Orange County
Multimodal Corridor Plan
Phase I

ORANGE COUNTY GOVERNMENT FLORIDA

Transportation Planning Division

Community, Environmental, and Development Services Department

June 5, 2014

Greetings,

As your Mayor, I have made transportation one of my top priorities to ensure that Orange County's residents, businesses, and visitors enjoy a community with exceptional transportation options and quality of life.

Orange County's Sustainability Plan, "Our Home for Life," reflects our efforts to create a future in which Orange County will be known as the best place to live, work, play, and raise a family. Orange County's Multimodal Corridor Plan furthers this vision by focusing on the need for a transportation network that embraces safety, livability, technology, and support of our economy, with the goal of creating a fully multimodal Orange County transportation network by the year 2040.

As we continue on our path of transformation and sustainability, SunRail will serve as a foundation for future transportation projects and initiatives. At the same time and through the Multimodal Corridor Plan, we will ensure that all areas of Orange County have the safest and best transportation system possible for automobiles, cyclists, pedestrians, and transit users.

Thank you for being a part of Orange County's transportation vision for the future.

Sincerely,

Teresa Jacobs

Orange County Mayor

Orange County
Multimodal Corridor Plan Phase 1

Acronym List

ADA: Americans with Disabilities Act
ADAAG: Americans with Disabilities Act Accessibility Guidelines
ADT: Average Daily Traffic
AMA: Alternative Mobility Area
AVL: Automatic Vehicle Locator
BCC: Board of County Commissioners
BRT: Bus Rapid Transit
CAFE: Federal Corporate Average Fuel Economy
CDD: Community Development District
CIP: Capital Improvements Program
CMS: Concurrency Management System
CUTR: (University of South Florida) Center for Urban Transportation Research
DMS: Dynamic Message Signage
DOJ: (United States) Department of Justice
DRI: Development of Regional Impact
FDOT: Florida Department of Transportation
FHWA: Federal Highway Administration
GIS: Geographic Information Systems
GPS: Global Positioning System
GTFS: Google Transit Feed Specification
HAWK: High Intensity Activated Crosswalk
HUD: (U.S. Department of) Housing and Urban Development
ITE: Institute of Transportation Engineers
ITS: Intelligent Transportation Systems
LRTP: Long Range Transportation Plan
MAP-21: Moving Ahead for Progress in the 21st Century Act
MFA: Multimodal Focus Area
MPO: Metropolitan Planning Organization
MSBU: Municipal Service Benefit Unit
MSTU: Municipal Service Taxation Unit
MUTCD: Manual on Uniform Traffic Control Devices
NCHRP: National Cooperative Highway Research Program
OCATMS: Orange County Advanced Traffic Management System
PROWAG: Public Right of Way Accessibility Guidelines
RCA: Roadway Conceptual Analysis
REMI: Regional Economic Model, Inc.
RRFB: Rectangular Rapid Flashing Beacon
RSA: Road Safety Audit
SCOOT: Split, Cycle, and Offset Optimization Technique
SIS: Strategic Intermodal System
TIGER: Transportation Investments Generating Economic Recovery

TMC: Traffic Management Center
TMP: Trails Master Plan
UCF: University of Central Florida

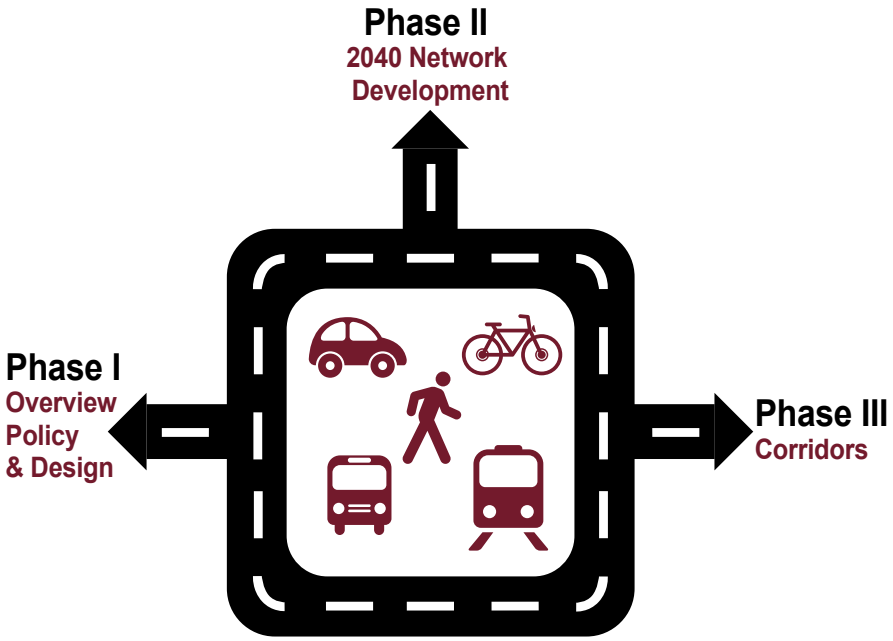
Introduction

Project Description and Goals

In recent years Orange County has developed several initiatives to implement a multimodal transportation network. These efforts included both policy and project development initiatives. For example, multimodal policy initiatives include Comprehensive Plan changes, transportation impact fee updates, and updates to the Concurrency Ordinance. From a project development process, Orange County continues to build and plan for an interconnected recreational trail system, on road bike lanes, transit amenities, a robust road program, and is a key funding partner of Central Florida's SunRail commuter rail line. Guided by Mayor Jacobs' Sustainability Plan, known as "Our Home for Life," the Multimodal Corridor Plan builds on these initiatives with the goal of creating a year 2040 transportation network for Orange County consistent with the MetroPlan Orlando 2040 Long Range Transportation Plan. The Multimodal Corridor Plan will focus particularly on Orange County's current and future multimodal system needs from transportation, land use, and capital planning perspectives.

The first phase of the Orange County Multimodal Corridor Plan is designed to define and depict the Orange County transportation network's safety, livability, technology, economy, and amenity systems and needs for Orange County and the public. Project Themes of Safety, Livability, Technology, Economy, and Amenity provide an overall organizing framework to address various components of Orange County's transportation-land use vision within the Multimodal Corridor Plan, including identification of key corridors related to each Theme. The overall Multimodal Corridor Plan concept by phase is depicted below.

Orange County Multimodal Corridor Plan Concept



Executive Summary

Safety Theme

The Safety Theme outlines a series of safety related analyses and assessments based on crash data, Complete Streets guidelines, posted speeds, ADA compliance, and intersection design parameters for the road network. A Complete Streets manual with prototypical sections forming the basis for policy implementation of a multimodal system has been completed. This Theme includes pedestrian planning strategies for crash reduction with network enhancements and operations. Safety Corridors are identified for prioritized funding of FHWA and FDOT approved countermeasures and related improvements. The resulting recommendations are presented below.

- Maintain a current inventory of priority safety projects and study needs to pursue funding through MetroPlan Orlando and federal grant sources
- Revise the RCA process to incorporate more multimodal and Complete Streets considerations, informed by the HUD Sustainable Communities Grant project and the recent FDOT Multimodal Planning Guidebook
- Evaluate the potential adoption of an Orange County Complete Streets Policy to guide design of new roadway projects and associated features, such as transit facilities
- Evaluate ADA compliance in resurfacing costs to determine issues, needs, and a prioritization strategy, as well as the ability to access additional state and federal funds through MetroPlan Orlando or grant development (ex. through the federal Transportation Alternatives Program)
- Ensure funding is maintained and efforts continue to scan “as built” plans for Orange County roadways to facilitate evaluations and safety retrofits, as needed

Safety Theme at a Glance

- Maintain a current inventory of priority safety projects
- Revise the RCA process
- Evaluate the potential adoption of Complete Streets Policy
- Evaluate ADA compliance
- Ensure funding is maintained
- Develop or access training modules for ADA compliance
- Conduct recommended pedestrian planning activities
- Conduct posted speeds analysis

- Develop or access training modules for ADA compliance, including new PROWAG standards being implemented by FDOT, for Public Works staff, including inspectors of development-provided infrastructure

- Conduct recommended pedestrian planning activities, as determined by County priorities and budget, as part of the emerging Orange County pedestrian and bicycle safety program

- Complete a Road Safety Audit or Pedestrian Road Safety Audit for identified “clusters” of high-crash locations, as noted in the Safety section

- Conduct initial engineering and planning evaluation, including crash data analysis, on County roadways with posted speeds above 45 miles per hour to determine if MUTCD criteria may be met for re-evaluation of posted speeds

Technology Theme

Orange County's transportation network benefits from a variety of technologies that enhance its operations, efficiency, and safety. These tools include Intelligent Transportation Systems, red light safety cameras, and others. This section considers additional technology options and concludes with the recommendations presented below.

- Participate in development of FDOT/MetroPlan Orlando proposals for additional ITS deployment to ensure interoperability and cost-effectiveness of technologies
- Determine if beacons or other safety features are currently available for distribution by FDOT District 5 or the Central Office
- Monitor the new FDOT Pedestrian Safety Initiative to determine potential changes to approved technologies used within FDOT District 5 through Central Office guidance
- Conduct a cost-benefit analysis for expansion of the use of state contracts and/or City of Orlando contracts for technology purchases
- Conduct a cost-benefit analysis for technology purchases
- Create GIS layers of available current pedestrian and bicycle counts and turning movement counts (after signal retiming next year) from relevant County divisions and FDOT District 5 for ongoing updates and accessibility across Public Works
- Determine the feasibility and a corresponding strategy for implementing an annual turning movement count program in conjunction with the annual traffic count or separately as part of Concurrency Management System updates
- Assess the feasibility of installing additional pedestrian counters, similar to the Parks and

Technology Theme at a Glance

- Participate in additional ITS deployment
- Determine if beacons are available
- Monitor FDOT Pedestrian Safety Initiative
- Conduct a cost-benefit analysis for technology purchases
- Conduct periodic reviews of FDOT's Qualified Products List and Innovative Product Evaluation List
- Expand data collection for vehicular, pedestrian, and bicycle counts

Recreation Division's trail user counters, in key locations in Orange County on a permanent or regular basis to assist in pedestrian planning and warranting of additional features, as needed

- Monitor the feasibility of development of open source multimodal trip planning tools, potentially through a "civic app" competition or expansion of existing Orange County mobile applications, in cooperation with LYNX and MetroPlan

Amenity Theme

The Amenity Theme addresses the Orange County Trails Master Plan in relation to community and transit destinations, and includes information on the economic benefit of trails and other pedestrian and bicycle infrastructure. The Theme also explores innovations in sharing services (car, bike, and ride) and their integration into the transportation network and discusses structured and on-street convenience parking as an investment tool. Amenity Corridors are identified for potential enhancement funding, and recommendations are presented below.

- Pursue grant funding through the Transportation Alternatives Program under MAP-21 and other nontraditional sources, such as foundations, for trail expansion, and pedestrian and bicycle facility enhancement
- Compile inventory of multi-purpose paths as GIS layer to further identify potential amenity connections as a cooperative project between GIS, Parks, and Transportation Planning
- Review recommendations of MetroPlan Orlando's Bike Sharing Working Group and evaluate other areas for potential bike and car sharing
- Review recommendations of MetroPlan Orlando's Trail Crossings Working Group and prioritize pedestrian and bicycle counts at these intersections to provide data for improvements to be identified by location in Phase II
- Recommend further study on existing on-street parking and implementation to evaluate its safety, maintenance, and development standards, including traffic calming, at the time of the County's next Evaluation and Appraisal Report of the Comprehensive Plan

Amenity Theme at a Glance

- Pursue grant funding through the Transportation Alternatives Program
- Compile inventory of multi-purpose paths as GIS layer
- Review recommendations of MetroPlan Orlando's Bike Sharing and Trail Crossings Working Groups
- Recommend further study on existing on-street parking

Livability Theme

The Livability Theme of the Multimodal Corridor Plan addresses characteristics of Orange County roads that affect people's daily lives and activities. The road right-of-way is intended to accommodate roads, but where possible, it should also provide space for other activities and modes of travel, including walking, bicycling and transit. To this end, this Theme explores opportunities to accommodate other transportation modes and systems within the existing right of way traditionally reserved for the single purpose of accommodating cars.

- Evaluate municipal land development codes within Orange County to make recommendations regarding sidewalk width and pedestrian connectivity requirements
- Implement the recommendations of the Trees in the Right of Way Group regarding measures to prevent root damage to infrastructure such as root barriers, steel reinforcement of sidewalks and other actions as appropriate
- Conduct a pilot study of a long-term University Boulevard cross-section reassessment based on the findings of Technical Memorandum 2, the recent GMB/Traffic Engineering study of this corridor, and the land use context, site development standards, transit service, and parallel facilities that would need to be present in the long-term for corridor transition
- Once recommended pedestrian/bicycle data are available, evaluate appropriateness of "bicycle boulevard" prototypes to assess if any suitable locations and projects can be determined

Livability Theme at a Glance

- Evaluate municipal land development codes for sidewalk requirements
- Implement the recommendations of the Trees in the Right of Way Group
- Conduct a pilot study of a long-term University Boulevard cross-section reassessment
- Evaluate appropriateness of "bicycle boulevard" prototypes

Economy Theme

Orange County's economy relies on the movement of residents, visitors, employees, freight, and goods throughout the county and the region. The transportation network's mobility and accessibility also promote development, redevelopment, and concentrations of economic activity, such as the International Drive tourist corridor and Alafaya Trail adjacent to the University of Central Florida. The transportation network is an economic asset to Orange County that is challenged by fiscal constraints and revenue decline, requiring preservation of existing capacity in key freight corridors and the pursuit of new partnerships that extend Orange County's existing base of public-private partnerships. In addition to assessing infrastructure costs and partnership opportunities, the Economy section identifies corridors that prioritize freight movement, and recommendations are outlined below.

- Conduct further assessment and modeling evaluation of proposed Multimodal Focus Areas in Phase II and III as part of the County's next Evaluation and Appraisal Report to determine feasibility, including outreach to relevant advisory boards and a worksession with the BCC
- Ensure facilities and programs on Economy Corridors prioritize or do not hinder freight movement
- Compile an inventory of Orange County freight-related roadway projects for inclusion in the MetroPlan Orlando Freight Goods and Services update and the Florida Freight Mobility and Trade Plan Investment Element
- Determine feasibility and relationship to County needs and interests of entering public-private partnerships as now enabled by s.336.71, F.S., and of use of Transportation Development Authorities under s. 163.3182, F.S., with Legal staff and other appropriate County Divisions
- Conduct a cost analysis of multimodal/Complete Streets prototypes for capital and operations and maintenance costs for appropriate capital planning

Economy Theme at a Glance

- Conduct further assessment of proposed Multimodal Focus Areas in Phase II and III
- Prioritize freight movement on selected corridors
- Include local freight-related roadway projects in regional and state plans
- Determine feasibility of public-private partnerships
- Conduct cost analysis of multimodal/Complete Streets prototypes
- Access or develop design-build training and procedures

and development of public-private partnerships using an Orange County staff working group after Phase II

- Access or develop design-build training and procedures for Orange County staff using FDOT and LYNX prototypes, such as the LYMMO expansion

See 11”x17” Gatefold Pages 1 - 4:

- Multimodal Corridor Plan Corridors Map
- Orange County Transportation Network
- Orange County 2030 Long Range Transportation Plan

Safety

This section includes safety related analyses and assessments on crash data, Complete Streets, posted speeds, ADA compliance and intersection design of the road network.

Safety Theme

Introduction

In 2011, Transportation for America published "Dangerous by Design," a report describing problems with pedestrian safety in America. A comparison of pedestrian fatalities for the years 2000-2009 in the Orlando-Kissimmee Metro area lists 557 pedestrian deaths, resulting in an average pedestrian death rate of 3.0 fatalities per 100,000 persons (population). The Surface Transportation Policy Project has ranked Orlando as the nation's most dangerous large metropolitan area for pedestrians. In light of this alarming statistic, the County's consultant conducted a series of safety related analyses of the road network on crash data, Complete Streets, posted speeds, ADA compliance, and intersection design to address these safety concerns. The studies concluded with pedestrian planning strategies based on the previous results. These analyses and recommendations are summarized briefly in the following sections, supplemented by additional recommendations. The full text of each analysis described is included in the Appendices.

The general trends for the high-crash roadway segments seen were:

- Pedestrian and bicycle crashes on Orange county roadways with four or more lanes have a higher fatality rate than two lane facilities.
- The majority of 2-lane high-crash segment locations were undivided roadways, and most of the 4 or more lane high-crash segment locations were divided roadways (One scenario was for all roads and the other was for County roads only).
- Overall, the high-crash segment locations were found to be primarily fronted with residential uses for the 2-lane locations and primarily fronted with commercial uses for the locations with 4 or more lanes.
- Very few of the high-crash locations were adjacent to undeveloped property.

See 11"x17" Gatefold Page 5:
- Pedestrian and Bicycle Crashes

A comparison of pedestrian fatalities for the years 2000-2009 in the Orlando-Kissimmee Metro area lists 557 pedestrian deaths, resulting in an average pedestrian death rate of 3.0 fatalities per 100,000 persons (population).

Crash Data Analysis

The consultant assembled and assessed three-year crash data to analyze 15 high-crash Concurrency Management System (CMS) segments in various categories, which were then evaluated and correlated to the road network attributes (see Appendix 1). These attributes included number of lanes, functional/roadway classifications, traffic volumes, general land use types, and general access management conditions, as well as the findings of "Dangerous by Design".

The general trends for the high-crash roadway segments seen were:

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- The majority of 2-lane high-crash segment locations were undivided roadways, and most of the 4 or more lane high-crash segment locations were divided roadways (One scenario was for all roads and the other was for County roads only).
- Overall, the high-crash segment locations were found to be primarily fronted with residential uses for the 2-lane locations and primarily fronted with commercial uses for the locations with 4 or more lanes.
- Very few of the high-crash locations were adjacent to undeveloped property.

Using the crash data collected for this study (all crashes, not limited by scenario criteria), and the 2010 Census population for Orange County of 1,145,956, the following summary was developed. As can be seen, there were 106 pedestrian fatalities in Orange County from 2009 to 2011, with an average rate of 3.08 pedestrian fatalities per 100,000 persons (population). The rate varied by year, with the latest year (2011) rate of 2.62 pedestrian fatalities per 100,000 persons.

Table 1: Orange County Crash Statistics – All Crashes 2009-2011

Year	Pedestrian Fatalities	Fatalities per 100,000 pop.	Pedestrian Crashes	Percent Fatal Crashes
2009	34	2.97	650	5.23%
2010	42	3.67	621	6.76%
2011	30	2.62	563	5.33%
Total	**106**	**3.08**	**1,834**	**5.78%**

Additionally, MetroPlan Orlando (the regional planning organization) adopted its Pedestrian Safety Action Plan on July 11, 2012, listing the Percentage of Pedestrian Crashes Resulting in Fatalities.

The report indicates approximately a 6 percent pedestrian fatality rate over the three year period in the tri-county area. As can be seen in the summary above, similar results (5.78 percent) were observed for Orange County during the three years analyzed in this study.
Most of the high crash pedestrian locations identified in the MPO report were located on state roads rather than County facilities. Of the list of 50 streets analyzed, only 3 were identified as high-crash segments owned and maintained by Orange County.

Complete Streets

A "Complete Street" refers to a roadway facility that has been designed to ensure that "all users" (bicyclists, public transportation riders/vehicles, pedestrians, motorists) can safely, conveniently, and accessibly navigate the roadway, regardless of their age, physical ability, and choice of transportation mode. The National Complete Streets Coalition reports that over 520 jurisdictions have adopted Complete Streets policies that reinforce these principles at a state or local level. In Central Florida, the State of Florida and the Cities of Winter Park, Orange City, Titusville, Cape Canaveral, Cocoa, and Rockledge have adopted Complete Streets policies. At the same time, the majority of these policies do not include guidance on how to implement the policies in roadway design and construction, which may preclude their use in design and capital planning of roadway networks. To address this issue, a number of jurisdictions have created corresponding Complete Streets manuals to assist in network development and enhancement.

A comprehensive Complete Streets policy:

- Includes a vision for how & why the community wants to complete its streets.
- Specifies 'all users' to include pedestrians, bicyclists, & transit passengers of all ages & abilities, as well as trucks, buses, & automobiles.
- Applies to both new and retrofit projects, including design, planning, maintenance, & operations, for the entire right of way.
- Makes specific exceptions & sets a clear procedure that requires high-level approval of exceptions.
- Encourages street connectivity & aims to create a comprehensive, integrated, connected network for all modes.
- Is understood by all agencies to cover all roads.
- Directs the use of the latest & best design guidelines while recognizing the need for flexibility in balancing user needs.
- Directs that Complete Streets solutions will complement the context of the community.
- Establishes performance standards with measurable outcomes.
- Includes specific next steps for implementation of the policy

Note: Emphasis the author's.
Source: Complete Streets: Policy Basics. National Complete Streets Coalition, Smart Growth America.

To help determine the scope of what may be needed to facilitate a Complete Streets approach in Orange County, Phase I of the Multimodal Corridor Plan included the development of a

Complete Streets manual (see Appendix 2). Development of the manual included an Orange County design workshop with engineering staff and a consultant to outline a decision framework, a palette of potential design options, and corresponding cross-sections. These cross-sections for Complete Streets are appropriate for the range of Orange County roads, including elements relating to auto, transit, pedestrian, and bike modes, as well as amenities. Cross-sections shown are conceptual, but would be implemented in a manner consistent with applicable provisions of the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (known as the "Florida Greenbook").

Assessing Posted Speeds

Consensus development, mutual education, and collaboration were important aspects of this effort. Moreover, the resulting Complete Streets manual includes both short and long-term enhancements relative to design, operational, and fiscal implications of building Complete Streets in the County. As part of this implementation plan, Orange County will proceed with the drafting and adoption of a Complete Streets policy. The intent of the policy is to establish an outline and the process to make sure that the County's roadways safe for all users and to define the appropriate conditions for use of the Complete Streets manual.

See 11"x17" Gatefold Page 6 - 7:

- Complete Streets Design Palette
- Complete Streets Cross Sections

Posted Speeds Analysis

The Multimodal Corridor Plan also included an analysis of posted speeds on County roadways for comparison to high-crash locations (see Appendix 3). This analysis was intended to assess roadway components and characteristics, including posted speeds, in high-crash locations. Criteria analyzed included functional classification, laneages, representative vehicular speeds, traffic volumes, frequency of operational conflicts, pedestrian and bike traffic levels, and adjacent land uses. The analysis used applicable standards and sources, such as ITE, FHWA and FDOT to prepare recommended guidelines relating to posted speeds on Orange County roadways.

In general, the study found crash rates to increase slightly with higher posted speed for facilities with posted speeds up to 45 MPH. The majority of functionally classified roadways within Orange County's urban area have posted speed limits of 45 MPH or less. Some of the trends identified indicated that lower posted speeds may reduce crashes along Orange County facilities.

FHWA's Manual for Uniform Traffic Control Devices (MUTCD) (Section 2B.13 "Speed Limit Sign")

provides the following standard: "Speed zones (other than statutory speed limits) shall only be established on the basis of an engineering study that has been performed in accordance with traffic engineering practices. The engineering study shall include an analysis of the current speed distribution of free-flowing vehicles." The MUTCD also states: "Other factors that may be considered when establishing or reevaluating speed limits are the following:

A. Road characteristics, shoulder condition, grade, alignment, and sight distance;

B. The pace (*pace of free flowing vehicles in the stream*) ;

C. Roadside development and environment;

D. Parking practices and pedestrian activity; and

E. Reported crash experience for at least a 12-month period."

In addition to MUTCD guidance above, Florida Statutes (316.183, 316.187 and 316.189) specify maximum speed limits and allow state or local governments to increase or decrease statutory speed limits on a highway after engineering and traffic investigations, with a local jurisdiction being limited to a maximum speed limit of 60 MPH. Based on the research conducted, utilizing an 85th percentile speed profile is recommended practice for determining posted speed limits. Additionally, various factors should be considered as part of an engineering study reviewing changes to determine any variation from the 85th percentile speed. The following factors should be part of the studies:

- Functional classification of roadway,
- Number of through lanes,

- Access density,
- Traffic signal spacing,
- Road geometry,
- On-street parking,
- Pedestrian and bicycle activity and
- Reported crash experience for at least a 12-month period.

These factors, as well as high crash locations, can be applied in a review of the speed limits on County roads, and developing criteria for design of future roadway projects. Other factors could include improved school crossings, installation and enhancements to mid-block pedestrian crossings, or changes to land uses adjacent to the roads (such as expansion to the Full Sail facilities on University Boulevard). Orange County should conduct initial engineering and planning evaluation, including crash data analysis, on the limited County roadways with posted speeds above 45 miles per hour to determine if criteria in the MUTCD and Ch. 316, Florida Statutes, may be met for re-evaluation of posted speeds.

Americans With Disabilities Act Compliance

The Americans with Disabilities Act (ADA) was signed in to law on July 26, 1990, and the United States Department of Justice (DOJ) began enforcement of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) in 1991. The US DOT ADA standards for transportation facilities became effective on November 29, 2006.

Meeting federal guidelines requires transition planning to establish the means and manner of any necessary retrofits to the system to meet federal standards, particularly important in light of recent DOJ guidance that roadway resurfacing is an activity that triggers the need to bring older roadways into current ADA compliance. Orange County has a comprehensive ADA Compliance Initiative underway to coordinate its ongoing ADA-related activities and projects to ensure full compliance with applicable federal and state law. This analysis is intended to contribute to this transition planning effort by identifying needs and presenting estimating parameters for use in system planning and investment.

As the County currently resurfaces roadways on a 15-year cycle, understanding the potential scope and funding needed to pursue ADA compliance in resurfacing and retrofit projects is essential. Much

of the County road network was built prior to the most current ADA standards for transportation facilities adopted in 2006. Construction completion years for a number of the County's functionally classified roads within the Concurrency Management System (CMS) were assessed to identify Orange County roads (by segment limits) that were constructed or reconstructed prior to adoption of the ADA standards. Several Orange County roadways were reviewed using "as-built" plans, where available, and field reviews to depict existing conditions in these corridors.

The critical ADA standards adoption point identified was before and after the end of year 2006. The major ADA standards for roadway construction included:

- accessible routes
- detectable warnings
- public sidewalk curb ramp details (landings, widths and alignment with crosswalks)

It can be determined whether specific Orange County road projects would have been required to comply with the 2006 ADA standards by reviewing the letting date of the project. Those projects with a "letting" date after November 29, 2006, were required to meet the ADA design standards. Therefore, a conservative approach used in this analysis assumes that no roads constructed or reconstructed before 2007 were in full compliance with current ADA design standards, as they were not in effect until late 2006. Orange County would certainly have designed and constructed all roads that were let after November 29, 2006, in compliance with the applicable ADA design standards in effect at that time. This analysis estimates that over 900 miles of County Roads were constructed or reconstructed before 2007.

This approach suggests that most of the Orange County roadway network facilities were built before the adoption of the standards meeting 2006 ADA guidelines. Therefore, although all major County roads have sidewalks and most have ramps, a conservative approach in transportation network assessment would assume the major elements of the ADA standards for road design required to be met for the construction or reconstruction of those Orange County road segments are not present, as the ADA standards were not in effect at their construction. Those major elements included pedestrian routes (ramps, sidewalks and crosswalks), detectable warnings, and access to pedestrian actuation for control devices.

Based on this assessment, it is estimated that Orange County will probably have to address minor improvements, such as the reconstruction of pedestrian ramps, installation of detectable warnings,

and the installation of crosswalk markings and cross-streets and major driveways for up to 90 percent of the CMS roadway segments. With this reconstruction, ramp slopes and sidewalk slopes (at driveways), may also be required to be modified to meet the ADA standards
A generalized cost to complete the corrections of the ADA compliance problems for County roads constructed before 2006 can be estimated based on the limited information obtained with the review of the six County roads, application of general construction costs from FDOT Construction Costs website resource (FDOT, 2013), and adjustment based on County experience. It was estimated that the following costs would apply:

- Installation of a detectable warning: $600
- Installation of reconstruction of a ramp: $5,000
- Installation of crosswalk pavement markings: $1,000
- Based on at least 900 miles of County Roads non-compliant with ADA standards, and applying the results of the review of the very limited road sample, the following estimates were determined:
- Installation or replacement of detectable warnings:
- $600 per location x (47.4 + 3.4) locations/mile x 900 miles = $27,432,000
- Installation of or reconstruction of ramps:
- $5,000 per location x 5.7 locations/mile x 900 miles = $25,650,000
- Installation of crosswalk pavement markings:
- $1,000 per location x 12.6 locations/mile x 900 miles = $9,072,000

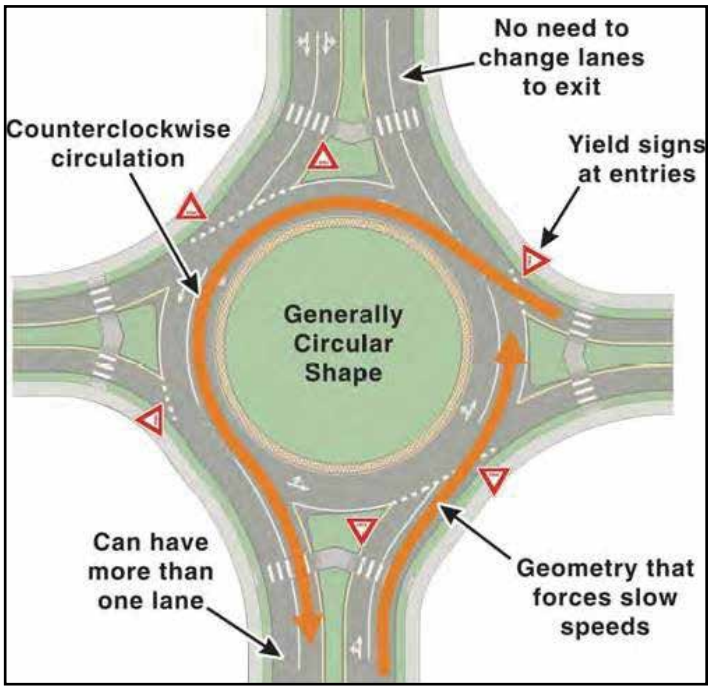
To assist in these efforts, the County should ensure funding is maintained and efforts continue to scan “as built” plans for Orange County roadways to facilitate evaluations and safety retrofits, as needed. Orange County should also evaluate ADA compliance in resurfacing costs to determine issues, needs, and a prioritization strategy, as well as the ability to access additional state and federal funds through MetroPlan Orlando or grant development (ex. through the federal Transportation Alternatives Program). Finally, Orange County should develop a coordinated effort to create or access training modules for ADA compliance, including new PROWAG standards being implemented by FDOT now pending federal adoption, for Public Works staff. In addition to Orange County’s roadway and intersection designers, this training initiative should also include inspectors of development-provided infrastructure, an essential component of overall transportation network compliance.

Intersection Design

The Multimodal Corridor Plan includes consultant review of Orange County intersection characteristics and recommended intersection improvement strategies, including conceptual

designs for intersections (see Appendix 4). This analysis included six roadway/intersection types that include approach volumes, adjacent land uses, approach speeds, spacing to adjacent intersections, and traffic control techniques (signalization, signage, and striping, roundabouts). In general, the evaluation found that Orange County intersections are well-designed and in good condition and that roundabouts may be a potential intersection design for consideration.

The evaluation of potential roundabout options would be based on the NCHRP Report 672 (Second Edition) adopted by FDOT as the primary guidance for roundabouts within the state. The Florida Intersection Design Guide is a supporting manual and includes a new Chapter 7 on roundabouts. (The Florida Roundabout Guide has been sunset, along with Manual on Uniform Traffic Studies chapter, as official guidance and is now advisory only.) Section 2.13 of FDOT's intersection policy, as updated in January 2013, requires roundabout evaluation for new construction, reconstruction, safety improvements, or changes in intersection control. Also, FHWA considers these to be a proven safety countermeasure with associated medium to high costs and research-established crash reduction of 60 to 87 percent. In recent years, Orange County Public Works drafted a Roundabout Study to do preliminary assessments of design and construction issues and area suitability. It is likely that FDOT and Orange County will need to consider roundabouts in select future intersection enhancement projects, based both on changing design standards and community preferences in some areas of Orange County.



Source: NCHRP Report 672, FHWA, 2010

Pedestrian Planning Strategies

Finally, Multimodal Corridor Plan analyses included consultant-recommended strategies for undertaking additional pedestrian safety planning (see Appendix 5), based on extensive background research and the review of Orange County pedestrian conditions.

FHWA (2009) outlines a framework for pedestrian planning recommended for use by Orange County in its program activities:

- Define objectives;

- Identify locations;
- Select countermeasures (depending on the type of crash, collision history and local conditions) such as spot speed enforcement, signage, and installing new traffic signals;
- Institutionalize changes to planning and design standards;
- Consider land use, zoning and site design issues;
- Reinforce commitment; and
- Evaluate results.

In addition to the FHWA template, other factors should be considered in pedestrian planning, which include stakeholder involvement, “Three E’s” as guiding principles, and consistency with related plans and programs.

See 11”x17” Gatefold Page 8
- Sample Crash Data Table

"Three E's" as Guiding Principles

Engineering

Sidewalks and other off-road facilities will be the foundation of pedestrian planning. However, other physical improvements are needed to create a safe pedestrian environment, such as street lighting, well- marked crosswalks, and pedestrian signals. Strategies should address:

- Continuing to implement the countywide sidewalk and traffic calming programs;
- Securing funds for the unfunded capital improvement pedestrian-related projects;
- Incorporating street lighting into the pedestrian-related projects;
- Assessing existing crosswalks and make improvements to ensure that they are visible to drivers;
- Assessing existing pedestrian signals and make improvements to signal timing, as needed and
- Reviewing existing pedestrian patterns to determine if mid-block crosswalks are warranted.

MetroPlan Orlando has completed Pedestrian Road Safety Audits (RSA) for segments of Orange Avenue, Semoran Boulevard, and Edgewater Drive and has received a funding commitment from FDOT District 5 to fund 3 Pedestrian RSAs per year.

Education

A pro-active pedestrian safety education program is needed. Making physical improvements to create a safe walking environment is only part of the solution. Drivers and walkers alike need to be aware of their surroundings and respect other modes of travel. Strategies should focus on:

- Creating an education program for a range of Orange County audiences – residents, school-aged children, businesses (especially within an activity hub), and visitors;
- Working with existing groups to reinforce the pedestrian safety message, such as Orange County Homeowner Associations, Orange County Sheriff's Office, Orange County Public Schools, Bike/Walk Central Florida, Downtown Orange County, Orange County Convention and Visitors Bureau, and International Drive Master Transportation and Improvement District;
- Using Orange County's communication networks (website, Orange TV, e-blasts) and other existing networks to communicate the pedestrian safety message; and
- Collaborating with other municipalities and agencies within the Central Florida Region to reinforce the pedestrian safety message.

Enforcement

Speeding and ignoring pedestrian-designated areas are a few of the ways in which pedestrian safety can be compromised. Enforcement of pedestrian-related violations should continue, as it has been done on a periodic basis through the Best Foot Forward Initiative.

FHWA Countermeasures

In 2012, the U.S. Department of Transportation Federal Highway Administration (FHWA) issued an updated list of Proven Safety Countermeasures that research has proven reduce highway fatalities and serious injuries. FHWA notes the agency is "highly confident that certain processes, infrastructure design techniques, and highway features are effective, and their use should be encouraged." The new list of proven safety countermeasures (in alphabetical order), with crash reduction factors identified by FHWA, includes:

Backplates with Retroreflective Borders (on Traffic Signals)

Backplates added to traffic signals increase their visibility and reflectivity in both daytime and nighttime conditions, reducing unintentional red-light running. The use of backplates with retroreflective borders may result in a 15 percent reduction in all crashes at urban, signalized intersections.

Corridor Access Management

Corridor access management refers to the design, implementation, and control of entry and exit points along a road managed to reduce traffic and vehicle conflicts and enhance traffic movement. Access management strategies can reduce severe (injury/fatal) crashes along urban/suburban arterials by 25 to 31 percent.

Midblock locations account for more than 70 percent of pedestrian fatalities.

This is where vehicle travel speeds are higher, contributing to the larger injury and fatality rate seen at these locations. More than 80 percent of pedestrians die when hit by vehicles traveling at 40 mph or faster while less than 10 percent die when hit at 20 mph or less.

Source: Medians and Pedestrian Crossing Islands in Urban and Suburban Areas, FHWA

photo courtesy of www.seefloridago.com

Enhanced Delineation and Friction for Horizontal Curves

A number of roadway treatments and signage can reduce horizontal roadway curves' safety concerns. For example, chevron signs, curve warning signs, and/or sequential flashing beacons can reduce all fatal and injury crashes by 38 to 43 percent. Providing horizontal alignment and advisory speed signs can reduce all injury crashes by 13 percent. Refinishing pavement with microsurfacing treatment can reduce all fatal and serious injury crashes by 43 percent.

Longitudinal Rumble Strips and Stripes on 2-Lane Roads

Rumble strips are milled or raised elements on pavement that alert inattentive drivers with vehicles leaving the travel lane through a combination of vibration and sound. Rumble stripes are edge line or center line strips where pavement marking is placed over the rumble strip. Center line rumble strips on urban two-lane roads reduce crashes by 64 percent for head-on / fatal and injury crashes.

Medians and Pedestrian Crossing Islands in Urban and Suburban Areas

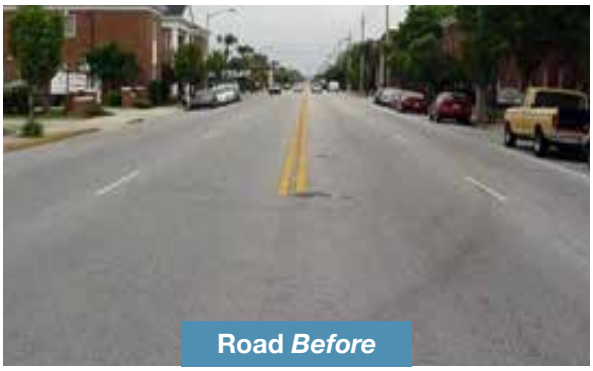
Medians are a particularly important pedestrian safety countermeasure in areas where pedestrians access a transit stop or other clear origins/destinations across from each other. Providing raised medians or pedestrian refuge areas at marked crosswalks reduces pedestrian crashes by 46 percent and motor vehicle crashes by 39 percent. At unmarked crosswalk locations, medians result in a 39 percent reduction in pedestrian crashes.

Pedestrian Hybrid Beacon

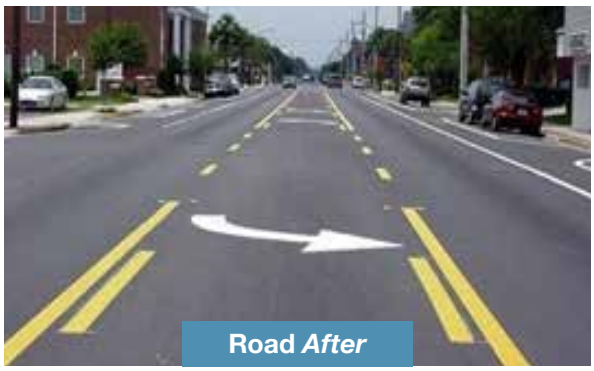
The pedestrian hybrid beacon (also called a High-intensity Activated crossWalK or HAWK) is a pedestrian-activated beacon on a mast arm over unsignalized midblock crossings that have a marked crosswalk. Pedestrians activate these systems by pushing a button to start the signal flashing yellow, then red to stop traffic. The system gives the pedestrian a walk signal with a countdown timer, then restores free flow of traffic by "going dark" when the timer ends. Pedestrian hybrid beacons can provide up to a 69 percent reduction in pedestrian crashes and up to a 29 percent reduction in total roadway crashes.

“Road Diets” (Roadway Reconfiguration)

The traditional “road diet” concept involves conversion of an undivided four lane roadway into three lanes, consisting of two through lanes and a center two-way left turn lane. The lane reduction allows the roadway to provide for other needs, such as bike lanes, pedestrian crossing islands, and/or parking. FHWA recommends consideration of roadways for dieting that have average daily traffic (ADT) of 20,000 or less, with good results at ADT of 15,000. When modified from four travel lanes to two travel lanes with a two-way left-turn lane, roadways have seen a 29 percent reduction in all roadway crashes.



Road *Before*



Road *After*

Roundabouts

The modern roundabout is a circular intersection that provides a low-speed environment, yielding by entering traffic, and channelization and deflection to reduce vehicle conflicts while maintaining continuous operation. Intersections converted from a two-way stop control to a roundabout can experience an 82 percent reduction in severe (injury/fatal) crashes and a 44 percent reduction in overall crashes. Signalized intersections converted to roundabouts can see a 78 percent reduction in severe (injury/fatal) crashes and a 48 percent reduction in overall crashes.

Safety Edge SM (Pavement Technology)

Safety EdgeSM shapes the edge of a roadway at approximately 30 degrees from the pavement cross slope during the paving process, which reduces crashes by an estimated 6 percent on two-lane roadways without curbs. The benefit-cost ratio ranges from 4 to 63, based on the low cost of the Safety EdgeSM application.

Road Safety Audit (RSA)

is an analysis of the safety of an existing or future road or intersection to report on safety issues and opportunities for improvement for all roadway users. RSAs can be used as part of the project development process during planning and preliminary engineering, design and construction for new roads and intersections. RSAs also can review existing roads and intersections.

The U.S. Department of Transportation Federal Highway Administration (FHWA) publishes guidelines, including a prompt list questionnaire, to be used during a RSA. RSAs should be completed by an independent, multidisciplinary team that includes engineering, law enforcement, transportation planning, and other related disciplines. FHWA also publishes guidelines for Pedestrian RSAs and Bicycle RSAs with prompt lists tailored to the safety of the respective user groups.

Orange County has completed RSAs for Northwest Orange County, Bithlo and Christmas, and, most recently, the Waterford Lakes area. In July 2012, Orange County Public Works hosted two sessions of FHWA's Road Safety Audit training, ensuring that 27 Orange County staff members and staff from six cities (including Orlando and Winter Park), two counties, five consulting firms, Reedy Creek Improvement District, Orange County Public Schools, and MetroPlan Orlando could access this important safety training at no cost to them or Orange County. Orange County plans to conduct additional RSAs as part of its ongoing traffic safety and engineering program activities.

MPO Pedestrian Safety Action Plan

MetroPlan Orlando completed a Pedestrian Safety Action Plan (Plan), adopted July 11, 2012, to address safety issues on a regional level through identification of corridors of concern based on historic crash data, as well as countermeasures to reduce accidents in these locations. Pedestrian road safety audits (PRSA) have been done or are scheduled for SR 436 from SR 50 to Old Cheney Highway, Orange Avenue from Gore Street to Kaley Street, Edgewater Drive from Lee Road to Forest City Road, and a forthcoming project at Oak Ridge Road. Oak Ridge Road has two segments of concern in the Plan: Millenia Boulevard to Wingate Drive and Orange Blossom Trail to Orange Avenue.

Completed PRSA have resulted in several Florida Department of Transportation projects to add countermeasures consisting of lighting, raised medians, and other safety features to these roadways. Other Plan-identified corridors of concern to be addressed include Hoffner Avenue from Mauna Loa Lane to SR 436, Kirkman Road from Conroy Road to Summer Oak Street, SR 50 from Culver Road to Murdock Boulevard, and University Boulevard from University Park Drive to Forsyth Road.

Summary and Recommended Safety Corridors

Safety corridors have been identified and listed below based on findings of the crash data analysis. Generally, the selected corridors are located on functionally-classified roads maintained by the County. Safety corridors should be appropriately prioritized in the County's Capital Improvements Program and evaluated for implementation of FHWA recommended countermeasures (see sidebar) and other safety improvements. They also highlight opportunities for targeted enforcement of pedestrian safety laws.

Below is a summary of Safety recommendations from this section in support of planning, construction, and maintenance of Orange County's transportation network:

- Develop and maintain a current inventory of priority safety projects and study needs to pursue funding through MetroPlan Orlando and federal grant sources
- Revise the RCA process to incorporate more multimodal and Complete Streets considerations, informed by the HUD Sustainable Communities Grant project and the recent FDOT Multimodal Planning Guidebook
- Evaluate the potential adoption of an Orange County Complete Streets policy to guide design of new roadway projects and associated features, such as transit facilities
- Evaluate ADA compliance in resurfacing costs and the ability to access additional state and federal funds through MetroPlan Orlando or grant development (ex. through the federal Transportation Alternatives Program)
- Ensure funding is maintained and efforts continue to scan "as built" plans for Orange County roadways to facilitate evaluations and safety retrofits, as needed
- Develop or access training modules for ADA compliance, including new PROWAG standards being implemented by FDOT, for Public Works staff, including inspectors of development-provided infrastructure
- Conduct recommended pedestrian planning activities, as determined by County priorities and budget, as part of the emerging Orange County pedestrian and bicycle safety program
- Complete a Road Safety Audit or Pedestrian Road Safety Audit for identified "clusters" of high-crash locations, as noted in the Safety section
- Conduct initial engineering and planning evaluation, including crash data analysis, on County roadways with posted speeds above 45 miles per hour to determine if MUTCD and Ch. 316, Florida Statutes, criteria may be met for re-evaluation of posted speed
- Draft Safety Corridors in the following table were selected in Phase I based on Phase I analysis of three-year crash data and include high-crash segments and intersections, as well as additional corridors connecting high-crash locations. These corridors and potential other candidates identified in Phase II will be evaluated as part of Phase II network development.

Safety Corridor	From	To
World Center Drive	Kissimmee Vineland Road	Buena Vista Drive
S. Apopka-Vineland Road	Hotel Plaza Boulevard	Winter Garden - Vineland Road
Sand Lake Road	Dr. Phillips Boulevard	Interstate 4
International Drive	Kirkman Road	SR 528
Universal Boulevard	International Drive	Sand Lake Road
Kirkman Road	Winter Garden Road	Vineland Road
Old Winter Garden Road	Kirkman Road	SR 408
Pine Hills Road	North Lane	SR 50
Silver Star Road	Hiawassee Road	Pine Hills Road
Hiawassee Road	Balboa Drive	SR 50
Beggs Road	Pine Hills Road	Rose Avenue
Rose Avenue	US 441	Clarcona Ocoee Road
US 441	Central Florida Parkway	Wetherbee Road
US 441	Sand Lake Road	Landstreet Road
Oak Ridge Road	Florida's Turnpike	Orange Avenue
US 441	Americana Boulevard	Oak Ridge Road
Americana Boulevard	Interstate 4	US 441
Honour Road	Texas Avenue	Rio Grande Avenue
Holden Avenue	Texas Avenue	US 441
US 441	Holden Avenue	LB McLeod
Michigan Street	US 441	Orange Avenue
Orange Avenue	Gore Street	Michigan Street
US 441	Gore Street	Kaley Street
Kaley Street	US 441	Interstate 4
SR 50	Interstate 4	Orange Avenue
SR 50	Bennett Road	SR 436
SR 436	University Boulevard	Hoffner Boulevard
University Boulevard	SR 436	Goldenrod Road
Alafaya Trail	University Boulevard	SR 50
SR 50	Rouse Road	Alafaya Trail

Sources:
Federal Highway Administration (FHWA). (2009). How to Develop a Pedestrian Safety Action Plan. Revised March 2009. Retrieved from http://safety.fhwa.dot.gov/ped_bike/ped_focus/docs/fhwasa0512.pdf.
Florida Department of Transportation (FDOT). (2013). Construction Costs website. Retrieved from http://www.dot.state.fl.us/specificationsoffice/Estimates/HistoricalCostInformation/HistoricalCost.shtm.
Orange County Government. (2006). Invest in Orange County: Our Children's Legacy

Technology

Orange County's transportation network benefits from a variety of technologies that enhance its operations, efficiency, and safety.

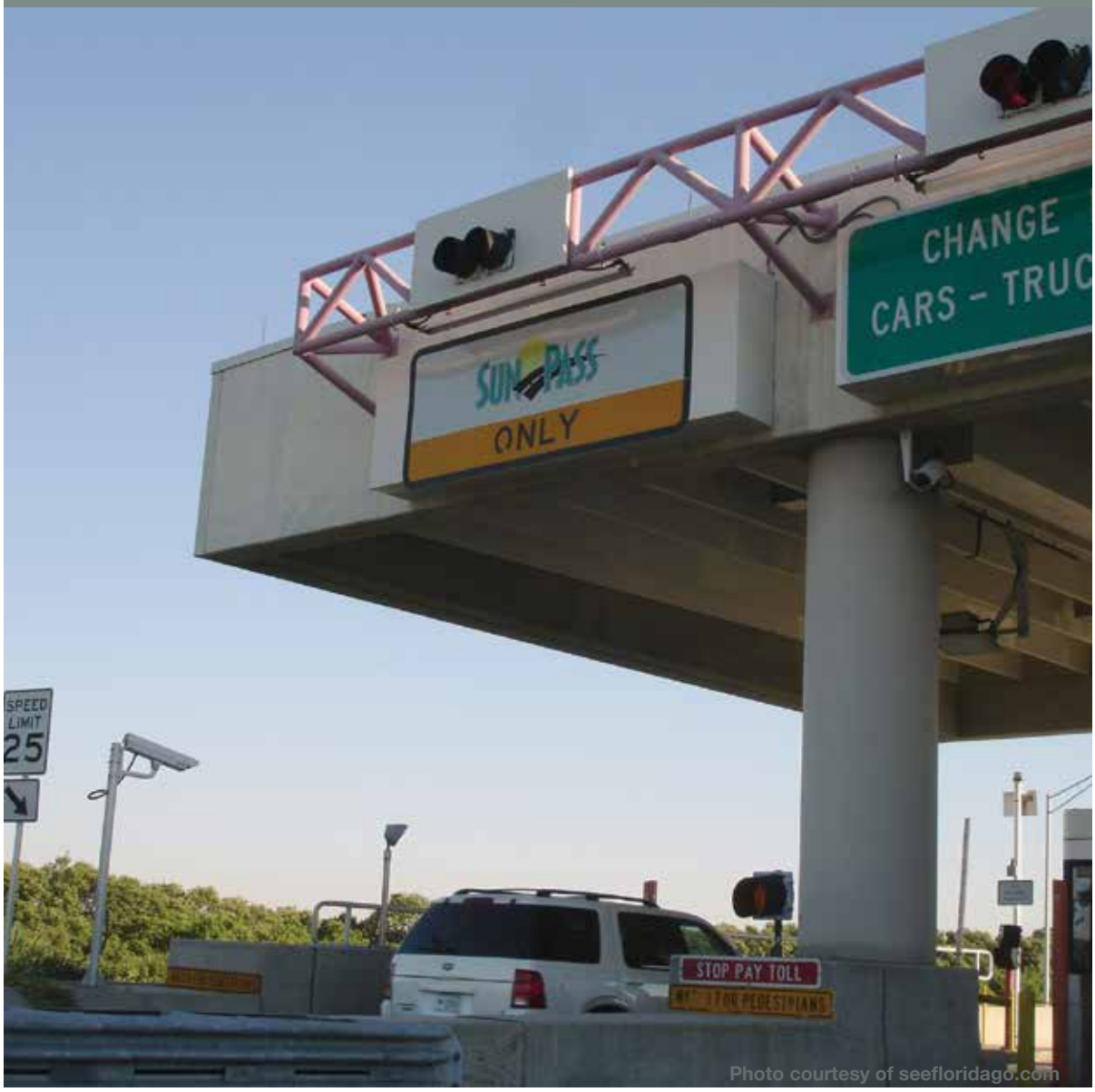


Photo courtesy of seefloridago.com

Technology Theme

Introduction

Orange County's transportation network has seen a variety of technologies improve its operations, efficiency, and safety over recent years, and new options have to potential to enhance these benefits. This section discusses how Orange County's comprehensive adoption of Intelligent Transportation Systems and initial deployment of red light safety cameras have provided numerous benefits, considers additional technology choices, and concludes with recommendations. In contrast to other Multimodal Corridor Plan themes that designate roadway corridors as key under the policy considerations of the theme, Technology is seen as countywide, particularly given the distribution of fiber-optic lines to all major arterials and the dispersed nature of beacon installations.

Intelligent Transportation Systems

"Intelligent transportation systems" refers to the integration of computer technologies and communication devices into transportation management systems for better coordinated and efficient operations. To implement a $7.5 million federal grant received in 2001, Orange County's Advanced Traffic Management System: Feasibility Study and Implementation Plan (April 2002) has guided the deployment of intelligent transportation systems (ITS) throughout the roadway network. With Phase II improvements of $5.25 million (2012-2014), Orange County is currently in Phase IIB of this plan's concept for an Orange County Advanced Traffic Management System (OCATMS). The OCATMS operations include extensive coordination with federal, state, and local governments and public agencies, as well as the Disney Traffic Operations Center and other private-sector entities, for optimal coordination between jurisdictions across the regional transportation network.

Traffic Management Center

The OCATMS has been implemented through the connection of over 480 urban intersections and 180 miles of existing fiber optic cable over an increasing share of the County's 2,768 miles of major roadways. The OCATMS includes the operation of an Orange County Traffic Management Center (TMC) that integrates traffic signal control, CCTV, communication switches, and dynamic message signage through video, voice, and data transmission over fiber optic cable supported by a gigabit Ethernet network. Traffic Management Center staff maintain over 200 communication switches, in addition to over 290 school zone flashing beacons. The TMC's available video includes 62 traffic cameras at key signalized intersections.

Dynamic message signage (DMS) also is a key component of ITS operations on Orange County network. Orange County maintains 13 DMS, including 8 approaching I-4 from roadways on the network, including SR 535, John Young Parkway, northbound and southbound Orange Blossom

Trail, Lee Road, eastbound and westbound Sand Lake Road, and Central Florida Parkway, and 5 in the UCF area on Colonial Drive, Alafaya Trail, and University Boulevard, primarily geared toward congestion management during University of Central Florida special events and stadium use. Other DMS are used for special event management functions along International Drive, State Road 528, Universal Boulevard, Westwood Boulevard, and Convention Way near the Orange County Convention Center. Programmed daily, the DMS direct attendees to event parking and are able to provide additional updates.

Planned upgrades to the TMC and the ITS network envision adding cameras and upgrading adaptive signal system and controllers at a total cost of $25 million. Upgrades will include 40 additional miles of fiber optic cable and approximately 40 additional closed circuit television monitoring (CCTV) installations to continue expansion of the system to all 570 intersections in the County, as well as additional video cameras and DMS monitoring using additional TMC equipment (videowall and work stations). If funding is available, other improvements would include consideration of wireless communication alternatives to fiber optics, safety features for pedestrians (loop detectors to detect the presence of pedestrians), better integration with LYNX schedules, and the ongoing transition of street name signs to energy-efficient LED lighting. All traffic signals, pedestrian signals, and some street name signs have already been upgraded to LED.

Adaptive Signal Control Systems

Another example of ITS first installed in 1999, Orange County's Split, Cycle, and Offset Optimization Technique (SCOOT) adaptive traffic control signal system measures traffic demand on all approaches to an intersection to dynamically adjust and optimize the signal timing to minimize congestion. The 80 intersections where SCOOT is operational are in the vicinity of the Orange County Convention Center, with system installation funded by the International Drive Community Redevelopment Area, and the University of Central Florida, enabled through project funds for football stadium construction.

A SCOOT alternative, InSync is a new system proposed in the Florida Mall area at 27 intersections along Sand Lake Road and Orange Blossom Trail. MetroPlan Orlando supported this installation with $1.5 million in FDOT funding as a "test bed" for this new adaptive signal control option in a highly-congested area of the state roadway network. The InSync signals offer several advantages over SCOOT, such as easier programming and a more flexible pedestrian interval that

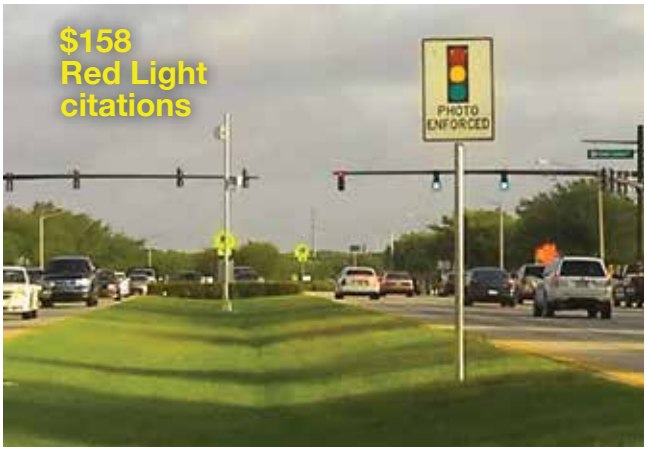
responds to the presence of pedestrians, as opposed to SCOOT's fixed interval. This installation offers the opportunity to assess operations and the feasibility of expansion to other portions of the state and county roadway networks.

At the regional level, FDOT District 5 also is considering a potential system for adaptive signal control and retiming, with a focus on active arterial management and collection of system performance data. With an initial estimate of $267 million over 10 years to fully install ITS systems on District 5's major arterial corridors, this consideration has turned to potentially looking to Bluetooth systems, currently used in the region for MetroPlan Orlando's annual travel time and delay study for traffic signal retiming, as one option for lower costs and faster deployment. Potential corridors would include portions of Orange Blossom Trail, Colonial Drive, John Young Parkway, and others in Orange County and Central Florida. The District 5 project also may be complemented by mobile application development to provide travel time data, parking management, LYNX and SunRail Automatic Vehicle Locator (AVL) data, and alarms for changed conditions.

It is recommended that Orange County continue to participate in the development of MetroPlan Orlando proposals with FDOT to ensure interoperability and cost-effectiveness of technologies. Additional ITS deployment projects are primarily considered as part of MetroPlan Orlando's Management and Operations Subcommittee of the Transportation Technical Committee. Orange County actively participates in these groups, with members assigned from Orange County's Traffic Engineering Division, Transportation Planning Division, and Office of Regional Mobility. Approved projects are added to MetroPlan Orlando's Prioritized Project List for the region.

Red Light Safety Cameras

Orange County's implementation of red light safety camera technology has resulted in safer intersections, fewer traffic violations and crashes over time, and reduced taxpayer costs for law enforcement and fire rescue response services. On July 13, 2010, the BCC created the red light camera program through adoption of Ord. 2010-09, based on the Legislature's 2010 adoption of the Mark Wandall Safety Act ("Safety Act") that enabled safety cameras' use in Florida. Orange County conducted a 2008 pilot study and enacted an initial ordinance, which was complicated by the 2009 Legislature not passing enabling legislation. Orange County initially installed ten cameras, and the County has been issuing violations and traffic citations to vehicle owners since February 2011. Citations carry a $158 fine per violation, per the Safety Act. Revenues are shared between the State of Florida and Orange County, and the camera vendor is paid from Orange County's revenues.



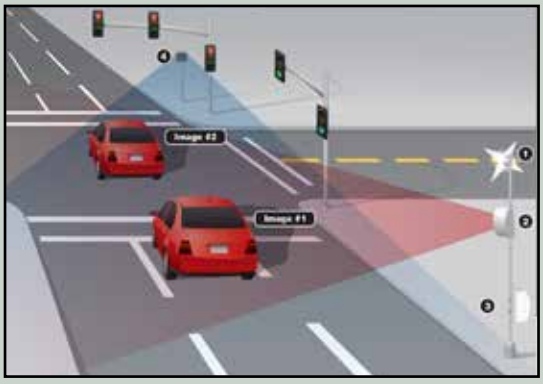
Municipalities within Orange County, including Apopka, Edgewood, Maitland,

Ocoee, Orlando, and Winter Park, also have installed red light safety cameras. In contrast to Orange County municipalities' use of red light safety cameras, Orange County does not issue citations for "right turns on red" and has relatively few cameras in place as of this writing, compared to the number of cameras installed in municipalities with much smaller geographic areas. However, in June 2012, the BCC approved the expansion of the program with installation of 40 cameras in FY 2013 and 40 additional cameras in FY 2014. In July 2013, the BCC adopted provisions for hearing officers and other program guidelines (Ord. 2013-17) to ensure flexibility and efficient processing of appeals.

Table 2: Orange County Red Light Safety Cameras

Intersection	Direction
John Young Pkwy at Central Florida Pkwy	NB
Dean Rd at University Blvd	NB
Lake Underhill Rd at Dean Rd	WB
Oak Ridge Rd at Texas Av	EB
Hiawassee Road at Clarcona Ocoee Road	NB
Hiawassee Rd at Old Winter Garden Rd	NB
Oak Ridge Rd at John Young Pkwy	EB
Alafaya Trail at Lake Underhill Road	NB
University Boulevard at Rouse Road	EB
Chickasaw Trail at Lake Underhill Rd	SB

Source: Orange County Traffic Engineering, 2013.



❶ Strobe
❷ Camera
❸ Controller
❹ 3D Radar

Image #1
The **1st Image** records the vehicle behind the violation point while the light is red

Image #2
The **2nd Image** records the vehicle proceeding through the intersection while the light is red

Technologies for Pedestrian Safety

Orange County also uses technology to make pedestrian crossings safer and has opportunities to use additional technologies to expand these opportunities, as well as to ensure that non-motorized transportation (pedestrian and bicycle) counts are conducted efficiently to identify additional needs. Currently, Orange County provides signalized pedestrian crossings at traffic signals, many with pedestrian countdown clocks, the new standard for installation in Orange County to assist safe pedestrian crossings. Several Orange County signalized intersections also have audible pedestrian signal timers or blank-out signs prohibiting vehicular turns in conflict with high volume pedestrian crossings during certain periods. Also, at residents' request, Orange County provides neighborhoods the use of a speed trailer or a portable radar unit to educate drivers on their compliance with speed limits, and the County is evaluating the larger permanent deployment of these speed signs throughout Orange County.

See 11"x17" Gatefold Page 9
- Flashing School and Pedestrian Beacons

Beacons and Midblock Crossings

Orange County's current pedestrian safety projects include annual installation and/or maintenance of sidewalks, school flashing beacons, school safety assessments, and pedestrian crossing upgrades. Currently, Orange County has 290 school flashers and 85 flashing beacons as part of its system, which are deployed throughout Orange County. In several areas of the County with identified pedestrian safety issues, the County also has built non-signalized crosswalks at the following locations:

- Oak Ridge Road at Magic Way
- Oak Ridge Road at Texas Avenue
- Waterford Lakes Parkway at Coquina Rock Street
- Woodbury Road at Mallory Circle
- Pine Hills Road at El Trio Way
- Pine Hills Road at Pipes O' the Glen Way
- Old Winter Garden Road at Hudson Street

These high-visibility crosswalks are equipped with “pedestrian prompting” signs, “sharks teeth” advance yield lines, “yield here to pedestrian” signs, and/or “yield to pedestrians” flex in pavement signs. These locations also had increased enforcement by Orange County Sheriff’s Office as part of the Best Foot Forward pedestrian safety campaign.

Development of midblock crosswalks and other pedestrian features is seen as important to improving the Orlando area’s ranking as the worst in the nation for pedestrian accidents, as discussed in detail in the Safety section. However, this development is complicated by a number of factors, including additional costs, allowable technologies, and assessment of areas of need and corresponding benefits of improvement. FDOT must approve installation of midblock crossings or upgraded crosswalks at signalized intersections (e.g., textured or stamped pavements) on state facilities and would require that Orange County provide the funding for any enhancements, including subsequent funds for ongoing maintenance and operation costs (ex. for friction testing, as discussed in the Economy section).

From time to time, FDOT Central Office/District 5 has offered beacons or other safety technologies for distribution at no cost to local governments, such as with FDOT’s distribution of almost 10,000 pedestrian countdown signals across the state in 2007 (FDOT, 2013). It is important that the County periodically monitors the availability of these state resources and evaluate the potential use of state contracts and/or City of Orlando contracts for technology purchases, such as for Rectangular Rapid Flashing Beacons (RRFB) currently used at a limited number of International Drive crossings that may be suitable for additional deployments on Orange County’s network. In doing so, Orange County would need to evaluate implications for the network. As an example, FDOT may have some restrictions in installing RFBs on facilities exceeding certain speed limits. These types of scenarios will be a component of future network development scenarios in Phase II of the Multimodal Corridor Plan, but this would not replace the requirement for corresponding engineering evaluation on a site-specific basis for a roadway facility.

Orange County should continually monitor the feasibility of using products added to FDOT’s Qualified Products List and Innovative Product Evaluation List, as applicable, to determine any potential new applications for the Orange County roadway network. One example of FDOT limitations is seen with the “HAWK” (High-intensity Activated crossWalK), an emerging safety treatment for unsignalized midblock crossings. Pedestrians activate these systems by pushing a button to start the signal flashing yellow, then red to stop traffic. The system gives the pedestrian a walk signal with a countdown timer, then restores free flow of traffic when the timer ends.

HAWKs, now commonly referred to as “pedestrian hybrid beacons,” have been included in the Manual of Uniform Traffic Control Devices (MUTCD), Chapter 4F and are recommended by FHWA as a Proven Safety Countermeasure (see Proven Safety Countermeasures sidebar). This MUTCD inclusion and federal recommendation should promote system use by offering guidelines for appropriate installation and configuration. At the time of this writing, FDOT is conducting a major statewide Pedestrian Safety Initiative, and Orange County should monitor this implementation to determine potential changes to allowable technologies and corresponding pedestrian/bicycle-oriented roadway treatments that may be used within FDOT District 5 through Central Office guidance.

Intersection/Pedestrian and Bicycle Counts

To determine operational needs and non-motorized transportation safety needs, Orange County benefits from having current turning movement counts and pedestrian and bicycle counts for state and county roadway facilities. These may be taken as part of larger corridor studies, such as with recent corridor studies for Orange Avenue and University Boulevard, or on a more site-specific basis to evaluate a potential improvement project. Having turning movement counts and pedestrian and bicycle counts is becoming increasingly vital to meeting new federal funding guidelines established with the recent adoption of Moving Ahead for Progress in the 21st Century (commonly known as “MAP-21”) legislation. MAP-21 sets new performance measures for the use of federal funds, making “exposure data” about the number of users of a facility proposed for federal funding and calculation of cost-benefit requirements important to accessing federal funds through grant program applications to Transportation Investments Generating Economic Recovery (TIGER) grants and through FDOT.

At the regional level, in September 2013, MetroPlan Orlando started a demonstration project to establish an annual Bicycle and Pedestrian Count Program that is funded by FDOT. These efforts will gather data on roadway facility use, mobility patterns, and areas that potentially may need improvement projects, including the corridors identified in their Pedestrian Safety Action Plan (see sidebar). The technologies used vary and may include a combination of manual counts and automated count methods, such as Bluetooth, infrared, or LED cameras (MPO, 2013). Orange County staff has begun limited coordination with this program and may participate in future data collection activities, but it is important to access any pedestrian and bicycle counts made available in County capital planning and project activities.

At the local level, Orange County Traffic Engineering periodically collects turning movement counts and has a limited number of pedestrian counts for locations on University Boulevard, Oak Ridge Road, Pine Hills Road, and International Drive, but data does not facilitate current and/or larger evaluations of the network. Orange County Transportation Planning collects periodic turning movement counts if ARTPLAN analyses are submitted for development projects undergoing evaluation under the County's Concurrency Management System (CMS). Orange County Parks and Recreation conducts ongoing pedestrian counts, but the installation of their counters is limited to Orange County trails, based on their program responsibilities. Pedestrian/trail user counters are installed based on observations of trail users and the number of counters approved for purchase at an average cost of $500 for the technology in use (Diamond Traffic Products' Trail Traffic Counter # TTC-4420). Counters are at Killarney, Winter Garden, Chapin, Apopka Vineland Outpost, and Apopka Station and are on average 3.5 miles apart, except Killarney counters are spaced to capture traffic figures leaving the West Orange Trail for South Lake Trail in Lake County.

Given the limited data available at this time and the lack of aggregation of data for capital planning and project activities, Orange County should create GIS layers of available current pedestrian and bicycle counts (within 1 year) and turning movement counts (within 3 years) from relevant County divisions and FDOT District 5 for ongoing updates and accessibility across Orange County Government. It is recommended the turning movement count data be aggregated after the County completes required signal retiming, which is due by the year 2015.

To leverage this initial effort at data aggregation and create a larger database for CMS, ITS, grant application, and capital planning purposes, Orange County should determine the feasibility and a corresponding strategy for implementing an annual turning movement count program in conjunction with the annual traffic count or separately as part of CMS updates. These turning movement counts could include pedestrian and bicycle counts at key locations where video or manual counts could be collected, in coordination with MetroPlan Orlando as not to duplicate their program efforts. As part of this program development, Orange County should assess the feasibility of installing additional pedestrian counters, similar to the Parks and Recreation Division's trail user counters, in key locations in Orange County on a permanent or regular basis to assist in CMS, ITS, grant application, and capital planning purposes. These counts would offer additional advantages in pedestrian safety planning and warranting of additional safety features, as needed.

Open Source Multimodal Trip Planning

Open source multimodal trip planning services offer the opportunity to leverage multimodal transportation investment in Orange County by making transit and travel data readily and instantly available to encourage ridership. The general public already is using popular multimodal and trip planning applications, including Walk Score and Waze. The term “open source” refers to a program or application with its enabling source code made available for users and developers to freely modify and enhance it, often using “open data” provided to the public.

Examples include the Google Maps Trip Planner and other application built using Google-provided or aggregated data. Google Transit uses the Google Transit Feed Specification (GTFS), launched in 2005 and now the standard for transit scheduling data used by 49 of the 50 largest U.S. transit agencies (CUTR 2013). LYNX has produced its data in GTFS format, and the implementation of Computer-Assisted Dispatch-Automatic Vehicle Locator (CAD-AVL) across the LYNX fleet could result in additional real-time data for use in mobility applications.

Open source multimodal trip planners that may leverage these activities and offer transit data availability include OpenTripPlanner and OneBusAway. The University of South Florida’s Center for Urban Transportation Research (CUTR) currently is using OneBusAway as part of a demonstration project in Tampa to highlight the area’s bus, campus shuttle, and bike travel options. Recently, CUTR completed a contract with FDOT and published a report to define options for making online trip planning services available to SunRail riders. The study recommends releasing open data to attract third party application developers, eventually using an open source trip planner (OpenTripPlanner) when funding becomes available.

In addition to transit data, MetroPlan Orlando will be developing a bicyclist mobile application as part of their Bicycle and Pedestrian Count Program. This application will enable bicyclists to do voluntary recording of trips via Global Positioning Systems (GPS) in their mobile phones, similar to applications used in Atlanta and other major cities for route calculation and network research (MPO, 2013). OpenStreetMap offers a freely-available base map for these applications on a national level. An example of use of this platform is seen in FDOT’s TransPort application.

Orange County should continue to monitor the status of available data to assess the feasibility of developing open source multimodal trip planning tools, potentially through a “civic app” competition or expansion of existing Orange County mobile applications, in cooperation with LYNX and MetroPlan Orlando. This could be researched through the County 311 application or development of an additional application. In particular, open source multimodal trip planning tools could focus on subareas of Orange County and/or a specific user base, such as tourists and convention

attendees at International Drive or students at the University of Central Florida, based on the diverse multimodal transportation options available at those locations.

Summary and Recommendations

Orange County's transportation network has benefited from the application of several notable technologies, with more options on the horizon. In addition to those detailed above, a brief list of technology needs and opportunities in the short and long term that are outside the scope of this analysis include:

- Potential expansion of the County's speed radar sign pilot program to provide driver feedback, now deployed on Chickasaw Trail at El Prado Avenue and Hiawassee Road at Haughton Lane, after assessments of its effectiveness

- Appropriate measures to deal with "Big Data" challenges seen in other industries as an enormous volume and complexity of generated raw data is generated that requires warehousing and analysis ("data mining") to meet its potential as intelligent data for system enhancement and congestion reduction

- Additional future data possibilities that will generated by vehicles, such as through GPS and crash avoidance features, as opposed to by the current ATMS network and "crowdsourcing" (seen in mobile applications like Waze)

- Larger scale use of autonomous vehicles, already legally allowable in Florida, in future years, as experimentation continues to develop commercially-available options

Below is a brief restatement of the recommendations of this section for Technology policy goals and program activities in support of Orange County's transportation network:

- Participate in development of MetroPlan Orlando proposals for additional ITS deployment to ensure interoperability and cost-effectiveness of technologies

- Determine if beacons or other safety features currently are available for distribution by FDOT District 5 or the Central Office

- Monitor the new FDOT Pedestrian Safety Initiative to determine potential changes to allowable technologies for beacons and midblock crossings used within FDOT District 5 through Central Office guidance

- Conduct a cost-benefit analysis for expansion of the use of state contracts and/or City of Orlando contracts for technology purchases

- Conduct periodic reviews of FDOT's Qualified Products List and Innovative Product Evaluation List, as applicable, to determine potential new applications feasible for the Orange County roadway network

- Create GIS layers of available current pedestrian and bicycle counts and turning movement counts (after signal retiming next year) from relevant County divisions and FDOT District 5 for ongoing updates and accessibility across Public Works

- Determine the feasibility and a corresponding strategy for implementing an annual turning movement count program in conjunction with the annual traffic count or separately as part of Concurrency Management System updates

- Assess the feasibility of installing additional pedestrian counters, similar to the Parks and Recreation Division's trail user counters, in key locations in Orange County on a permanent or regular basis to assist in pedestrian planning and warranting of additional features, as needed

- Monitor the feasibility of development of open source multimodal trip planning tools, potentially through a "civic app" competition or expansion of existing Orange County mobile applications, in cooperation with LYNX and MetroPlan Orlando

Sources:

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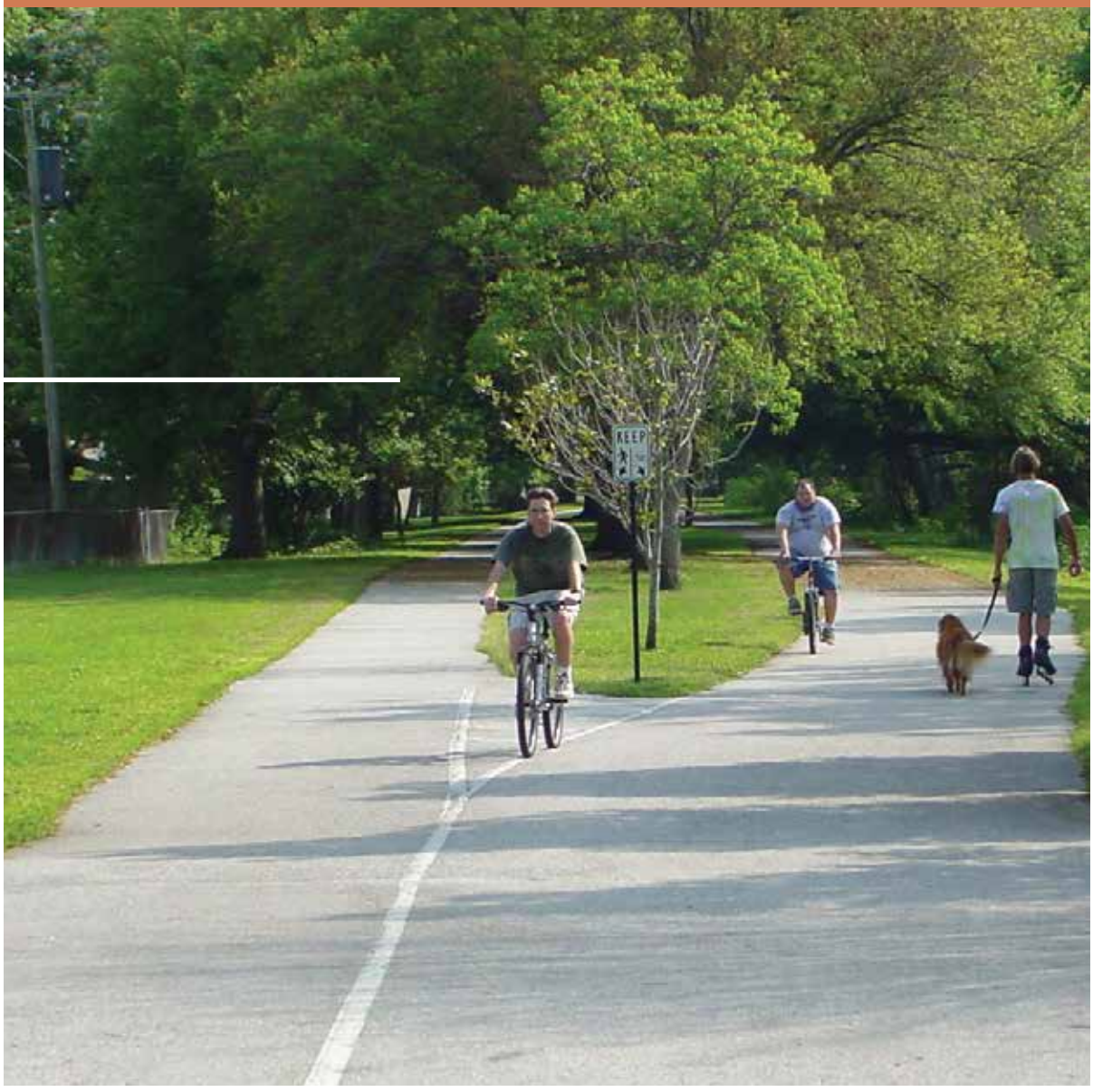
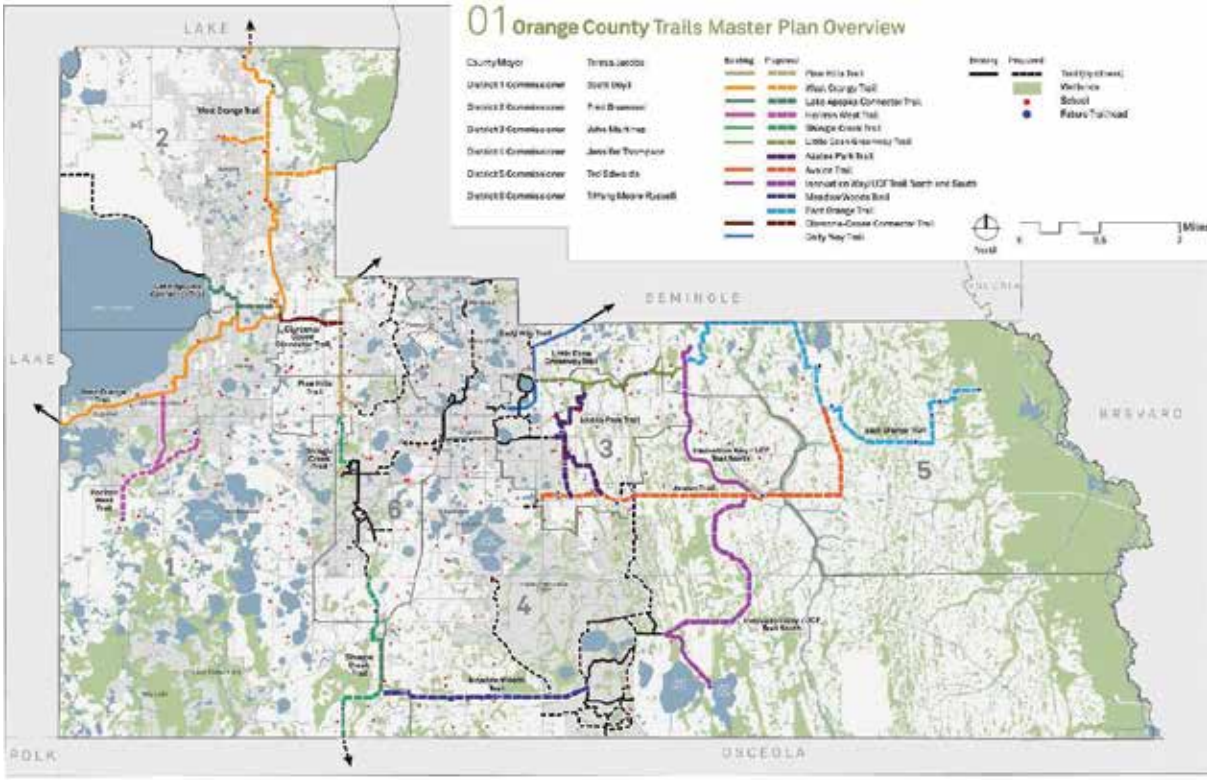
Amenity

This section reviews Orange County Trails Master Plan in relation to community & transit destinations.



Amenity Theme



Introduction

As the desire for multimodal transportation increases, there is additional demand on Orange County's transportation network to serve different purposes, including alternatives that accommodate pedestrians and bicyclists, offer flexible commuting options, and provide additional amenities for tourists and visitors. The following section will address how existing investments in and facilities on Orange County's transportation network can provide or facilitate amenities for Orange County residents and visitors, resulting in conveniences with both recreational and economic advantages. Consideration of Amenity Corridors also provides a clear focus on where additional investments, such as funding for landscaping or lighting, or prioritization within existing programs may leverage these existing resources. The section concludes by identifying Amenity Corridors that are proposed as the focus of Orange County's efforts in this area.

Overview of Trails Master Plan

The Orange County Board of County Commissioners adopted a newly updated Trails Master Plan (TMP) in November 2012. The previous Bikeways, Trails, and Greenways Master Plan, adopted in 1996, was broader in scope and included sidewalks, bike lanes, and other on-road facilities. The current TMP focuses solely on the proposed system of wide, paved, multi-purpose trails, forming the basis of a countywide bicycle and pedestrian network. It is a conceptual plan for future trail development which allows for coordination with road projects and future development.

The Orange County Parks and Recreation Division identified 12 trail corridors, linking schools, neighborhoods, commercial areas, and other destinations. After a field visit and suitability analysis, the TMP then evaluated each corridor on various criteria, including population and density, transportation value, construction cost, economic development, urban infill, connection to other trail corridors, and available grant funding. The top five project rankings are Shingle Creek Trail, Little Econ Greenway Phase 3, Pine Hills Trail, Innovation Way/UCF Trail (North and South), and Lake Apopka Connector Trail.

Shingle Creek Trail

PROJECT COST $9,837,911

PER MILE COST $898,330

- Scored the highest in ranking criteria, due to its connection to Pine Hills Trail, Meadow Woods Trail, and Osceola County's portion of Shingle Creek Trail
- Stretches 12 miles through four jurisdictions, including a segment along John Young Parkway, near Central Florida Parkway
- Connects highly populated areas, such as Hunters Creek residential area and several schools
- Ranked as number one priority on MetroPlan Orlando's Prioritized Project List for Bicycle and Pedestrian Projects
- Recognized on a national level in the Department of Interior, America's Great Outdoors Fifty-State Report, published in November 2011

Little Econ Greenway Phase 3

PROJECT COST $8,117,222

PER MILE COST $1,341,560

- Provides a much needed connection to the Cady Way Trail from Forsyth Road to Semoran Boulevard, creating a network of trails 21 miles long
- Connects elementary, middle, and high schools, as well as Orange County Parks

Pine Hills Trail

PROJECT COST $12,193,307

PER MILE COST $1,617,726

- Runs parallel to Pine Hills Road and connects to the West Orange Trail and Shingle Creek Trail
- Connects several elementary schools and a baseball complex along the way

Innovation Way/UCF Trail (North)

PROJECT COST $4,756,594

PER MILE COST $1,292,912

(South)

PROJECT COST $8,074,314

PER MILE COST $690,660

- Utilizes existing Alafaya Trail and Innovation Way roadway right-of-way and provides access for UCF commuters
- Connects residential and commercial uses in and around the Waterford Lakes Town Center

Lake Apopka Connector Trail

PROJECT COST $4,079,880

PER MILE COST $4,842,726

- Links West Orange Trail to SJRWMD Lake Apopka Loop Trail
- Provides a connection for some residences and an elementary school

The SunRail commuter rail line, opened in May 2014, provides the opportunity to connect much of the existing and proposed trail segments to transit. While bicyclists and pedestrians have previously relied on automobile access to the trail, the new rail mode will be an alternative, potentially bringing new users to the trail network. In particular, the Meadow Woods SunRail station is less than a mile north along Orange Avenue, of the planned Meadow Woods Trail connecting to the Shingle Creek Trail.

Economic Benefits of Trails and Bicycling

The economic benefits of trails and related infrastructure have been well documented, including in the April 2011 report "Economic Impact Analysis of Orange County Trails" produced locally by the East Central Florida Regional Planning Council. This study examined the economic impact of the Little Econ Greenway, West Orange, and Cady Way Trails. Surveys were conducted with associated trail users and businesses and results were analyzed using the Regional Economic Model, Inc. (REMI). There are an estimated 1.7 million trail users every year in Orange County, infusing millions of dollars into the local economy. Trails which run through local communities have a positive economic benefit on home values and employment, seen in how the West Orange Trail through Downtown Winter Garden has served as a catalyst for the City's successful revitalization and additional investments in a new City Hall, farmer's market pavilion and event space, streetscaping, and other corridor improvements. Apopka could experience similar success, as the network expands with the proposed Lake Apopka Connector Trail linking the West Orange Trail to the St. Johns River Water Management District Lake Apopka Loop Trail. Use of the trail system is projected to grow, as both residents and visitors seek accessible outdoor recreational opportunities in the area.

Enhancing trail connections throughout the region will aid in this effort. Implementing the Trails Master Plan and increasing access to trails for destinations, such as residential neighborhoods, schools, parks, and businesses, will help create an alternative transportation network. Connecting trails to SunRail would meet a growing demand for linkages to transit systems. Studies from Wisconsin, Iowa, and other states have explored the impact of bicycling in particular (Flusche, 2012). These studies estimate the sizable direct and indirect economic benefits of tourism-based bicycling events and facilities, as well as the savings in health care costs associated with increased physical activity. Bicycling for commuting and short trips also contributes to economic activity and cost savings. The relatively smaller investments needed for bicycle and pedestrian infrastructure projects, compared to roadway construction and widening costs, can offer a larger economic return for state and local governments.

Bike sharing

Transportation Amenity Assessments and Models

In addition to constructing trails and designated bicycle routes, the installation of additional bicycle facilities related to parking and storage provides convenience

amenities to users, which helps provide multimodal access and use of Orange County's transportation network. The LYNX public transportation system offers a "bike on bus" option with a rack holder for two bicycles mounted to the front of the bus. The SunRail system allows passengers to bring their bicycles onto the train car. As the number of bicyclists increases, more businesses are providing bicycle parking to serve customers, and Orange County's Land Development Code now includes detailed bicycle parking standards to enhance the number and type of bicycle parking spaces available. An interactive, user-generated bike parking map is available on the Commute Orlando website to help bicyclists plan their routes and park their bicycles on secure racks. Users also can provide feedback on where additional bicycle parking is needed.

A program growing in popularity nationwide, called bike sharing, makes bicycles available for short-term public use or rental. "Bike Sharing in the United States: State of the Practice and Guide to Implementation" reports that as of March 2012, approximately 20 bike sharing programs were in place in the U.S., with over 20 more in active planning stages. Notable systems are found in Minneapolis, New York, Washington, D.C., Denver, and Miami. More recently, smaller cities such as Chattanooga and Fort Worth, have begun to implement their own bike sharing programs. A bike sharing program typically consists of docking stations at fixed site locations where users can retrieve a bicycle for a fee and return it when the trip is finished to any station in the network.

There are many aspects of implementation to be considered including ownership, funding, station siting, and operating procedures. Some programs are owned and managed by the jurisdiction; others are run by a non-profit or for-profit business. Bike sharing can extend public transportation by a mile and provide the missing link to an origin or destination. It enhances multimodal travel and improves network connectivity.

Orange County is currently participating in a bike sharing working group through MetroPlan Orlando to explore options along the SunRail corridor. In addition to the SunRail corridor, International Drive and University of Central Florida (UCF) may also be identified as pilot locations, since population and employment density, proximity to colleges and tourist areas, and presence of supportive transit systems (UCF Shuttle, IRide Trolley in International Drive) are other factors to consider when selecting a service area. To promote cycling to and on campus, UCF has already installed repair stands with staff to assist students and commuters in performing maintenance on their bikes and provides support to Spokes Council, a student organization engaged in bicycling advocacy and safety.


Zipcar Car Sharing

Car sharing is a similar program which gives people access to cars on demand without the cost of ownership and maintenance. UCF recently became the first local example of car sharing with the launch of their partnership with Zipcar, Inc. Members can reserve a vehicle for an hourly rate, which includes gas, insurance, roadside assistance, and the ability to drive up to 180 miles. Zipcar, Inc. claims studies have shown that each car sharing vehicle removes at least a dozen vehicles from the privately-owned fleet. In cities without a formal car sharing system, national-level peer-to-peer car sharing systems have arisen that facilitate individuals offering temporary rentals of their car or bike through websites like RelayRides and Liquid. While these programs have seen some success in college campuses and urban areas, there have been challenges related to insurance coverage and unexpected disincentives, like rental car taxes, that complicate vehicles' transition from only private ownership to commercial rental.

The recent acquisition of Zipcar, Inc., by the Avis car rental company may provide expanded availability for the service in new markets, based on Avis' existing global presence, substantial fleet, and extensive logistics experience and expertise. This acquisition also may provide healthy competition in this emerging industry and market for Hertz, which contracted with the Florida Department of Transportation to launch the first car sharing program in the City of Orlando in 2013. Rates start at $10 an hour, which covers gas, maintenance, parking, and insurance. Six locations are available in the downtown area, including Orlando City Hall and Florida Hospital Orlando campus.

LYNX assists commuters

Other transportation amenity models offer commuting and ridesharing alternatives. The LYNX Vanpool program assists commuters who live and work near one another and have similar commuting schedules by providing a van for which the costs are shared among participants. The University of Central Florida offers a shuttle service for students living on and off campus, complemented by a LYNX superstop on campus that provides transit access to other local and regional destinations. Ridesharing options also include online peer-to-peer services like Zimride, currently operating in and around UCF, which operates like a "Facebook for commuters" for ride matching to combine commuting trips and share costs.

In major urban areas across the United States, large private companies, such as the Microsoft corporate campus in Redmond, Washington, have begun to offer transit service for their employees and customers independent of public transportation systems (Peterson, 2012). This has greatly reduced internal congestion and the need to provide on-site parking, with 40 percent of Microsoft commuters riding the shuttle to work. Other private partners have chosen to connect to public transportation by providing shuttle service for the "last mile" from a public transit stop to the corporate site. In Orange County, LYNX employer-based Vanpool programs and fleet options provide an ideal starting point for this type of effort, and LYNX has seen private sponsorship of service to International Drive as one example. In addition, the tourist industry's presence in Orange County

has brought corresponding private shuttle and transportation services to the area, which could be leveraged for this purpose. With the growth of Orange County's economy post recession, these resources would be a positive asset to both the workforce and to the community.

Parking Amenities

Recognizing those who may drive the "last mile" or round trip by car, many private and public entities are willing to accommodate this demand by providing structured or on-street parking. Parking increasingly serves as an amenity for its users who may be commuting by transit or accessing a recreational trail network. Finally, structured or on-street parking serves an important function in creating urban form and improving the pedestrian environment by avoiding large expanses of surface parking interrupting the streetscape and allowing land uses to be more compact.

The provision of park and ride facilities for transit is usually publicly-funded, as is the case for the SunRail commuter rail line financed by the Florida Department of Transportation. Other publicly-funded parking projects may also serve downtown commercial areas, such as Park Avenue in Winter Park, or attractions like Orange County's theme parks, in conjunction with overall transportation system improvements.

Some local governments view the provision of public parking as an economic development tool. Orange County is currently considering construction of a parking garage in the International Drive tourist area, and the City of Winter Garden plans to fund a new parking structure with the expectation of commercial expansion in the historic downtown.

Private or nongovernmental structured parking can be found in downtown Orlando, UCF, International Drive, mixed use development in "SoDo" (south of downtown Orlando), and the Village at Lake Lily in Maitland. These provisions serve their adjacent destinations and may have associated user costs or may be free of charge. While financial statements and rates of return are not available from private companies, these investments appear to be economically feasible in the right locations and supporting the right mix of land uses.

On-street parking is prevalent Baldwin Park, Avalon Park, and Horizon West, as traditional

neighborhood developments with narrower streets and more compact design. Design standards vary depending on the context, land use, street width, and presence of alleys. In recent years, Orange County Public Works staff has drafted standards for development review of on-street parking that advise staff review in the development process, but are not a part of the Land Development Code.

While most jurisdictions do not have specific codes for on-street parking, Charlotte, North Carolina, for example, has adopted dimensional cross sections based on the width of a Mixed Vehicle and Parking Zone. As Orange County begins to implement on-street parking on larger scale, guidelines can incorporate any lessons learned from experience, such as the accommodation of emergency access. Recently, the BCC adopted amendments to the Land Development Code enhancing and providing further guidance for required bicycle parking for all commercial or office properties, as well as Planned Developments.

Upcoming Land Development Code changes likely will include new parking standards with smaller ratios, maximums, and lower minimums. There are many aspects to consider, including the location of parking in the rear or side in relation to urban form, retail preferences, and security. In some cases, a mix of parking (structured, on-street, surface) may be appropriate to serve adjacent land uses. Additional research on the effects of land value per acre, density and intensity, and tenant/customer needs and preferences would provide a greater understanding of what makes convenience parking amenities successful within a development and how it can lead to better urban form.

See 11”x17” Gatefold Page 10
- Transportation Amenities and Corridors

Summary and Recommended Amenity Corridors

Amenity corridors have been identified and listed below in anticipation of further analysis in Phase II. Generally, the selected corridors are located on functionally-classified roads maintained by the County, correspond to Orange County’s adopted Trails Master Plan, and contain a trail segment or a multipurpose path in the roadway right-of-way. Amenity corridors should be prioritized for additional lighting, street trees, pedestrian features/signal timing at intersections, or bulbouts for on-street parking, according to funding availability, to leverage their existing assets and planned enhancements. They also highlight opportunities for connectivity to other transportation system amenities.

Below is a summary of Amenity recommendations from this section in support of planning, construction,

and maintenance of Orange County's transportation network:

- Pursue grant funding through the Transportation Alternatives Program and other nontraditional sources, such as foundations, for trail expansion, and pedestrian and bicycle facility enhancements

- Compile inventory of multi-purpose paths as GIS layer to further identify potential amenity connections as a cooperative project between GIS, Parks, and Transportation Planning

- Review recommendations of MetroPlan Orlando's bike sharing working group and evaluate other areas for potential bike and car sharing

- Review recommendations of MetroPlan Orlando's Trail Crossings Working Group and prioritize pedestrian and bicycle counts at these intersections to provide data for improvements to be identified by location in Phase II

- Recommend further study on existing on-street parking and implementation to evaluate its safety, maintenance, and development standards, including traffic calming, at the time of the County's next Evaluation and Appraisal Report of the Comprehensive Plan

- Draft Amenity Corridors in the following table were selected in Phase I for roadways containing a trail segment or multipurpose path in the roadway right-of-way that correspond to Orange County's adopted Trails Master Plan. These corridors and potential other candidates identified in Phase II will be evaluated as part of Phase II network development.

Amenity Corridor	From	To
John Young Parkway	Central Florida Parkway	SR 417
McCormick Road	Ingram Road	Clarcona Road
Binion Road	CR 437	Ocoee Apopka Road
Ocoee Apopka Road	Binion Road	SR 429
Beggs Road	US 441	Pine Hills Trail
Clarcona Ocoee Road	SR429	Pine Hills Road
Apopka Vineland Road	McCormick Road	Clarcona-Ocoee Road
Alafaya Trail	Curry Ford Road	Avalon Park Boulevard
Ficquette Road	CR 535	Reams Road
Wetherbee Road	Boggy Creek Road	US 441
Moss Park Road	Narcoossee Road	Lake Mary Jane Road
McCulloch Road	Tanner Road	Chuluota Road
Dallas Boulevard	SR 50	SR 528

Sources:

East Central Florida Regional Planning Council. 2011. Economic Impact Analysis of Orange County Trails. April 2011.

Flusche, Darren. 2012. Bicycling Means Business: The Economic Benefits of Bicycle Infrastructure. Advocacy Advance. July 2012.

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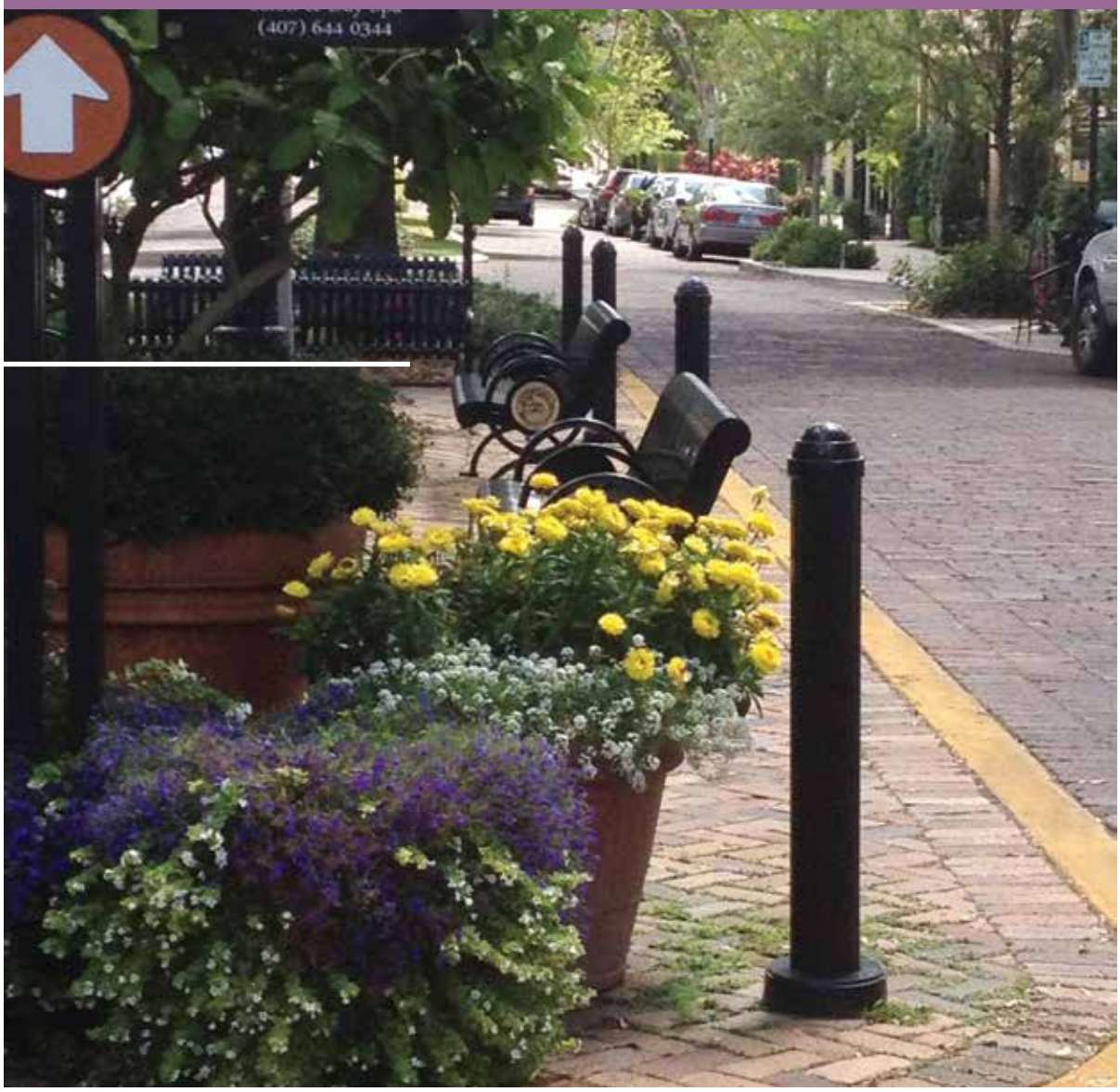
Livability

This section addresses characteristics of Orange County roads that affect people's daily lives and activities.



Livability Theme

Introduction

The Livability theme of the Multimodal Corridor Plan addresses characteristics of Orange County roads that affect people's daily lives and activities. Roadway right-of-way accounts for a significant percentage of the urban area, so it comprises a large part of publicly-owned space. The right-of-way is intended to accommodate roads, but where possible, it should also provide space for other activities and modes of travel, including walking, bicycling, and transit.

The form of streets should be guided by adjacent land uses. Residential and non-residential uses generally have different needs and expectations from the roads that serve them. Industrial uses are less likely to cater to pedestrians and bicyclists and more likely to provide wide lanes and generous turning radii at roadway intersections. Commercial roads, however, should accommodate pedestrian and bicycle travel, as well as automobiles. As they connect neighborhoods to retail and services, commercial streets should actually have more generous provisions for alternative modes of travel, such as wider sidewalks and bicycle paths. Making these streets comfortable and inviting to pedestrians can result in eliminating some auto trips and replacing them with alternative travel modes. More livable streets can also nurture a broad mix of retail and service establishments that enrich the local community experience.

Some components of livability are the same across all land uses. These include safety considerations, such as striping or separation for bicycles, and comfort enhancements, such as shade trees in the pedestrian realm and bus shelters to improve the transit experience. These types of accommodations improve the experience for non-auto users and encourage alternative transportation mode choices. Since automobiles are adequately accommodated across all types of roadways, the Livability section will focus on improving alternative travel modes. This could include street furnishings, such as street trees, bus shelters, and lighting that improve the experience for non-auto users.

Placemaking in the Multimodal Corridor Plan

Roads serve two primary functions in the urban environment – mobility and accessibility. Mobility focuses on efficient movement of transportation modes, including vehicles, through the urban area to their ultimate destination. Accessibility relates to connecting residents with goods and services on a day-to-day basis. Accessibility is the domain of placemaking. Close association of goods and services to residential land uses has a direct effect on the frequency and length of trips in the region.

Streets have a significant influence on how an area is perceived and how it is used. Many factors contribute to this perception, including speed and dominance of traffic, pedestrian separation, street trees, street furnishing and bicycle lanes. Streets provide access, but also influence the look and feel of an area. Relatively simple changes to the street can alter the perception of the places they serve and, over time, bring about changes in adjacent land uses.

Local commercial districts provide access to shopping, entertainment and services and also create a sense of place within the community. They can be furnished with on-street parking, pedestrian lighting and wide sidewalks to increase their appeal to local customers. Orange County's municipalities have embraced this placemaking approach within their downtowns, Community

Redevelopment Areas, and activity centers (see Figure 11), and Orange County should consider whether municipal land development codes within Orange County offer more appropriate sidewalk width and pedestrian connectivity requirements for developing and redeveloping urban districts within the unincorporated area.

The location of roads can also influence their placemaking ability in areas that offer favorable environments for development through policies, codes, land use and zoning districts, and other designations and programs that encourage investment.
These conditions in Orange County's Community Redevelopment Areas or the Alternative Mobility Area can significantly increase the potential for change.

Streets should not be designed exclusively to accommodate automobile traffic. As roads are built, improved or maintained, they should be designed to comfortably accommodate all modes of travel and fully furnished to cater to all users. Street right-of-way represents a significant proportion of public land and should be expected to provide high quality open space to the community. There are many ways this can be realized.

- Street trees enhance the comfort of pedestrians providing shade and separation from traffic. Their presence tends to slow traffic and thereby improve safety. Orange County is currently studying means to plant trees in the County rights-of-way, while minimizing potential damage to infrastructure over time.

- On-street parking provides convenient access to shops and adds further separation from moving traffic. It also provides traffic calming along roadways.

- Roadway lighting may be included along roads (see Economy Section for more detail), and, can be supplemented with pedestrian scale lighting that contributes to the attractiveness and livability of streets. In the context of appropriate land uses, pedestrian lighting enhances the walking environment and invites evening use of streets.

Additional treatments can be included in the context of adjacent land uses. As the environment becomes more urban in character, street furniture and other elements can be added to distinguish the character of the street and attract more pedestrian traffic. Land uses, such as cafes, can begin to take advantage of the enhanced environment.

Complete Streets

By definition, Complete Streets are roads that comfortably accommodate all modes of travel. Ideally, there should be a balance in each right-of-way to provide for multiple users. In reality, making every street complete is a lofty aspiration that may be achieved over time, if resources are available, but the current strategy will be more focused. One goal of the Multimodal Corridor Plan is to identify a network of streets that will be prioritized for enhancement as Complete Streets. The ultimate goal is to make all streets as complete as possible, but an initial network will provide a framework for the overall system.

To help guide this effort, Phase I of the Multimodal Corridor Plan includes a project that selected a range of county roads to be reviewed against Complete Streets guidelines (see Appendix 2). These prototypical streets were considered in the context of adjacent land uses to evaluate their potential for evolving into more Complete Streets. The likelihood of changing land uses or traffic counts was not perceived as limiting their role as prototypes.

This project provided a toolbox that can be used to classify County roadway corridors and help guide their evolution over time. The range of solutions will continue to form the basis for context sensitive design in the County and transportation-land use integration on the County roadway network, while ensuring safety is not compromised in these transitions.

Bus Lines, Bicycle Facilities and Sidewalks

Streets in Orange County that are candidates for Compete Streets transition will be identified and prioritized for implementation in Phase II. A methodology that includes safety issues, transit frequency, pedestrian access and other criteria will be developed to identify and rank potential candidates.

Once the network is identified, candidate roads that are scheduled for maintenance, upgrades or ongoing preservation work can be reviewed for potential inclusion as Complete Streets. Priority Complete Street candidates could be prioritized in maintenance programs to accomplish early completion of key components of Orange County's thoroughfares.

Methodology

A focused and limited network of proposed Complete Streets will be drafted using Phase II workshops and analysis. Complete Streets could be selected and prioritized by review of existing conditions of each roadway under consideration. Priorities can be determined by factors such as:

- Density/type of land use
- Transit ranked by frequency of service
- Presence of bike facilities
- Presence of sidewalks

- Average daily traffic on the road
- Safe Routes to School candidates
- Redevelopment areas
- Other overlay districts

Each factor will contribute to designation as a Complete Streets candidate. Where there are gaps in facilities of prime candidates, completion of facilities could be a priority to provide continuity. This will encourage completion of facilities, such as bike lanes and sidewalks, where they are the most fragmented. Once a street is designated as a Complete Street candidate it is possible that Level of Service rankings, which evaluate service characteristics for automobiles, could be replaced with Quality of Service that addresses all modes of transportation in the corridor. The implications of this transition can be explored in Phase II modeling and analysis in the short term. As better data regarding pedestrian and bicycle use become available, Orange County should evaluate the appropriateness of "bicycle boulevards," a limited network of roadways designated for bicycle usage through separated lanes, pavement markings, and other features, as prototypes to determine if suitable locations and projects can be found within the Complete Streets network.

See 11"x17" Gatefold Page 11
- Redevelopment Areas

Multimodal Corridors

Current FDOT multimodal corridor projects on Alafaya Trail and Orange Avenue will provide guidance on the degree of flexibility possible with regard to state roads in Orange County. Because these roads are owned and maintained by the State of Florida, any changes must be coordinated with FDOT. These two projects represent some of the range in scale and context of state roads in the region. The corridor's study areas are very different in their role in Orange County - Alafaya Trail is a major corridor connecting Seminole and Orange Counties, and Orange Avenue serves as the "Main Street" of Pine Castle and Belle Isle. These projects will be helpful in establishing prototypical treatments for other state roads.

In addition to these specific projects, other state roads are of great significance in Orange County, including East Colonial Drive, currently the subject of an Alternatives Analysis considering transit options, and Semoran Boulevard, the main gateway to Orlando from the Orlando International Airport. These key roadways are important to the function and appearance of Orange County. They are both prioritized for consideration by Metroplan Orlando, the regional transportation agency serving Orange, Seminole, and Osceola Counties.

Phase II network analysis will include additional multimodal corridor projects on the approved Priority Project List maintained by MetroPlan Orlando. Selected County facilities with appropriate

characteristics, such as Balboa Drive, a two-lane road in Pine Hills north of West Colonial Drive, may also be included in potential Complete Streets analysis.

In addition to their current status as collectors and minor arterials, these roads could potentially provide multi-modal access as parallel corridors to Alafaya Trail and Colonial Drive. These are lower speed facilities that might be more attractive to less-experienced bicyclists, one of the selection criteria being considered for identifying Complete Streets candidates for County investment over time, as resources become available.

MetroPlan Multimodal / Context Sensitive Improvement Projects

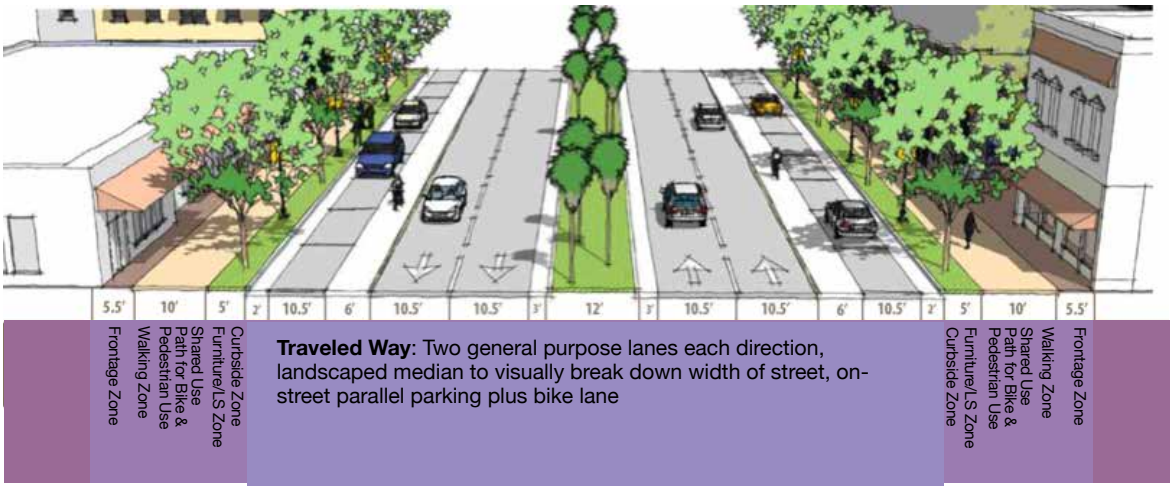
Priority	Road	Boundaries
8	Orange Avenue	Sand Lake to Hoffner
9	Alafaya Trail	SR 5o to McCulloch Road
21	SR 436	OIA to Seminole County Line
28	Goldenrod	SR 408 to SR 50
34	Aloma Avenue	SR 436 to Seminole County Line
35	Sand Lake Road	OBT to Orange Avenue

Context Sensitive Solutions

Another long-term component of this study will examine potential redesign of selected sections of 6-lane facilities. Major arterials often are not inviting environments to pedestrians or bicycles. In certain circumstances, redesign could help distinguish a district and contribute to the pedestrian environment, assuming the appropriate land use context is present, such as buildings with shorter setbacks and a stronger relationship to the street. A significant focus of Multimodal Corridor Plan Phase II modeling efforts would be ensuring the transportation network would not be adversely affected by any change in configurations. Segments proposed for this treatment should be very carefully chosen to enhance the adjacent land uses and their context, with a focus on a multimodal year 2040 network.

University Boulevard Existing Conditions

The Orange County Complete Streets manual explored the western portion of University Boulevard next to Full Sail University, one of the fastest growing schools in the state. There are many pedestrians and bicyclists along this section of road. In addition, on-street parking would be very supportive of area businesses and services that support the students at this fast-growing university. Slower traffic along the western end of University Boulevard would reduce the severity of conflicts among transportation modes and enhance awareness of the campus. In certain circumstances, the benefits could greatly offset a decrease in peak hour speeds. Research has demonstrated that while traffic does move more slowly during peak hours, vehicle density and through-put actually increase until roadway capacity is reached (Transportation Research Board, 1994). In some cases, congestion offers a significant benefit to adjacent land uses.



University Boulevard Conversion to University District Main Street

Orange County should consider a pilot study of a long-term University Boulevard cross-section reassessment, based on the findings of Technical Memorandum 2 and the recent GMB/Traffic Engineering study of this corridor, and the land use context, site development standards, transit service, and parallel facilities that would need to be present in the long-term for corridor transition. This pilot study would identify opportunities to create a more livable corridor, establish a district that

> "A number of project sponsors, local officials, and other stakeholders we spoke to emphasized the importance of BRT projects' physical features—particularly those that are perceived as permanent—in helping to spur economic development. They explained that BRTs with dedicated running ways, substantial stations with enhanced amenities, and other fixed assets represent a larger investment in the corridor by the public sector and assure developers that the transit service and infrastructure will be maintained for decades into the future. For example, Los Angeles local officials told us that the city's Orange Line BRT can come close to light rail in terms of economic development because its station infrastructure and enhanced amenities relay a sense of permanence to developers."
>
> GAO Report to the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, July, 2012

supports these educational facilities, and promote additional economic investment.

Edgewater Drive Cafe

Road Diets

"Road diets" are projects that reconfigure existing roads, reduce the number of automobile travel lanes, and provide amenities, such as on-street parking, bicycle facilities and protected pedestrian environments. They are typically associated with Main Street settings, but can also be found in higher-density residential development. The literature on road diets within the U.S. is currently focused on 4-lane or 5-lane undivided streets with fewer than 20,000 average annual vehicle trips per day, as volumes above that have an increased likelihood that traffic congestion will cause diversion to alternative roadway corridors (FHWA, n.d.). The pavement width allows these to be re-striped as 2-lane roads with a center turn lane. The remaining pavement often is repurposed for parallel parking and bicycle lanes.

Staff has conducted a thorough analysis of Orange County roadways in GIS using these screening criteria. Based on this analysis, there are a very limited number of potential road diet candidates in unincorporated Orange County. However, one possible consideration could include reconfiguration of planned Orange County 2 lane road widenings to 4 lanes that could result in an enhanced 3-lane section, similar to Orlando's successful Edgewater Drive reconstruction. Edgewater Drive has enhanced the livability of the corridor, while alleviating congestion and carrying an estimated 21,900 vehicles per day. This example and Orange County's Complete Street standards offer design guidance that notes providing a center turn lane and alternative travel modes might be adequate, in some circumstances, to mitigate increased congestion.
Of the limited available candidates for road diets, Oak Ridge Road was chosen as an example to illustrate the potential for this type of conversion in the Complete Streets analysis (see Appendix


Oak Ridge Road Main Street

2). The eastern end of Oak Ridge Road, as it dead-ends into Orange Avenue, has slightly higher traffic volumes than would normally be considered for road diets. However, since all cars must turn one way or the other on Orange Avenue, slowing traffic through a limited section of Oak Ridge Road should not affect the overall function of the road. Also, Lancaster Road, a parallel facility to Oak Ridge Road, has only 11,000 to 14,000 trips per day in 2012 traffic counts, presenting available capacity immediately to the south. At present, the land uses are primarily auto-oriented, but the corridor has significant multifamily and single-family development. Existing commercial zoning would also support additional retail establishments and restaurants that could be attracted to the area over time. The neighborhoods in South Orlando, including Pine Castle and Sky Lake, could support a walkable 'Main Street' development of this nature.

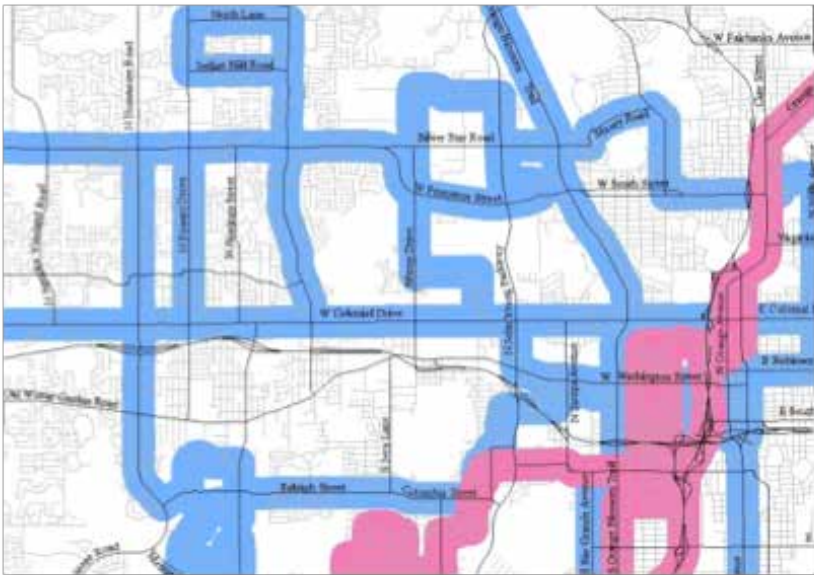
High Quality Transit Areas

Transit accessibility is of particular importance in livable communities. Ready access to high quality transit benefits residents who cannot, or choose not to drive to many destinations. At a regional level, the permanence of rail is nearly always rewarded by investors, and the predictability of transit times and frequency of service make this type of transportation highly desirable. SunRail forms the backbone of regional transit connectivity and should be supported with bus and other transit types in order to ensure its success over time. Other rail projects might be considered to build on this initial investment over time.

Two SunRail stations are located in unincorporated Orange County. The Sand Lake Road Station on Orange Avenue is included in Phase 1 and the Meadow Woods station further to the south will be developed as part of Phase 2 of SunRail. To support the stations, Orange County will be drafting a Transit Oriented Development Code to provide for compatible development with design and land uses that support transit ridership. Transit areas are special places that provide a mix of housing and employment at high densities in close proximity to points of transit access. This makes them destinations that provide a variety of goods and services in addition to transit and related amenities, all which promote livability in adjacent roadway corridors.

Sand Lake Road Station Concept

Bus Rapid Transit (BRT) is an emerging technology which, when run in dedicated lanes, produces similar predictability and can be almost as attractive to developers as rail. In order to facilitate this development, rail station areas and areas served by Bus Rapid Transit should reflect their major infrastructure investments and should be provided every opportunity to transition to transit-supportive districts. These neighborhoods, focused on transit access, should be planned to provide local services and retail for residents as well as those commuting to the station from other locations.



Potential High Quality Transit Areas based on Frequency

Buses that offer frequent service should be considered part of a High Quality Transit network that promotes livability. Infill projects should be expedited within these areas to incentivize transit supportive development. Development, while not as intense as that supporting fixed guideway transit, will contribute significantly to ridership.

Special attention to the pedestrian environment is also important in these areas, as every transit trip begins with a walking trip. Sidewalks and street trees should be provided, at a minimum, to make this a safe, comfortable walking environment. Mixed-use development – either vertical or horizontal – should be encouraged in areas served by transit to maximize the internal capture of trips. Whether these trips are on alternative modes or shortened auto trips, the benefits to the overall transportation network are significant. This type of development will create opportunities for shorter auto trips or alternative modes of travel within these districts.

Summary and Recommended Livability Corridors

Orange County roads should, in the future, experience a transition from auto-dominated roadways to a network of roads that include more shared-use facilities that promote livability. In conjunction with infill development, the existing roads can be transformed into thoroughfares that are attractive for multiple modes of travel. Landscaping will make them more pleasant for walking and biking, and local destinations will provide services that can be easily accessed. Corridors that will help characterize the full range of features that improve livability have been identified and listed below in anticipation of further study in Phase II. In addition to County roads, several state roads for which the Florida Department of Transportation plans to conduct multimodal corridor feasibility studies, similar to the Alafaya Trail and Orange Avenue studies, and that are identified in the MetroPlan Orlando Prioritized Project List for this purpose are included in the Livability Corridor list.

Recommendations

- Evaluate municipal land development codes of municipalities within Orange County to make recommendations regarding sidewalk widths and pedestrian connectivity requirements
- Implement the recommendations of the Trees in the Right of Way Group regarding measures

to prevent root damage to infrastructure such as root barriers, steel reinforcement of sidewalks and other actions as appropriate

- Conduct a pilot study of a long-term University Boulevard cross-section reassessment based on the findings of Technical Memorandum 2, the recent GMB/Traffic Engineering study of this corridor, and the land use context, site development standards, transit service, and parallel facilities that would need to be present in the long-term for corridor transition

- Once recommended pedestrian/bicycle data are available, evaluate appropriateness of "bicycle boulevard" prototypes to assess if any suitable locations and projects can be determined

- Draft Livability Corridors in the following table were selected in Phase I for state roadways included in MetroPlan Orlando's Prioritized Project List for Multimodal Corridor Feasibility Studies, with the addition of SR 50 based on current Alternatives Analysis project and Pine Hills Road and Balboa Drive to serve Pine Hills. These corridors and potential other candidates identified in Phase II will be evaluated as part of Phase II network development.

Livability Corridor	From	To
SR 50	SR 429	SR 417
Balboa Drive	Clarke Road	Pine Hills Road
Pine Hills Road	Silver Star Road	SR 50
Kirkman Road	Old Winter Garden Road	Sand Lake Road
US 441	SR 50	Sand Lake Road
Orange Avenue	Gore Street	Taft-Vineland Road
Sand Lake Road	US 441	Orange Avenue
Oak Ridge Road	Winegard Road	Orange Avenue
SR 436	Orange County Line	Hoffner Avenue
Goldenrod Road	University Boulevard	Lake Underhill Road
Aloma Avenue	Lakemont Avenue	Hall Road
Alafaya Trail	Orange County Line	SR 50

Source

Federal Highway Administration (FHWA). (n.d.) Evaluation of Lane Reduction "Road Diet" Measures on Crashes. Highway Safety Information System Summary Report FHWA-HRT-10-053.

Transportation Research Board (TRB). (1994). Highway Capacity Manual, Special Report 209, pp. 3-15.

Economy

Orange County's economy relies on the movement of residents, visitors, employees, freight, and goods.

Economy Theme

Introduction

In Orange County, the transportation network serves a number of important economic functions, including the movement of residents, visitors, employees, freight, and goods throughout the county and the region. Also, Orange County is a regional employment center within Central Florida, as seen by in-commuting patterns from adjacent counties and employment data. As the center of a regional commuting network, these needs require Orange County to work in partnership with the Florida Department of Transportation, adjacent cities and counties, and LYNX as the regional transit provider to ensure local and regional coordination on traffic operations and transportation capital planning.

Photo courtesy of seefloridago.com

At the same time, the transportation network's mobility and accessibility facilitate economic activity, redevelopment, and infill development that, in turn, enhance transportation choices, access to goods and services, and the economic value of these transportation corridors. SunRail commuter rail service likely will promote these efforts, as discussed in the Livability section, and significant planning already has taken place to encourage compatible related development. At key corridors within the network, notably the International Drive tourist corridor and Alafaya Trail adjacent to the University of Central Florida, economic activity centers exist that host a significant portion of Orlando's over 50 million annual visitors and the majority of the 59,000 students at the University of Central Florida.

The following section will address each of these economic themes in turn, identifying the various ways the transportation network is an economic asset to Orange County, while recognizing ongoing fiscal constraints and revenue decline. The section concludes by identifying Economy Corridors that are proposed as the focus of Orange County's efforts in this area and related Economy recommendations.

Employment and Freight

Employment Concentrations

In Orange County, major concentrations of employment are found clustered around several major roadways and limited-access highways, primarily Interstate 4, Maitland Boulevard, Colonial Drive, Orange Blossom Trail, Oak Ridge Road, and International Drive, as well as the Walt Disney World Company's properties within the Reedy Creek Improvement District. The mobility and accessibility of the roadways serving these existing employment concentrations are of primary importance to travel demand and are an integral part of any economic considerations of the transportation network.

Table 3: Orange County Major Employers

Private Sector Employer	Estimated Number of Employees	Major Roadways Serving Employment Locations
Walt Disney World Company	62,000	Interstate 4, SR 528, SR 429
Adventist Health Systems	16,002	Interstate 4, Orange Avenue
Universal Orlando	13,000	Interstate 4, SR 528, Universal Boulevard
Orlando Health	10,000	Interstate 4, Orange Avenue
Busch Entertainment Corp.	7,800	International Drive
Central Florida Investments	7,000	Various throughout Orange County
Lockheed Martin	7,200	Sand Lake Road, Kirkman Road, Universal Boulevard
Siemens Power Generation	7,000	Alafaya Trail, University Boulevard
Marriott International	6,312	International Drive, SR 417, CR 535
Darden Restaurants (Headquarters Only)	5,950	SR 528, John Young Parkway, Taft-Vineland Road

Source: Enterprise Florida, 2013; 2011 InfoGroup data, Orange County.

See 11"x17" Gatefold Page 12
- Economic Overlay Zones

Multimodal Focus Areas

Alternative Mobility Area (AMA)

In May 2009, the BCC adopted Comprehensive Plan policies that created an Alternative Mobility Area (AMA) of approximately 30 square miles within the County's Urban Service Area to promote infill and redevelopment in a manner that supports broader mobility choices, including public transit. The AMA is adjacent to the City of Orlando's existing Transportation Concurrency Exception Area boundaries as they existed at the time and provides a transportation concurrency exception for all development types within its boundaries. Development within the AMA also is subject to a different transportation impact fee schedule calculated on person trips, rather than vehicle trips, resulting in impact fees that average 5 percent lower than non-AMA development. Within the AMA, transportation impact fees may be used for a wider spectrum of mobility improvements. Sidewalks, transit shelters, park and ride lots, lighting, landscaping, pedestrian bridges, Intelligent Transportation Systems enhancements, and other mobility improvements all are eligible for transportation impact fee funding within the AMA, based on Sec. 23-97 (2)(b)(ii) of Orange County Code.

As a significant mobility and transportation funding policy initiative, the AMA policies and their implementation will be the subject of an extensive review in 2015. This review in 2015 builds upon initial assessment completed as part of the County's recent update of transportation impact fees in 2012, which resulted in significant AMA policy changes, and is required by Transportation Element Policy T2.3.13 of the Comprehensive Plan. In the interim, the first phase of the Multimodal Corridor Plan assesses the potential of expanding transportation concurrency alternatives to other geographic areas of Orange County to prepare for future phases of the Multimodal Corridor Plan and to explore how these expansions may continue to meet Orange County's mobility and accessibility goals. Please see Appendix 6 for this detailed analysis, which is summarized in the following section.

International Drive/University of Central Florida

The term *Multimodal Focus Area* as used in this analysis refers to a large concentration of economic activity that usually contains a mix of land uses, such as offices, industrial sites, shopping centers, universities, hotels, and/or medical centers, that is

Photo courtesy of seefloridago.com

supported by a multimodal transportation network. The term "activity center" is not used to avoid confusion with International Drive's existing Activity Center designation in the Comprehensive Plan. A Multimodal Focus Area (MFA) is typically located where it will have access to large consumer or labor markets and convenient transit and highway access. The Multimodal Corridor Plan includes an analysis of the various districts and designations associated with the International Drive Activity Center and the University of Central Florida to determine appropriateness and potential boundaries for any alternative transportation concurrency designations (e.g. Multimodal Focus Area) that may be considered in future phases of the Multimodal Corridor Plan, based on the areas' transportation and land use characteristics.

The International Drive MFA study area is located within a tourist destination corridor, which includes retail, entertainment and hotel land uses specifically targeted toward attracting visitors to Universal Studios, Sea World, Walt Disney World, and the Orange County Convention Center. The area contained within and adjacent to the International Drive MFA is a combination of mixed-use development that is pedestrian-friendly, compact in nature, transit-friendly and transit-oriented. The study area for the International Drive MFA consists of a north-south corridor approximately one-mile wide and seven miles long. Orange County first adopted the International Drive Activity Center as part of the 1991 Comprehensive Plan and provides future land use designations, Activity Center Residential and Activity Center Mixed Use, that encourage a mixture of tourist related developments with appropriate densities and compatible land uses.

The University of Central Florida Multimodal Focus Area (UCF MFA) study area is located in east Orange County, which has experienced a tremendous amount of growth fueled by the growth of the University, in conjunction with the Central Florida Research Park DRI and the Quadrangle DRI, as well as support services (residential and retail) needed to accommodate university enrollment. The area contained within and adjacent to the UCF MFA is a combination of mixed-use development connected by sidewalks, and bike lanes are provided on some of the roadways within the area. The 1,415 acre University of Central Florida (UCF) main campus has the majority of its land area (1,018.8 acres) planned for conservation (including a 81.3-acre Arboretum), open space and recreation, and future development area. Currently, almost 400 acres have been developed, and 382 acres are available for future development. The campus was originally designed around a core set of buildings serving a largely commuter population that has evolved into a concentrated campus with multimodal features, due to the vast number of sidewalks connecting every building, on-site bike lanes and the on-site shuttle service.

Consultant recommendations for consideration as Multimodal Focus Area, including the selection methodology, are detailed in Appendix 6 and include:

- *Location in areas identified in the Future Land Use Map with designations conducive to mixed-use high density land use, such as institutional (educational), commercial (major shopping centers), office parks, hotel/motel/timeshare, and single family and multi-family residential or with specific designations of Activity Center Residential and Activity Center Mixed Use.*

- *Existing transit service with multiple routes and potential for expansion, including future Bus Rapid Transit (BRT) service, which should be prioritized over non BRT locations*

- *Pedestrian friendly with continuous sidewalk connections (including pedestrian bridges where feasible and warranted by existing pedestrian traffic) between transit stops and MFA on-site destinations*

- *Enhanced pedestrian features, such as mid-block crosswalks, pedestrian bridges over major roadways, wide sidewalks with landscaping in place or programmed*

- *Transit shelters and bike lanes and bicycle facilities in place or programmed*

- *A geographic area of at least one-half mile diameter with a connected transportation network*

- *Compatible transportation network and land use development and enhancement as guided by a Master Plan prepared for any candidate Multimodal Focus Area location*

Technical Memorandum 7 recommends an International Drive Multimodal Focus Area boundary be considered from Carrier Drive on the north, to the properties fronting the west side of Turkey Lake Road/Palm Parkway, Osceola County line on the south and to Shingle Creek/Universal Boulevard on the east. The recommended University of Central Florida Multimodal Focus Area boundary would encompass the Quadrangle DRI on the west and then follow University Boulevard to Alafaya Trail (SR 434) where it extends south to Colonial Drive where it turns east following Colonial Drive to the eastern side of the East-West Expressway where it turns north following the wetlands west of Bonneville Drive and east of Discovery Drive until it follows the University of Central Florida eastern property boundary to the Seminole County line on the north. Phase II and III of the Multimodal Corridor Plan include further assessment and modeling evaluation of proposed Multimodal Focus Areas (Figure 12) to determine their feasibility and transportation network implications.

See 11”x17” Gatefold Page 13
- Multimodal Focus Area

Freight Activity and Resources

Photo courtesy of seefloridago.com

Freight movement is an essential economic function of the transportation network, as goods distribution supports the tourism, wholesale, retail, service, office, and industrial industries within a community. In April 2002, MetroPlan Orlando, the regional transportation agency serving Orange, Seminole, and Osceola Counties, completed its Freight, Goods, and Services Mobility Strategy Plan to document freight movement throughout the three-county region, assess operational enhancements to the freight network, and identify important freight activity centers and corridors. The original study had a horizon year of 2025 and resulted in a number of key management and operations project that improved intersections and other locations used by freight traffic. In October 2013, MetroPlan Source:

Orange County Freight Infrastructure

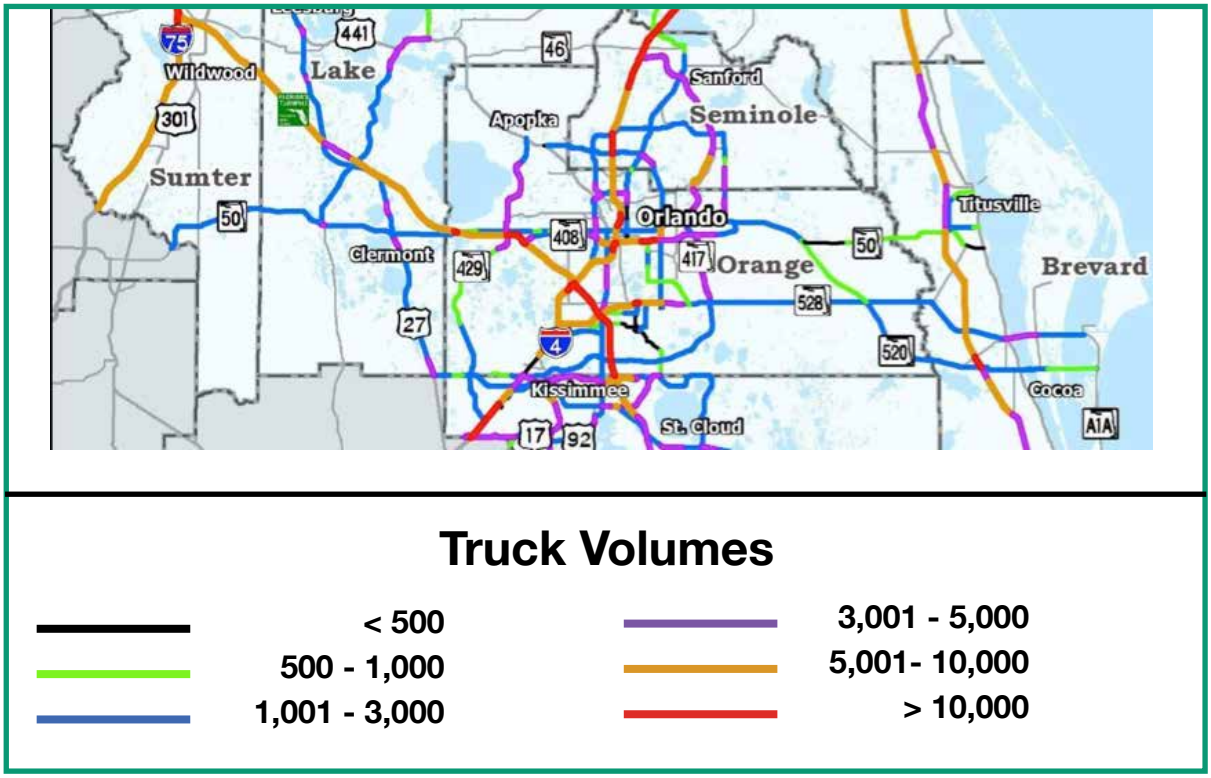
FDOT, 2013c.

Orlando updated the original study with a new planning horizon of 2040 and a study area of seven Central Florida counties. One outcome of this study is an assessment of future year commodity flows and the freight network necessary to support anticipated demand for freight, goods, and services movement in Orange County and the region. This assessment is reviewed below to contribute to the identification of Orange County Economy Corridors within the county.

In the Orlando area, over 80 percent of freight movement occurs by truck, compared to 70 percent nationally. If the freight origin or destination is within Orlando, that percentage soars to 95 percent (FDOT, 2013a). In 2010, a total of 132 million tons of freight moved into, from, within, and through Orange County, of which 97 percent was by truck. By 2040, this total is projected to be in the range of 178 to 209 million tons annually (MetroPlan Orlando, 2013). Freight tonnage largely is comprised of nonmetallic minerals; clay, concrete, glass, or stone products; warehouse and distribution goods; and food and kindred products (MetroPlan Orlando, 2013), reflecting local economic activity in tourism and construction, as well as Central Florida's population size.

The following exhibits depict the average annual daily truck traffic in and through Orange County in 2011, as well as projected increases by 2040 on major routes within the County.

Average Annual Daily Truck Traffic (AADTT), 2011



Source: MetroPlan Orlando, 2013.

Primary Orange County Freight Corridors

Roadway	2040 Truck Volume Per Day
I-4	>10,000
Florida's Turnpike	>10,000
SR 528	>10,000
SR 408	>10,000
SR 417	>10,000
SR 436 (Semoran Boulevard)	>10,000
SR 423/John Young Parkway	>10,000
SR 434	>5,000
SR 429	>10,000
US 17/92	>10,000
SR 50	>5,000
SR 429/Wekiva Parkway	>5,000

Source: MPO, 2013.

Orange County Key Transportation and Freight Facilities

Strategic Intermodal System (SIS) Highways		I-4, US 27, SR 408, SR 417, SR 429, SR 528
SIS Railroads		Florida Central, FDOT/ Sunrail, CSX Terminal
SIS Airports		Orlando International Airport Orlando Sanford International Airport
Seaports		Port Canaveral
Non SIS State Highways		US 1, US 441, SR 50, SR 520
General Aviation Airports		Bob White Field, Orlando Apopka Airport Orlando Executive Airport

Source: FDOT, 2013c.

While Florida and Orange County are fortunate not to have the freight infrastructure concerns debated at a national level, where 1 in 9 bridges are structurally deficient and 42 percent of major urban highways are congested (Tita, 2013), the County does have significant needs in key components of the freight network and sub-network serving freight users. Also, the Florida Department of Transportation notes that trucks contribute about 95 percent of damage done to roadways from a pavement management perspective (FDOT, 2013b), and designated truck routes and freight routes confine these effects and maximize efficiency. Route designations also serve the freight and logistics industries by presenting optimal routes that leverage existing conditions and allowable truck travel. Designation of a Freight Sub-Network to complement existing state Strategic Intermodal System (SIS) and Emerging SIS roadways is a focus of the MetroPlan Orlando freight plan update and will include the County's Landstreet Road and Taft-Vineland Road, with Boggy Creek Road also proposed for inclusion.

In planning for freight movement in the short and long term, it is clear that maintaining conditions for appropriate freight movement on key corridors must be a planning and investment priority. Travel-time reliability may be an issue for some of the County's most significant freight corridors, impacting a shipper or carrier's ability to meet pick-up and delivery schedules, optimize vehicle speed and turns, and maximize driver productivity under limited hours of service regulations. As demonstrated by American Travel Research Institute data obtained through a nationwide network of thousands of Global Positioning System-equipped trucks, data indicate that several Orange County corridors studied experience greater than 10-percent variability between the best and worst travel times (MPO, 2013).

Orange County Roadway Truck Travel Time Variability

Orange County Roadway	Direction	Travel Time Variability
SR 528	Eastbound	10%
SR 408	Eastbound	29%
SR 408	Westbound	24%
SR 436	Northbound	47%
SR 436	Southbound	34%
SR 50	Eastbound	19%
SR 50	Westbound	15%
SR 15	Northbound	14%
SR 15	Southbound	23%
US 17-92	Northbound	17%
US 17-92	Southbound	39%

Source: MPO, 2013.

To preserve the economic functions of and freight movement on Orange County's transportation network, Orange County must ensure facilities and programs on Economy Corridors prioritize or do not hinder freight movement. Orange County also should compile an inventory of Orange County freight-related roadway projects, such as the County's Boggy Creek Road and Taft-Vineland Road widening to four lanes, for inclusion in the MetroPlan Orlando Freight Goods and Services update and the Florida Freight Mobility and Trade Plan Investment Element to seek funding partnerships for these important facilities.

Transportation Revenues

The revenues available to construct, operate, and maintain Orange County's transportation network are fundamental to ensuring the network can meet the demands of travel and its roles within the overall function of the County's economy. At this time, Orange County must face increasing needs and declining revenues, but it is important not to attribute these circumstances solely to the recent economic recession. At periodic junctures in its recent history, the County has been in the same position, meriting an overall consideration of whether transportation revenues structurally are able to meet the needs of the network. Phase II of the Multimodal Corridor Plan will complete detailed financial estimates to the year 2040 compared to specific transportation network scenarios that can inform that consideration. In the interim, this section briefly reviews the County's major transportation revenue analyses and proposals, identifies major sources of current revenues, and concludes with an outline of the County's strategies to encourage public-private partnerships.

Past Initiatives

Several past initiatives have included sales tax referenda as a proposed new source of transportation revenues. While similar initiatives have been successful in neighboring jurisdictions, most notably Seminole County, or for school funding in Orange County, Orange County voters have not supported these efforts in recent years for transportation projects. Orange County qualifies for two local option sales taxes that have not been enacted to date. Orange County may levy the Local Government Infrastructure Surtax of 0.5 to 1.0 percent, per s. 212.055(2), F.S., by adoption of an ordinance enacted by a majority vote of the county's governing body and approved by voters in a countywide referendum. Also, as a charter county, Orange County is eligible to assess the Charter County Transportation System Surtax of up to 1 percent per s. 212.055(1), F.S., if a majority of Orange County voters approve an enabling charter amendment (OMB, 2013b).

In 1996, Orange County Mayor Linda Chapin's Blue Ribbon Commission on Orange County Infrastructure recommended increasing the property tax millage rate and asking the Orange County electorate to approve a Local Government

Infrastructure Surtax. This proposed initiative would have imposed the surtax for six years, with eight-tenths of a cent being used for five years and a full cent in the final year to meeting the County's transportation needs, "the most critical of all infrastructure considered" (BRCoOCI 1996). A corresponding 1997 penny infrastructure tax that would have funded a variety of roadway, school, and park projects received only 44 percent of Orange County voters in support.

In 2002, Orange County Mayor Richard Crotty formed a Transportation Commission that created *Mobility 20/20: The Orange County Transportation Mobility Initiative.* Mobility 20/20 proposed an $8.6 billion package of specific transportation improvements over 12 to 15 years that addressed light rail and commuter rail transit, freight relocation/mitigation, traffic signal upgrades, bicycle trails, additional sidewalks, pedestrian overpasses, and $6.6 billion in roadway improvements. Funding was proposed, in part, via enactment of a half-cent Local Infrastructure Sales Tax for a 20-year period. Mobility 20/20 would have dedicated funds to advancing construction on a number of major roadways, 180 miles of additional sidewalks, 30 miles of bicycle trails, 20 pedestrian overpasses, 20 intersection improvements, and other safety and efficiency improvements. In October 2003, the referendum was defeated by 54 percent of Orange County voters in opposition.

Also in 2002, Orange County Public Works drafted a Needs Assessment to project future transportation needs and revenues to 2011. The Needs Assessment was seen as a "tool to form the basis for a CIP that will result in money being spent where it is most needed," and it cited "a rapidly growing and urbanizing county…aging facilities, deferred maintenance, new technology, ongoing program changes" as issues that led it to observe that "current sources of revenue are often insufficient while competition for new funds increases daily" (Public Works, 2002). While some estimating methods were conservative, such as projecting zero growth in transportation impact fees over that period, the Needs Assessment found that total revenues needed to support capital construction, operations, and maintenance expenditures would have $53.9 million in unfunded needs by 2011.

These unfunded needs and revenue shortfalls have resulted in some major line items, like roadway resurfacing, that were occurring on an 8 to 10 year cycle at that time now moving to the current 15 year cycle instituted during the recent economic recession. These trends continue today, with Public Works estimating the County has over $337 million in unfunded roadway projects currently needed to relieve congestion (see the Executive Summary for a detailed list). Additional needs will be identified during year 2040 network analysis initiated by MetroPlan Orlando for their year 2040 Long Range Transportation Plan, then refined in Phase II of the Multimodal Corridor Plan.

Current Revenues

For Fiscal Year 2013-2014, Orange County Public Works has a budget of $92,587,396, an increase of only 0.8 percent from the prior fiscal year, in the Transportation Trust Fund. The Transportation Trust Fund is a primary source for meeting needs for new capital projects and ongoing maintenance of the County's transportation network, including roadway paving and construction, intersection improvements, drainage projects, traffic signals, traffic calming, sidewalk construction and repair, and bridges. This total is supplemented by other funding sources, such as Municipal Service Taxation Unit (MSTU) funds for maintenance responsibilities, as applicable. The Orange County Fiscal Year 2013-2014 budget for all transportation needs is approximately $272 million, a decrease of -17.9 percent prior to any rollover of unspent funds from the prior fiscal year (OMB, 2013a). Transportation expenditures include $21.3 million for roadway repaving within the capital projects budget, the final $10 million payment of Orange County's $35.4 million contribution to SunRail service, and LYNX transit funding of $38.1 million using general revenue funds.

Orange County Major Transportation Revenue Sources

Source	Uses	2013-2014 Projected Revenue
Transportation Impact Fee	Assessed per fee schedule for growth-related transportation capital expenditures within the zone in which the fee is assessed and collected	$ 16,500,000
County Gas Tax	One cent tax per gallon funds the Transportation Trust Fund	$4,500,000
Local Option Gas Tax	Six cent tax per gallon shared with municipalities based on population used for public transportation, roadways, rights-of-way, drainage, lighting, signs, signals, pavement markings, bridges, and capital expenditures	$23,500,000
Constitutional Gas Tax	Two cent tax per gallon funds the Transportation Trust Fund (20%) and Constitutional Gas Tax Fund (80%) for acquisition, construction or maintenance of roads	$8,700,000
Communication Services Tax	As of FY 2011, funded the Transportation Trust Fund	As of this fiscal year, funds now directed to the Special Tax MSTU Fund

Source: OMB, 2013a and 2013b, OMB correspondence.

Budgets fluctuate during the year based on rollovers of unspent funds from prior year projects and annual rebudget in January, which affect percentage changes.

It is clear from review of the Fiscal Year 2013-2014 budget that gas taxes provide the core of transportation network funding within Orange County. However, the Office of Management and Budget notes in their Fiscal Year 2014 budget that "maintenance costs are going up, but gas tax revenue has been flat for some time," resulting in sales tax funds continuing to be directed to roadway maintenance to help meet existing needs (OMB, 2013). Also, the County's reliance on an existing base of gas taxes is challenged by the increasing efficiency of vehicles, as promoted by federal environmental standards. Federal Corporate Average Fuel Economy (CAFE) fuel economy standards for new vehicles will reach 35.5 miles per gallon (MPG) by 2016 and 54.5 MPG for cars and light-duty trucks by model year 2025.

These new standards will "nearly double the fuel efficiency of those vehicles compared to new vehicles currently on our roads" (NHTSA, 2012), with financial implications as projected by FDOT depicted in Figure 16. These trends have led governments and other stakeholders to assess vehicle-miles-traveled fees, assessments for owners of electric vehicles, additional tolling, and a variety of other mechanisms, some of which are the subject of pilot projects across the country. At this time, it is difficult to ascertain what mechanisms may be applied in Florida and in the Orlando area, as counties vary as to the amount of gas taxes currently levied (Florida law allows a maximum of 12 cents per gallon in local option gas taxes as part of three separate allowable levies.) However, Orange County must monitor projected revenues closely to determine additional future impacts. Phase II of the Multimodal Corridor Plan will iterate MetroPlan Orlando's financial projections to the year 2040 to assess the financial feasibility of the future Orange County network.

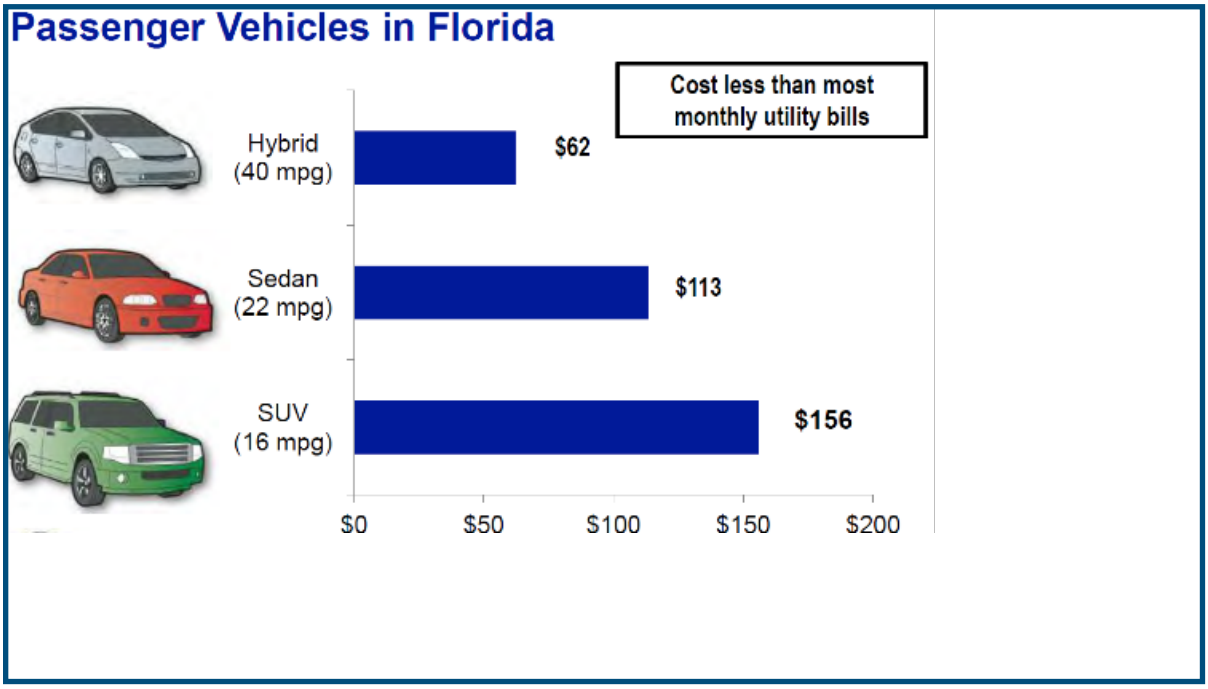
Orange County has the following two options for local option gas taxes that are not being implemented:

The Ninth Cent Fuel Tax of one cent on every gallon of gasoline is enabled by s. 336.021, Florida Statutes. This tax may be authorized by an ordinance adopted by an extraordinary vote of the Board of County Commissioners or by voter approval in a countywide referendum. As opposed to other gas taxes shared with municipalities, the Ninth Cent Fuel Tax proceeds are not shared. Under statewide equalization, the County currently receives approximately $1million per year from this revenue source.

The Second Local Option Motor Fuel Tax of one to five cents on every gallon of motor fuel is enabled by s. 336.025(1)(b), Florida Statutes. This tax may be authorized by an ordinance adopted by majority plus one vote of the Board of County Commissioners or by voter approval in a countywide referendum.

Source: OMB,2013b.

Fuel Taxes



Source: FDOT, 2013d.

Multimodal Transportation

As described in various sections of the Multimodal Corridor Plan, multimodal transportation relies on having adequate lighting, landscaping, midblock crossings, and other features that make walking, biking, and transit use comfortable and convenient for users. However, these multimodal features have cost implications for both capital planning and for operations and maintenance funding, creating issues with their programming in Orange County transportation projects. This section highlights past treatment of these planning and policy issues.

In the next fiscal year, Orange County will be restarting the roadway lighting program suspended in Fiscal Year 2009-2010 due to budget concerns. Public Works will allocate an estimated $1.2 million in available revenues annually for this program, which will prioritize 4-lane and 6-lane roadways that are impact-fee eligible and use other ranking criteria (ex. proximity to transit, traffic volumes, accident data) to allocate limited funding efficiently. While an estimating benchmark of $120,000 per mile for installation costs may be used, existing conditions in installation, such as the presence or absence of utility service and poles, creates variation in actual pricing. Of the County's approximately 395 miles of 2-lane and 4-lane roads, an estimated 160-180 miles have had lighting installed, with the remaining facilities to be lighted within five years of resuming the roadway lighting program in Fiscal Year 2015. One constraint of the new program is its new funding source is impact fee funds, limited to use in the impact fee zone in which they were collected, as opposed to the unrestricted use of funds from the prior source, gas tax revenues. In addition to streetlighting on Orange County facilities, Orange County also now maintains over 1,800 streetlights for FDOT with reimbursement under corresponding interlocal agreements.

From 1994 to 1999, Orange County used OrangeScape, its first roadway landscaping program, to retrofit county roadways, with a goal of 98 miles of roadway to be landscaped. The OrangeScape program created uniform landscaping on arterial and collector roads to enhance the aesthetics, facilitate a signature appearance and sense of place, and promote walking. With a budget of $1 million per year from matching grants, the general fund, and FDOT/Expressway Authority partnerships, the County landscaped 53 miles of roadway at an enhanced standard that included trees, turf, and shrubbery at an estimated $180,000 per mile and maintenance cost of $22,400 per mile per year (Orange County, 2006).

After 2009, roadway landscaping became part of the County's highway construction program funded through the Capital Improvements Program (CIP), which later provided an additional 14 miles of landscaping toward meeting the OrangeScape goal. However, the CIP projects installed planted trees and turf without irrigation, in contrast to the more extensive OrangeScape standard. Besides the additional expense, irrigation requires the availability of reclaimed water lines or water truck services, repair of sprinkler heads and pipes, and adequate subsurface drainage on the roadway system to avoid affecting the roadway base and the need for additional roadway maintenance and/or reconstruction (Orange County, 2006). Orange County CIP projects were budgeted at $75,000 per mile for landscape installation, which is now suspended in light of the past several years' budgetary concerns amid the economic recession. Maintenance costs per year were previously projected at $17,200 per mile per year (Orange County, 2006).

Orange County funds the maintenance of portions of County roadway streetlighting, ponds, and other elements of the network through assessments via Municipal Service Benefit Units (MSBU) and Municipal Service Taxation Units (MSTU). Special assessments for streetlighting MSTU alone resulted in $10,330,858 in funds collected in Fiscal Year 2012-2013. Within certain developments in Orange County, primarily in Orange County's municipalities, the private sector accomplishes similar infrastructure maintenance through the adoption of Community Development Districts (CDD). Orange County has approved only a few CDD in the unincorporated area, and the recent economic recession has limited the viability of the CDD mechanism as declining housing sales within some CDD threatened their revenue streams and solvency. However, MSTU and MSBU will likely

continue to be an important component of the County's multimodal transportation funding in future years.

For state roadway corridors, FDOT standards provide 1 percent of CIP cost for landscaping for the minimum landscaping standard, but do not include any enhancements for landscaping above the minimum, high-visibility crosswalks, midblock crossings, pedestrian-scale lighting, or other features noted in the Livability or Safety sections of this analysis. Any additional upgrades or features to enhance multimodal transportation are done at the expense of local governments, both for installation and ongoing maintenance responsibilities. These can be significant, as illustrated by the example of enhancing crosswalks with textured pavement or an alternative to basic thermoplastic striping. FDOT requires that installation must be funded by a local government, which must then fund the ongoing maintenance, including required friction testing twice in the first year of installation and biannually thereafter at an estimated cost of $3,000 to $4,000 per test for each installed crosswalk.

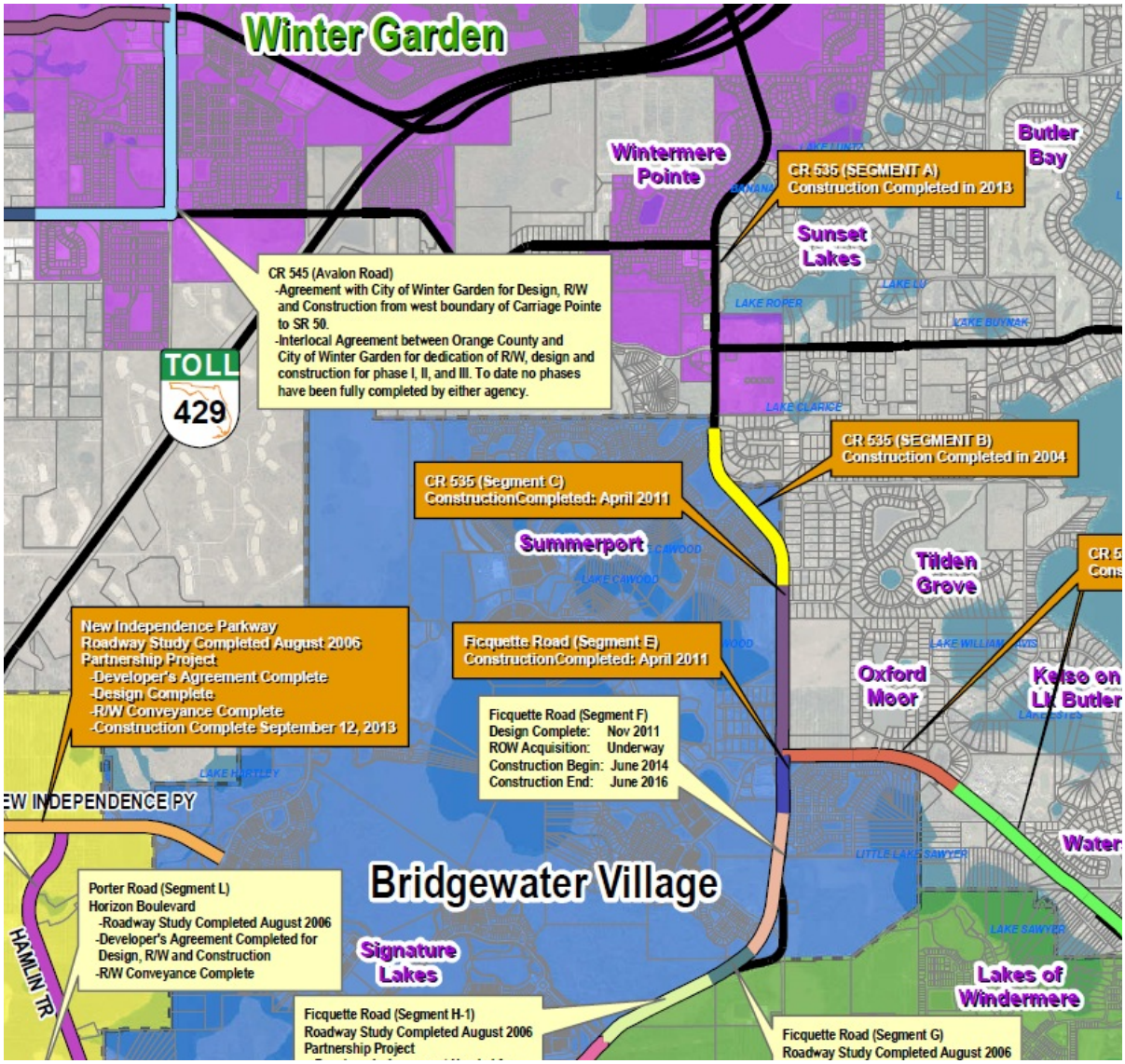
As discussed in the Livability section, FDOT's forthcoming multimodal corridor feasibility projects for Orange Avenue and Alafaya Trail, completed at the end of 2013, will provide important inputs into cost estimates and cost sharing for corridor retrofits. However, Orange County must continue to explore available and new revenue sources for multimodal transportation features to meet the needs of the transportation network, as well as the policy goals of the Orange County Comprehensive Plan. These costs and sources will be assessed in Phase II of the Multimodal Corridor Plan relative to ongoing development of a multimodal transportation network in Orange County.

Public-Private Partnerships

Orange County participates in a wide variety of public-private partnerships, including Development of Regional Impact and Planned Development development-related commitments, state/federal grant projects, and other economic investments. In addition, the County's future transportation network relies on expectations of additional partnerships, primarily in urbanizing planning areas like Innovation Way in southeast Orange County and Horizon West in southwest Orange County. Orange County's adopted Long Range Transportation Plan in the Transportation Element of the Comprehensive Plan (see Figure 17 below) conceptually depicts a number of these projects and their potential alignments. However, a number of partnerships have moved beyond this conceptual stage to executed agreements. Consideration of draft agreements is facilitated by review and approval by a staff-level advisory board (Roadway Agreement Committee) that makes recommendations to the Orange County Board of County Commissioners for their review and decision.

This Orange County process, as established and refined during recent periods of rapid population and economic growth in Orange County, has resulted in approval of 248 agreements totaling over $158 million in funding for Orange County's transportation network. The application of these agreements to the Horizon West planning area has been a significant factor in existing and future roadway development, as depicted in the exhibit on the following pages.

Orange County Partnership Roadways, Horizon West Area



Source: Orange County Transportation Planning, 2013.

See 11"x17" Gatefold Page 4
- **Long Range Transportation Plan**

Orange County Partnership Roadway Agreements

Year	Number of Approved Agreements	Value of Approved Agreements
1998	0	0
1999	21	$8,646,200
2000	17	$15,102,929
2001	16	$4,985,502
2002	12	$35,233,594
2003	13	$5,756,225
2004	16	$7,339,312
2005	25	$12,708,685
2006	25	$24,975,584
2007	25	$11,954,573
2008	19	$10,473,038
2009	19	$4,936,825
2010	11	$4,020,025
2011	12	$8,506,285
2012	17	$3,404,690
2013	10	$74,095,824
Total	**258**	**$232,139,291**

Source: Orange County Transportation Planning, 2013.

Orange County's successful legacy with public-private partnerships offers a substantial base of expertise with which to evaluate emerging opportunities in that sector. The 2013 Florida Legislature has enabled new public private partnership options with the creation of s. 336.71, Florida Statutes (F.S.), which authorizes counties to utilize public-private partnerships to construct county roadways through the receipt or solicitation of proposals and by entering into agreements with private entities to construct, extend, or improve a county road or portion thereof within a county. As referenced in the statute, "the county must conduct a noticed public hearing and determine that the partnership is in the best interest of the public, would only use county funds for portions of the project that will be part of the county road system, would have adequate safeguards to ensure that additional costs or unreasonable service disruptions are not realized by the traveling public and citizens of the state, would be owned by the county upon completion of the agreement, and would result in a financial benefit to the public by completing the project at a cost to the public significantly lower than if the project was constructed by the county using the normal procurement process" (s. 336.71, F.S.).

In addition, the 2013 Florida Legislature amended provisions of s. 163.3182, F.S. regarding the use of Transportation Development Authorities as a mechanism to implement a capital program to eliminate identified transportation deficiencies within a defined geographic area by use of an ad valorem

tax increment to construct improvements identified in an adopted transportation sufficiency plan. Orange County should determine the feasibility and relationship to County needs and interests of entering public-private partnerships, as now enabled by s.336.71, F.S., and of use of Transportation Development Authorities under s. 163.3182, F.S. This feasibility study should include the participation of the Roadway Agreement Committee, Legal staff and other appropriate County Divisions with expertise in public-private partnerships to determine if these strategies offer advantages to the County in specific areas of the County or to meet defined needs.

These needs may include the provision of transportation improvements and amenities designed to promote livable, multimodal transportation, as discussed in the Livability and Safety sections. Orange County's consideration of potential public-private partnerships using an Orange County staff working group should also encompass a cost analysis of multimodal/Complete Streets prototypes for capital and operations and maintenance costs, once baselines for these costs have been established via FDOT multimodal corridor projects and the analysis of capital planning and development included in Phase II.

As Orange County considers long-term network development and funding through public-private partnerships, Central Florida is offering new models for infrastructure development. Design-build, design-build-operate-maintain, and similar mechanisms are emerging with the planning and implementation of the LYMMO expansion and FDOT's Ultimate Interstate 4 project. These projects require specialized skills and expertise in risk management, bidding and contracting, and project management that achieves their potential efficiencies and recognizes the unique dynamics between project phases. Orange County should add this dimension to its research and determine if accessing or developing design-build training and procedures for Orange County staff modeled on these FDOT and LYNX prototype projects would help to continue Orange County's tradition of innovation and excellence in transportation network development and as stewards of public resources used for community benefit.

Summary and Recommended Economy Corridors

- Conduct further assessment and modeling evaluation of proposed Multimodal Focus Areas in Phase II and III as part of the County's next Evaluation and Appraisal Report to determine feasibility, including outreach to relevant advisory boards and a worksession with the BCC

- Ensure facilities and programs on Economy Corridors prioritize or do not hinder freight movement

- Compile an inventory of Orange County freight-related roadway projects for inclusion in

the MetroPlan Orlando Freight Goods and Services update and the Florida Freight Mobility and Trade Plan Investment Element

- Determine feasibility and relationship to County needs and interests of entering public-private partnerships as now enabled by s.336.71, F.S.,and of use of Transportation Development Authorities under s. 163.3182, F.S., with Legal staff and other appropriate County Divisions
- Conduct a cost analysis of multimodal/Complete Streets prototypes for capital and operations and maintenance costs for appropriate capital planning and development of public-private partnerships using an Orange County staff working group after Phase II

- Access or develop design-build training and procedures for Orange County staff using FDOT and LYNX prototypes, such as the LYMMO expansion

- Draft Economy Corridors in the following table were selected in Phase I based on the MetroPlan Orlando freight plan update's Primary Freight Corridors, with limited-access facilities removed. Draft corridors also include County roads listed as Plan's Other Freight Corridors by trucking companies/drivers, predominantly serving the Turnpike/OIA industrial cluster. Sand Lake Road also was added, due to cluster proximity and connectivity between 3 high-truck volume limited-access facilities. These corridors and potential other candidates identified in Phase II will be evaluated as part of Phase II network development.

Economy Corridor	From	To
US 441	Orange County Line	Sand Lake Road
John Young Parkway	US 441	Taft-Vineland Road
Sand Lake Road	Apopka-Vineland Road	Boggy Creek Road
Boggy Creek Road	SR 528	SR 417
Taft-Vineland Road	Orange Avenue	John Young Parkway
Landstreet Road	Boggy Creek Road	US 441
SR 436	Orange County Line	SR 528

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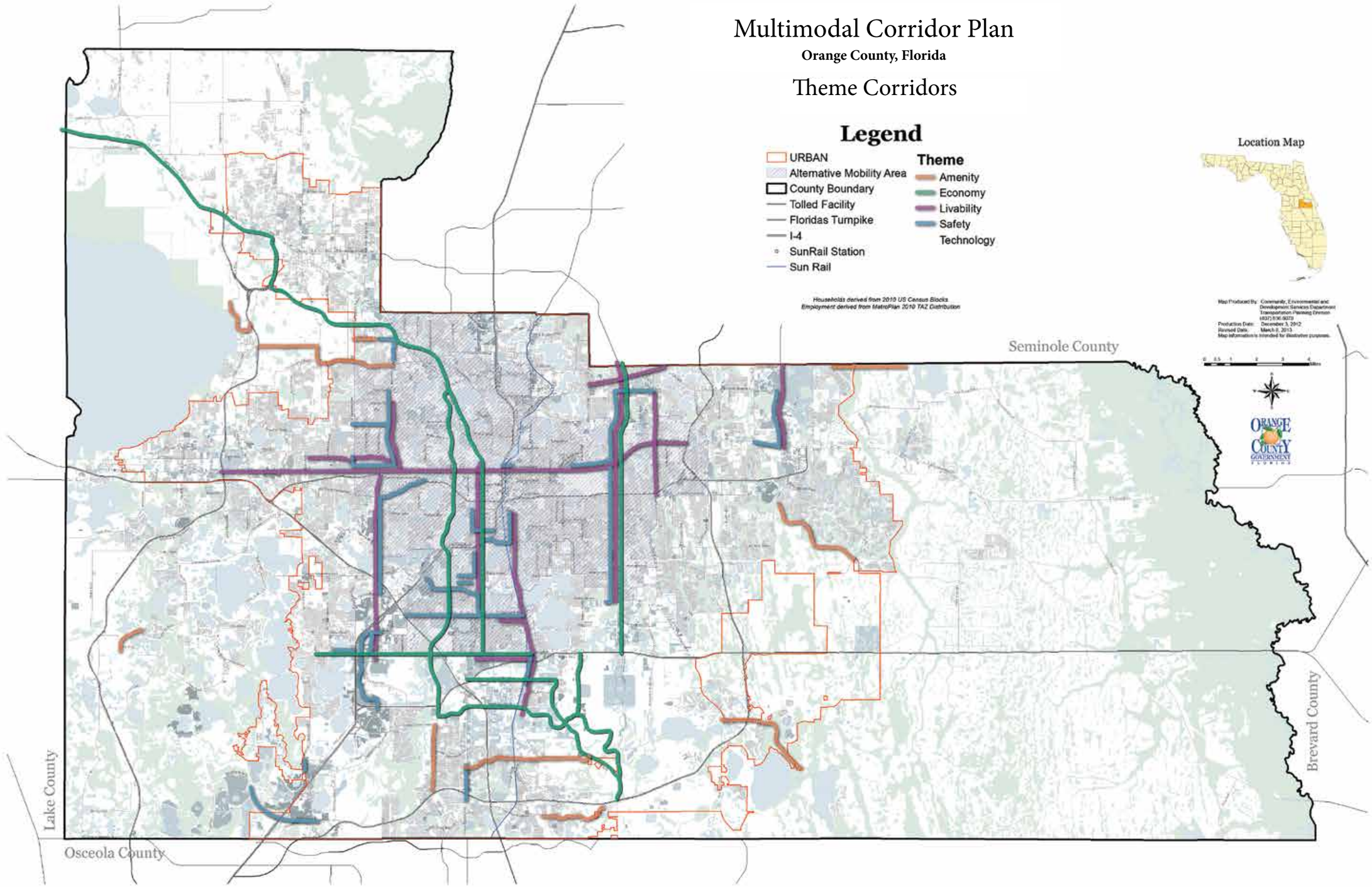
Multimodal Corridor Plan

Orange County, Florida

Theme Corridors



In Fiscal Year 2012-2013, Orange County:

- Installed 15 miles of new sidewalks as part of 56 sidewalk projects
- Resurfaced 170 lane miles of arterial, collector, and subdivision roads

In 2013, Orange County maintained

- 2,768 miles of roadway
- Over 3,400 acres of right-of-way
- Over 1,655 stormwater retention ponds
- 95 miles of drainage canals
- 79 drainage wells
- 52 control structures
- 17 pump stations
- 78 bridges
- 6 dams
- Over 75 miles of secondary drainage systems
- 567 traffic signals
- 103,030 traffic signs
- 290 school flashers
- 85 flashing beacons
- 62 CCTV cameras
- 180 miles of fiber optic cable to support traffic signals
- 45.3 miles of pavement markings
- 13 Dynamic Message Signs

Orange County Maintenance Schedule:

- Resurfacing done every 15 years
- Mowing rights-of-way and retention ponds every 4 to 6 weeks
- Street sweeping done every 5 to 6 weeks for 3,200 miles of roadway
- Tree trimming done as needed to avoid drainage or sight distance issues

Fiscal Year 2013-2014 Construction Projects:

- Clarcona Ocoee Road (SR 429 to Clarke Road)
- Lake Underhill Road (Goldenrod Road to Chickasaw Trail)
- John Young Parkway (Beachline Expressway to Florida's Turnpike)
- Rouse Road South (Lake Underhill Road to Colonial Drive)
- Econlockhatchee Trail (SR 408 to Colonial Drive)
- Valencia College Lane (Wakeview Road to Econlockhatchee Trail)
- International Drive (Westwood Boulevard North to Westwood Boulevard South)
- Reams Road (Taberfield Avenue to DelMar Avenue)
- Wetherbee Road (Balcombe Road to Orange Avenue)

Fiscal Year 2013-2014 Construction of Partnership Projects:

- Alafaya Trail (Mark Twain Boulevard to Avalon Park Boulevard)
- Wildwood Avenue bridge and roads (International Drive to Palm Parkway)
- Ficquette Road (Overstreet Road to Fossick Road)
- New Independence Parkway (SR 429 to Tiny Road)
- Destination Parkway (Tradeshow Boulevard to Lake Cay)

Orange County Transportation Network

Fiscal Year 2013-2014 Design Projects:

- International Drive Transit Lanes (Universal Boulevard to Destination Parkway)
- International Drive Pedestrian Bridge (Orange County Convention Center across International Drive)
- John Young Parkway/Sand Lake Road Interchange
- Lake Underhill Road (Econlockhatchee Trail to Rouse Road)

Fiscal Year 2013-2014 Right-of-Way Acquisition:

- Holden Avenue (John Young Parkway to Orange Blossom Trail)
- Taft-Vineland Road (Orange Avenue to Orange Blossom Trail)
- All American Boulevard (Clarcona-Ocoee Road to Kennedy Boulevard)

Orange County currently has $337 million in unfunded phases of needed roadway improvements, including:

- Boggy Creek Road (Osceola County Line to SR 417)
- CR 545 (Florida's Turnpike to SR 50)
- Dean Road (University Blvd to the Seminole County Line)
- Econlockhatchee Trail (Curry Ford Road to University Blvd)*
- Edgewater Drive (Clarcona- Ocoee Road to Pine Hills Road)
- Kennedy Boulevard (Forest City Road to Wymore Road)
- Lake Destiny Drive (Lee Road to Kennedy Blvd)
- Lake Underhill Road (Econlockhatchee Trail to Rouse Road)
- Little River Elementary Access Drive (Chickasaw Trail and Lake Underhill Road)
- Pine Hills Road Extension (Beggs Road to Orange Blossom Trail)
- Richard Crotty Parkway (SR 436 to Dean Road)
- Taft Vineland Road (Orange Blossom Trail to Orange Avenue)
- Texas Avenue (Oak Ridge Road to Holden Avenue)
- Valencia College Lane (Goldenrod Road to SR 417)
- Woodbury Road (Lake Underhill Road to SR 50)

*Excludes portion from Valencia College Lane to Colonial Drive currently under construction.

Source: Public Works Engineering Division Budget Workshop Presentation on July 15, 2013.

Other Fiscal Year 2013-2014 Projects:

- 23 intersection projects under design, right-of-way acquisition, or construction
- Two Roadway Conceptual Analysis projects, Sand Lake Road and County Road 545 (Avalon Road)

ORANGE COUNTY, FLORIDA
COMPREHENSIVE PLAN TRANSPORTATION ELEMENT

MAP 1

ORANGE COUNTY 2030 LONG RANGE TRANSPORTATION PLAN

ORANGE COUNTY GOVERNMENT FLORIDA

0 1.5 3
1 Inch = 3 Miles

LEGEND

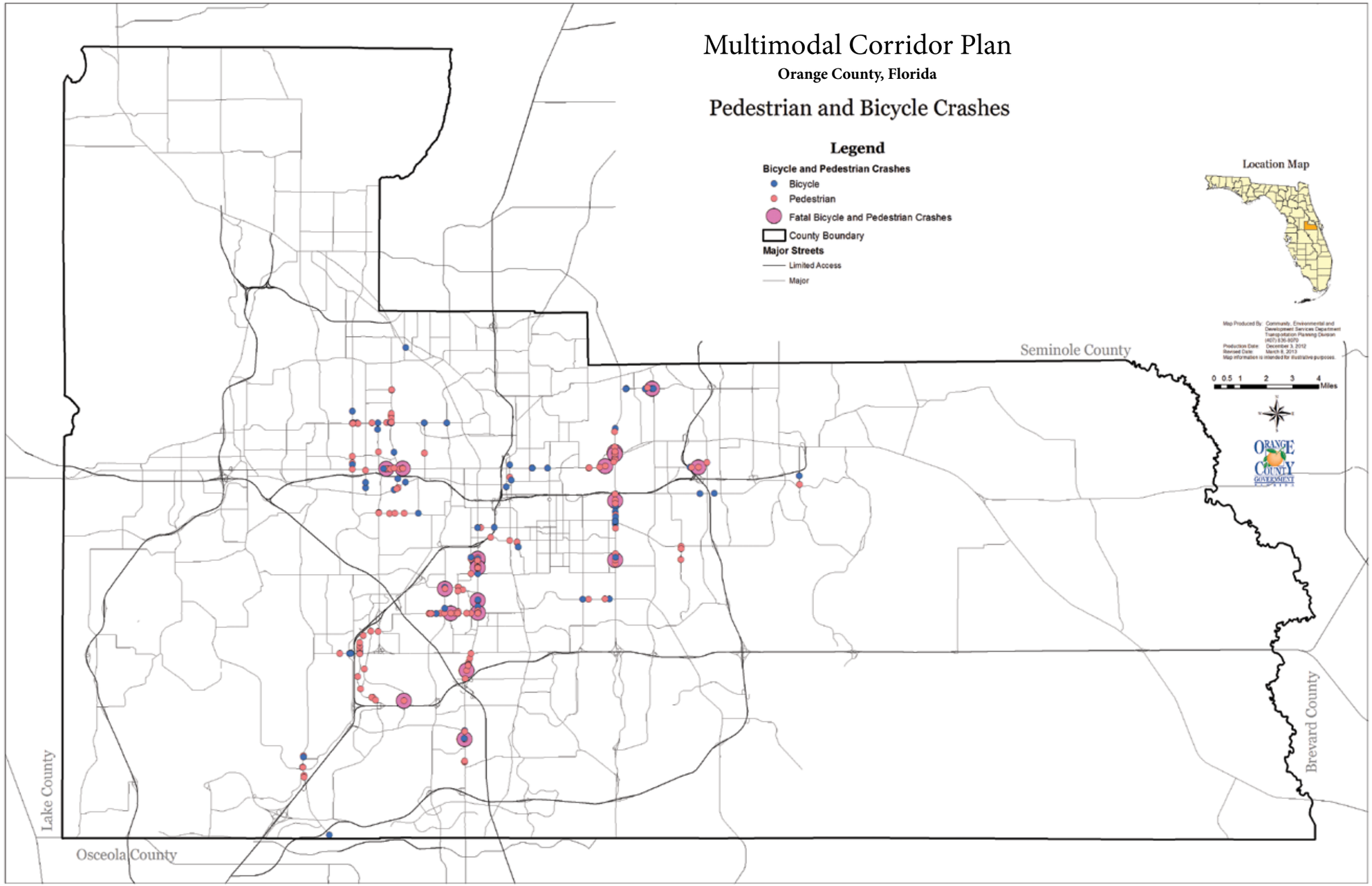
Comprehensive Plan Roads
- Programmed County Roadways
- Planned County Roadways
- Planned County Partnership
- State Roadway Project

- Canadian Court Intermodal Center
- MMTD Boundary
- TCEAs
- Urban Service Area
- County Boundary

Disclaimer:
Data is provided "as is" without any warranty or any representation of accuracy, timeliness, or completeness. The burden of determining accuracy, completeness, timeliness, merchantability and fitness for or the appropriateness for use rests solely on the requestor. The County makes no warranties, express or implied, as to the use of the Data. There are no implied warranties of merchantability or fitness for a particular purpose. The requester acknowledges and accepts the limits of the Data, including the fact that the Data is dynamic and is in a constant state of maintenance, correction, and update.
*Partnership roadways are depicted on the map conceptually and do not represent actual alignments.
Not to be resold -- Data, maps, or digital files may not be resold without prior consent of the Orange County Board of County Commissioners

Produced By Orange County Public Works Department, Transportation Planning Division
Source:Orange County Transportation Planning Division

Revision Date: 10/15/2012


Multimodal Corridor Plan
Orange County, Florida
Pedestrian and Bicycle Crashes
Legend
Bicycle and Pedestrian Crashes
Bicycle
Pedestrian
Fatal Bicycle and Pedestrian Crashes
County Boundary
Major Streets
Limited Access
Major
Location Map
Seminole County
Lake County
Osceola County
Brevard County
0 0.5 1 2 3 4 Miles
ORANGE COUNTY GOVERNMENT

SAFETY

SAFETY

Summary of Tools

Orange County has a number of tools at its disposal to “close the gaps” in its delivery of complete streets. The following pages outline brief descriptions of each of these tools, the context zones and thoroughfare types in which they are most appropriate, and some considerations for their use. They are organized by their location within the thoroughfare- either within the traveled way or the streetside - or, for signals and signage, as operational elements. Each of the example corridors in the following section includes a section summarizing the tools that may be considered for application.

Operational Elements includes signals and signage intended to produce a change in driver and/or pedestrian behavior,

Streetside: Includes facilities located between the back of the curb and the edge of the right of way, primarily in the furniture/ landscape zone and walking zone.

Traveled Way: Includes facilities that occur within general purpose lanes, special purpose lanes, turn lanes, medians, on street parking and bus lanes.

General Purpose Lanes

Travel Lane Narrowing

Description
Travel lane widths should be 10’ where target speeds are 35 mph or less, 11’ above 35 mph, or 12’ where truck or bus traffic is heavy.
Context Zones // Thoroughfare Types
GU, UC // BHS, AVN, STR
Considerations
Vehicle capacity reduced 3-7%, but speeds also reduced, improving pedestrian comfort on adjacent sidewalks.

Lateral Shift

Description
Deflection created by build-out or island with vertical element such as a street tree intended to reduce vehicle speeds.
Context Zones // Thoroughfare Types
GU, UC // STR
Considerations
Design should accommodate emergency vehicles and facility should be paired with warning signage to increase visibility to motorist.

Narrowing (pinch)

Description
Similar to lateral shift, intended to reduce vehicular speeds.
Context Zones // Thoroughfare Types
SN, GU, UC // STR
Considerations
Design should accommodate emergency vehicles and facility should be paired with warning signage to increase visibility to motorist.

Turn Lanes

Left Turn Lanes

Description
Intersection design should include shortest possible crossing distance and median islands to provide refuge for pedestrians not able to cross the intersection within their signal phase.
Context Zones // Thoroughfare Types
SN, GU, UC, DS // BHS, BLS, AVN, STR
Considerations
Minimization of conflicts between pedestrians and vehicles.

Right Turn Lanes

Description
Right turn lanes should only be used when absolutely necessary and geometric design should not create high speed right turns, utilize ”porkchop” islands to provide refuge on larger crossing distance intersections.
Context Zones // Thoroughfare Types
SN, GU, UC, DS // BHS, BLS, AVN, STR
Considerations
Minimization of conflicts between pedestrians and vehicles.

Special Transit Lanes

Mass Transit Lanes

Description
To provide improved transit headways and schedule reliability, special purpose lanes can be provided on high volume roadways.
Context Zones // Thoroughfare Types
SN, GU, UC // BHS, BLS, AVN
Considerations
Access to adjacent land uses must be maintained (e.g. Business Access and Transit Lane) or median lanes.

In-Road Bicycle Facilities

Marked Shared Roadways

Description
General purpose travel lane with shared lane markings used to encourage bicycle travel and proper positioning in the lane.
Context Zones // Thoroughfare Types
SN, GU, UC // BLS, AVN, STR
Considerations
Used where speed differential between bicyclist and motor traffic is very low, generally not appropriate where travel speed is > 35 mph.

Lateral Shift

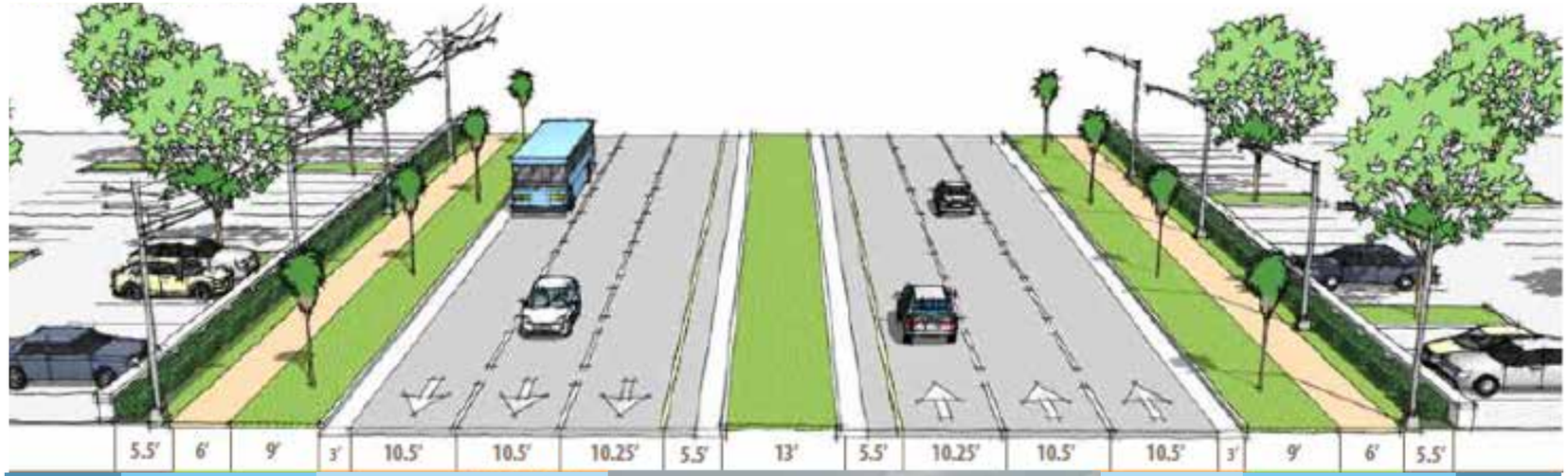
Description
Designated exclusive space for bicyclists through pavement markings and signage to increase bicyclist comfort and confidence on busier or higher speed streets.
Context Zones // Thoroughfare Types
SN, GU, UC // BLS, AVN, STR
Considerations
Best where speed differential between bicyclist and motorist traffic is very low, generally not appropriate where travel speed is > 35 mph.

Buffered Bike Lanes

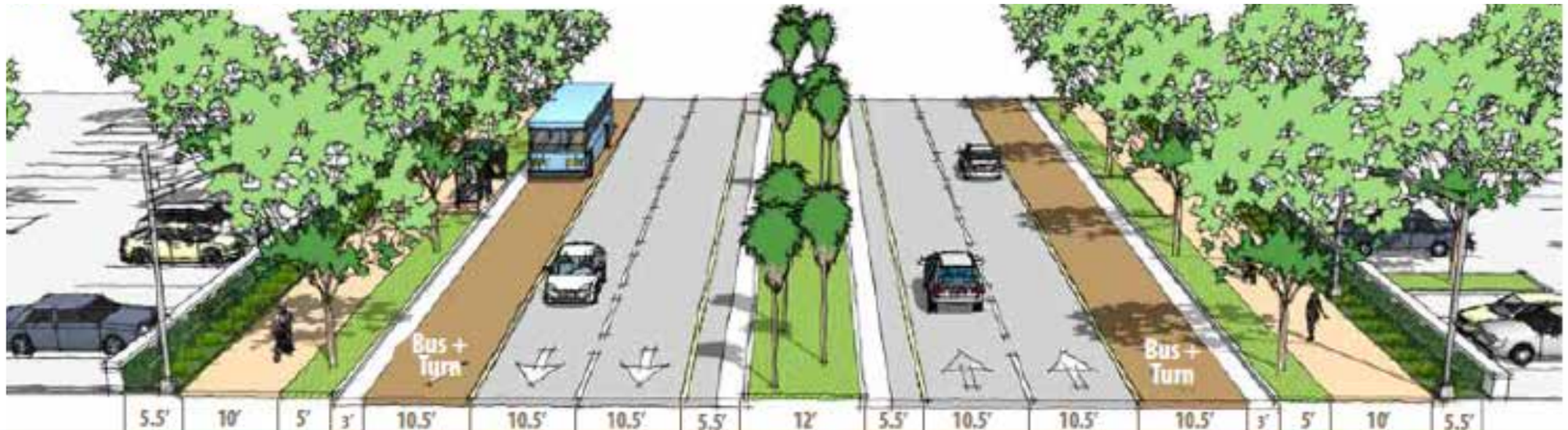
Description
Designated exclusive space for bicyclists plus additional separation provided through pavement markings and signage.
Context Zones // Thoroughfare Types
SN, GU, UC, DS // BHS, BLS, AVN
Considerations
Additional 2-3” buffering can be helpful in higher speed environments or adjacent to on-street parking.

Protected Bike Lanes

Description
On street bicycle facilities delineated from general purpose lanes through raised islands with landscape.
Context Zones // Thoroughfare Types
GU, UC, DS // BHS, BLS, STR
Considerations
Provide safer environment from high speed vehicles and/or in situations with higher volumes of bicyclists.



Traveled Way: 3 Travel Lanes plus Median with Left Turns (High Speed Boulevard)



Frontage Zone
Walking Zone
Shared Use Path for Bike & Pedestrian Use
Furniture/LS Zone
Curbside Zone

Traveled Way: Two general purpose lanes each direction, landscaped median to visually break down width of street, curbside bus lane (right turning vehicles only allowed)

Curbside Zone
Furniture/LS Zone
Shared Use Path for Bike & Pedestrian Use
Walking Zone
Frontage Zone

Complete Streets Cross Sections

Table 6-5

Orange County Roads - Characteristics for High Crash Locations

Crashes Involving Pedestrians or Bicycles

Crashes Involving Bikes or Pedestrians - County 2-Lane Roadways Only

Road Name	From	To	Length	Lanes	Median?	Sidewalk Condition	Nearby school?	Crosswalks ?	# of signals	Avg Spacing (ft)	Signals/ Mile	Posted Speed
Kaley Ave	Rio Grande Ave	Interstate 4	0.94	2	No	Good, no breaks	None	Yes	1	N/A	0.0	30
Texas Ave	Oak Ridge Rd	Americana Blvd	1.00	2	Portions	Good, no breaks	Elem.	Yes	2	5,280	1.0	35
Osceola Ave	Baxter St	Michigan St	0.65	2	Portions	Has breaks	None	No	2	3,432	1.5	30
Mercy Dr	W.D. Judge Dr	Silver Star Rd	1.26	2	Yes	Good, breaks NB/EB dir.	None	Yes	3	3,326	1.6	35
Rio Grande Ave	Holden Ave	33rd St	1.00	3	Yes	Good, breaks NB/EB dir.	None	No	3	2,640	2.0	35
Powers Dr	Old Winter Garden Rd	Colonial Dr	0.96	2	No	Good, no breaks	None	Yes	2	5,069	1.0	40
Woodbury Rd	Lake UnderHill Rd	Waterford Lakes Py	0.72	2	No	Good, no breaks	None	Yes	2	3,802	1.4	40
Hasting St	Balboa Dr	Silver Star Rd	1.27	2	No	Good, no breaks	None	Yes	2	6,706	0.8	30
Hiawassee Rd	Silver Star Rd	Nester Rd	0.93	2	Yes	Good, no breaks	None	No	3	2,455	2.2	45
Chickasaw Tl	Cascade Rd	Curry Ford Rd	0.82	2	Yes	Has breaks	Middle	Yes	2	4,330	1.2	40
Valencia College Ln	Econlockatchee Tl	SR 417	1.02	2	Portions	Has breaks	College	No	1	N/A	0.0	50
Lake Underhill Rd	Madeira Rd	Dean Rd	1.23	2	Yes	Good, breaks SB/WB dir.	None	No	4	2,165	2.4	35
Econlockhatchee Tl	Valencia College Ln	Colonial Dr	0.98	2	Portions	Has breaks	College	Yes	2	5,174	1.0	45
Pine Hills Rd	Old Winter Garden Rd	Colonial Dr	0.73	2	Yes	Good, no breaks	None	No	2	3,854	1.4	40
Texas Av	Oak Ridge Rd	Americana Blvd	1.00	2	Portions	Good, no breaks	Elementary	Yes	2	2,640	2.0	35
Mercy Dr	W.D. Judge Dr	Silver Star Rd	1.26	2	Yes	Good, but NB/EB breaks	None	Yes	3	2,218	2.4	35
Rio Grande Av	Holden Av	33rd St	1.00	2	Yes	Good, but NB/EB breaks	None	No	3	1,760	3.0	35
Valencia College Ln	Econlockatchee Tl	SR 417	1.02	2	Portions	Has breaks	College	No	1	5,386	1.0	50
Lake Underhill Rd	Madeira Rd	Dean Rd	1.23	2	Yes	Breaks SB/WB, none NB/EB	None	No	4	1,624	3.3	45
Econlockhatchee Tl	Valencia College Ln	Colonial Dr	0.98	2	Portions	Has breaks	College	Yes	2	2,587	2.0	45
Pine Hills Rd	Old Winter Garden Rd	Colonial Dr	0.73	2	Yes	Good, no breaks	None	No	2	1,927	2.7	40

Crashes Involving Bikes or Pedestrians - County 4 or more Lane Roadways Only

Road Name	From	To	Length	Lanes	Median?	Sidewalk Condition	Nearby school?	Crosswalks ?	# of signals	Avg Spacing (ft)	Signals/ Mile	Posted Speed
International Dr	Sand Lake Rd	Kirkman Rd	1.39	4	Yes	Has breaks	None	Yes	4	2,446	2.2	30
Oak Ridge Rd	John Young Py	Orange Blossom Tl	1.27	4	Yes	Good, no breaks	None	Yes	4	2,235	2.4	40
University Blvd	Semoran Blvd	Goldenrod Rd	0.51	6	Yes	Good, no breaks	None	Yes	5	673	7.8	45
Oak Ridge Rd	Harcourt Ave	John Young Py	0.96	4	Yes	Good, no breaks	Elem, Mid	Yes	3	2,534	2.1	45
Pine Hills Rd	Silver Star Rd	North Ln	1.27	6	Yes	Good, no breaks	High, Priv.	Yes	4	2,235	2.4	40
Pine Hills Rd	Balboa Dr	Silver Star Rd	1.38	4	Yes	Good, no breaks	None	Yes	3	3,643	1.4	40
Sand Lake Rd	Dr Phillips Blvd	Interstate 4	0.58	4	Yes	Good, no breaks	None	Yes	3	1,531	3.4	45
Old Winter Garden Rd	Kirkman Rd	Ivey Ln	1.59	4	Yes	Good, no breaks	None	Yes	3	4,198	1.3	45
International Dr	Pointe Plaza Ave	Sand Lake Rd	1.40	4	Yes	Good, no breaks	None	Yes	5	1,848	2.9	40
International Dr	North Westwood Blvd	Pointe Plaza Ave	1.17	4	Yes	None	None	Yes	5	1,544	3.4	45
Hiawassee Rd	Colonial Dr	Balboa Dr	0.50	4	Yes	Good, no breaks	None	Yes	3	1,320	4.0	45
Apopka-Vineland Rd	Winter Garden-Vineland Rd	Fenton Rd	1.43	4	Yes	Good, no breaks	None	Yes	4	2,517	2.1	45
Universal Blvd	Sand Lake Rd	International Dr	1.02	4	Yes	Has breaks	None	Yes	4	1,795	2.9	40
Michigan Ave	Interstate 4	Orange Ave	0.83	4	Yes	Good, no breaks	None	No	2	4,382	1.2	35
John Young Py	Oak Ridge Rd	Americana Blvd	1.00	6	Yes	Good, no breaks	None	No	2	5,280	1.0	45
Universal Blvd	Sand Lake Rd	International Dr	1.02	4	Yes	Has breaks	None	Yes	4	1,795	2.9	40
Michigan Av	Interstate 4	Orange Av	0.83	4	Yes	Good, no breaks	None	No	2	4,382	1.2	35

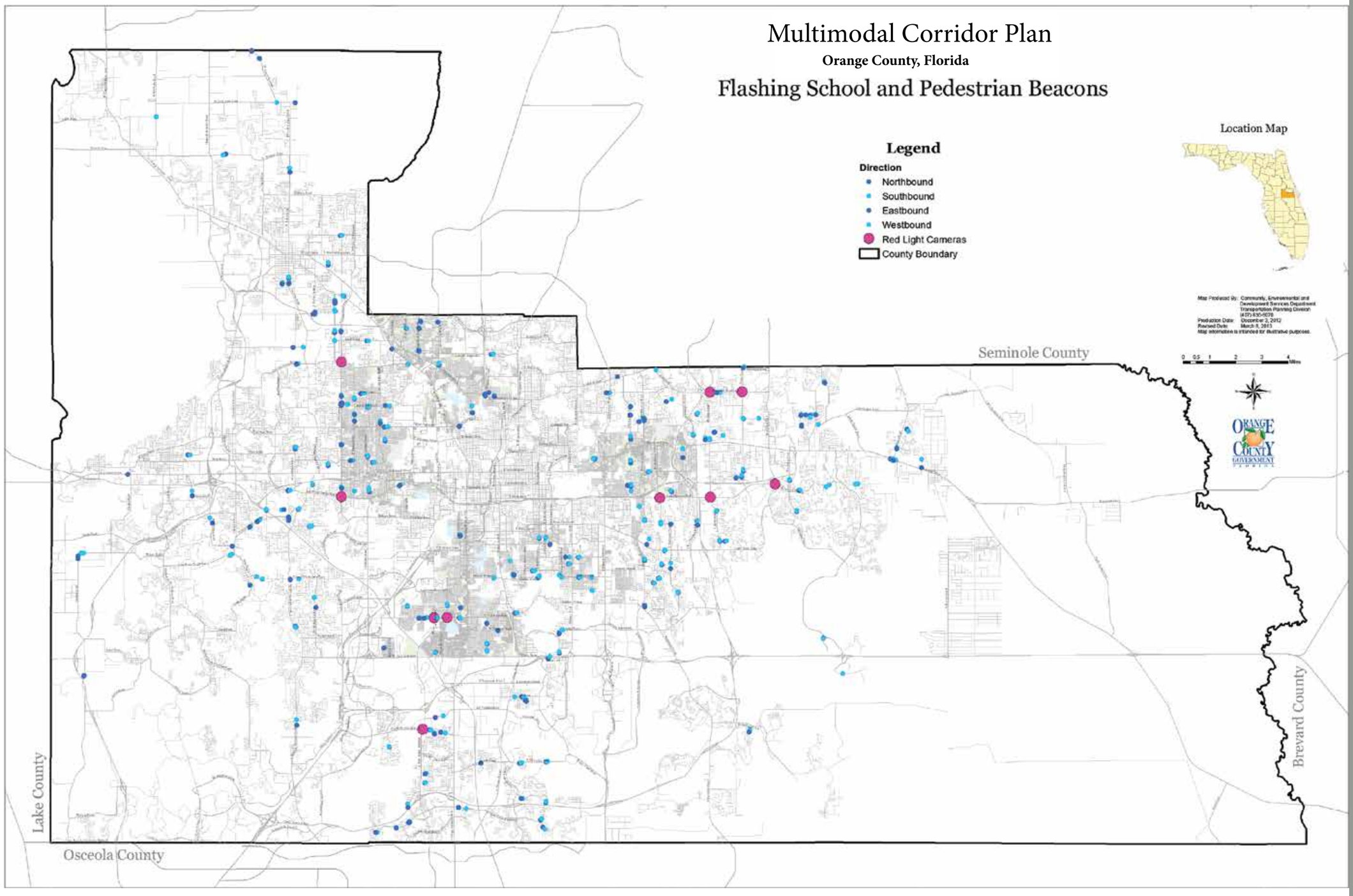
Notes: 1- County Roads: County Roads within Concurrency Management System Network
2- Nearby School: School adjacent or within approximately 1000 feet of roadway

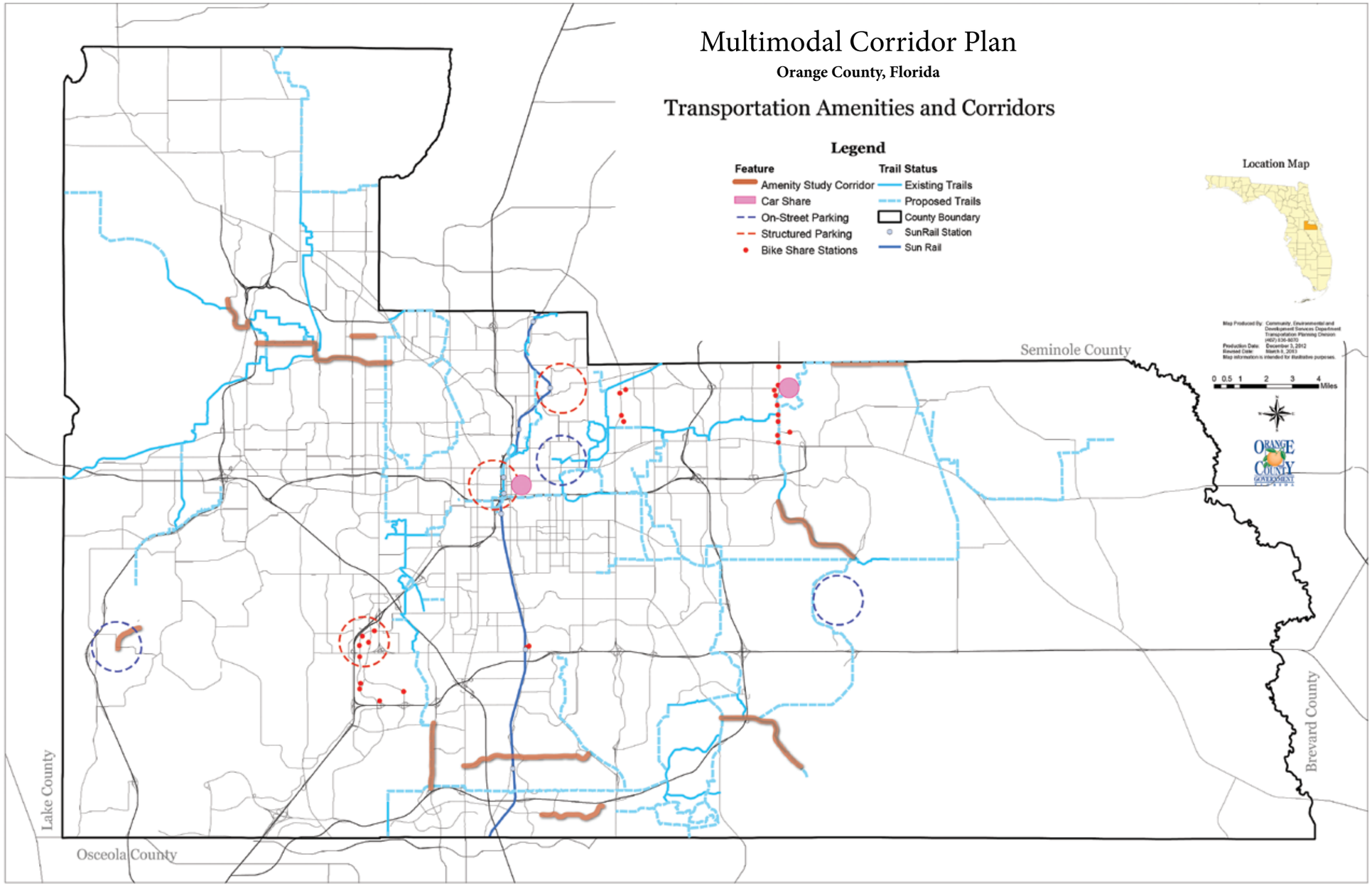
Source: L tec Aug 2013

Multimodal Corridor Plan

Orange County, Florida

Flashing School and Pedestrian Beacons

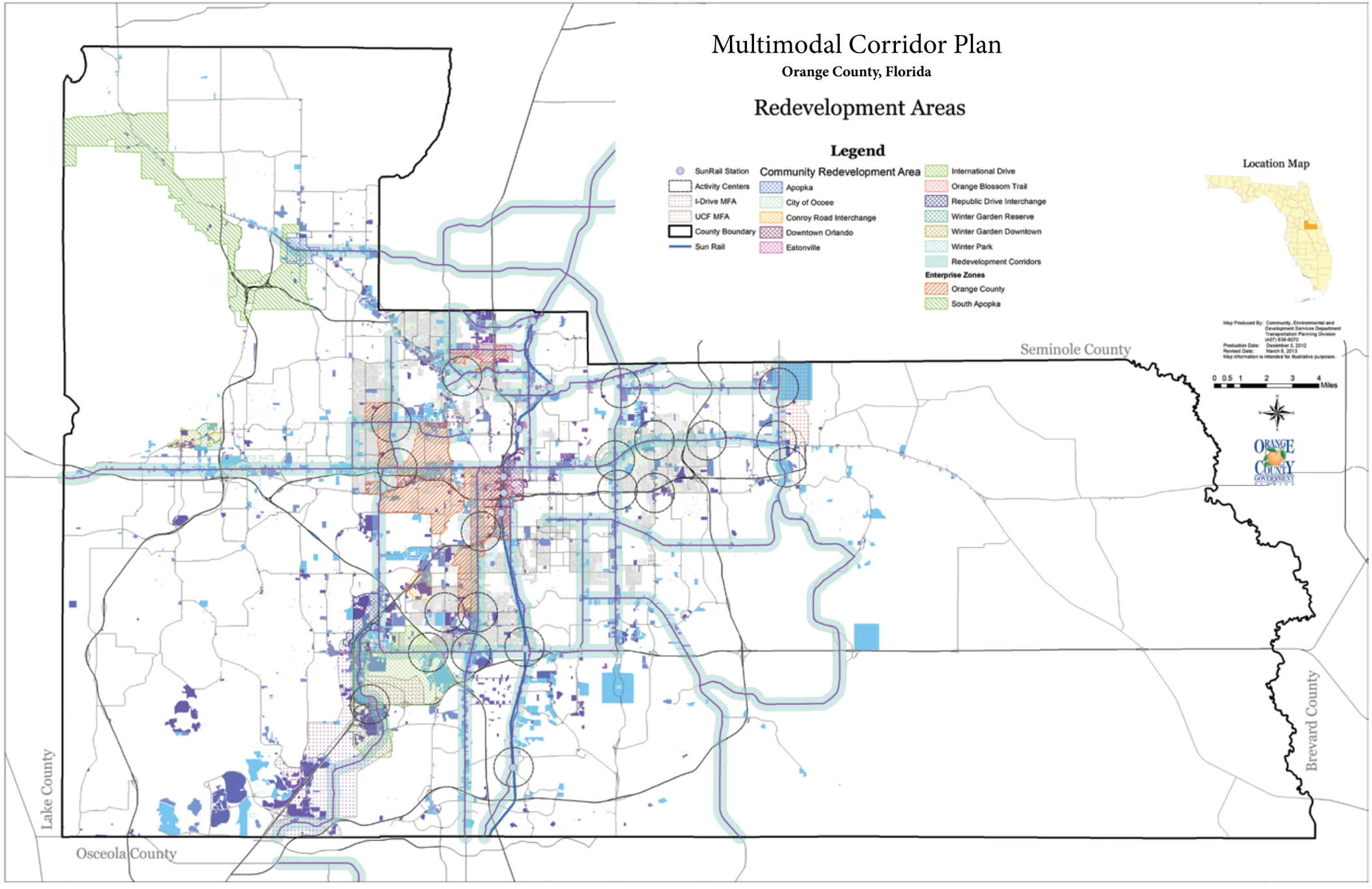



Multimodal Corridor Plan
Orange County, Florida
Transportation Amenities and Corridors
Legend
Feature
Amenity Study Corridor
Car Share
On-Street Parking
Structured Parking
Bike Share Stations
Trail Status
Existing Trails
Proposed Trails
County Boundary
SunRail Station
Sun Rail
Location Map
Seminole County
Lake County
Osceola County
Brevard County
Miles

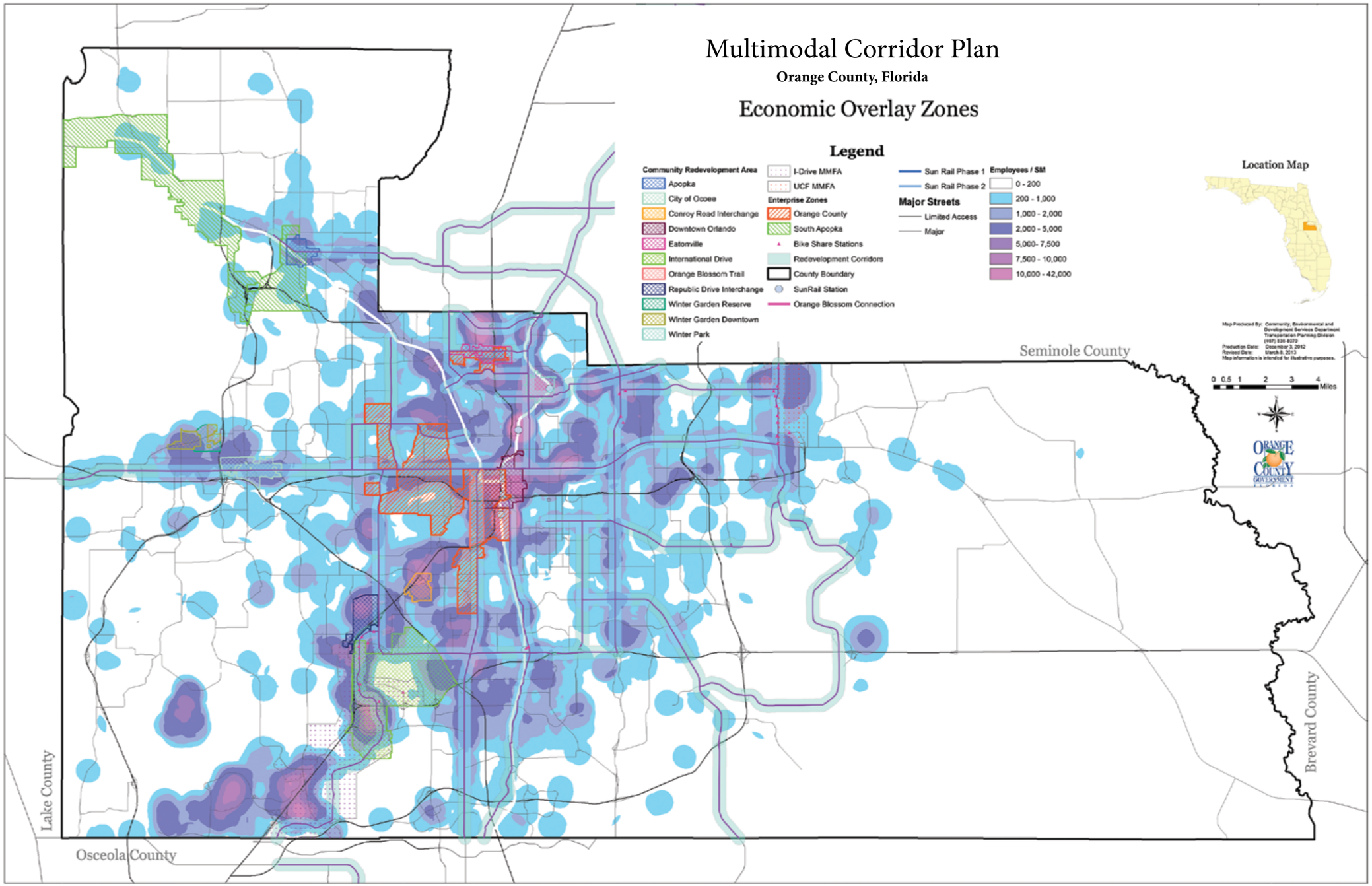
Multimodal Corridor Plan

Orange County, Florida

Redevelopment Areas



ECONOMY


Multimodal Corridor Plan
Orange County, Florida
Economic Overlay Zones
Legend
Community Redevelopment Area
Apopka
City of Ocoee
Conroy Road Interchange
Downtown Orlando
Eatonville
International Drive
Orange Blossom Trail
Republic Drive Interchange
Winter Garden Reserve
Winter Garden Downtown
Winter Park
I-Drive MMFA
UCF MMFA
Enterprise Zones
Orange County
South Apopka
Bike Share Stations
Redevelopment Corridors
County Boundary
SunRail Station
Orange Blossom Connection
Sun Rail Phase 1
Sun Rail Phase 2
Major Streets
Limited Access
Major
Employees / SM
0 - 200
200 - 1,000
1,000 - 2,000
2,000 - 5,000
5,000- 7,500
7,500 - 10,000
10,000 - 42,000
Location Map
Seminole County
Lake County
Osceola County
Brevard County
0 0.5 1 2 3 4 Miles

Multimodal Corridor Plan

Orange County, Florida

Multimodal Focus Area
International Drive Multimodal Focus Area
and
University of Central Multimodal Focus Area
Potential Boundaries