LYNX® VISION 2030

Technical Memorandum #5

Supporting and Ciculator Network
FINAL

October 2011

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2030 VISION

FINAL
Technical Memorandum #5:
Supporting and Circulator Networks

Prepared for

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1. Introduction

LYNX Vision 2030 is a comprehensive examination of 22 corridors in Orange, Osceola, and Seminole Counties. The purpose of the study is to determine primary premium modal improvements along these corridors as well as a supporting and circulator network to provide increased access to the premium modal network. Primary modal improvements are those that operate along the corridor. Supporting and circulator service may operate along corridors or in surrounding areas.

Potential modes considered for the primary network include local bus, enhanced express bus, bus rapid transit (BRT), light rail, and streetcar. Preliminary primary modal improvements were identified in a previous technical memorandum.

In this memorandum, the supporting and circulator transit networks are examined to determine how they should be developed to provide connectivity to the primary modes operating on the 22 corridors. The supporting network may operate along the corridor or serve areas beyond the corridor by providing transit service to and from the primary mode on the corridor. The supporting network consists of local and enhanced express bus service while the circulator network consists of community connectors and flex-route circulators.

This technical memorandum is the fifth in a series for this study. The first two technical memoranda and an addendum provided information on the current and future conditions of the 22 corridors. The third and fourth technical memoranda focused on the methodology employed and the resulting recommended primary modal improvements for the corridors.

This technical memorandum examines the supporting network. The supporting network was developed for the 2030 Transit Oriented Development (TOD) scenario as it is the adopted scenario under the 2030 Long Range Transportation Plan (LRTP). This memorandum is divided into two sections in addition to this introduction:

Section 2 provides an overview of the methodology used to develop the supporting network.

Section 3 provides the results of the application of the methodology to the corridors.

2. Methodology

The development of a transit system requires a balance of mobility and accessibility. Mobility is defined as the movement of individuals whereas accessibility is a measure of an individual's ability to reach and use the transportation system. In the case of *LYNX Vision 2030*, there are three parts of the transit system: premium network, supporting network, and circulator network.

The premium network focuses on mobility while the circulator networks focuses on accessibility. The supporting network balances providing both mobility and accessibility. In other words, the premium network focuses on moving individuals, the supporting network focuses equally on moving individuals as well as an increased network of stops by which people can access the transit system, and the circulator network focuses on providing ample opportunity for people to access the transit system.

Figure 1 provides an overview of the balance between mobility and accessibility in the three different parts of the transit system.

PREMIUM NETWORK

The premium network results were presented in *Technical Memoranda #3 and #4 Methodology and Results*. As the supporting and circulator networks were developed, a few changes were made to the premium network in order to create a more logical transit system. Table 2-1 provides a list of the premium modes assigned to each corridor. Map 2-1 provides an overview of the premium network modal assignments.

The highlighted modes indicate changes from the previously recommended modes. In three instances, the segmentation was adjusted to provide for more logical service termini. On Corridors 15 and 17, the corridors were divided into five segments instead of the original four segments. The added segment allowed for service termini in a different location. The total length of the corridors was not affected. Corridor 17 was extended slightly in order to locate the terminus at a more logical location. Corridor 16 was extended in order to terminate at the Florida Mall, which offered a more logical terminus than the original corridor. Map 2-2 provides each corridor divided into segments. This map offers a view of the updated segments.

Figure 1
LYNX Network Descriptions

I.	**Mobility/ Accessibility Scale** Reflects the relationship between mobility, accessibility, and the service levels/ categories.	Mobility ——— Accessibility		
II.	**Service Level/ Category** Hierarchy of bus services.	1 Premium Network	2 Supporting Network	3 Circulator Network
III.	**Objectives** Defined for each service level/ category.	• Enhances and supports local land use design and livability • Supports economic development opportunities • Supports longer intra-county movements • Supports longer regional movements between counties • Improves transit travel time throughout region • Minimizes transfers • Serves major activity centers • Connects to major stops and transit center hubs	• Provides access and connectivity to premium network • Connects to major stops and transit center hubs • Bridges service between premium and circulator networks	• Enhances connectivity within downtowns, activity centers, and neighborhoods • Connects to major stops and transit center hubs • Provides flexible service to lower volume enclaves • Provides accessibility for neighborhood level destinations • Supports local economic development objectives and operation of service where partnership opportunities exist
IV.	**Service Characteristics** General operational characteristics for each service level/ category.	• Most frequent service • Less frequent stops • Longest hours of service • Weekend service • Meets service demand for largest user market • Major corridors • More peak service frequency • Exclusive lanes/guideways	• Less frequency than premium network • More frequent stops than premium network • Hours of service parallel the premium network • Days of service parallel the premium network	• Similar frequency as supporting network • Flexible stops based on service area demand • Base level hours of service • Weekend service • Routing dependent on service area • Includes trolleys and other circulator services

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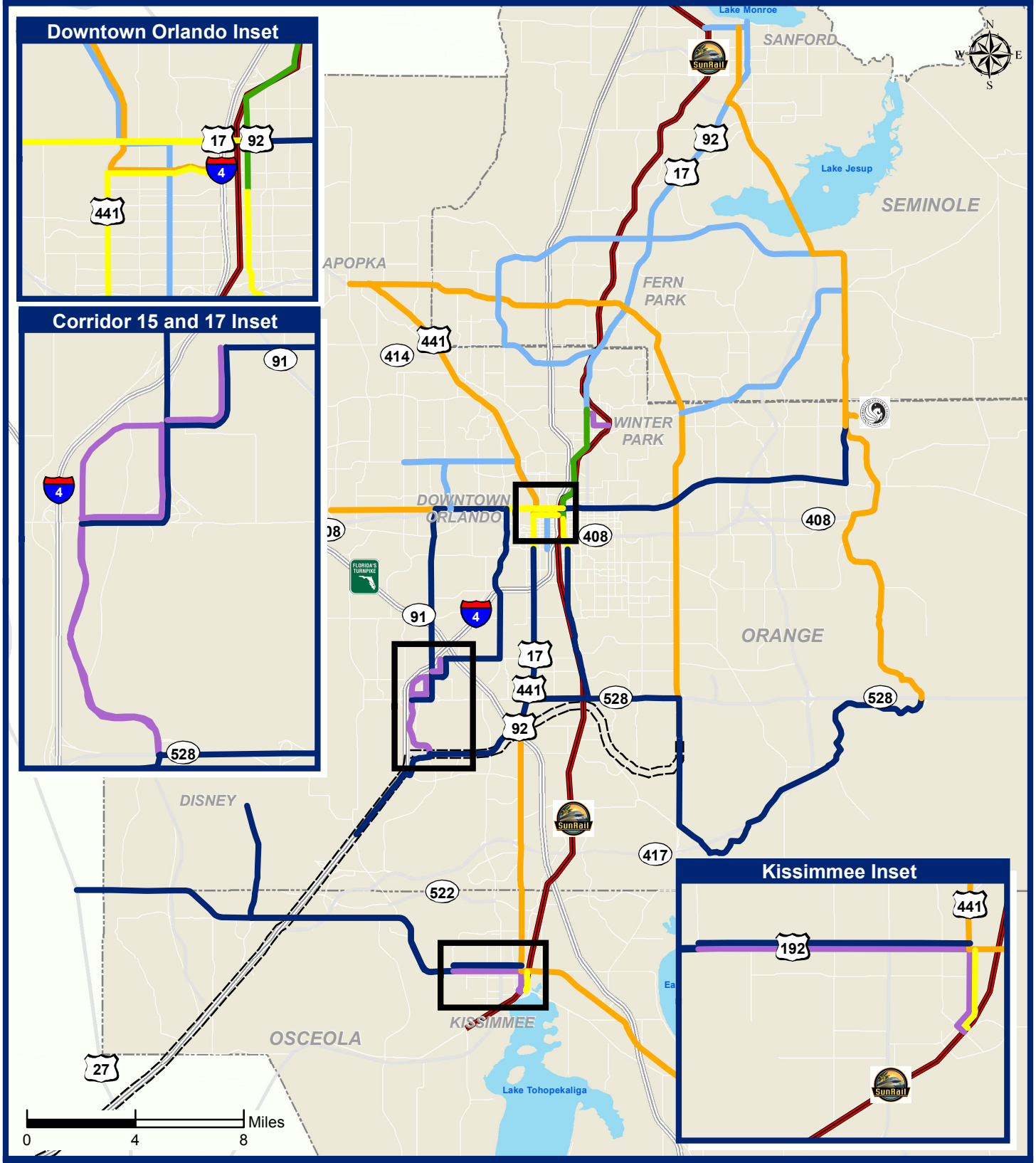

Map 2-1 Modal Assignments

Legend

- Exclusive Lane BRT
- Mixed Lane BRT
- SunRail
- Express Bus
- Streetcar
- Interstates
- Local Bus
- Light Rail
- Toll Roads

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Table 2-1
Premium Modal Improvements

Corridor	Segment	2030 TOD Mode
Winter Park SunRail Connector	1-1	Streetcar
US 192: Disney to Kissimmee	2-1	BRT
	2-2	BRT
	2-3	Streetcar
	2-4	Streetcar
US 192: Lake County to St. Cloud	3-1	BRT
	3-2	BRT
	3-3	Streetcar
	3-4	Express
Silver Star Rd to Parramore	4-1	Local Bus
	4-2	Local Bus
	4-3	Local Bus
	4-4	Local Bus
	4-5	Local Bus
Sanford SunRail Connector	5-1	Local Bus
Innovation Way: OIA to UCF	6-1	BRT
	6-2	Express
US 17-92: Fern Park to Downtown	7-1	Local Bus
	7-2	LRT
	7-3	LRT
US 17-92: Sanford to Fern Park	8-1	Local Bus
	8-2	Local Bus
SR 436: Apopka to Fern Park	9-1	Express
	9-2	Express
	9-3	Express
SR 436: Fern Park to OIA	10-1	Express
	10-2	Express
US 441: Apopka to Downtown	11-1	Express
	11-2	Express
	11-3	Express
US 441/17-92: Downtown to Florida Mall	12-1	BRT
	12-2	BRT
	12-3	BRT
US 441/17-92: Florida Mall to Kissimmee	13-1	Express
	13-2	Express
	13-3	Express

TABLE 2-1
Premium Modal Improvements (continued)

Corridor	Segment	2030 TOD Mode
SR 50: West Oaks Mall to UCF	14-1	Express
	14-2	BRT
	14-3	BRT
	14-4	BRT
	14-5	BRT
	14-6	BRT
John Young Parkway: Downtown to International Drive	15-1	BRT
	15-2	BRT
	15-3	BRT
	15-4	BRT
	15-5	Streetcar
Orange Ave: Downtown to Sand Lake Rd	16-1	BRT
	16-2	BRT
Kirkman Rd: Park Promenade to International Drive	17-1	Local Bus
	17-2	Local Bus
	17-3	BRT
	17-4	Streetcar
	17-5	Streetcar
SR 528: Disney to OIA	18-1	BRT
	18-2	BRT
	18-3	BRT
SR 434: Maitland Blvd to UCF	19-1	Local Bus
	19-2	Local Bus
	19-3	Local Bus
Aloma Ave: Winter Park to Oviedo	20-1	Local Bus
	20-2	Local Bus
Maitland Blvd: SR 434 to US 17-92	21-1	Local Bus
Seminole Way: Sanford to UCF	22-1	Express
	22-2	Express
	22-3	Express

Notes: Cells highlighted in yellow indicate changes in the final mode from the results in Technical *Memoranda #3 and #4 Methodology and Results*. Cells highlighted in peach indicate changes in the segmentation from *Memoranda #3 and #4 Methodology and Results*.

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3. Supporting Network and Circulators

SUPPORTING AND CIRCULATOR NETWORKS

The supporting network provides "all-stop" service along a corridor when there are longer distances between stops of the premium transit operating along the corridor. The circulator network connects the corridor's premium transit service with other activity centers and destinations that are removed from the corridor.

The remainder of this section provides an explanation of the methodology employed to develop the supporting and circulator networks. The supporting network consists of changes to the existing LYNX system of local and express buses as well as the addition of new services. The circulator network requires the addition of new services that will connect to the premium network.

It should be noted that the supporting and circulator networks were only developed for the 2030 transit oriented development scenario as that is the scenario that was adopted under the 2030 LRTP.

Supporting Network

The supporting network provides circulation from the corridor to other nearby destinations or added accessibility along the corridor in between premium stops. Many of the premium network modes have longer distances between stops in order to increase speed of travel. The supporting network allows passengers to use the premium network to go longer distances and the supporting network to go shorter distances to complete their journey based on their specific trip purpose.

The first step in the development of the supporting network was a review of current local and express bus service on each corridor to determine whether adjustments were needed. Only Links that run along the corridor for an extensive portion of the corridor were reviewed individually. The rest were reviewed as a network.

For each corridor, the frequency of each Link operating along the corridor was adjusted to a frequency of 30 minutes. This adjustment could represent a reduction or an increase in frequency for the Link. When two Links overlap on the same corridor, each may have a lower frequency that when combined effectively provides 30-minute service on the corridor. Table 3-1 provides an

overview of the recommended changes for each Link. Corridor 4, Silver Star Rd. to Parramore, does not have existing local bus service so it is recommended that new service be added. The last row in Table 1 encompasses all Links that were not specifically changed in the rest of the table.

Map 3-1 provides graphical representation of the proposed supporting network frequency adjustments, while also highlighting the frequencies of the overlay services along the Vision 2030 premium corridors.

Table 3-1
Supporting Network

Corridor	Corridor Name	Link	Weekdays				Saturday				Sunday			
			Existing		Adjusted		Existing		Adjusted		Existing		Adjusted	
			Peak Frequency (MIN)	Off-Peak Frequency (MIN)	Peak Frequency (MIN)	Off-Peak Frequency (MIN)	Peak Frequency (MIN)	Off-Peak Frequency (MIN)	Peak Frequency (MIN)	Off-Peak Frequency (MIN)	Peak Frequency (MIN)	Off-Peak Frequency (MIN)	Peak Frequency (MIN)	Off-Peak Frequency (MIN)
1	Winter Park SunRail Connector	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Disney to Kissimmee	55	30	30	60	60	30	30	60	60	30	30	60	60
		56	30	30	60	60	30	30	60	60	30	30	60	60
3	Lake County to St. Cloud	10	60	60	30	30	60	60	30	30	N/A	N/A	30	30
4	Silver Star Road to Parramore	New*	N/A	N/A	15	30	N/A	N/A	30	30	N/A	N/A	30	30
5	Sanford SunRail Connector	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	OIA to UCF (Innovation Way)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	Fern Park to Downtown	102	15	30	30	30	30	60	30	30	30	60	30	30
		102	15	30	15	30	30	60	30	30	30	60	30	30
8	Sanford to Fern Park	103	15	30	15	30	30	30	30	30	60	60	30	30
9	Apopka to Fern Park	41	30	30	30	30	30	30	30	30	60	60	30	30
10	Fern Park to OIA	41	30	30	30	30	30	30	30	30	60	60	30	30
11	Apopka to Downtown	17	30	30	30	30	30	30	30	30	60	60	30	30
12	Downtown to FL Mall	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	FL Mall to Kissimmee	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14	West Oaks Mall to UCF	30	30	60	30	30	60	60	30	30	60	60	30	30
15	Downtown to International Drive	38***	15	N/A	N/A	N/A	15	N/A	N/A	N/A	30	N/A	N/A	N/A
		8	15	30	30	30	30	30	30	30	30	30	30	30
16	Orange Ave	18	60	60	30	30	60	60	30	30	N/A	N/A	30	30
		7***	60	60	N/A	N/A	60	60	N/A	N/A	60	60	N/A	N/A
		11***	30	30	N/A	N/A	30	60	N/A	N/A	60	60	N/A	N/A
17	Park Promenade to International Drive	301**	N/A	N/A	15	30	N/A	N/A	30	30	N/A	N/A	30	30
18	Disney to OIA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	UCF to Maitland	434	60	60	30	30	60	60	30	30	N/A	N/A	30	30
20	Winter Park to Oviedo	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
21	Maitland Blvd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Seminole Way	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	All other existing Links	N/A	Existing	Existing	30	60	Existing	Existing	30	60	Existing	Existing	30	60

*There is no existing service on this corridor, but it recommended that local bus service be provided when the premium mode is implemented.

**Recommend changing service from peak period-only service to 14 hours of service per day.

***These routes are recommended for deletion when premium service is implemented.

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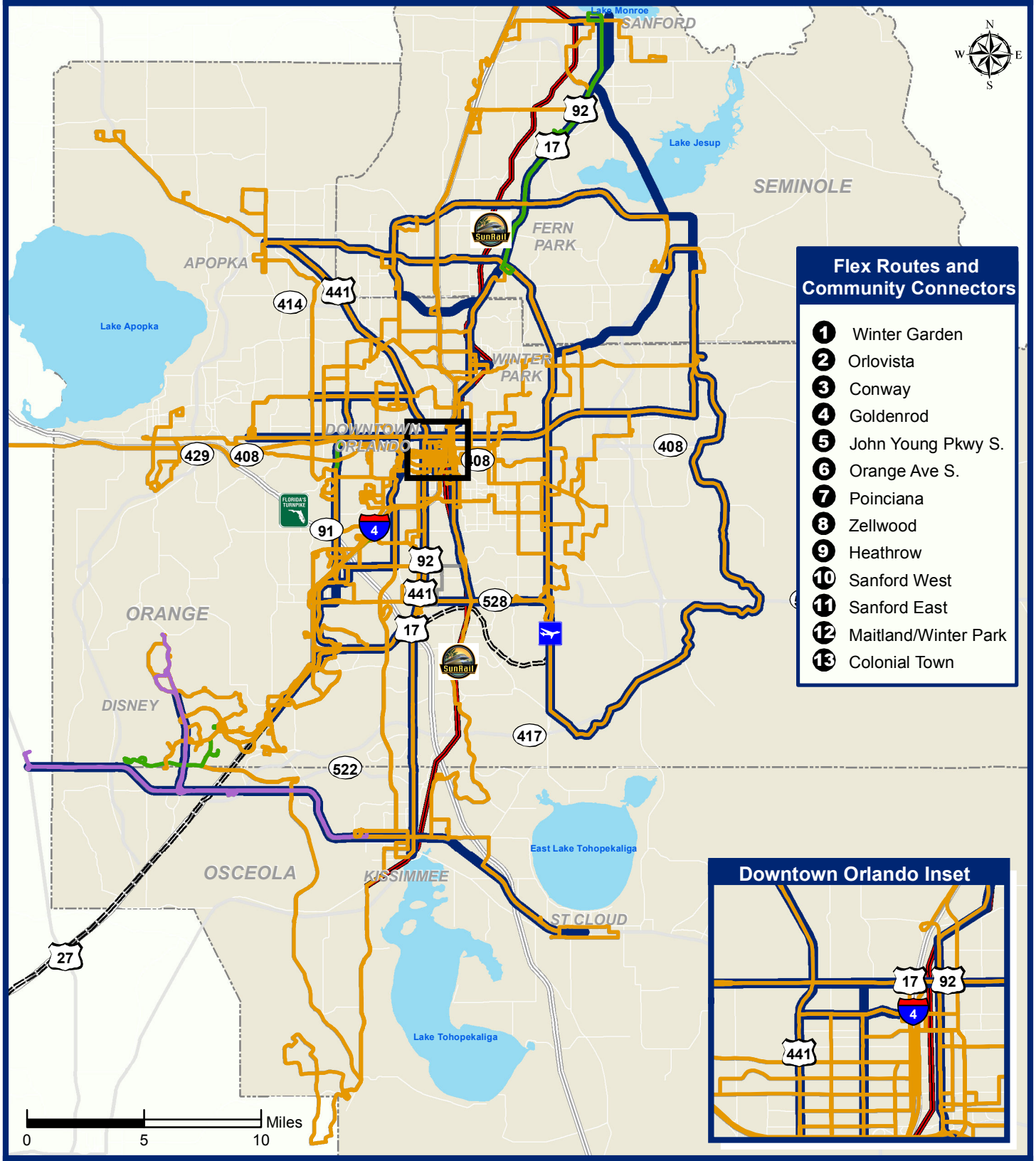

Flex Routes and Community Connectors

1. Winter Garden
2. Orlovista
3. Conway
4. Goldenrod
5. John Young Pkwy S.
6. Orange Ave S.
7. Poinciana
8. Zellwood
9. Heathrow
10. Sanford West
11. Sanford East
12. Maitland/Winter Park
13. Colonial Town

Downtown Orlando Inset

Map 3-1 Supporting Network

Legend

- 15 Minutes
- 30 Minutes
- 60 Minutes
- Existing Local Bus Network
- Premium Corridor
- SunRail
- Potential Future High Speed Rail Corridor
- Interstates

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Circulator Network

In addition to adding service along the premium corridors to span the gaps between stations or stops, new supporting services are needed and recommended in some areas to better connect passengers to the corridors. Two types of new service were identified:

- Community Connector: A community connector circulates on a specific route and makes frequent stops at pre-determined bus stops. It is used to connect activity centers to a corridor.

- Flex-Route Circulator: The flex-route circulator operates in a specified area and along a pre-determined route, although upon request the service can deviate from the route as long as it is still within the service area. This type of service works well in areas where origins and destinations are dispersed and there are lower levels of ridership.

To develop the circulator network, existing activity centers and bus stop activity were examined. Using aggregated daily boardings and alightings at each bus stop, those with higher and lower current passenger activity were identified. Using the activity centers and high-use bus stops to identify areas that need to be connected to the corridors, a circulator network was developed.

Map 3-2 is a map of the proposed connectors and circulators as well as bus stops by level of utilization and activity centers.

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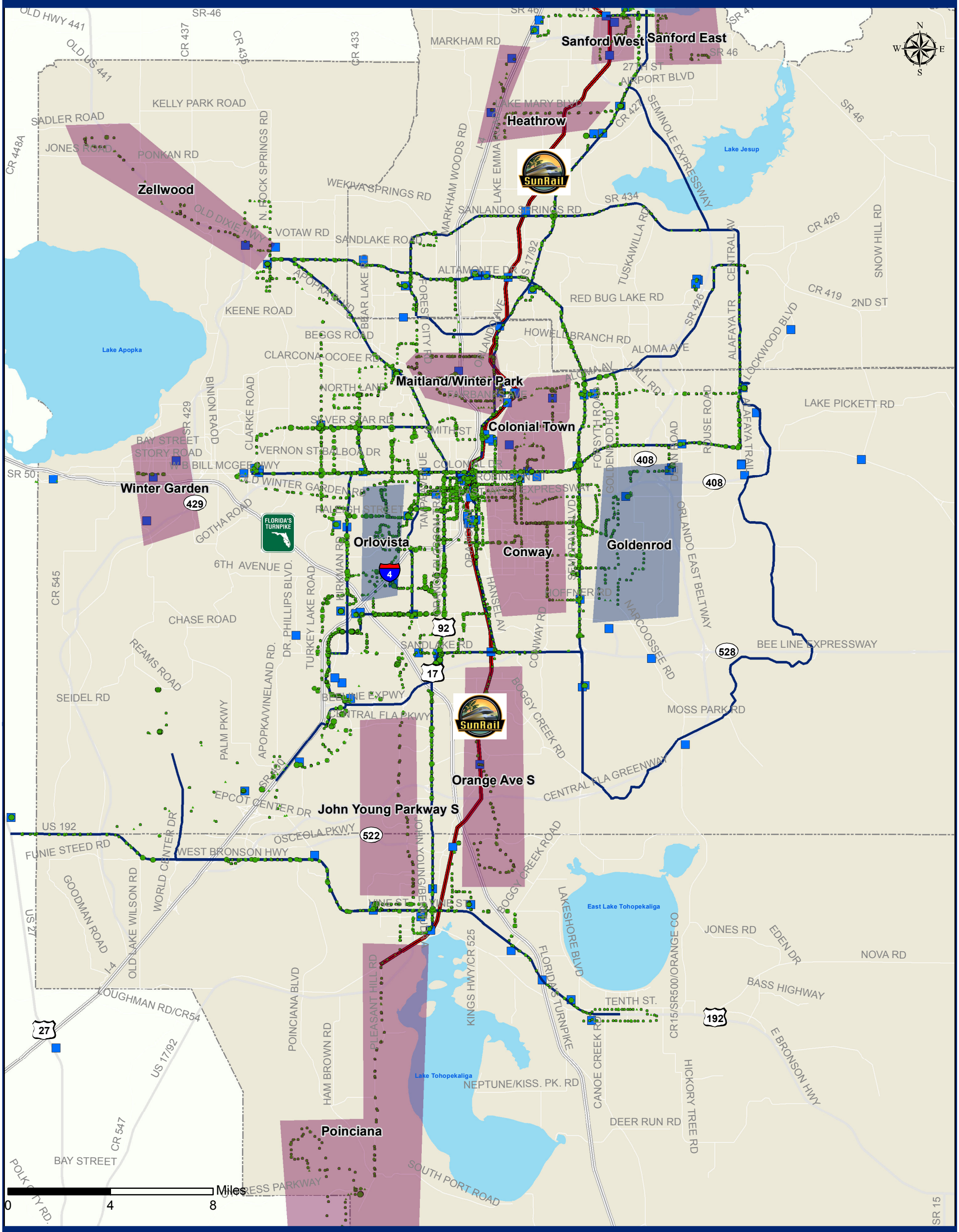

Map 3-2 Circulator Network

Legend

Stop Ridership

- Very High
- High
- Medium
- Low
- Very Low
- Zero

- Community Connector
- Flex Route Circulators
- Activity Centers
- Lynx Premium Corridor
- SunRail

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