 115 (64%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow

SR 527 Corridor Planning Study
 2: Orange AV & W Michigan ST/E Michigan ST

8/18/2014

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.23

Intersection Signal Delay: 94.1

Intersection LOS: F

Intersection Capacity Utilization 115.0%

ICU Level of Service H

Analysis Period (min) 15

* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.

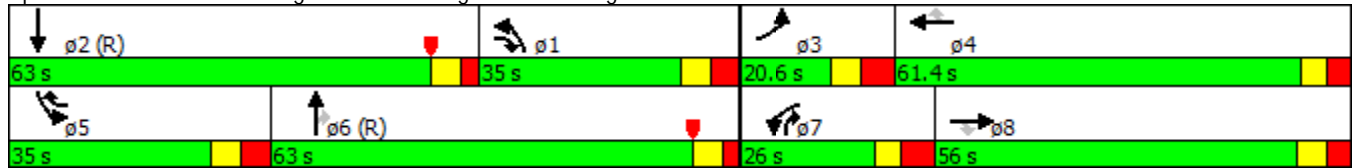
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Orange AV & W Michigan ST/E Michigan ST



SR 527 Corridor Planning Study
 3: Orange AV & W Grant ST/E Grant ST

8/18/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	109	108	19	33	10	87	1137	18	33	1462	79
Satd. Flow (prot)	3433	1723	0	0	1794	0	1770	3356	0	1770	3335	0
Flt Permitted	0.950				0.647		0.950			0.195		
Satd. Flow (perm)	3433	1723	0	0	1179	0	1770	3356	0	363	3335	0
Satd. Flow (RTOR)		27			5			2			5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Parking (#/hr)								0			0	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	190	259	0	0	74	0	104	1374	0	39	1834	0
Turn Type	Prot	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases	3	8			4		1	6			2	
Permitted Phases				4						2		
Detector Phase	3	8		4	4		1	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		20.0	20.0	
Minimum Split (s)	15.0	36.5		36.5	36.5		15.0	44.0		37.0	37.0	
Total Split (s)	15.0	51.6		36.6	36.6		17.0	128.4		111.4	111.4	
Total Split (%)	8.3%	28.7%		20.3%	20.3%		9.4%	71.3%		61.9%	61.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5		3.5	3.5		2.5	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0		-2.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	5.0		5.0	5.0	
Lead/Lag	Lead			Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		C-Max	C-Max	
Act Effect Green (s)	10.5	32.5			17.5		17.8	138.0		115.7	115.7	
Actuated g/C Ratio	0.06	0.18			0.10		0.10	0.77		0.64	0.64	
v/c Ratio	0.95	0.78			0.63		0.59	0.53		0.17	0.86	
Control Delay	133.6	78.4			93.5		116.6	2.3		9.3	12.1	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	133.6	78.4			93.5		116.6	2.3		9.3	12.2	
LOS	F	E			F		F	A		A	B	
Approach Delay		101.8			93.5			10.4			12.1	
Approach LOS		F			F			B			B	
Queue Length 50th (ft)	118	268			80		119	42		10	263	
Queue Length 95th (ft)	#204	356			135		m125	m55		m12	m291	
Internal Link Dist (ft)		807			703			1264			1264	
Turn Bay Length (ft)	260						85			120		
Base Capacity (vph)	200	470			214		175	2573		233	2144	
Starvation Cap Reductn	0	0			0		0	0		0	4	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.95	0.55			0.35		0.59	0.53		0.17	0.86	

Intersection Summary

Cycle Length: 180
 Actuated Cycle Length: 180

SR 527 Corridor Planning Study
 3: Orange AV & W Grant ST/E Grant ST

8/18/2014

Offset: 64 (36%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 23.4

Intersection LOS: C

Intersection Capacity Utilization 91.8%

ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Orange AV & W Grant ST/E Grant ST

 φ1	 φ2 (R)		 φ3	 φ4
17 s	111.4 s		15 s	36.6 s
 φ6 (R)			 φ8	
128.4 s			51.6 s	

SR 527 Corridor Planning Study
4: Orange AV & W Kaley ST./E Kaley ST

8/18/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	377	348	79	167	33	138	1108	98	82	1227	147
Satd. Flow (prot)	1770	1863	1583	1770	*1600	0	1770	3322	0	1770	3362	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1816	0	1770	3322	0	1770	3362	1583
Satd. Flow (RTOR)			142		5			7				136
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Parking (#/hr)								0			0	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	227	449	414	94	238	0	164	1436	0	98	1460	175
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									2
Detector Phase	3	8	8	7	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	15.0	37.5	37.5	15.0	39.0		15.0	31.5		15.0	35.0	35.0
Total Split (s)	30.0	53.0	53.0	16.0	39.0		25.0	93.0		18.0	86.0	86.0
Total Split (%)	16.7%	29.4%	29.4%	8.9%	21.7%		13.9%	51.7%		10.0%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.0	3.0		4.0	4.0		3.5	3.5	3.5
All-Red Time (s)	2.5	3.0	3.0	3.0	3.0		4.0	2.5		3.5	2.5	2.5
Lost Time Adjust (s)	0.0	-2.0	-2.0	0.0	-2.0		0.0	-2.0		0.0	-2.0	0.0
Total Lost Time (s)	6.0	4.5	4.5	6.0	4.0		8.0	4.5		7.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	C-Max		None	C-Max	C-Max
Act Effect Green (s)	23.9	47.1	47.1	10.0	33.7		18.4	89.8		11.1	82.0	80.0
Actuated g/C Ratio	0.13	0.26	0.26	0.06	0.19		0.10	0.50		0.06	0.46	0.44
v/c Ratio	0.97	0.92	0.80	0.96	0.79		0.91	0.87		0.90	0.95	0.22
Control Delay	125.5	89.4	52.4	161.0	86.5		137.9	22.8		143.5	35.6	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	1.7	0.0
Total Delay	125.5	89.4	52.4	161.0	86.5		137.9	22.8		143.5	37.3	5.6
LOS	F	F	D	F	F		F	C		F	D	A
Approach Delay		82.9			107.6			34.6			40.1	
Approach LOS		F			F			C			D	
Queue Length 50th (ft)	271	516	313	113	264		205	354		121	199	0
Queue Length 95th (ft)	#455	#719	461	#244	#375		m#351	m507		m#225	#1016	57
Internal Link Dist (ft)		802			953			1264			1256	
Turn Bay Length (ft)	175			90			170			90		
Base Capacity (vph)	236	501	530	98	315		180	1660		109	1531	779
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	1	0	0		0	0		0	25	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.96	0.90	0.78	0.96	0.76		0.91	0.87		0.90	0.97	0.22

Intersection Summary

Cycle Length: 180
Actuated Cycle Length: 180

SR 527 Corridor Planning Study
 4: Orange AV & W Kaley ST./E Kaley ST

8/18/2014

Offset: 36 (20%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 52.7

Intersection LOS: D

Intersection Capacity Utilization 97.7%

ICU Level of Service F

Analysis Period (min) 15

* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Orange AV & W Kaley ST./E Kaley ST



SR 527 Corridor Planning Study
 5: Orange Av/Orange Avenue & W Miller ST./E Miller ST

8/18/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	84	188	30	9	30	95	1231	80	70	1153	64
Satd. Flow (prot)	3433	1669	0	0	1716	0	1770	3507	0	1770	3511	0
Flt Permitted	0.950				0.478		0.950			0.950		
Satd. Flow (perm)	3433	1669	0	0	838	0	1770	3507	0	1770	3511	0
Satd. Flow (RTOR)		63						6			5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	183	324	0	0	83	0	113	1560	0	83	1448	0
Turn Type	Prot	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	3	8			4		1	6		5	2	
Permitted Phases				4								
Detector Phase	3	8		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		7.0	20.0	
Minimum Split (s)	15.0	41.0		36.0	36.0		15.0	39.5		15.0	38.5	
Total Split (s)	19.0	55.0		36.0	36.0		25.0	104.0		21.0	100.0	
Total Split (%)	10.6%	30.6%		20.0%	20.0%		13.9%	57.8%		11.7%	55.6%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0		-1.5	-1.0		-1.0	-1.0	
Total Lost Time (s)	3.5	4.0			4.0		5.0	5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	15.2	39.2			20.5		17.9	111.4		14.3	108.4	
Actuated g/C Ratio	0.08	0.22			0.11		0.10	0.62		0.08	0.60	
v/c Ratio	0.63	0.79			0.87		0.65	0.72		0.59	0.68	
Control Delay	90.1	66.4			139.5		83.2	19.0		111.3	19.2	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.1	
Total Delay	90.1	66.4			139.5		83.2	19.0		111.3	19.3	
LOS	F	E			F		F	B		F	B	
Approach Delay		75.0			139.5			23.3			24.3	
Approach LOS		E			F			C			C	
Queue Length 50th (ft)	109	300			98		139	319		101	552	
Queue Length 95th (ft)	156	397			161		m161	m435		160	478	
Internal Link Dist (ft)		797			923			1256			828	
Turn Bay Length (ft)	250						105			140		
Base Capacity (vph)	295	518			148		202	2173		159	2116	
Starvation Cap Reductn	0	0			0		0	0		0	65	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.62	0.63			0.56		0.56	0.72		0.52	0.71	

Intersection Summary
 Cycle Length: 180
 Actuated Cycle Length: 180
 Offset: 44 (24%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow

SR 527 Corridor Planning Study
 5: Orange Av/Orange Avenue & W Miller ST./E Miller ST

8/18/2014

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 33.2

Intersection LOS: C

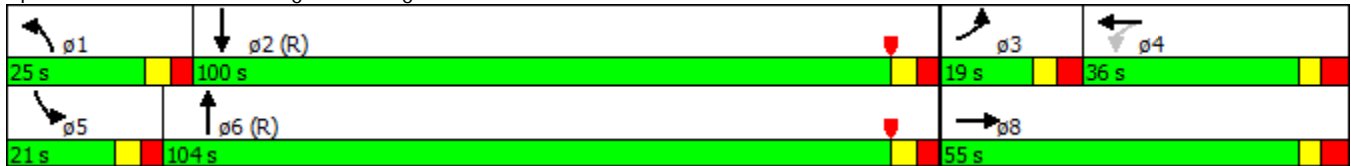
Intersection Capacity Utilization 90.0%

ICU Level of Service E

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Orange Av/Orange Avenue & W Miller ST./E Miller ST



SR 527 Corridor Planning Study
6: Orange Avenue & Copeland Dr

8/18/2014



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	40	64	1401	0	0	1256
Satd. Flow (prot)	1770	1583	3539	0	0	3539
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	3539	0	0	3539
Satd. Flow (RTOR)		59				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	119%	119%	119%	119%	119%	119%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	76	1667	0	0	1495
Turn Type	NA	custom	NA		Perm	NA
Protected Phases			2			2
Permitted Phases	4	4			2	
Detector Phase	4	4	2		2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0		20.0	20.0
Minimum Split (s)	35.0	35.0	29.0		29.0	29.0
Total Split (s)	38.0	38.0	142.0		142.0	142.0
Total Split (%)	21.1%	21.1%	78.9%		78.9%	78.9%
Yellow Time (s)	3.0	3.0	3.5		3.5	3.5
All-Red Time (s)	3.0	3.0	2.5		2.5	2.5
Lost Time Adjust (s)	-2.0	0.0	-2.0			-2.0
Total Lost Time (s)	4.0	6.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max		C-Max	C-Max
Act Effect Green (s)	12.4	10.4	159.6			159.6
Actuated g/C Ratio	0.07	0.06	0.89			0.89
v/c Ratio	0.39	0.52	0.53			0.48
Control Delay	88.8	37.9	0.9			7.6
Queue Delay	0.0	0.0	0.3			0.6
Total Delay	88.8	37.9	1.2			8.2
LOS	F	D	A			A
Approach Delay	57.6		1.2			8.2
Approach LOS	E		A			A
Queue Length 50th (ft)	55	20	0			360
Queue Length 95th (ft)	103	78	5			550
Internal Link Dist (ft)	836		828			484
Turn Bay Length (ft)						
Base Capacity (vph)	334	329	3137			3137
Starvation Cap Reductn	0	0	688			1115
Spillback Cap Reductn	0	8	494			44
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.14	0.24	0.68			0.74

Intersection Summary

Cycle Length: 180
Actuated Cycle Length: 180
Offset: 111 (62%), Referenced to phase 2:NBSB, Start of Yellow

SR 527 Corridor Planning Study
6: Orange Avenue & Copeland Dr

8/18/2014

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 6.5

Intersection LOS: A

Intersection Capacity Utilization 60.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: Orange Avenue & Copeland Dr



SR 527 Corridor Planning Study
7: Orange Avenue & Columbia ST./DriveWay

8/18/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	488	0	146	3	0	10	39	1307	1	0	1039	51
Satd. Flow (prot)	3433	1583	0	0	1655	0	1770	3539	0	1863	3514	0
Flt Permitted	0.950				0.988		0.950					
Satd. Flow (perm)	3433	1583	0	0	1655	0	1770	3539	0	1863	3514	0
Satd. Flow (RTOR)		358			94						4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	581	174	0	0	16	0	46	1556	0	0	1297	0
Turn Type	Split	NA		Split	NA		Prot	NA		Perm	NA	
Protected Phases	3	3		4	4		1	6				2
Permitted Phases											2	
Detector Phase	3	3		4	4		1	6		2		2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		20.0		20.0
Minimum Split (s)	35.0	35.0		35.0	35.0		15.0	32.0		32.0		32.0
Total Split (s)	44.0	44.0		35.0	35.0		15.0	101.0		86.0		86.0
Total Split (%)	24.4%	24.4%		19.4%	19.4%		8.3%	56.1%		47.8%		47.8%
Yellow Time (s)	3.0	3.0		3.0	3.0		3.5	3.5		3.5		3.5
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	2.5		2.5		2.5
Lost Time Adjust (s)	-2.0	-2.0			-2.0		-1.5	-1.0		-1.0		-1.0
Total Lost Time (s)	4.0	4.0			4.0		5.0	5.0		5.0		5.0
Lead/Lag	Lag	Lag		Lead	Lead		Lead			Lag		Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		C-Max		C-Max
Act Effect Green (s)	38.5	38.5			9.0		11.7	124.7				110.7
Actuated g/C Ratio	0.21	0.21			0.05		0.06	0.69				0.62
v/c Ratio	0.79	0.28			0.09		0.40	0.63				0.60
Control Delay	75.0	1.1			1.1		93.1	22.3				11.3
Queue Delay	0.0	0.0			0.0		0.0	0.3				0.0
Total Delay	75.0	1.1			1.1		93.1	22.6				11.3
LOS	E	A			A		F	C				B
Approach Delay		57.9			1.1			24.6				11.3
Approach LOS		E			A			C				B
Queue Length 50th (ft)	339	0			0		51	874				163
Queue Length 95th (ft)	388	0			0		95	1047				222
Internal Link Dist (ft)		752			638			484				1088
Turn Bay Length (ft)	280						130					
Base Capacity (vph)	794	641			362		118	2451				2161
Starvation Cap Reductn	0	0			0		0	290				0
Spillback Cap Reductn	0	13			0		0	0				42
Storage Cap Reductn	0	0			0		0	0				0
Reduced v/c Ratio	0.73	0.28			0.04		0.39	0.72				0.61

Intersection Summary
 Cycle Length: 180
 Actuated Cycle Length: 180
 Offset: 148 (82%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow

SR 527 Corridor Planning Study
 7: Orange Avenue & Columbia ST./DriveWay

8/18/2014

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 26.7

Intersection LOS: C

Intersection Capacity Utilization 73.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 7: Orange Avenue & Columbia ST./DriveWay



SR 527 Corridor Planning Study
8: Orange Avenue & W Gore ST/E Gore ST

8/18/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	231	299	152	38	95	70	157	1474	90	109	920	123
Satd. Flow (prot)	1593	3023	0	1593	2981	0	1593	3157	0	1593	3185	1425
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1593	3023	0	1593	2981	0	1593	3157	0	1593	3185	1425
Satd. Flow (RTOR)		50			83			5				182
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	275	537	0	45	196	0	187	1861	0	130	1095	146
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												2
Detector Phase	3	8		7	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	15.0	39.5		15.0	43.5		15.0	31.0		15.0	37.0	37.0
Total Split (s)	30.0	57.5		16.0	43.5		30.0	88.5		18.0	76.5	76.5
Total Split (%)	16.7%	31.9%		8.9%	24.2%		16.7%	49.2%		10.0%	42.5%	42.5%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	2.5		3.5	2.5	2.5
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0		-1.0	-2.0		-1.0	-2.0	-2.0
Total Lost Time (s)	5.5	4.5		5.5	4.5		5.5	4.0		6.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	24.5	39.3		9.8	21.9		27.8	87.8		25.8	86.3	86.3
Actuated g/C Ratio	0.14	0.22		0.05	0.12		0.15	0.49		0.14	0.48	0.48
v/c Ratio	1.27	0.77		0.52	0.45		0.76	1.21		0.57	0.72	0.19
Control Delay	211.4	67.6		103.9	43.5		96.4	125.5		88.7	31.2	0.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	211.4	67.6		103.9	43.5		96.4	125.5		88.7	31.2	0.8
LOS	F	E		F	D		F	F		F	C	A
Approach Delay		116.3			54.8			122.8			33.4	
Approach LOS		F			D			F			C	
Queue Length 50th (ft)	~407	294		53	64		198	~1406		162	329	0
Queue Length 95th (ft)	#608	346		102	104		m300	#1561		#268	374	6
Internal Link Dist (ft)		1092			1228			1088			827	
Turn Bay Length (ft)	85			185			245			50		
Base Capacity (vph)	216	925		92	710		253	1542		228	1526	777
Starvation Cap Reductn	0	0		0	0		0	0		0	13	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.27	0.58		0.49	0.28		0.74	1.21		0.57	0.72	0.19

Intersection Summary
 Cycle Length: 180
 Actuated Cycle Length: 180
 Offset: 127 (71%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow

SR 527 Corridor Planning Study
 8: Orange Avenue & W Gore ST/E Gore ST

8/18/2014

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.27

Intersection Signal Delay: 90.6

Intersection LOS: F

Intersection Capacity Utilization 105.3%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

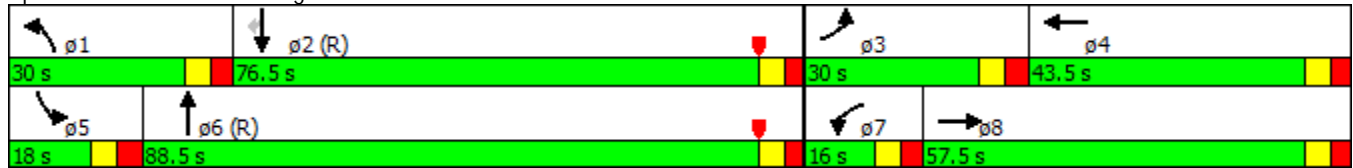
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Orange Avenue & W Gore ST/E Gore ST



SR 527 Corridor Planning Study
9: Orange Avenue & S Lucerne CR

8/18/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	0	69	79	0	189	0	1769	0	0	944	0
Satd. Flow (prot)	1593	0	1425	2357	0	1425	0	4577	0	0	4577	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1593	0	1425	2357	0	1425	0	4577	0	0	4577	0
Satd. Flow (RTOR)			91			225						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	211	0	82	94	0	225	0	2105	0	0	1123	0
Turn Type	custom		custom	custom		custom		NA			NA	
Protected Phases								6				2
Permitted Phases	7		7	4		4						
Detector Phase	7		7	4		4		6				2
Switch Phase												
Minimum Initial (s)	7.0		7.0	7.0		7.0		20.0				20.0
Minimum Split (s)	41.0		41.0	41.0		41.0		30.0				26.0
Total Split (s)	41.0		41.0	41.0		41.0		57.0				57.0
Total Split (%)	22.8%		22.8%	22.8%		22.8%		31.7%				31.7%
Yellow Time (s)	3.0		3.0	3.0		3.0		3.5				3.5
All-Red Time (s)	3.5		3.5	3.0		3.0		2.5				2.5
Lost Time Adjust (s)	-2.0		-2.0	-2.0		-2.0		-2.0				-2.0
Total Lost Time (s)	4.5		4.5	4.0		4.0		4.0				4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None		None	None		None		C-Max				C-Max
Act Effect Green (s)	31.0		31.0	16.0		16.0		120.6				120.6
Actuated g/C Ratio	0.17		0.17	0.09		0.09		0.67				0.67
v/c Ratio	0.77		0.26	0.45		0.68		0.69				0.37
Control Delay	89.4		9.8	83.9		18.8		2.2				14.3
Queue Delay	0.0		0.0	0.0		0.0		0.0				0.0
Total Delay	89.4		9.8	83.9		18.8		2.2				14.3
LOS	F		A	F		B		A				B
Approach Delay								2.2				14.3
Approach LOS								A				B
Queue Length 50th (ft)	240		0	72		0		28				204
Queue Length 95th (ft)	333		42	113		91		m35				279
Internal Link Dist (ft)		462			539			827				351
Turn Bay Length (ft)			90			200						
Base Capacity (vph)	323		361	484		471		3065				3065
Starvation Cap Reductn	0		0	0		0		0				0
Spillback Cap Reductn	0		0	0		0		0				0
Storage Cap Reductn	0		0	0		0		0				0
Reduced v/c Ratio	0.65		0.23	0.19		0.48		0.69				0.37

Intersection Summary
 Cycle Length: 180
 Actuated Cycle Length: 180
 Offset: 176 (98%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow

SR 527 Corridor Planning Study
 9: Orange Avenue & S Lucerne CR

8/18/2014

Natural Cycle: 155

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 13.7

Intersection LOS: B

Intersection Capacity Utilization 83.6%

ICU Level of Service E

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Orange Avenue & S Lucerne CR

↓ ø2 (R)	↙ ø7	↘ ø4	⚣ ø8
57 s	41 s	41 s	41 s
↑ ø6 (R)			
57 s			

Orange Avenue

CORRIDOR PLANNING STUDY



Appendix D

Cost Estimate Data

Date: 11/14/2014 3:53:30 PM

FDOT Long Range Estimating System - Production

R4: Project Details Composite Report

By Version

Project: 241152-1-32-01

Letting Date: 01/2099

Description: Orange Avenue Corridor Planning Study from Pineloch Avenue to Anderson Street

District: 05 County: 99 DISTRICT/STATE WIDE

Project Manager: MIM

Version 2 Project Grand Total

\$2,812,536.22

Description: Ultimate Alternative

Pay Items

Pay Item	Description	Total Unit Weighted Avg. Unit Quantity	Price	Total Amount
102-1	MAINTENANCE OF TRAFFIC	10.00		\$228,308.78
101-1	MOBILIZATION	10.00		\$251,139.66
110-1-1	CLEARING & GRUBBING	1.41 AC	\$7,357.63	\$10,374.26
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	51,861.33 SY	\$2.00	\$103,722.66
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	4,278.56 TN	\$94.55	\$404,537.85
337-7-43	ASPH CONC FC, TRAFFIC C, FC-12.5, PG 76-22	2,074.45 TN	\$101.14	\$209,809.87
425-1-201	INLETS, CURB, TYPE 9, <10'	9.00 EA	\$3,896.70	\$35,070.30
425-1-202	INLETS, CURB, TYPE 9, >10'	45.00 EA	\$5,677.53	\$255,488.85
425-2-41	MANHOLES, P-7, <10'	10.00 EA	\$5,000.00	\$50,000.00
425-5-1	MANHOLE, ADJUST, UTILITIES	10.00 EA	\$747.27	\$7,472.70
425-6	VALVE BOXES, ADJUST	13.00 EA	\$425.00	\$5,525.00
430-175-118	PIPE CULV, OPT MATL, ROUND, 18"S/CD	120.00 LF	\$52.94	\$6,352.80
520-1-7	CONCRETE CURB & GUTTER, TYPE E	6,250.00 LF	\$25.00	\$156,250.00
520-1-10	CONCRETE CURB & GUTTER, TYPE F	1,951.49 LF	\$23.50	\$45,860.02
522-1	CONC SIDEWALK AND DRIVEWAYS, 4" THICK	3,570.00 SY	\$43.03	\$153,617.10
526-1-1	PAVERS, ARCHITECTURAL, ROADWAY	2,315.00 SY	\$71.39	\$165,267.85
570-1-1	PERFORMANCE TURF	578.94 SY	\$3.00	\$1,736.82
630-2-11	CONDUIT, F&I, OPEN TRENCH	1,500.00 LF	\$5.80	\$8,700.00
630-2-12	CONDUIT, F&I, DIRECTIONAL BORE	500.00 LF	\$20.32	\$10,160.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	2.00 PI	\$6,181.92	\$12,363.84
635-2-11	PULL & SPLICE BOX, F&I, 13" X 24"	32.00 EA	\$503.91	\$16,125.12
639-1-112	ELECTRICAL POWER SRV, F&I, OH, M, PUR BY CON	2.00 AS	\$1,831.63	\$3,663.26
639-2-1	ELECTRICAL SERVICE WIRE	120.00 LF	\$5.39	\$646.80
649-31-103	M/ARM, F&I, WS-150, SINGLE ARM, W/O LUM-60	8.00 EA	\$33,176.14	\$265,409.12
650-1-311	TRAFFIC SIGNAL, F&I, 3 SECT, 1 WAY, ALUMINUM	24.00 AS	\$912.84	\$21,908.16

653-191	PEDESTRIAN SIGNAL, F&I, LED-COUNT DWN, 1	16.00 AS	\$665.46	\$10,647.36
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	108.00 EA	\$189.52	\$20,468.16
660-1-106	LOOP DETECTOR INDUCTIVE, F&I, TYPE 6	84.00 EA	\$434.07	\$36,461.88
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	24.00 AS	\$654.94	\$15,718.56
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	16.00 EA	\$210.55	\$3,368.80
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	2.00 AS	\$22,568.99	\$45,137.98
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	8.00 EA	\$217.36	\$1,738.88
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	1,377.00 EA	\$7.25	\$9,983.25
711-14-123	THERMOPLASTIC, PREFORM, WHITE, SOLID, 12"	1,200.00 LF	\$8.86	\$10,632.00
711-14-170	THERMOPLASTIC, PREFORMED, WHITE, ARROWS	123.00 EA	\$132.32	\$16,275.36
711-14-560	THERMOPLASTIC, PREFORMED, WHITE, MESSAGE	20.00 EA	\$329.77	\$6,595.40
711-16-111	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	6.80 NM	\$3,293.59	\$22,396.41
711-16-131	THERMOPLASTIC, STD-OTH, WHITE, SKIP, 6"	13.60 GM	\$1,075.10	\$14,621.36
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)	1.00 LS	\$50,000.00	\$50,000.00
104-18	INLET PROTECTION SYSTEM	54.00 EA	\$70.00	\$3,780.00
700-5-21	INTERNAL ILLUMINATED SIGN	36.00 EA	\$3,200.00	\$115,200.00
Project Unknowns		0.00 %		\$0.00
Design/Build		0.00 %		\$0.00
Version 2 Project Grand Total				\$2,812,536.22