2050 Metropolitan Transportation Plan

Technical Report: Congestion Management Process

December 2024

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1. Introduction

Attractions, natural beauty, and a pleasant climate continue to draw people to the Central Florida region. The population in MetroPlan Orlando's planning area grew by 26% from 2012 through 2022. For comparison, the US population grew 6.2% and Florida's population grew 15.2% during that period. As the population grows, so does the demand on existing infrastructure. Orange, Osceola, and Seminole Counties are expected to see continued population growth. The three-county population is projected to grow more than 30% by 2050.

Based on the region's current transportation and land use, a larger population will mean more vehicles on the road and more vehicle miles traveled – resulting in heavy congestion as infrastructure gets outpaced by travel demand. This can increase delays for drivers and intensify public health and environmental impacts, making congestion management more important than ever.

1.1 PURPOSE

MetroPlan Orlando is the metropolitan planning organization (MPO) for Central Florida. It plans for a multijurisdictional, integrated multimodal transportation system managed by the Florida Department of Transportation (FDOT) and local jurisdictions. It is the MPO's responsibility to plan for a multimodal approach that can move people and goods efficiently and safely through the area. To accomplish this, the MPO collaborates with Osceola County, Orange County, Seminole County, local jurisdictions and transportation agencies, and FDOT.

The Federal Highway Administration (FHWA) requires MPOs with populations greater than 200,000 to use a congestion management process (CMP) (see Chapter 23 of the Code of Federal Regulations 23 CFR 450.322 for more information). With a three-county population of more than 2.4 million, MetroPlan Orlando is required to produce a CMP to help provide a safe and reliable transportation system for residents and visitors alike. This report documents a CMP established by the MPO for Seminole, Orange, and Osceola Counties.

1.2 APPROACH

This CMP takes a data-driven, performance-based planning approach to managing recurring and nonrecurring traffic congestion. Analyzing data to identify potential congestion issues, the CMP proposes strategies that address safety and congestion hot spots. These remedies are often operational fixes that focus on transportation system management and operations (TSM&O) strategies.

The plan uses safety and mobility metrics to assess congestion severity and track progress toward the MPO's congestion management goals. Ultimately, the CMP aims to reduce congestion, improve safety, and keep people and goods moving efficiently throughout the three-county region.

THE TEAM BEHIND THIS CMP FOLLOWED THE EIGHT STEPS OF FHWA'S PROCESS MODEL (SEE FIGURE 1):

1. Define goals and objectives. The CMP's goals align with the goals of MetroPlan Orlando and its 2050 Metropolitan Transportation Plan (MTP) to support the MTP goal areas of safety and security; infrastructure and resiliency; mobility and reliability; economy and tourism; environment and conservation; and equity and livability. Each goal includes coordinating objectives that provide clarity, direction, and ways to track progress.

2. Define the CMP network. The process identifies the area covered by the CMP and the specific facilities that were analyzed.

3. Develop multimodal performance measures. The process uses mobility and safety performance metrics to help the MPO quantify progress toward its goals.

4. Collect data. The process uses multiple data sources, including crash data, roadway characteristics data, traffic volume counts, speed and travel time data, intelligent transportation system (ITS) inventories, multimodal facility data, travel surveys, and demographics.

5. Analyze congestion problems and needs. To identify area needs, the process analyzes local roadway safety and congestion based on a series of performance measures.

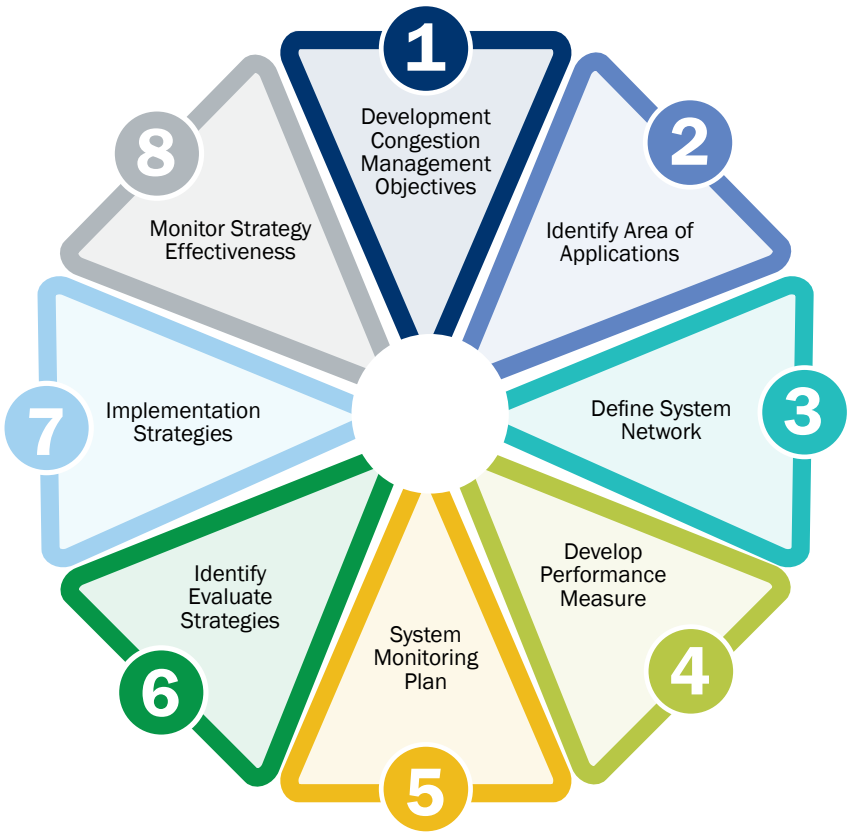
6. Identify and assess strategies. The process proposes management strategies based on analyses conducted in the fifth step, congestion causes, and crash factors.

7. Program strategies. The CMP's systematic approach will help integrate safety and congestion mitigation strategies into the MPO's MTP, with some strategies moving through the implementation pipeline into the Transportation Improvement Program (TIP).

8. Evaluate effectiveness. The CMP includes a monitoring plan to help MetroPlan Orlando track the region's progress towards performance targets, and assess which strategies are most effective in helping the region pursue congestion management goals.

For more on FHWA's CMP process model, visit FHWA's website. https://ops.fhwa.dot.gov/plan4ops/focus_areas/cmp.htm.

Figure 1–1: FHWA's Eight Step Congestion Management Process



1.3 UNDERSTANDING CONGESTION

Understanding what causes congestion is essential to managing and preventing it. There are two types of congestion: recurring congestion and nonrecurring congestion (see Figure 1-2).

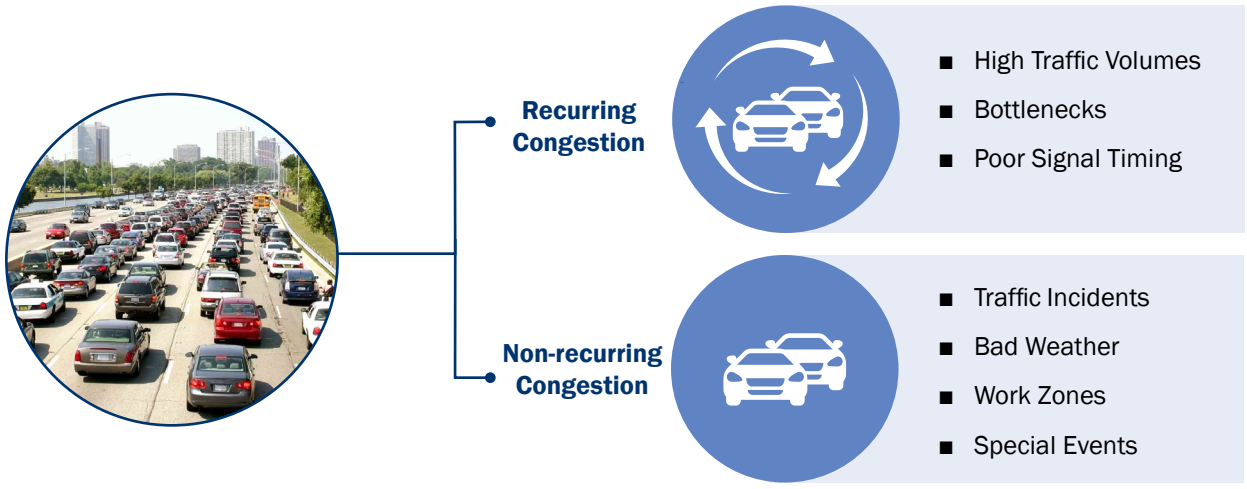
Recurring congestion. Travelers often expect some congestion at certain locations during predictable times of day. This expected traffic, sometimes referred to as rush hour, is recurring congestion, which primarily occurs when roadways reach their capacity at a predictable time of day.

For example, from 5:00 to 6:00 p.m. most travelers anticipate congestion on roadways in and around downtown Orlando. Historically, this has served as the peak hour but the recent spread in volume distribution has created a peak period that goes from 4:30 to 6:30 p.m. Vehicle volumes surge during this time as commuters leave the workplace. Rush hour is a state of recurring congestion, which primarily occurs when roadways reach their capacity at a predictable time of day.

Nonrecurring congestion. There are also irregular constraints on roadway capacity or sporadic travel demand increases that cause congestion. Some capacity constraints can be forecasted, such as construction work zones. Other constraints are less predictable, such as car crashes and inclement weather when the loss of a travel lane or reduced travel speeds create congestion. Nonrecurring congestion can also be caused by special events that generate travel demand that exceeds typical roadway volumes such as sporting events or holiday weekends. In Orange, Seminole, and Osceola Counties, congestion has various causes, including:

- **High traffic volumes.** Congestion is often measured by the ratio of traffic volume to roadway capacity. High traffic volumes raise this ratio, creating more congestion.
- **Bottlenecks.** This occurs where a roadway narrows, such as spots where lanes narrow or reduce in number. Bridges that serve beaches are common bottleneck sites.
- **Traffic incidents.** When an incident closes a lane, it also slows traffic flow in the remaining lanes. Drivers traveling past a crash will often slow down to be cautious or to view the scene.
- **Inclement weather.** Thunderstorms, heavy rain, or any severe weather can reduce drivers' visibility and travel speeds, slowing the flow of traffic.
- **Work zones.** Like traffic incidents, work zones restrict or redirect traffic flow, which can slow traffic overall.
- **Inefficient traffic signal timing.** Signal timing that does not accommodate overtaxed approaches or does not coordinate with nearby signals can slow traffic flow.
- **Special events.** Irregular events such as sporting events or concerts can cause congestion by changing traffic patterns. Traffic is also severely impacted by the tourist season, which is considered a long-term special event.

Figure 1–2: Sources of Congestion



2. Goals and Objectives

The 2024 CMP goals are the same as those in MetroPlan Orlando's 2050 MTP. The CMP includes objectives and performance indicators that measure progress towards the goals in Figure 2-1.

Figure 2–1: CMP Goals

Safety

Provide a safe and secure transportation system for all users

A safe and secure transportation system is the most fundamental commitment we can make to Central Florida's residents, businesses, and visitors. MetroPlan Orlando and its partners for many years have committed to a vision of zero fatalities and serious injuries. This goal expands our view of safety to include better preparing for and responding to emergency events, as well as reducing the potential for harm from environmental, security, and other risks to transportation users and the regional system.

Reliability

Provide a reliable transportation system across all modes for people and freight

The region's transportation system should provide reliable service to all users. This means that roads, bridges, rail corridors, passenger and freight terminals, transit vehicles, pedestrian and bicycle facilities are in good condition. It also means that customers can expect reliable travel times between destinations and efficient connections between modes. Finally, it means that the system adapts to accommodate changing customer expectations and technologies.

Connectivity

Enhance lives through improved access to opportunities for people of all ages and abilities

The Central Florida region depends on a robust transportation system that connects people to jobs, health care, education, and other essential services. Individual modes and facilities should be well connected to link the region's diverse communities and support end-to-end trips for residents and visitors. More robust public transportation systems and active transportation networks will provide residents and businesses with meaningful travel choices and reduce reliance on driving as the primary mode for travel. MetroPlan Orlando and its partners will continue to make Central Florida's transportation system more accessible, inclusive, and responsive to the needs of the diverse communities it serves.

Community

Enhance the health and vitality of our region's communities and environments

A mix of communities and unique natural environments make Central Florida a special place to live, work, and visit. MetroPlan Orlando and its partners are committed to advancing transportation solutions that contribute to healthier and more thriving communities and protect and enhance our natural environment. This means working closely with local governments to support local visions and plans while contributing to more efficient use of land and protection of unique historical, cultural, and environmental resources.

Prosperity

Strengthen our region's economy

Transportation is a critical foundation for Central Florida's continued economic development and prosperity. MetroPlan Orlando and its partners will continue to work to enhance access to jobs for all residents, support growth in trade and visitor activity, and strengthen the region's competitiveness as a place to live, work, and do business.

The CMP goals and objectives are summarized in Table 2-1 and provide a mechanism for ensuring investment decisions are made with a clear focus on desired outcomes.

Table 2–1: MetroPlan Orlando 2050 CMP: Goals and Objectives

Goals	Objectives
SAFETY	Eliminate deaths and serious injuries on the transportation system, with an emphasis on the most vulnerable users
	Provide infrastructure and services to help mitigate, prepare for, respond to, and recover from emergencies
	Increase the resilience of transportation infrastructure to environmental, security, and other risks
CONNECTIVITY	Increase the frequency, service, and accessibility of public transportation and shared mobility services
	Improve the connectivity and accessibility of multimodal transportation infrastructure
	Enhance the connectivity of the region by reducing trip distance per capita
RELIABILITY	Enhance the multimodal transportation system to maintain a state of good repair
	Improve travel time reliability for all modes
	Accommodate changing customer needs and preferences, including changing technologies
COMMUNITY	Provide transportation solutions that contribute to improved public health, including reducing adverse health impacts associated with physical inactivity
	Reduce air quality pollutants and emissions per capita from transportation sources
	Provide transportation solutions that enhance the natural and built environments
PROSPERITY	Promote transportation investments and strategies that enhance economic prosperity
	Improve access to jobs, with emphasis on essential service workers
	Increase Central Florida's affordability as a place to live, work, and visit

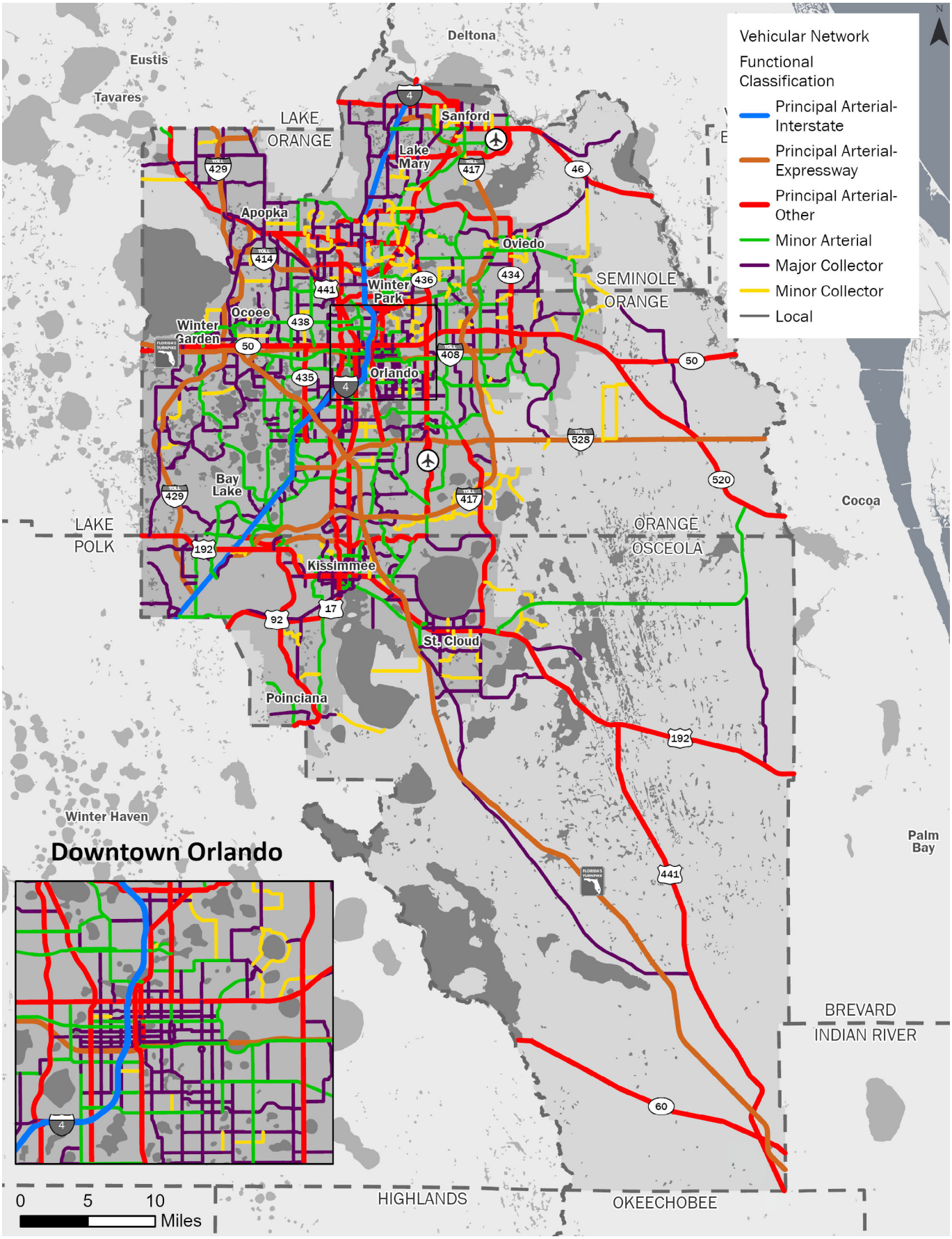
3. CMP Study Area

The traditional planning process aims to mitigate future congestion and provide strategies to address mobility needs. Infrastructure projects are programmed in phases and typically take five to ten years from planning to implementation.

MetroPlan Orlando's 2024 CMP provides a systematic approach for managing existing congestion in the MPO's planning area, which includes all of Orange, Osceola, and Seminole Counties as illustrated in Figure 3-1. The CMP's area of application, the area within which the recommended congestion management strategies will be applied, is the three-county region. The CMP addresses present-day congested locations that threaten the mobility of the regional transportation network. Recurring and non-recurring congestion was analyzed for all publicly-owned roadways to consider how those roadways may impact auto, transit, and freight travel.

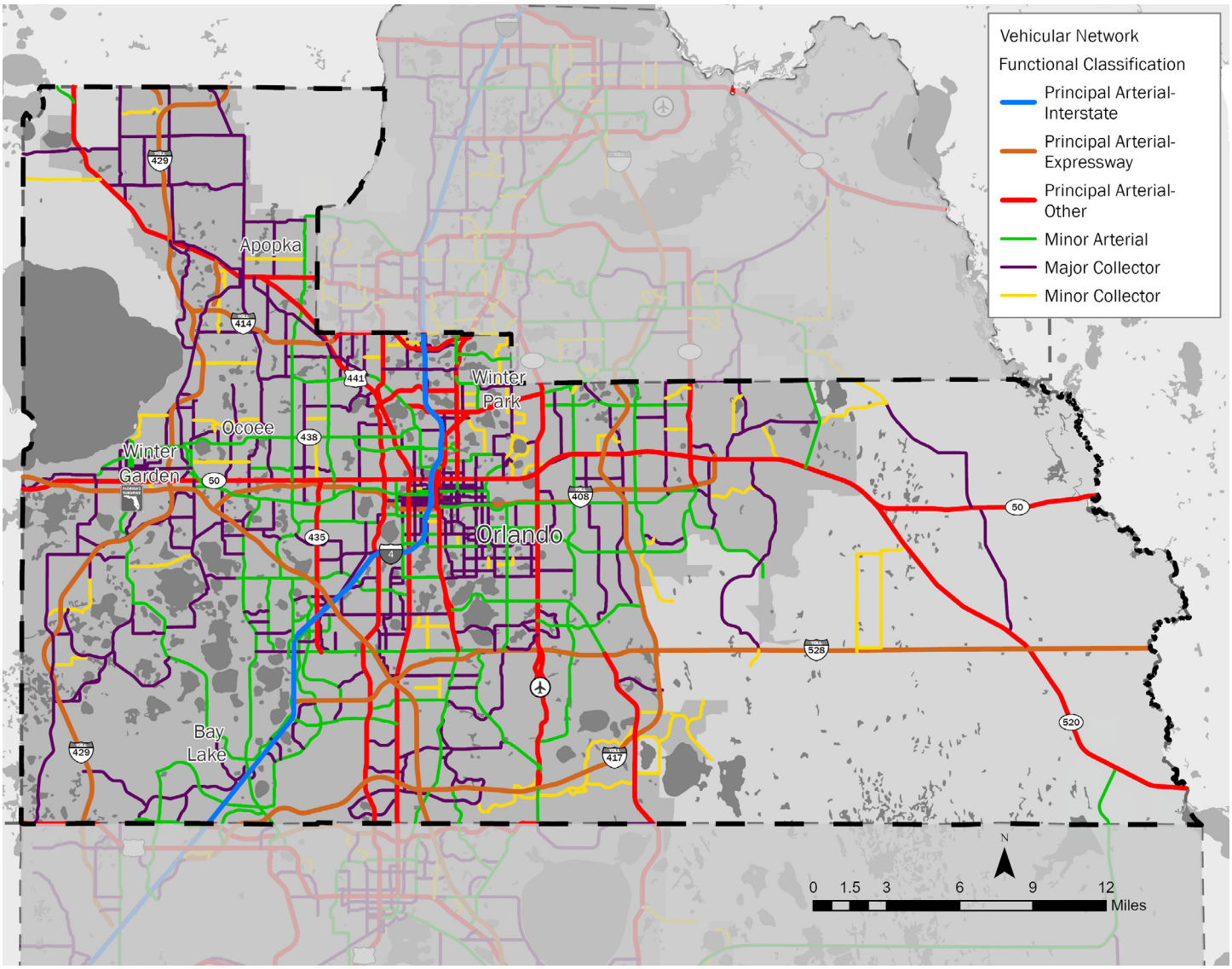
In addition, pedestrian and bicycle facilities were assessed from a safety and access perspective. All transportation facilities within the MetroPlan Orlando planning area were assessed where data was readily available. Figures 3-1 is the Vehicular Network for the entire MetroPlan Orlando area, Figures 3-2 through 3-4 provide an up-close perspective of the network within each individual county. This sequence is followed for the bicycle and pedestrian maps as well, the first maps in the series (i.e. Figures 3-5 and 3-9) are for the entire MetroPlan Orlando area and the following figures are for the individual counties.

Figure 3–1: Map of CMP Study Network



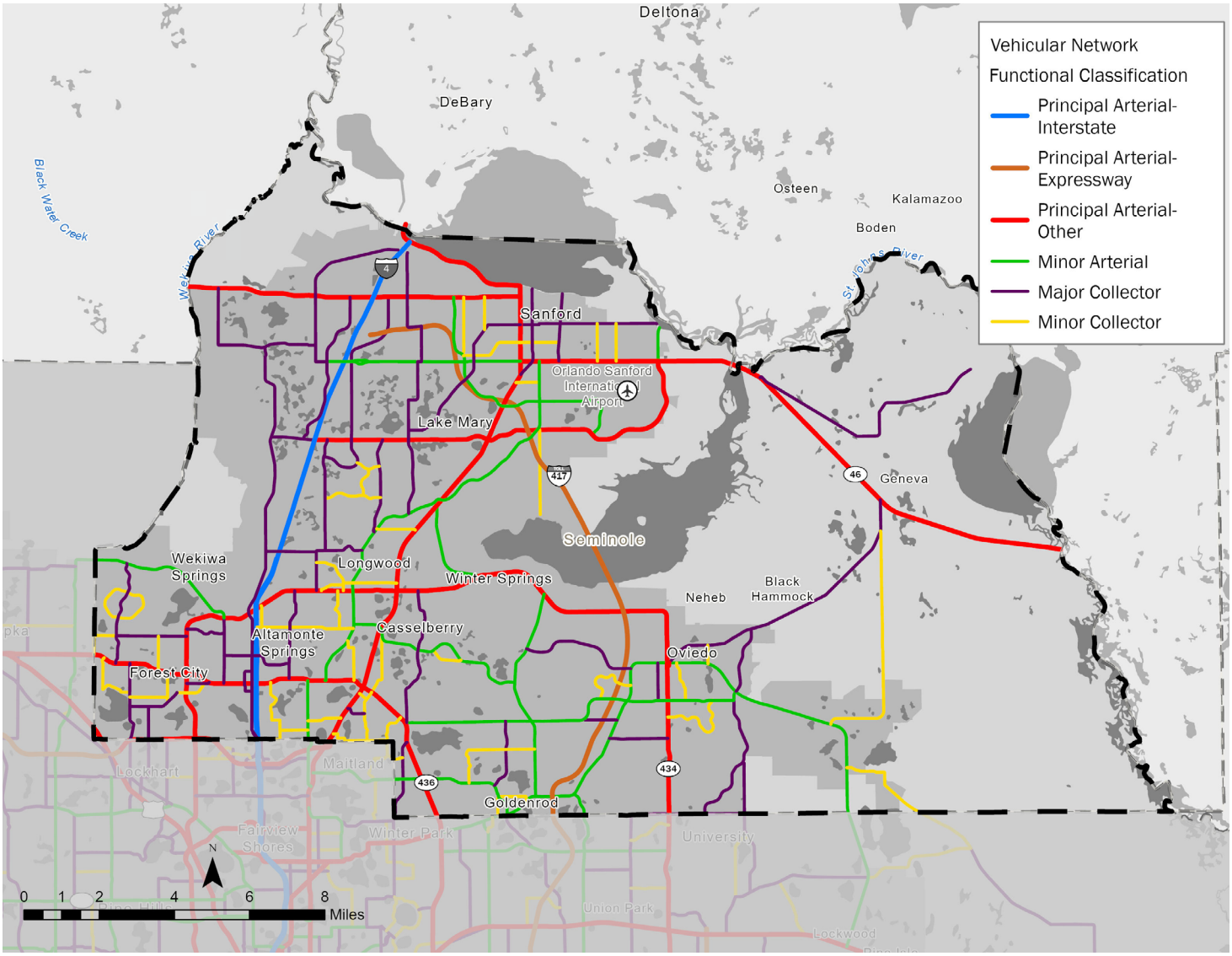
(Source: FDOT Roadway Characteristics Inventory, Feature 124: Functional Classification, 2023)

Figure 3–2: Map of Orange County CMP Study Network: All Vehicle



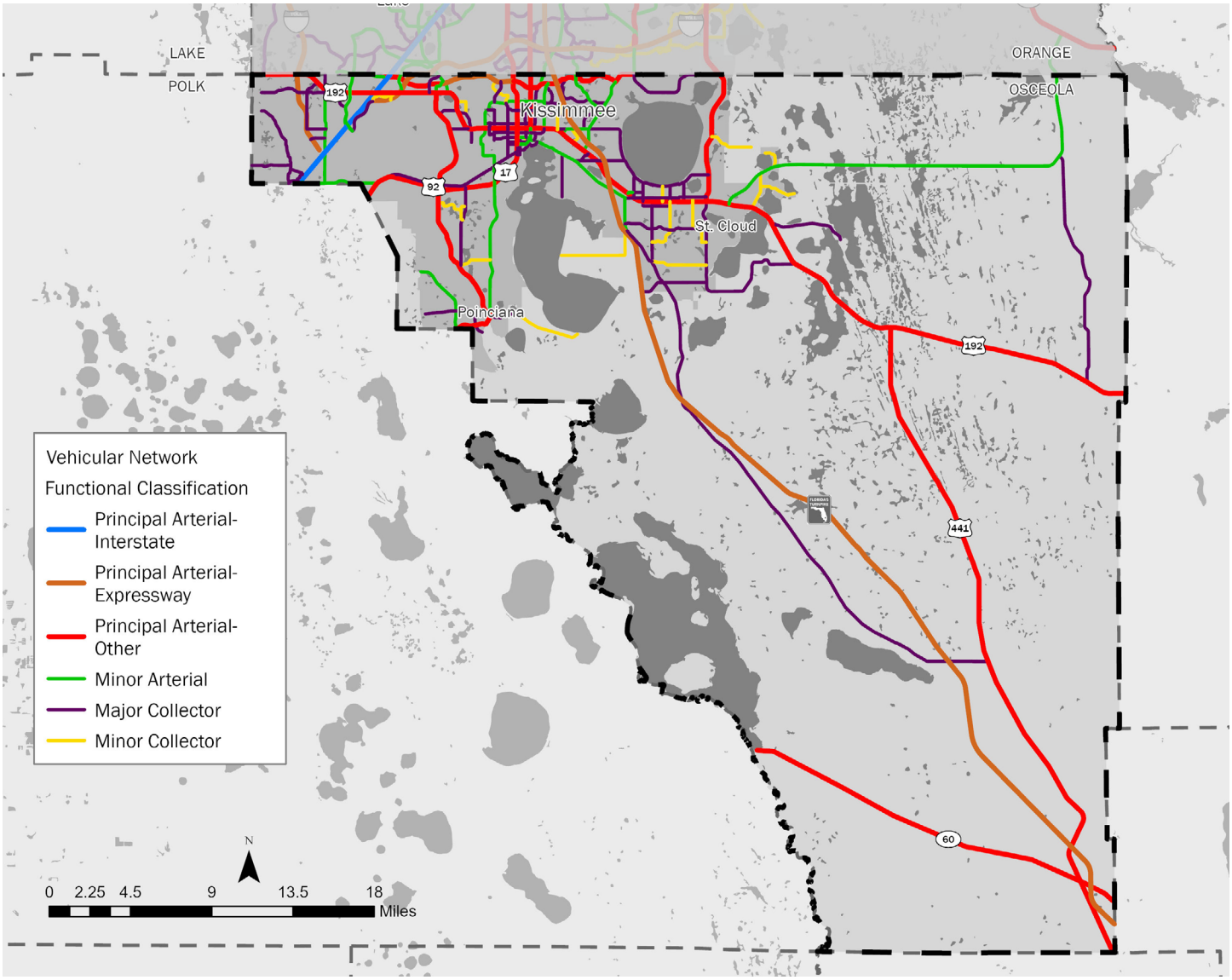
(Source: FDOT Roadway Characteristics Inventory, Feature 124: Functional Classification, 2023)

Figure 3–3: Map of Seminole County CMP Study Network: All Vehicle



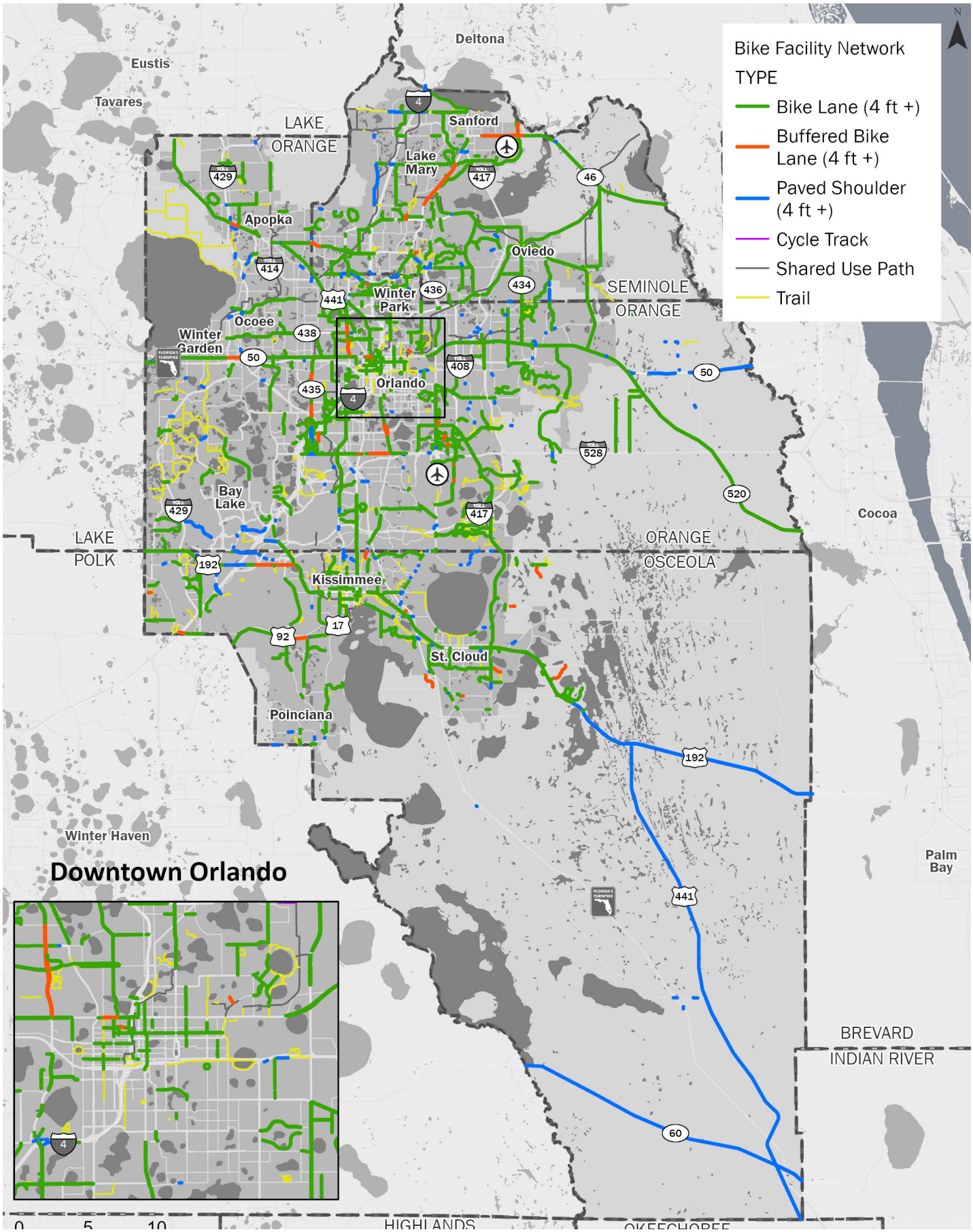
(Source: FDOT Roadway Characteristics Inventory, Feature 124: Functional Classification, 2023)

Figure 3–4: Map of Osceola County CMP Study Network: All Vehicle



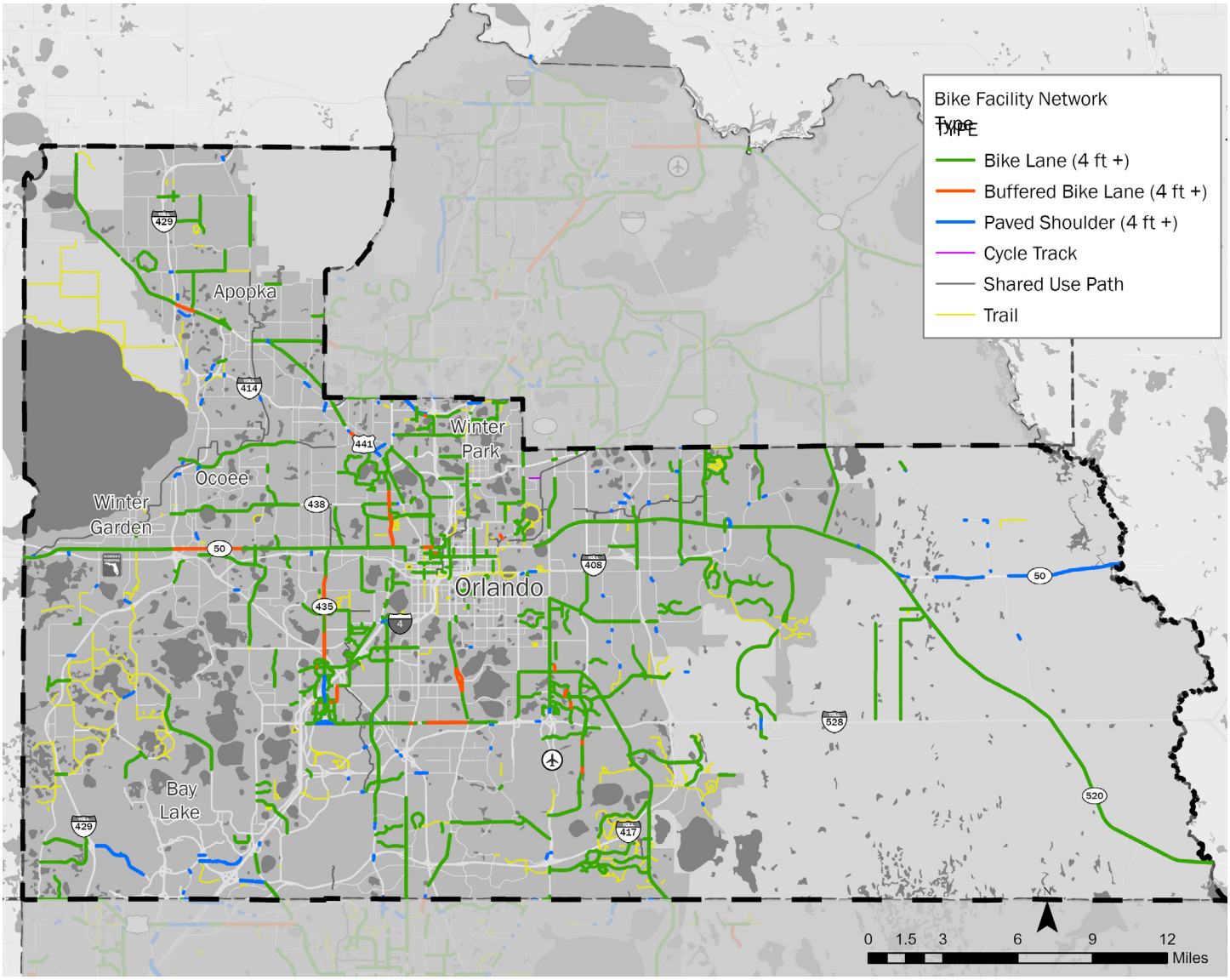
(Source: FDOT Roadway Characteristics Inventory, Feature 124: Functional Classification, 2023)

Figure 3–5: Map of CMP Study Network: Bike Facilities



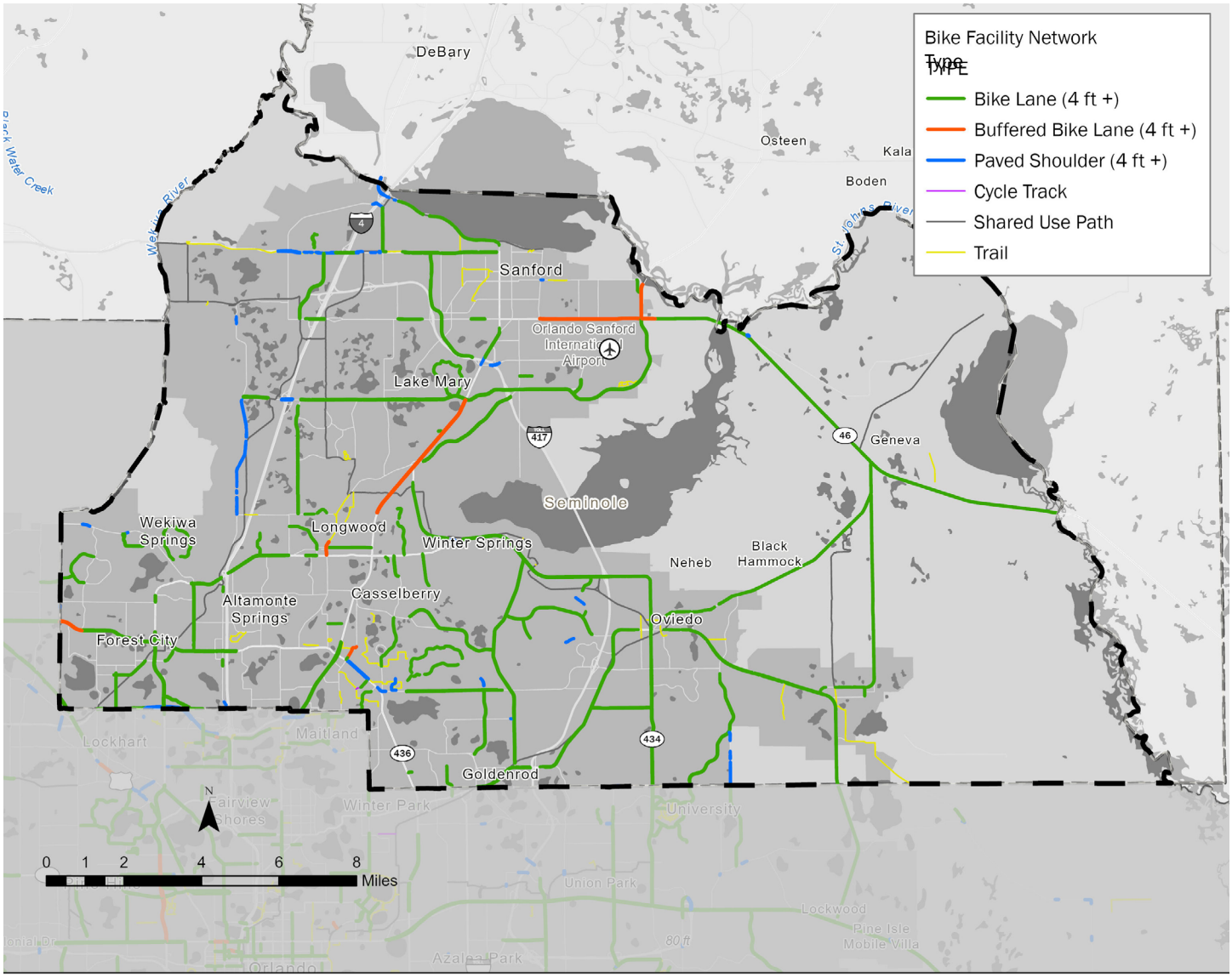
(Source: xGeographic; MetroPlan Orlando, 2024)

Figure 3–6: Map of Orange County CMP Study Network: Bike Facilities



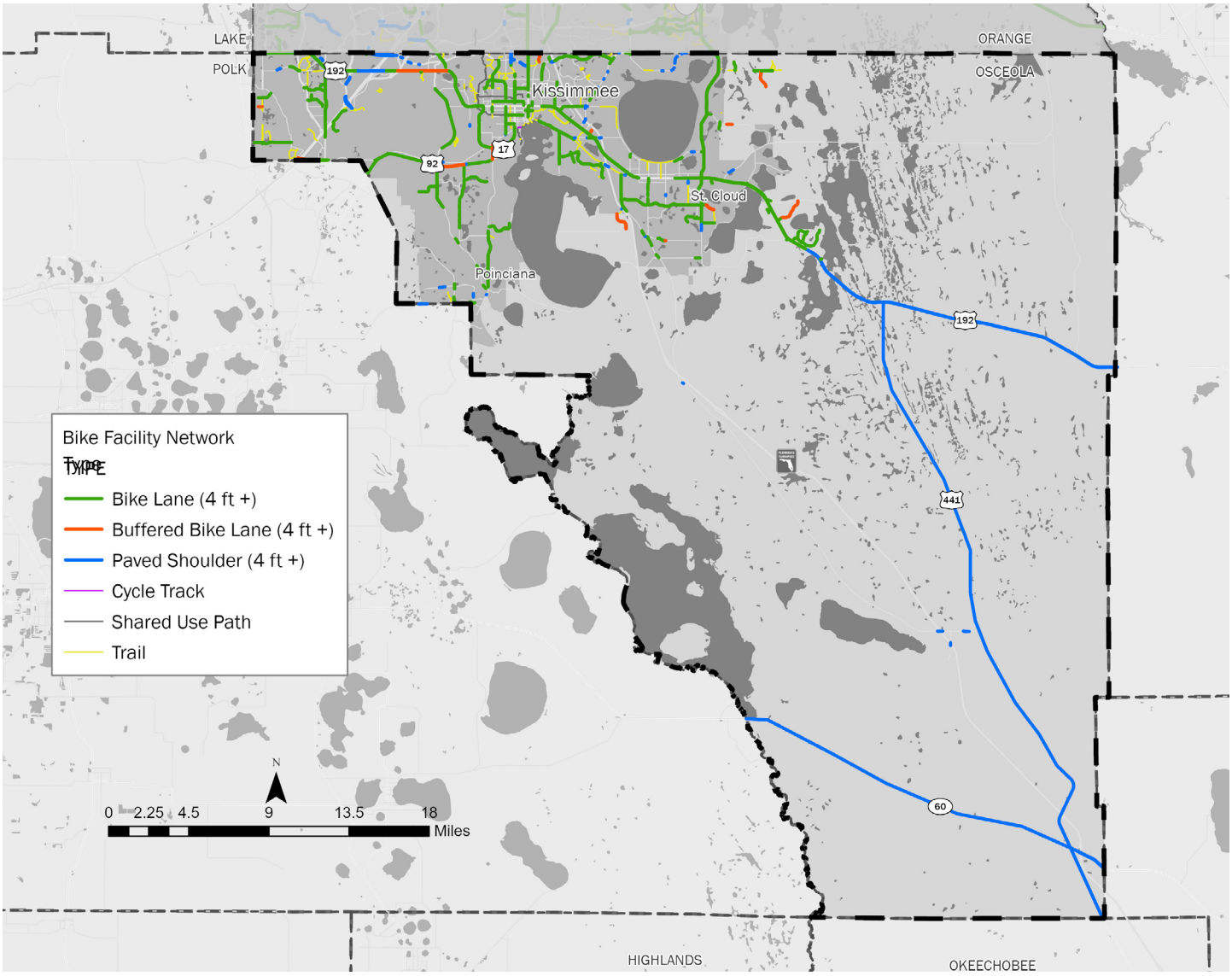
(Source: xGeographic; MetroPlan Orlando, 2024)

Figure 3–7: Map of Seminole County CMP Study Network: Bike Facilities



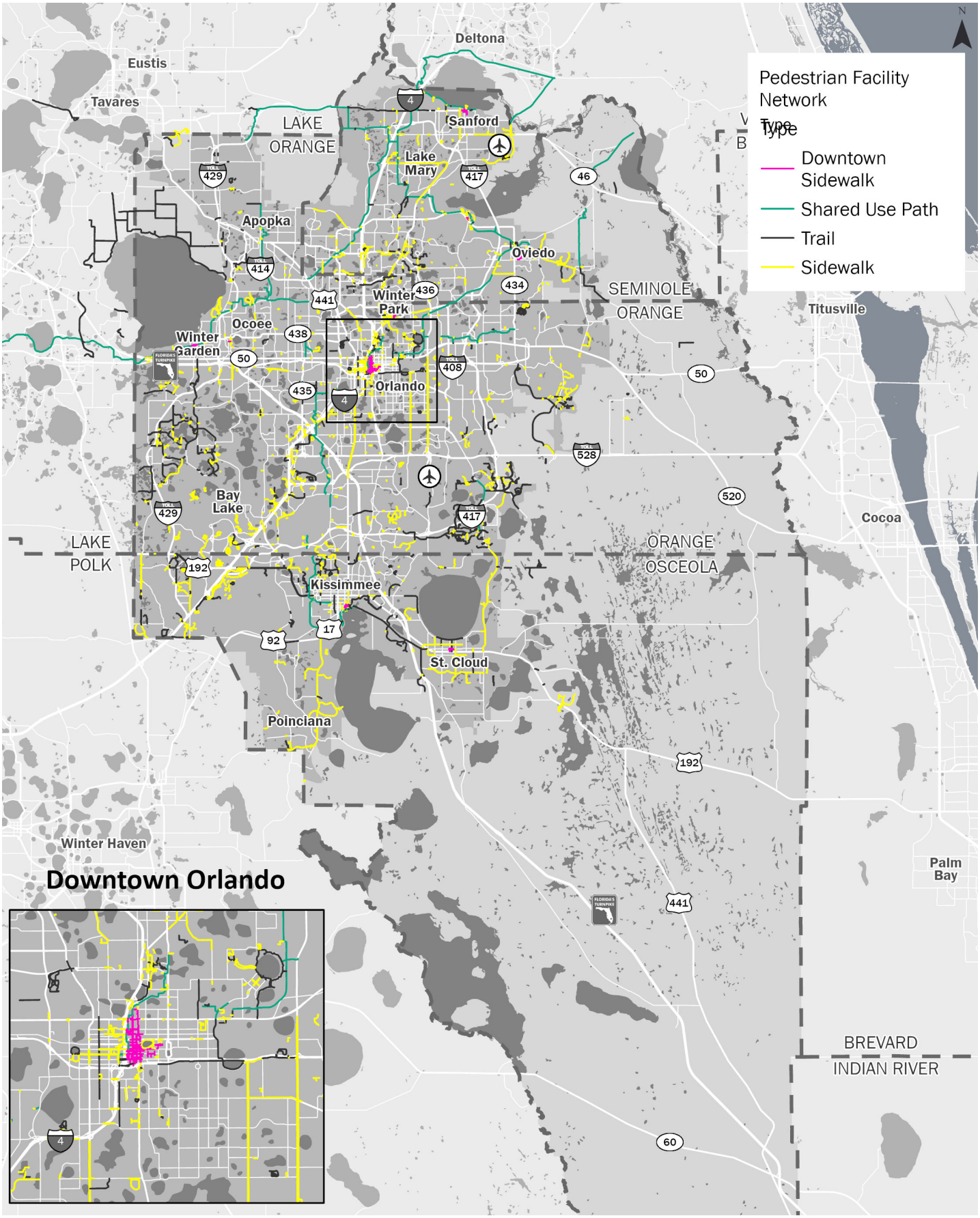
(Source: xGeographic; MetroPlan Orlando, 2024)

Figure 3–8: Map of Osceola County CMP Study Network: Bike Facilities



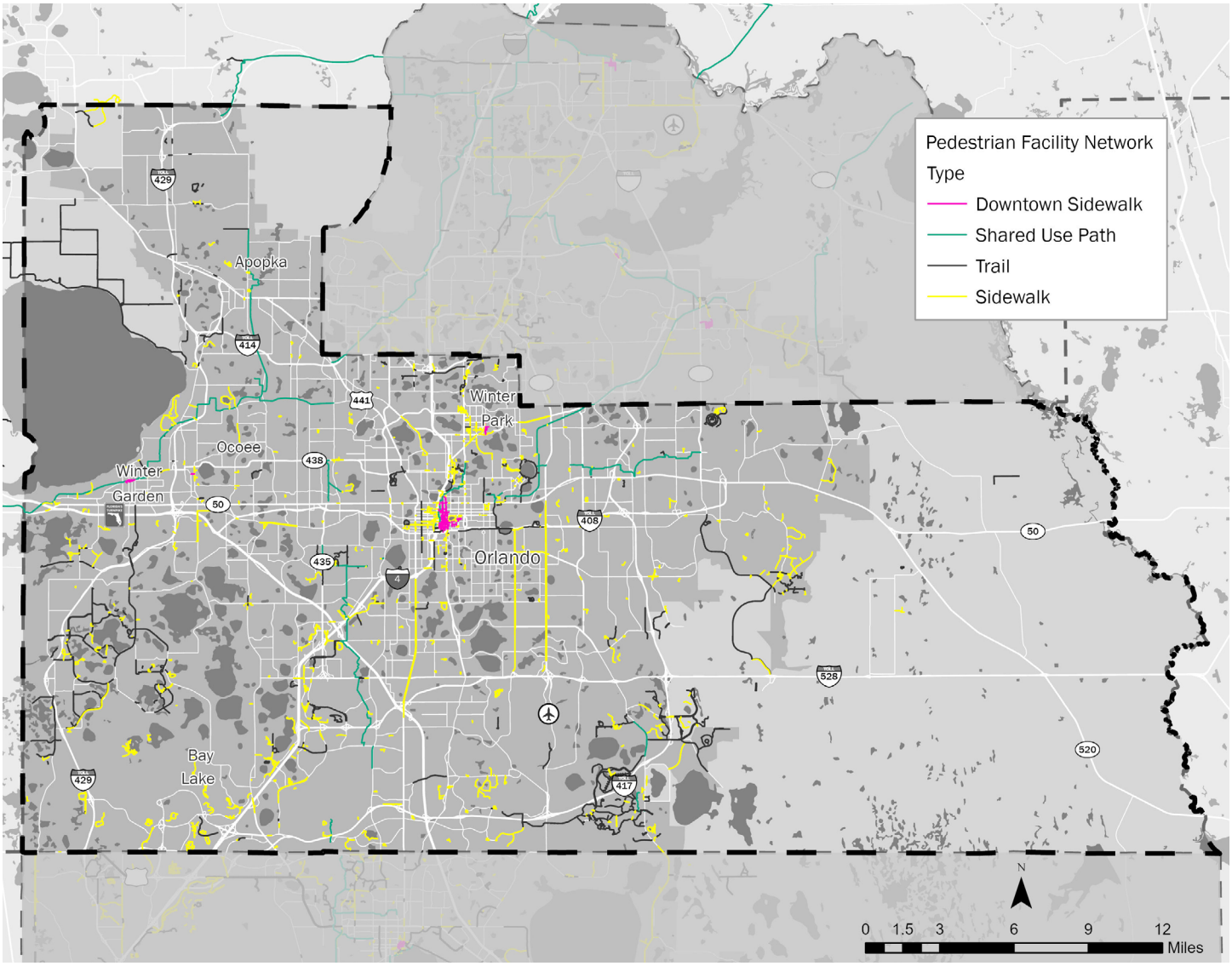
(Source: xGeographic; MetroPlan Orlando, 2024)

Figure 3–9: Map of CMP Study Network: Pedestrian Facilities



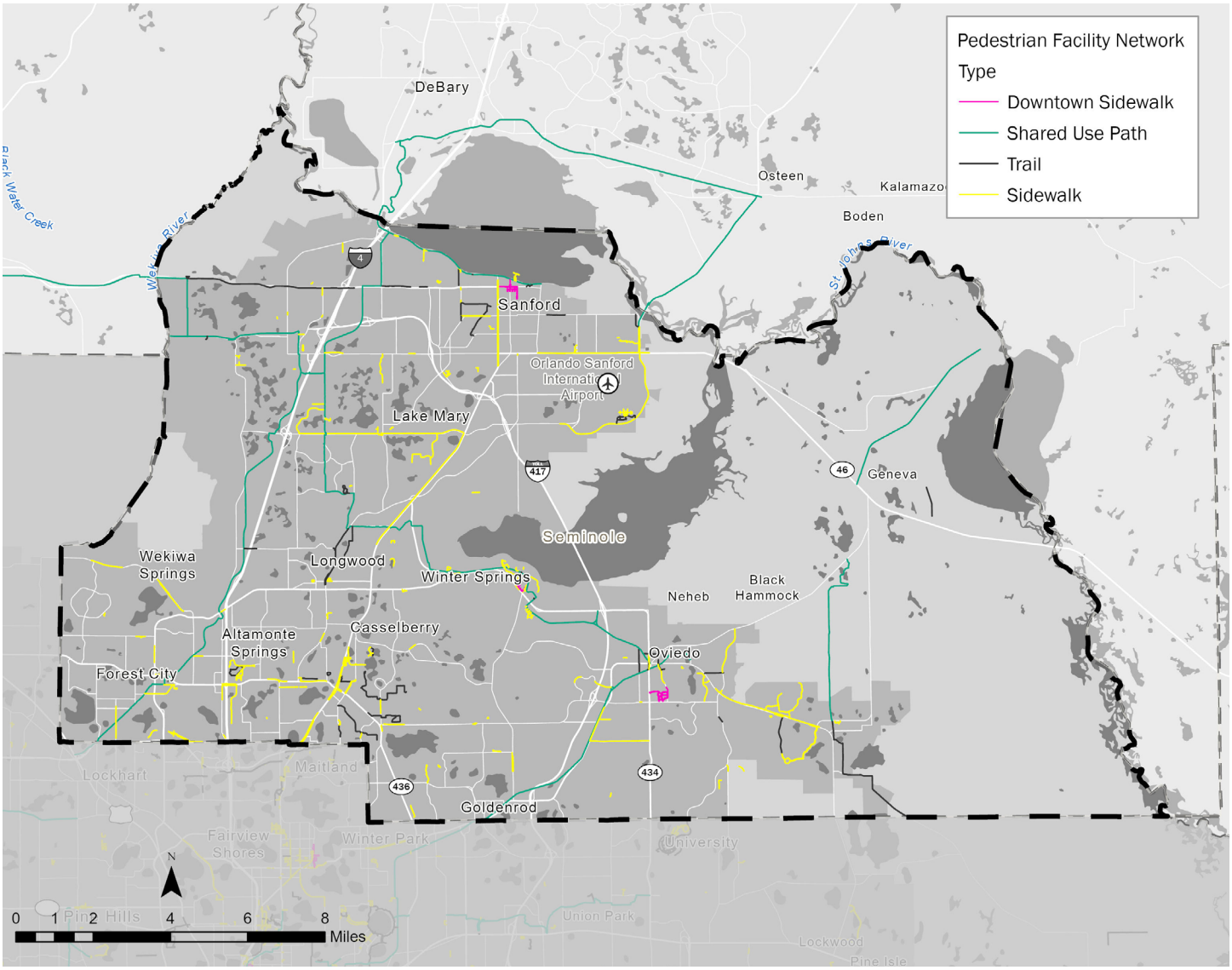
(Source: xGeographic; MetroPlan Orlando, 2024)

Figure 3–10: Map of Orange County CMP Study Network: Pedestrian Facilities



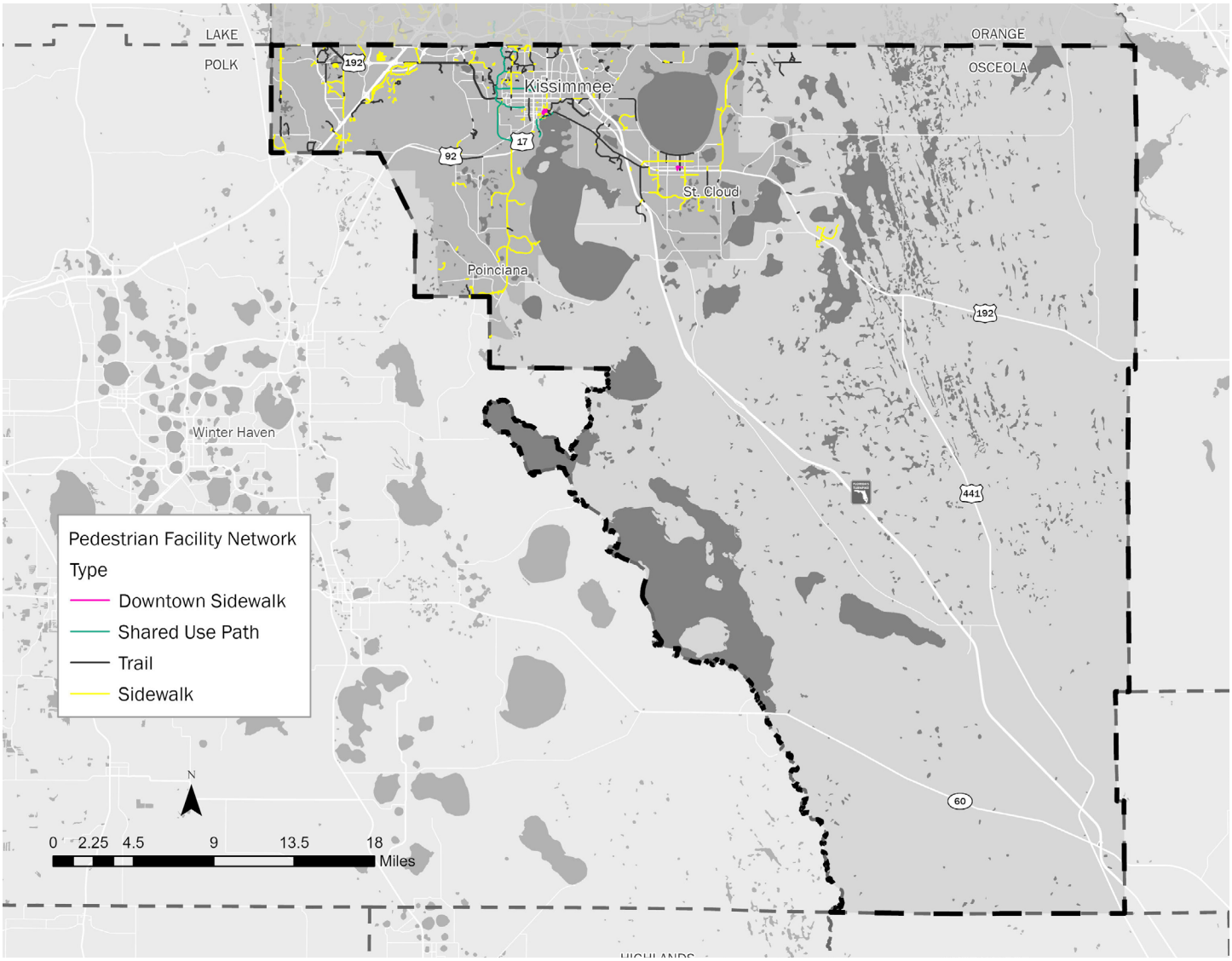
(Source: xGeographic; MetroPlan Orlando, 2024)

Figure 3–11: Map of Seminole County CMP Study Network: Pedestrian Facilities



(Source: xGeographic; MetroPlan Orlando, 2024)

Figure 3–12: Map of Osceola County CMP Study Network: Pedestrian Facilities



(Source: xGeographic; MetroPlan Orlando, 2024)

4. System Monitoring

MetroPlan Orlando manages the collection of data to foster monitoring changes in the various performance measures, determining the impacts on congestion levels throughout the region, and reporting on the effectiveness of implemented strategies over time. During each CMP update, the MPO will compile and analyze all available new data to identify and adjust goals, objectives, and performance measures.

Performance measures are the indicators primarily used to conduct monitoring and evaluation. After assessing baseline visioning and data, the extent to which goals and objectives are being met is evaluated based on which metrics are moving towards the targets set by MetroPlan Orlando. This aims to assist the MPO in its CMP as well as implementing the MPO's performance based project prioritization process with a specific focus on the elements of congestion, safety, mobility, and reliability. Through pinpointing hotspots on the road network, this analysis helps the MPO determine which roads should be prioritized for projects aimed at mitigating congestion and improving mobility, safety and reliability. The monitoring goes beyond system performance for vehicles to evaluate accessibility and the quantity of infrastructure provided to bicyclists and pedestrians system wide.

4.1 PERFORMANCE MEASURES

The objectives-driven, performance-based approach, promoted by FHWA and Federal Transit Administration (FTA), focuses on working toward desired system performance outcomes rather than only responding to problems. This approach recognizes that what is measured matters in decision making, and that setting specific, measurable performance objectives will facilitate incorporating operational strategies into the MTP.

Further discussed in the Evaluation Plan section of the CMP (Section 6), MetroPlan will collect data periodically for each performance measure to track progress using a performance "scorecard" system.

The following pages present the performance measures used to monitor the network. Each subsequent table includes a description of the measure, provides a recent historic trend, and a further explanation on the magnitude of change. To provide more background, data sources are also included for each measure.

4.2 SAFETY

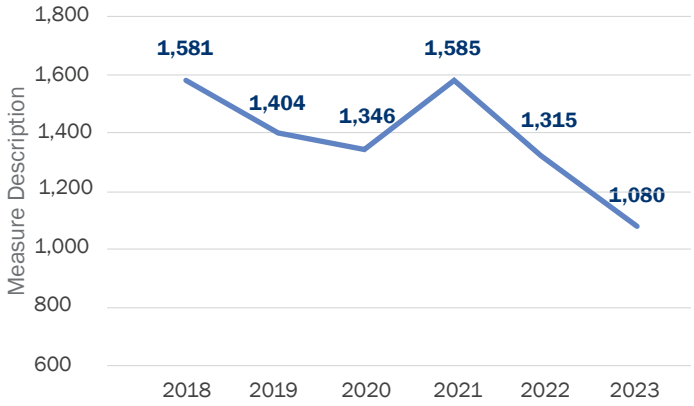
MetroPlan Orlando is planning a safe and connected transportation network for everyone. In Orange, Osceola, and Seminole Counties, more than five people are killed and 35 people are seriously injured on the region's roads every week – a higher rate than elsewhere in Florida, or much of the nation. Understanding the relationship between safety and congestion patterns allows for data-driven solutions.

Addressing safety is crucial to address congestion. Reducing the number of crashes will lead to less traffic disruption and overall improved traffic flow. Safer roads also improve emergency response times, minimizing congestion caused by incidents. Additionally, safe infrastructure for walking and biking encourages more people to choose these modes, reducing road congestion.

A safe transportation system enhances the overall quality of life, increasing public satisfaction and decreasing congestion issues.

Charts 4-1 through 4-6 report on the safety in the MetroPlan Orlando region.

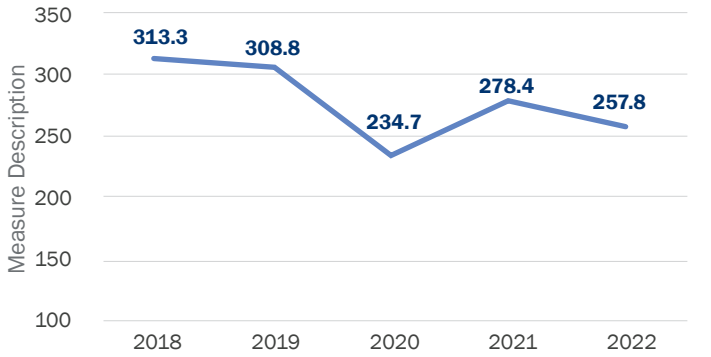
Chart 4–1: Fatal and Serious Injury Crashes



(Data Source: Signal Four Analytics)

This measure accounts for persons who have lost their lives in a vehicle crash or suffered through a serious injury requiring hospitalization. With the exception of 2021, the trend is heading in a positive direction. Fatalities and serious injury crashes have decreased by 32% or roughly a third over the last 5 years. This can be attributed to law enforcement, safer vehicles, safety projects improving infrastructure in the region, and awareness campaigns.

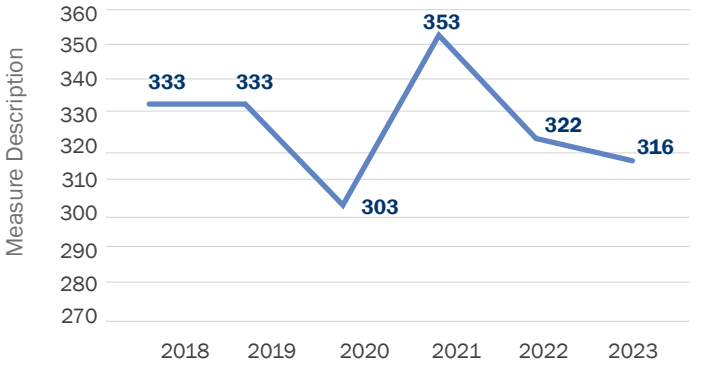
Chart 4–2: Crash Rates



(Data Source: Signal Four Analytics)

Crash rates refer to the ratio of the total number of crashes to the number of vehicle miles traveled (VMT) (expressed in 100 million VMT) in a calendar year. It provides a common denominator to understand the magnitude of the occurrence of crashes on roadways in MetroPlan Orlando's three county area. Over the 5-year period from 2018 through 2022, the crash rate has decreased by 18%.

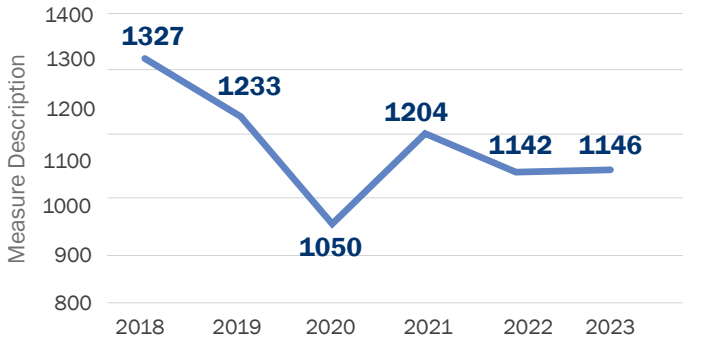
Chart 4–3: Pedestrian and Bicycle Fatal and Serious Injury Crashes



(Data Source: Signal Four Analytics)

This measure accounts for pedestrians and bicyclists who have lost their lives in a crash or suffered through a serious injury requiring hospitalization. Of all the fatal and serious injury crashes in the region, one in three involve a bicyclists or pedestrian. This measure is trending in a positive direction.

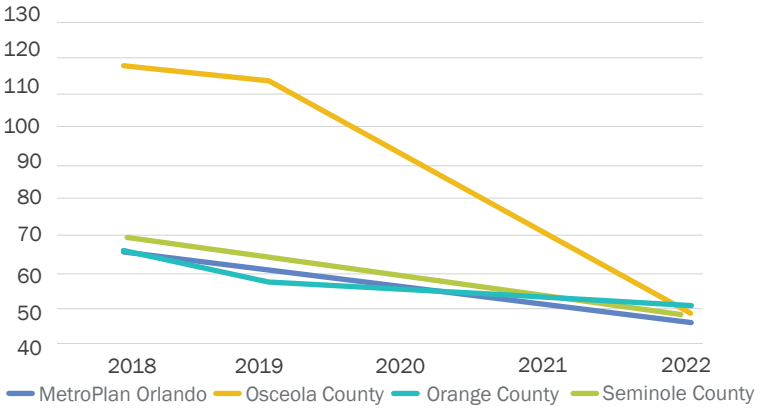
Chart 4–4: Speeding-Related Crashes



(Data Source: Signal Four Analytics)

Speeding can increase the severity of the crash and lead to more fatal and serious injury crashes. These figures account for all the crashes that occurred over the 5-year analysis period where speeding was determined to be the primary cause of the crash. Speeding related crashes for the past two observed years are within 1 percentage point of each other.

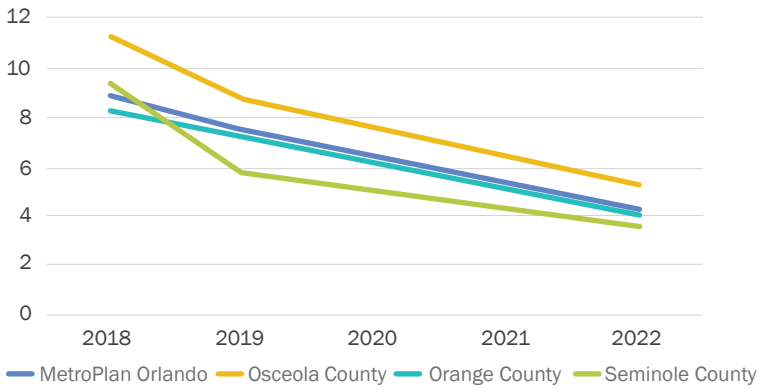
Chart 4–5: Average Incident Clearance Time (minutes)



(Data Source: SunGuide Report)

The clock typically starts for clearing an incident when the first responder arrives at the scene. This is because the clearance process often begins with the assessment of the situation, securing the area, and initiating any necessary actions, such as traffic control, medical assistance, or removal of debris. In the most recent year reported the average incident clearance time for the 3 county area was 48 minutes. This measure is trending in a positive direction.

Chart 4–6: Average Incident Response Time (minutes)

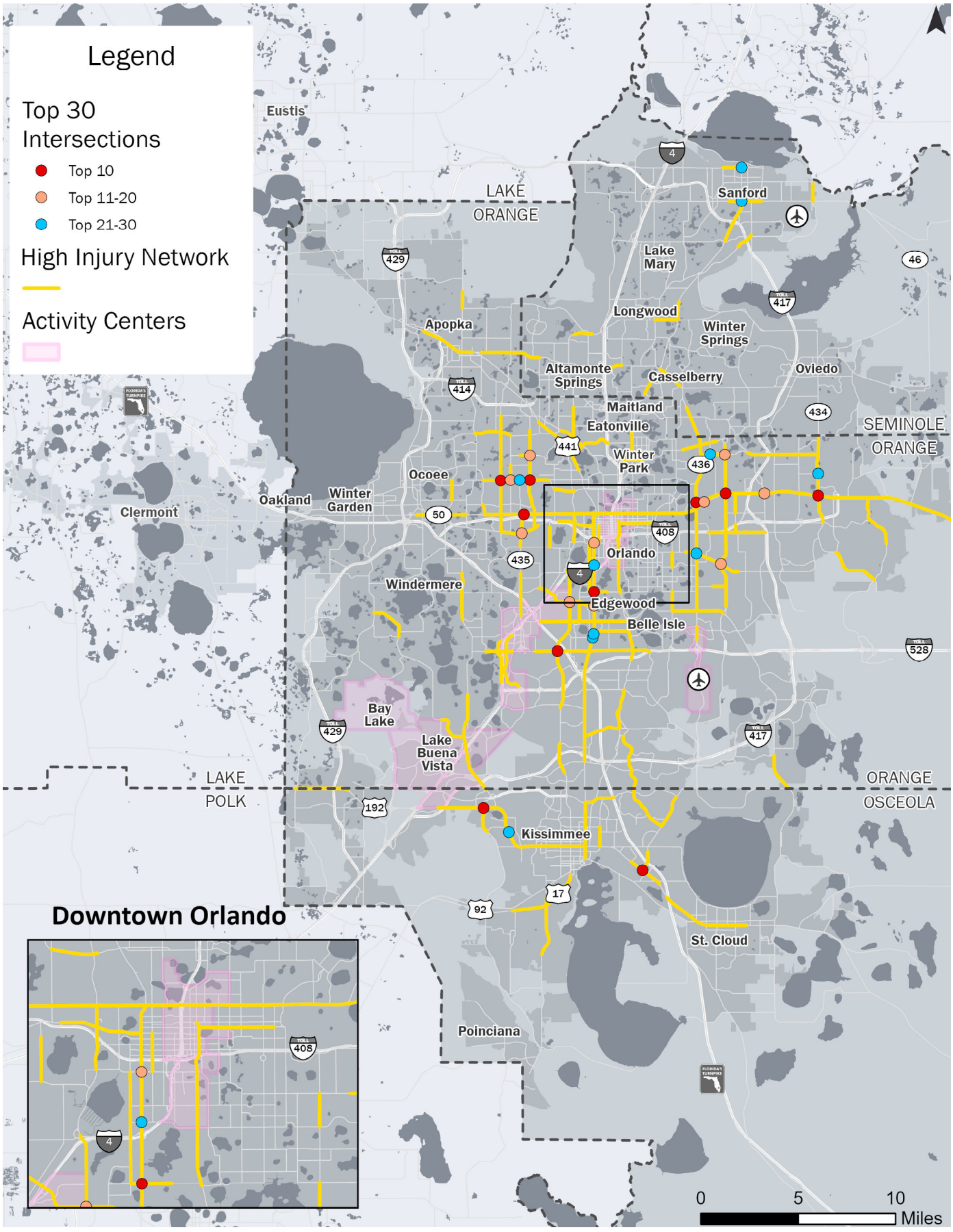


(Data Source: SunGuide Report)

Average emergency response time refers to the average number of minutes between dispatch and arrival to the scene. The CMP reports only SunGuide-operated facilities within the MPO boundaries, which include I-4, SR 414, SR 423, SR 520, SR 408, SR 417, SR 429, SR 436, SR 451, SR 50, SR 528, US-192, SR 415, SR 434, Lee Road, Turnpike, and US 441. This measure is trending in a positive direction.

The High Injury Network (HIN) represents the corridors and intersections where a disproportionate number of fatal or serious injury crashes occurred, with added emphasis on crashes involving people walking, bicycling, and motorcycling. The HIN provides a comprehensive set of locations for MetroPlan Orlando and partner jurisdictions to prioritize safety improvements and resources. Figure 4-1 shows the HIN on both local and state roadways. The intersections are identified and grouped by their safety performance.

Figure 4–1: High Injury Network



(Source: MetroPlan Orlando Vision Zero Action Plan, 2024)

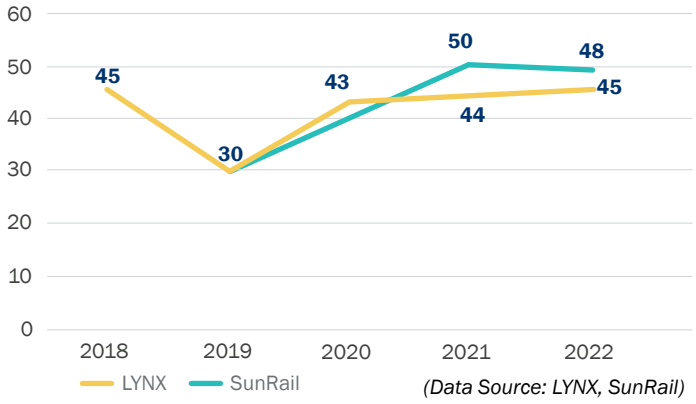
4.3 CONNECTIVITY

Connectivity ensures that everyone, regardless of age, ability, income, or location, has equal opportunities to access jobs, education, healthcare, and other essential services. This evaluation also considers access to a set of key regional destinations, including major attractions, airports, and the convention center. It promotes a more equitable and inclusive community by breaking down barriers to transportation.

Connected communities are more livable, offering residents a higher quality of life by connecting people to places and each other. Accessible walking and biking infrastructure encourage physical activity and improve public health. This can also improve the community's air quality due to reduced car dependency.

When connectivity improves, individuals experience reduced travel time and increased productivity. This can lead to more productivity from workers who are more satisfied with their commutes. A region with good accessibility attracts businesses and talent, boosting economic growth. Charts 4-7 through 4-14 report on the connectivity in the MetroPlan Orlando region.

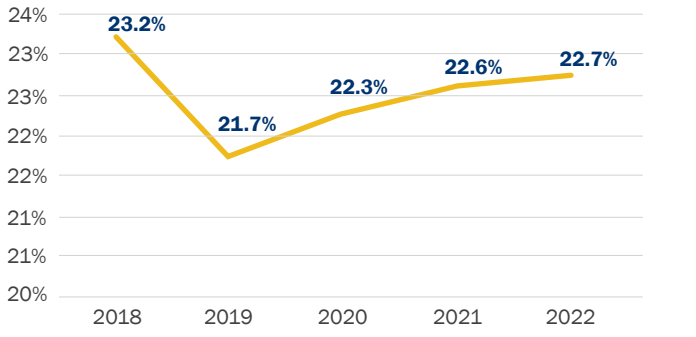
Chart 4–7: Average Transit Frequency (minutes)



(Data Source: LYNX, SunRail)

This measure accounts for the time elapsed between transit vehicles. More popular routes, with higher ridership, should operate more frequently. For LYNX, this trend has not changed significantly over the most recent 3 years reported.

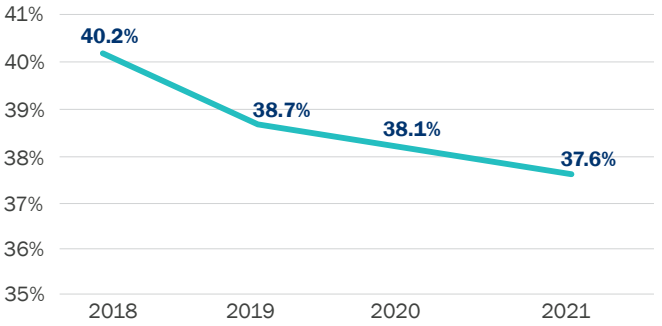
Chart 4–8: % Population within ½-mile of frequent transit



(Data Source: LYNX, SunRail, LEHD)

Access to transit is afforded when transit is within a half-mile travel distance. Frequent transit is defined as 30-minute or less headways. This measure accounts for how accessible reliable transit is to the population within the MetroPlan Orlando service area. Accessible frequent and reliable transit is a viable alternative to single occupancy vehicle use. This measure is trending in a positive direction.

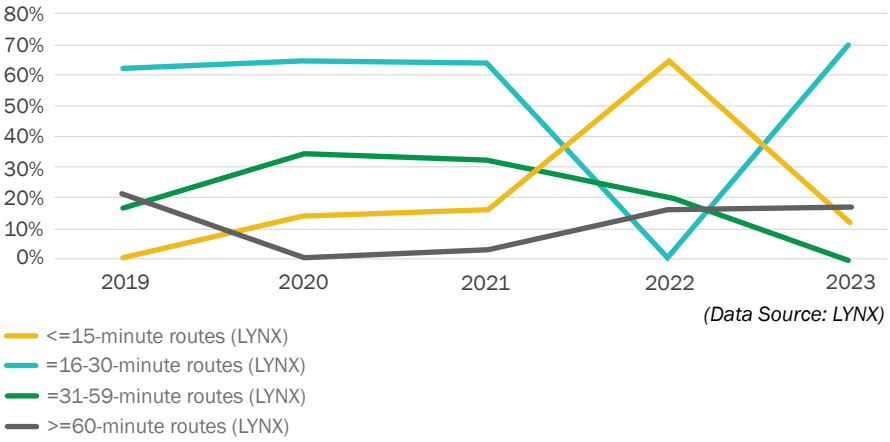
Chart 4–9: % Jobs within ½-mile of Frequent Transit



(Data Source: LYNX, SunRail, LEHD)

This measure accounts for all the frequent transit routes and the jobs that are within ½ mile (seen as an acceptable walking distance from the frequent transit service). This measure includes transit routes with headways of 30 minutes or less.

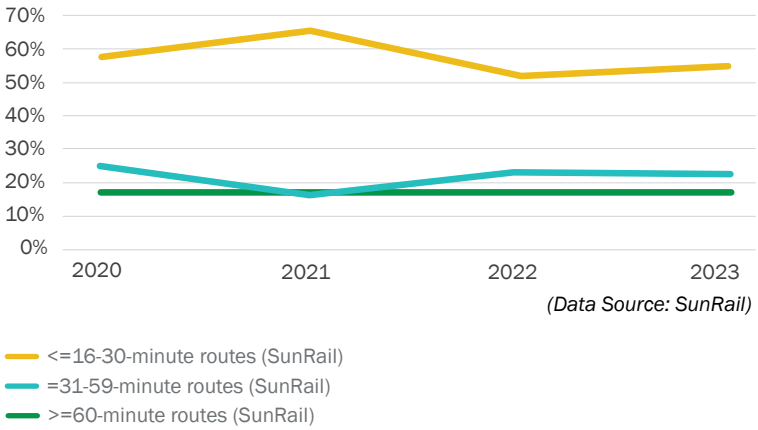
Chart 4–10: % Transit Ridership, by Headway (LYNX)



(Data Source: LYNX)

This is the percent of passengers who board public transportation vehicles on the transit system's fixed routes with 15-minute, 30-minute, and 60-minute headways (i.e., how frequently a bus stops). The most recent trend for this measure is sporadic.

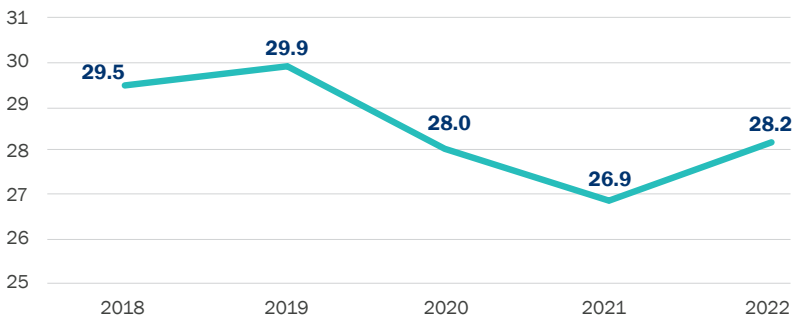
Chart 4–11: % Transit Ridership, by Headway (SunRail)



(Data Source: SunRail)

This is the percent of passengers who board SunRail trains with 16-30-minute, 31-59-minute, and 60-minute headways (i.e., how frequently a train arrives). The annual changes in the trend are minor and do not represent either a positive or negative direction.

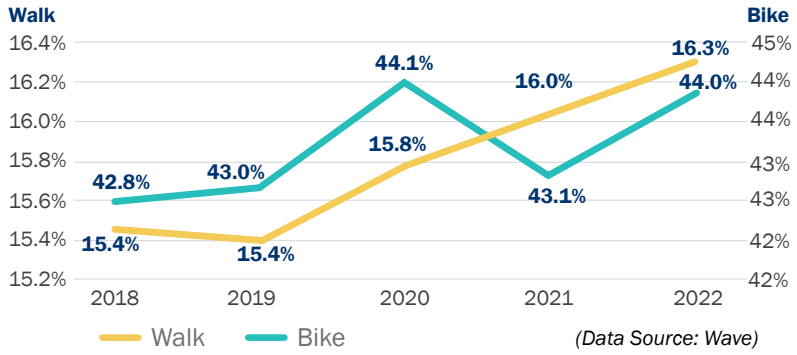
Chart 4–12: Daily VMT, per Capita



(Data Source: FDOT DVMT Report, U.S. Census)

This is the average daily vehicle miles traveled per person within the 3-county region. On average persons in the area drove over 28 miles a day for the last 5 years. In 2021 commuters were teleworking and that likely lessened the number of miles drive daily. This measure is trending in a negative direction.

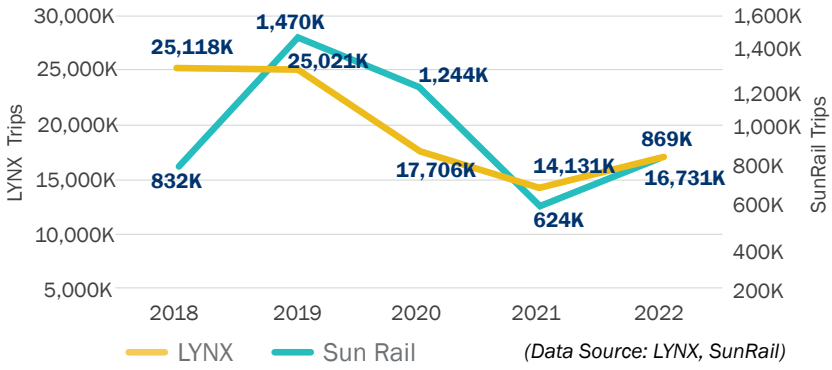
Chart 4–13: % Population within a 10-minute Walk/Bike Ride of Essential Services



(Data Source: Wave)

This measure serves as an indicator of the access to essential services including grocery stores, markets/convenience stores, small markets, restaurants, public parks, government, schools and health care. The measures reflects the percent of population within the MetroPlan Orlando planning area that has a proximity score of 8 or higher, indicating that percentage of population has access to essential services within a 10-minute walk or bike ride.

Chart 4–14: Annual Unlinked Trips



(Data Source: LYNX, SunRail)

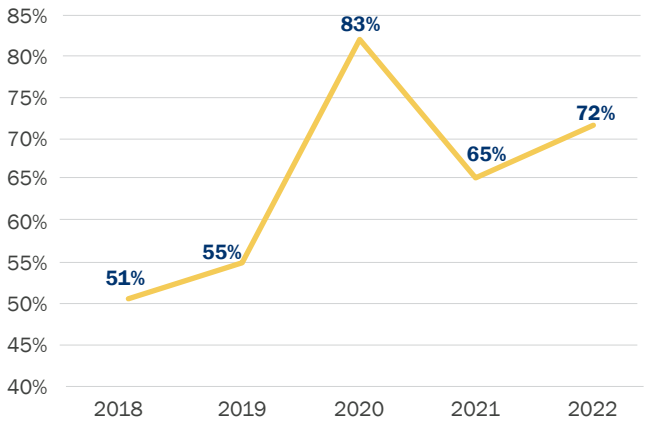
This measure tracks the number of passengers who board public transportation vehicles. Passengers are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination. After 2 consecutive years of decreases in trips, this measure is trending in a positive direction.

4.4 RELIABILITY

Travel time reliability refers to the consistency and predictability of travel times. It's a critical factor in transportation system planning for several reasons. Reliable transportation is essential for businesses to operate efficiently. Unpredictable travel times can disrupt supply chains, increase costs, and reduce productivity. Reliability's economic impact is not only through efficiency. It can also lead to increased employment opportunities. A reliable transportation system attracts businesses and industries, leading to job creation and economic growth.

By identifying travel time reliability needs, MetroPlan Orlando will develop more effective strategies to improve the overall performance of the transportation system, enhance economic competitiveness, and improve the quality of life for residents. Predictable travel times allow residents to better plan their day, leading to increased leisure time and productivity. Reliable travel times reduce stress and improve overall quality of life for commuters. Charts 4-15 through 4-20 report on the reliability in the MetroPlan Orlando planning area.

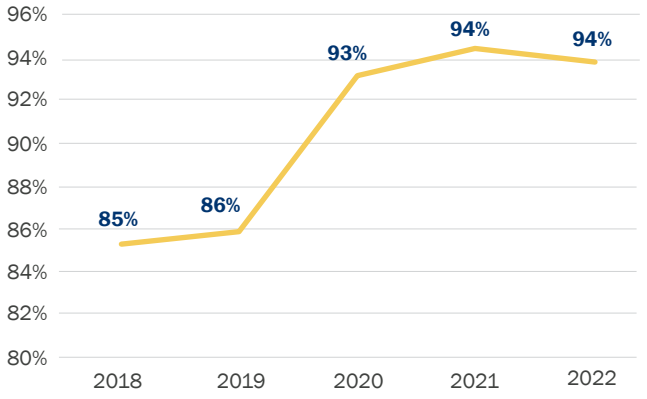
Chart 4–15: % of Reliable Interstate Miles



(Data Source: FDOT Source Book)

A segment of interstate is considered reliable when its Level of Travel Time Reliability (LOTTR) is less than 1.5. This performance measure compares the 80th percentile travel time to the median (50th percentile) travel time. With a LOTTR of 1.5, if your work commute takes 30 minutes on average, you would need to plan 45 minutes to ensure an on-time arrival, 80 percent of the time. This measure accounts for the person miles traveled on reliable interstate segments and is trending in a positive direction.

Chart 4–16: % of Reliable Non-Interstate Miles



(Data Source: FDOT Source Book)

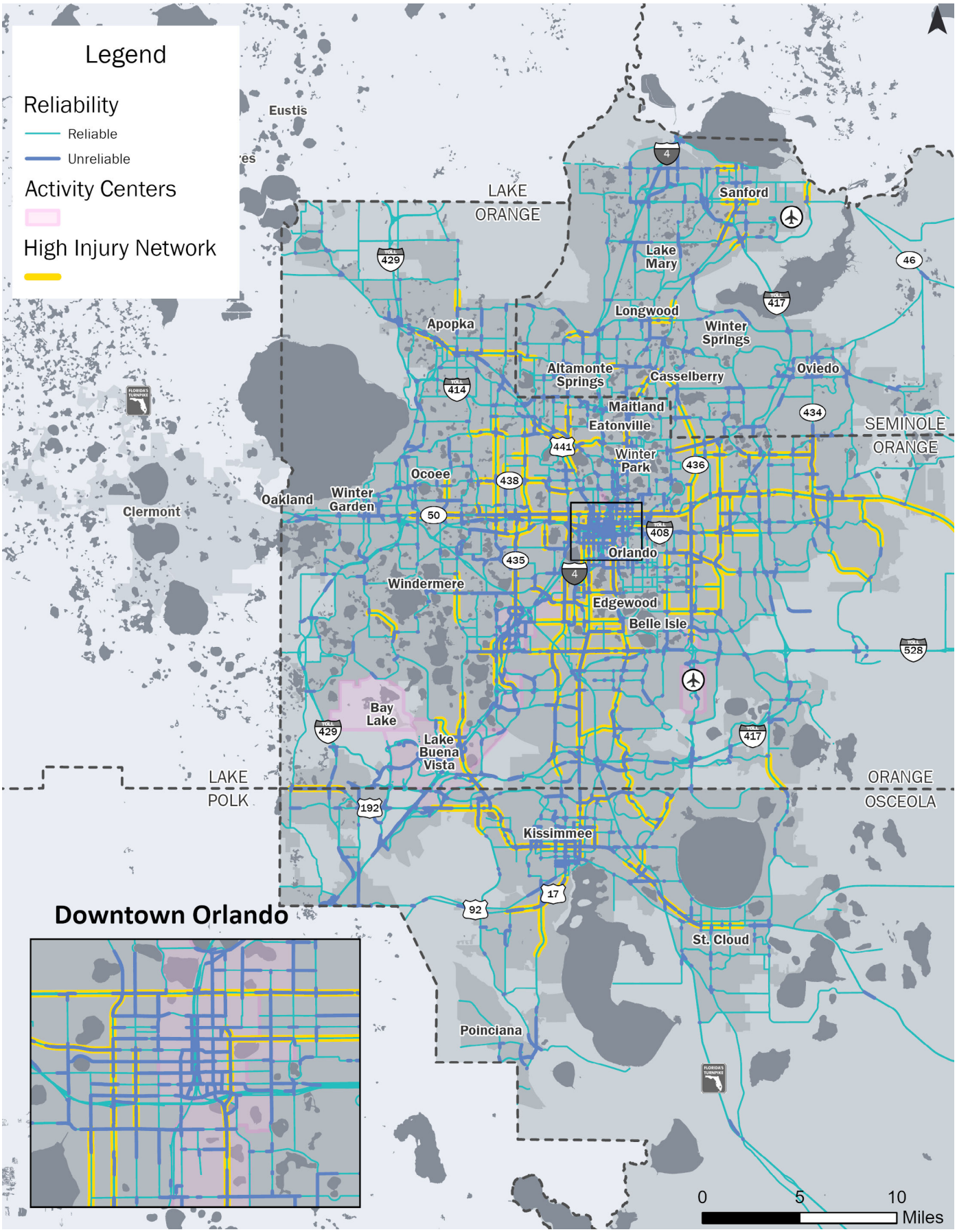
A segment of National Highway System (NHS) is considered reliable when its LOTTR is less than 1.5. Level of Travel Time Reliability performance measures compare the 80th percentile travel time to the median (50th percentile) travel time. With a LOTTR of 1.5, if your work commute takes 30 minutes on average, you would need to plan 45 minutes to ensure an on-time arrival, 80 percent of the time. This measure accounts for the person miles traveled on reliable NHS segments that are not on the Interstate. The last two years reported have witnessed a consistent trend.

Table 4-1 identifies the least reliable segments of roadway in MetroPlan Orlando's area. These roadways are ordered based on the worst performing period. Most of the time the worst performing period is the PM Peak but in some instances it is another time period. Figure 4-2 illustrates travel time reliability in the region. The unreliable threshold is an LOTTR of 1.50. The map includes the High Injury Network (HIN) for a high level association between travel time reliability and crashes. Most of the HIN segments are also unreliable.

Table 4–1: Twenty-five Least Reliable Roadway Segments

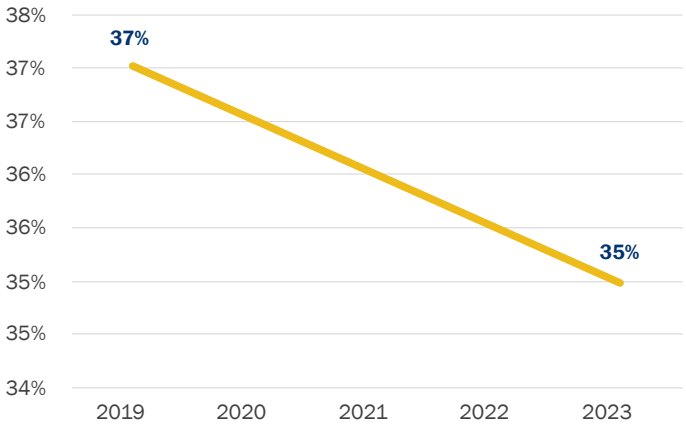
Road Name	From	To	AM Peak	Midday	PM Peak	Weekend
SR-50 (W Colonial Dr)	CR-431 (N Pine Hills Rd)	SR-435 (N Kirkman Rd)	2.66	2.15	2.05	2.04
Partin Settlement Rd	Aeronautical Dr	US-192	1.43	1.96	2.27	1.93
SR-50 (W C Dr)	SR-435 (N Kirkman Rd)	CR-431 (N Pine Hills Rd)	1.96	1.42	2.16	1.64
SR-50 (W Colonial Dr)	N Powers Dr	N Hiawassee Rd	1.80	2.12	2.13	1.91
John Young Pkwy	Shader Rd	SR-416 (Silver Star Rd)	1.20	2.10	2.04	1.60
Clay St	Dawes Ave	S Thacker Ave	1.08	1.31	2.05	1.12
W SR-46	Rinehart Rd	Upsala Rd	1.29	1.47	1.56	2.01
SR-50 (E Colonial Dr)	Woodbury Rd	N Alafaya Trl	1.40	1.95	1.96	1.78
I-4	Exit Ramp 75A (Universal Blvd)	Grand National Dr	0.00	1.96	1.70	0.00
Osceola Pkwy	Florida Pkwy	Buenaventura Blvd	1.40	1.37	1.93	1.27
University Blvd	Rouse Rd	Quadrangle Blvd	1.57	1.58	1.91	1.50
W SR-46	Wayside Dr	Rinehart Rd	1.83	1.77	1.59	1.91
Funie Steed Rd	Banana Palm Dr	Westside Blvd	1.10	1.31	1.90	1.33
John Young Pkwy	SR-416 (Silver Star Rd)	Shader Rd	1.33	1.37	1.89	1.42
W Lancaster Rd	S Orange Blossom Trail	Voltaire Dr	1.72	1.89	1.77	1.74
SR-429 (Daniel Webster Western Beltway)	Sand Hill Rd	I-4 SB	1.04	1.17	1.88	1.09
SR-50 (E Colonial Dr)	Bennett Rd	Maguire Blvd	1.88	1.74	1.57	1.69
Major Blvd	SR-435 (S Kirkman Rd)	Vineland Rd	1.88	1.45	1.40	1.42
SR-50 (W Colonial Dr)	CR-535 (Winter Garden-Vineland Rd)	9th St	1.67	1.88	1.78	1.53
E FL-434	Heritage Park St	N Winter Park Dr	1.85	1.31	1.53	1.56
CR-535 (Winter Garden-Vineland Rd)	Fowler Grove Blvd	Daniels Rd	1.27	1.51	1.85	1.39
Patrick St	John Young Pkwy	S Thacker Ave	1.61	1.64	1.65	1.85
Sherbeth Rd	US-192 WB	Osceola Pkwvy	1.08	1.10	1.85	1.16
W SR-436 (Semoran Blvd)	Riverbend Dr	N SR-434	1.63	1.84	1.63	1.60
Osceola Pkwy	Buenaventura Blvd	Coral Reef Cir	1.80	1.71	1.84	1.74

Figure 4–2: Travel Time Reliability



(Source: Streetlight Connected Vehicle Data, 2022)

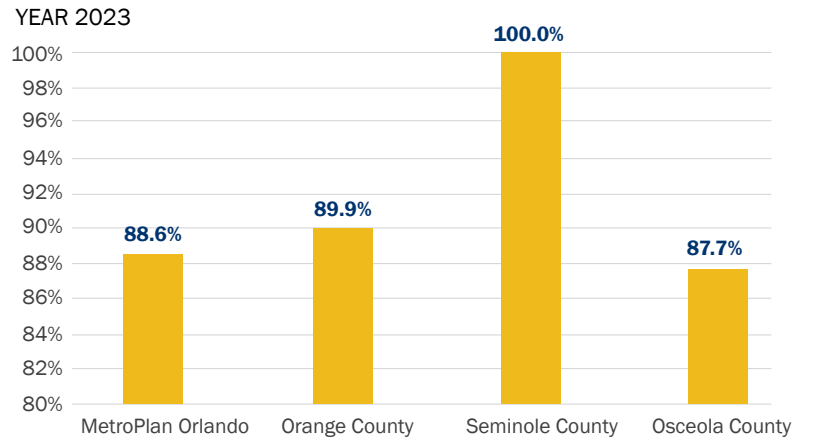
Chart 4–17: % of System Connected with Fiber



Data Source: Local maintaining agencies

This measure accounts for the percentage of miles that are actively monitored or managed through fiber that connects to another device or back to a centralized monitoring center. This measure is slightly trending in a negative direction.

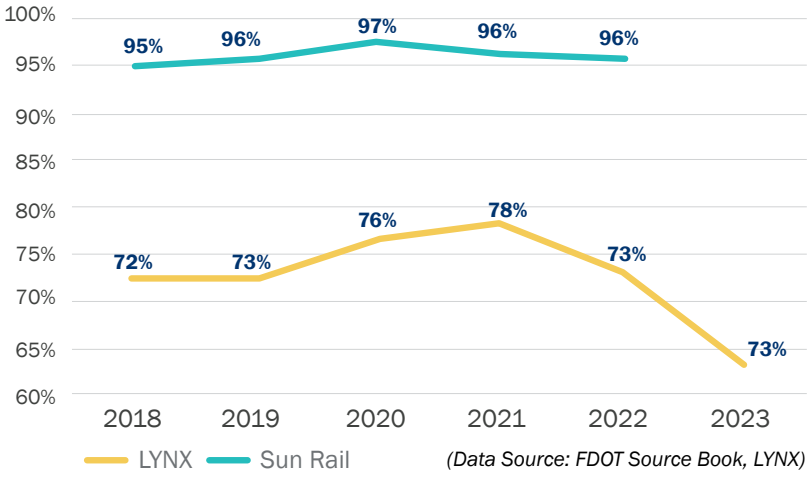
Chart 4–18: % of System with Connected Signals



(Data Source: Local maintaining agencies)

This measure represents the percent of signalized intersections that are connected to a network, typically fiber. Connectivity between signals allows them to communicate to each other for vehicle throughput and with a traffic monitoring center. Many of the connected signals also produce advanced traffic signal performance measures.

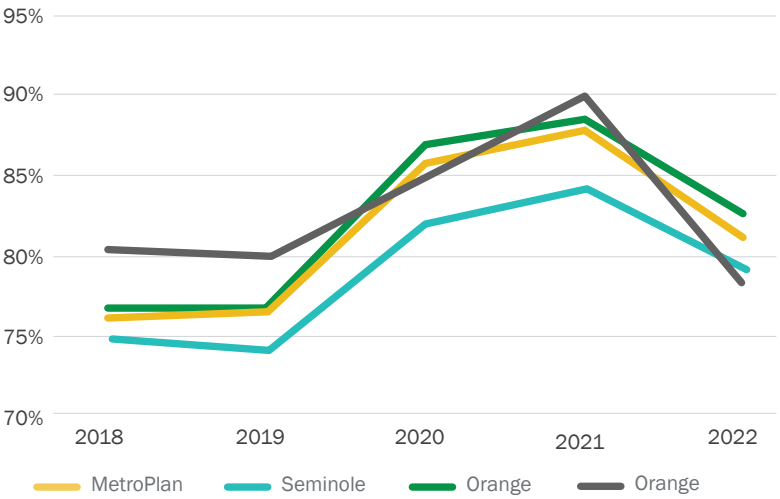
Chart 4–19: Transit On-Time Performance



(Data Source: FDOT Source Book, LYNX)

The on-time performance threshold is within 5 minutes of the scheduled arrival time. These figures represent the level of success of the service operating according to the published schedule. This measure is trending in a negative direction for LYNX.

Chart 4–20: % of Speed Limit Achieved by Drivers



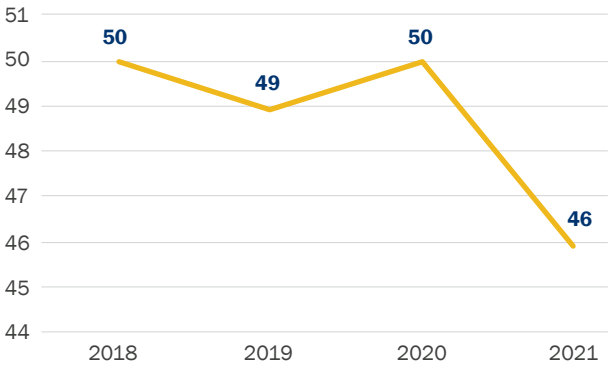
(Data Source: FDOT Source Book, LYNX)

This measure represents the percent of the posted speed limit achieved by all vehicles during the peak hour. The measure is expressed as the ratio of average peak hour speed against the posted speed limit. Travelers' ability to travel at the speed limit is decreasing.

4.5 COMMUNITY

The primary source of air pollution in many urban areas is transportation, with vehicles emitting harmful pollutants like nitrogen oxides, particulate matter, and greenhouse gases. Improving mobility lessens pollutants. The health of the public is impacted by poor air quality. Performance measures within the community goal area focus on protecting public health. Charts 4-21 through 4-24 report on measures impacting community and health in the MetroPlan Orlando study area.

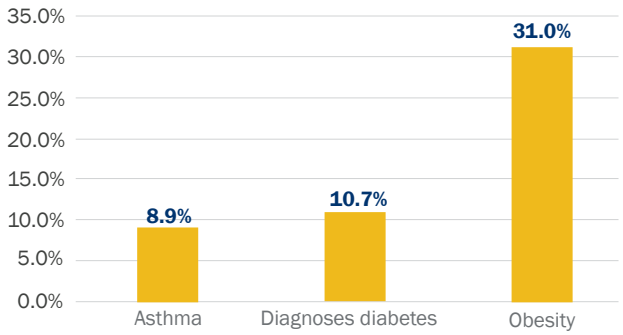
Chart 4–21: Air Quality Index



(Data Source: Florida Department of Environmental Protection)

The air quality index (AQI) is an index for reporting daily air quality, and it is calculated based on monitored concentrations of ground-level ozone, particulate matter, carbon monoxide, sulfur dioxide and nitrogen dioxide. The highest AQI for the pollutants measured at each site over the past 24 hours are displayed. There are four air quality monitoring stations in Central Florida, two in Orange County and one each in Osceola and Seminole Counties. This measure is trending in a positive direction.

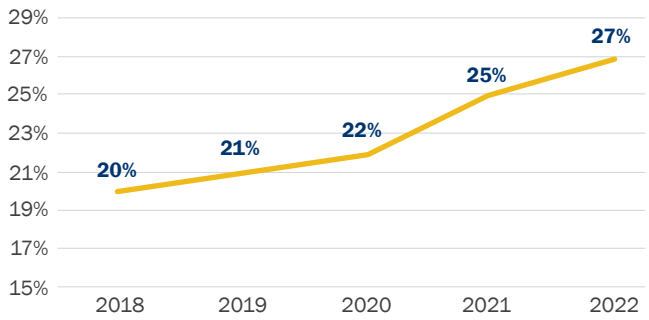
Chart 4–22: Rates of Asthma, Obesity and Diabetes



(Data Source: Centers for Disease Control and Prevention: PLACES)

Traffic congestion can have significant negative impacts on public health, particularly in relation to asthma, obesity, and diabetes. Increased traffic leads to higher levels of air pollutants negatively affecting asthma. Traffic congestion can discourage walking or biking, leading to a more sedentary lifestyle. Physical inactivity is a major risk factor for obesity and diabetes.

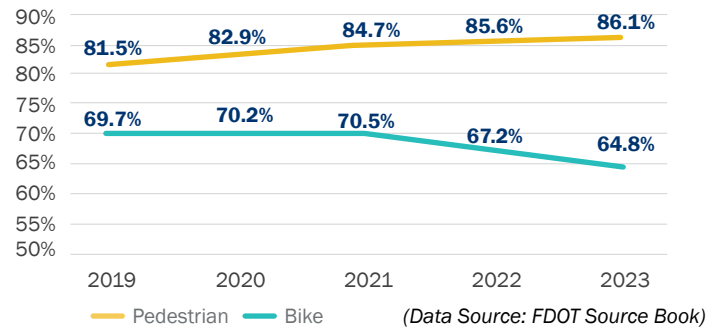
Chart 4–23: % of Commutes using non SOV Modes



(Data Source: U.S. Census)

Multimodal accessibility is important to ensure that a transportation system serves all its users. Increasing the percentage of multimodal commute trips helps reduce the number of single-occupant vehicles (SOVs) on the road, which are the main contributors to traffic congestion. The percentage of commute trips made via a method other than a SOV, such as by foot, by bike, or by transit is trending in a positive direction.

Chart 4–24: % of Network with Active Transportation Facilities



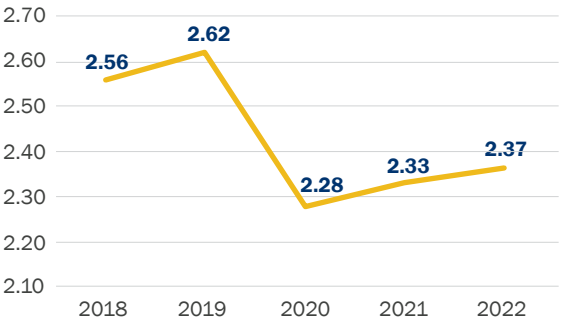
(Data Source: FDOT Source Book)

This measure identifies the share of non-limited access roads on the State Highway System that have shared use paths, bicycle or pedestrian facilities on one or both sides of the road.

4.6 PROSPERITY

Metroplan Orlando is committed to strategically investing in transportation improvements that strength the economy. Better highways and roads make it easier for tourists to reach destinations. Similarly, transportation investments are crucial for the efficient and timely movement of freight. These investments can significantly impact the supply chain, economic growth, and overall business operations. These indicators account for congestion impacting visitors, residents, and shippers. Charts 4-25 through 4-27 report on measures of prosperity for the MetroPlan Orlando study area.

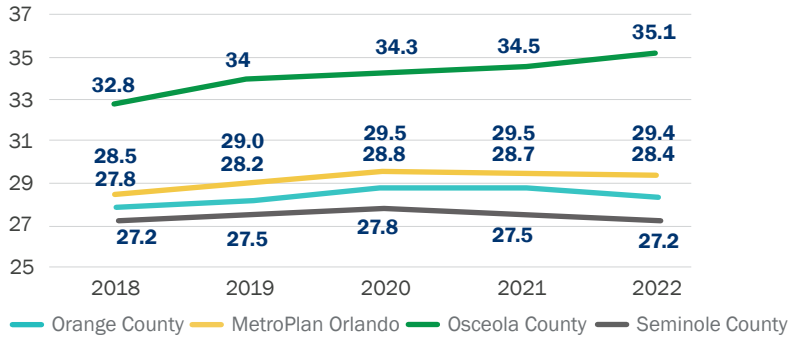
Chart 4–25: Truck Travel Time Reliability



(Data Source: FDOT Source Book)

Truck travel time reliability is reflective of the Planning Time Index (PTI) for trucks. Truck travel time reliability measures the extent of this the unexpected delay. The PTI represents the additional time that a traveler should budget to ensure on-time arrival to their destination at least 95% of the time. The higher the PTI, the less reliable the travel time which necessitates additional time to ensure on-time arrival. Since 2020 truck reliability has slightly worsened.

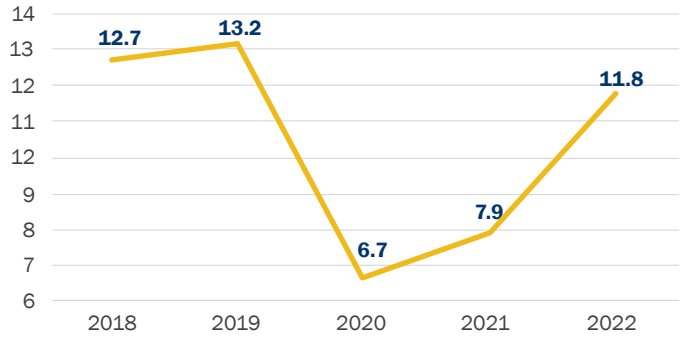
Chart 4–26: Median Commute Travel Time



(Data Source: U.S. Census)

This measure represents the one way commute time for workers. The average commute time in the United States is 26 minutes. Orange and Seminole Counties have not experienced much change in annual commute times. Osceola County commute time continues to worsen.

Chart 4–27: Annual Delay per Capita



(Data Source:FDOT Source Book, U.S. Census)

This measure accounts for the time lost due to unattainable travel speeds. Higher travel times reflect slower travel speeds. The difference between the uncongested travel time and observed travel time is delay. This figure represents the number of hours lost by commuters each year. Delay per commuter increased by 50% from 2021 to 2022.

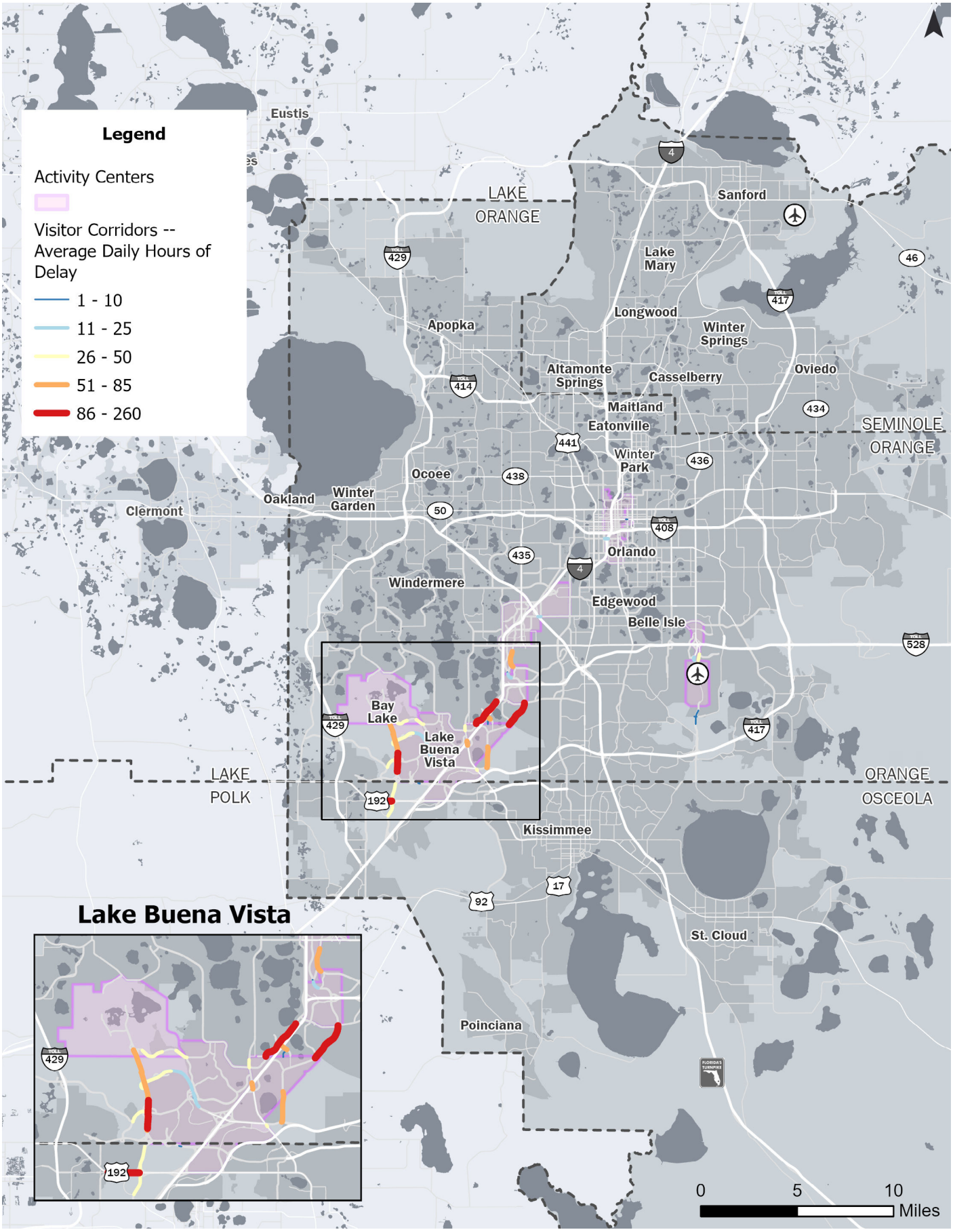
DELAY ON VISITOR CORRIDORS

Metropolitan Orlando draws millions of tourist and visitors each year. The mobility of visitors is important to their overall experience. Table 4-2 accounts for the vehicle hours of delay experienced on visitor corridors in the area based on StreetLight data. Visitor corridors are defined as roads where the majority of travel either originated or terminated in an area frequented by visitors (i.e. activity centers: attractions, theme parks, hotel clusters, airports, etc.). Table 4-2 identifies the top 20 individual visitor corridors based on hourly delay. Figure 4-3 shows where these corridors are located. The majority of delay on visitor corridors, expectedly, occurs around Disney and the other major theme parks.

Table 4–2: Average Daily Hours of Delay on Visitor Corridors

Road Name	From	To	% Visitors	Hourly Delay
World Drive	N. of Epcot Center Dr	Irio Bronson Memorial Hwy	95.6	402.2
International Drive	Central FL Pkwy	Westwood Blvd	89.2	298.9
Bronson Highway	Age Ct	World Dr overpass	66.0	243.8
Palm Parkway	Lake Street	Citrus Peak Dr	68.3	189.8
Apopka Vineland Road	Vinings Way Blvd	I-4 exit ramp	71.4	96.8
Universal Boulevard	Marriott Residence Inn	W. Perimeter Rd	66.1	85.4
Vista Boulevard	Dream Tree Blvd	World Drive	90.2	75.1
Epcot Center Drive	World Drive	E. Buena Vista exit	98.1	71.9
Daryl Carter Parkway	Palm Pkwy	Regency Village Dr	62.6	63.9
West Buena Vista Drive	Western Way	World Drive	61.8	48.2
Kissimmee Vineland Road	Griffin Rd	EB Osceola Pkwy Off-ramp	96.5	40.1
International Drive	Orange County Convention Cte	Exhibit Dr	96.4	24.7
Gore Street	I-4 on-ramp	S. Division Ave	62.9	14.9
Epcot Center Drive Ramp	World Drive overpass	Southbound World Dr	65.7	13.8
Jeff Fuqua Boulevard	Cargo Rd	Runway overpass	71.4	11.8
Magic Kingdon Ramp	World Drive	Vista Blvd exit ramp	85.1	9.6
International Drive	World Center Dr	1/2 mile south of Little Lake Bryan Pkwy	78.6	8.2
Regency Village Drive	Lake Street	Daryl Carter Pkwy	77.7	7.6
Robinson Street	N Eola Dr	N Summerlin Ave	61.4	6.7
Oak Ridge Road	Millenia Blvd	Turnpike overpass	66.4	2.9

Figure 4–3: Average Daily Hours of Delay on Visitor Corridors



(Source: Streetlight Connected Vehicle Data, 2022)

4.7 UPDATED PERFORMANCE MEASURES

Multiple updates were made to the performance measures captured in the 2050 CMP that differ from the performance measures reported in the 2045 CMP. Table 4-3 captures all the measures reported in the 2045 and 2050 Congestion Management Processes. Within the table are explanations for the addition of the new measures and discontinuation of the 2045 measures that are no longer reported.

Table 4–3: Changes in Measures from Previous CMP

	Measure	Reported in 2045 CMP	Reported in 2050 CMP	Notes
SAFETY	All fatal crashes and crash rate	Yes	Yes	Fatal and Incapacitating injury crashes reported jointly in 2050 CMP. Crash rates not reported by severity
	All incapacitating injury crashes and crash rate	Yes	Yes	Fatal and Incapacitating injury crashes reported jointly in 2050 CMP. Crash rates not reported by severity
	Bicycle fatal crashes	Yes	Yes	Measure reported in both
	Bicycle incapacitating injury crashes	Yes	Yes	Measure reported in both
	Pedestrian fatal crashes	Yes	Yes	Measure reported in both
	Pedestrian incapacitating injury crashes	Yes	Yes	Measure reported in both
	Average emergency response time	Yes	Yes	Same in each CMP
	Average crash/incident clearance time	Yes	Yes	Same in each CMP
	Speeding related crashes	No	Yes	New measure for 2050 CMP; this measure provides more specificity to the types of crashes occurring
RELIABILITY	Percent of interstate roadways providing reliable travel times	Yes	Yes	Same in each CMP
	Percent of non-interstate roadways providing reliable travel times	Yes	Yes	Same in each CMP
	Percent of system miles actively monitored and managed	Yes	Yes	Measure reported in both
	Annual vehicle hours of delay (per capita)	Yes	Yes	Measure reported in both
	Percent of transit system meeting on-time performance standard	Yes	Yes	Measure reported in both
	Percentage of TIP funding spent on TSM&O projects	Yes	No	Removed because the year over year change is not significant
	Percent of system with connected signals	No	Yes	New measure for 2050 CMP; this measure is an indicator of improved arterial operations
	Percent of speed limit achieved by drivers	No	Yes	New measure for 2050 CMP; This measure accounts for congestion

	Measure	Reported in 2045 CMP	Reported in 2050 CMP	Notes
CONNECTIVITY	Annual trips using shared micromobility	Yes	No	Micromobility has not yet proven to be an alternative mode for commuting it has little impact on congestion
	Average fixed-route transit frequency	Yes	Yes	Same in each CMP
	Percent of fixed-route transit ridership on: <15-minutes, 16-30 minutes, 31-59 minutes, >60 minutes routes	Yes	Yes	Same in each CMP
	Percent of population within ½ mile of 30-minute or 15-minute transit frequency	Yes	Yes	Same in each CMP
	Percent of jobs within ½ mile of 30-minute or 15- minute transit frequency	Yes	Yes	Same in each CMP
	Percentage of population/acreage with access to essential services within a 10-minute walk/bicycle Ride	Yes	Yes	Same in each CMP
	Daily VMT per capita	Yes	Yes	Same in each CMP
	Annual passenger miles	Yes	No	Annual unlinked passenger trips is the primary indicator for transit use
	Annual unlinked trips	Yes	Yes	Same in each CMP
	Average weekday unlinked trips	Yes	No	Annual unlinked passenger trips is the primary indicator for transit use
	Average weekend unlinked trips	Yes	No	Annual unlinked passenger trips is the primary indicator for transit use
COMMUNITY	Percent of commutes that are non-single occupant vehicle (SOV)	Yes	Yes	Same in each CMP
	Percentage of TMA/SU funds Allocated for projects that support the MetroPlan Orlando Board Emphasis Areas	Yes	No	MetroPlan Orlando is no longer tracking spending by Board Emphasis Area
	Average annual Air Quality Index	Yes	Yes	Same in each CMP
	Annual vehicle hours of delay and associated cost per capita (for personal travel)	Yes	No	The delay experienced provides an indication of congestion, not the associated costs
	Rates of asthma, obesity and diabetes	No	Yes	New measure for 2050 CMP; this measure accounts for the impacts of congestion and idling vehicles
	Percent of network with active transportation facilities	No	Yes	New measure for 2050 CMP; this measure accounts for multimodal alternatives
PROSPERITY	Percent of regional visitor emphasis corridors providing reliable travel times	Yes	No	Replaced by "Annual hours of delay on visitor corridors" measure. Delay a better indicator of visitor experience than reliability
	Truck travel time reliability index	Yes	Yes	Measure moved from Reliability goal area (2045) to Prosperity goal area (2050)
	Median commute travel time	No	Yes	New measure for 2050 CMP; this measure accounts for congestion
	Annual hours of delay on visitor corridors	No	Yes	New measure for 2050 CMP

4.8 DATA COLLECTION

The key to effective transportation decision making is accurate and reliable transportation data. Gathering data to monitor system performance is the element of the CMP that requires the largest number of resources and staff time for MetroPlan Orlando and its planning partners.

Nearly all the CMP performance measures have available data that is reported routinely. MetroPlan Orlando staff will periodically monitor when new data becomes available for each of the performance measures described in the previous section. As new data becomes available, MetroPlan Orlando staff will update "Performance Scorecards" that will be used to provide a visual snapshot of how congestion is impacting key performance measures over time. The intent is for the scorecard to indicate if the region is moving in the right direction with respect to system performance.

It is essential to devise a mechanism for collecting the data needed to quantify the performance measures listed in the CMP and to track congestion and system performance over time. A detailed data collection plan that identifies specific elements such as type, frequency of data collection, responsibilities, analysis techniques, and performance reporting is important for a CMP. The performance measures background information reported in the previous section identifies the specific data sources, and reporting periods for the MetroPlan Orlando CMP. In general, the data types include:

- Roadway characteristics data
- Traffic volume counts
- Speed and travel time data
- ITS and operations data
- Private sector cellular data
- Transit data
- Bicycle/pedestrian data
- Crash data
- Travel survey data
- Environmental data
- Cost of congestion data
- Micromobility data
- Land use data
- Funding data

The collection techniques vary by data source. MetroPlan Orlando staff coordinate and compile the data from various sources and transportation partners. Most data is reported annually, while some of the measures are reported monthly. MetroPlan Orlando coordinates with these transportation partners that collect their own data: FDOT, SunRail, LYNX, University of Florida, and local governments.

5. Identified Strategies

The CMP is supported through the identification and development of various strategies to improve operations. These strategies are targeted to alleviate existing operational issues, separate from the MPO's planning process that addresses future mobility needs. The planning process is carried out in phases where the time elapsed from the planning phase through the construction phase could take 10 years or more. Projects identified through the CMP are intended to be implemented in less than half that time. These projects could be completed within a year or two of the project's initial execution.

Aside from the strategies identified in the CMP, newer approaches and remedies may exist but are reliant on further study that could identify a winning strategy for inclusion in a future CMP update. An example of a possible future study is the impact of the pedestrian call activation on a signal system with coordinated green cycles.

5.1 STRATEGIES IMPLEMENTED SINCE 2045 CMP

The 2045 CMP identified strategies in three broad categories in order to reduce recurring and non-recurring congestion in the region. This section will summarize those strategies that have been implemented, that are in progress, or that are programmed for implementation.

STRATEGIES THAT IMPROVE SAFETY

Several of the safety-related strategies identified in the 2045 CMP were pursued since plan adoption including developing a Vision Zero Safety Action Plan for the region along with individual action plans for each jurisdiction. The region also continued to support traffic incident management strategies like road user notifications, the Road Rangers program, and utilizing integrated corridor management (ICM) to manage nonrecurring congestion.

STRATEGIES THAT OPTIMIZE SYSTEM CAPACITY

Several strategies have been implemented to improve capacity while utilizing existing infrastructure since the 2045 plan adoption. FDOT implemented managed lanes along I-4 and added auxiliary lanes along I-4 near the Champions gate area. Maintaining agencies continue to add fiber and utilize signal retiming, which allows staff to actively monitor operations and periodically make adjustments to manage congestion along key corridors.

STUDIES THAT SHIFT SOV TRIPS TO OTHER MODES

Strategies in this category focus on TDM strategies, improving transit operations and information sharing, and adapting existing roads to better accommodate all users safely. More work remains to be done for all strategies identified in this area. MetroPlan Orlando will begin a TDM Strategic plan in fiscal year 2025 that will provide recommendations for specific strategies. Additionally, coordination continues with local partners through the long range planning process to fund projects that will improve the user experience for all modes.

The strategies identified in the next section take into consideration those projects and strategies that are underway and expands on them to develop a holistic toolbox of options that are recommended for implementation to benefit immediate operational needs and to support safe and efficient operations within the region moving forward

5.2 CONGESTION MANAGEMENT STRATEGY TOOLBOX

Solutions for congestion at an intersection or along a corridor must be tailored to the causes of that congestion and the context of the surrounding area. The traditional approach has been to increase roadway capacity by adding a lane, but expanding a roadway comes with costs for planning, design, right-of-way acquisition, and construction. TSM&O strategies, on the other hand, can help mitigate congestion with significantly lower costs and faster installation times. Some TSM&O strategies aim to alter travel behavior while others improve the efficiency of the existing infrastructure.

This toolbox identifies strategies that provide connectivity, data collection, or mobility remedies for arterials and limited access facilities. Table 5-1 provides a summary of the strategies:

Table 5–1: Summary of Congestion Management Strategies

Demand Management	
■ Create a Transportation Demand Management (TDM) Strategic Plan ■ Magnify TDM strategies ■ Adapt roads to accommodate all users ■ Improve local street connectivity/accessibility	■ Support LYNX/SunRail projects to optimize route structure, service hours, and frequency ■ Incorporate TSP on corridors with high transit ridership ■ Active parking management
System Communication	
■ Continue connecting intersections with each other and the traffic management center ■ Promote interagency communications/ interoperability	■ Support Traffic Signal Coordination/Active Arterial Management
Information Collection	
■ Expand the actively monitored system ■ Set aside funding for data purchases to support decision-making	■ Support deployment of instruments to collect data (speed/volume/queuing/etc) ■ Adopt systems to provide consistent reporting
Arterial Management	
■ Evaluate special use lanes ■ Continue to support signal retiming ■ Assess feasibility of reversible lanes ■ Reduce access (conflict) points	■ Consider alternative intersection geometry ■ Expand ICM program ■ Develop consistent curb management ■ Support deployment of adaptive signal control
Interstates and Expressway Management	
■ Assess feasibility of ramp metering ■ Implement congestion pricing ■ Expand installation of advanced warning signs ■ Study part-time shoulder use	■ Program interchange improvements ■ Adopt variable speed limits ■ Increase reliability of key truck routes ■ Promote work zone management
Safety	
■ Implement Vision Zero Action Plan ■ Intersection collision avoidance ■ Continue to support Road Rangers service	■ Continue to utilize ICM to redirect traffic for major incidents ■ On-board units and roadside units

MetroPlan Orlando has staff whose role is to manage the collection of data to allow for monitoring changes in the various performance measures, determine the impacts on congestion levels throughout the region, and report on the effectiveness of implemented strategies over time.

5.2.1 TRANSPORTATION DEMAND MANAGEMENT

Demand management is an effective congestion management strategy because it focuses on reducing the number of vehicles on the road, rather than simply trying to accommodate more cars. By influencing travel behavior and providing alternatives, it can significantly alleviate traffic congestion.

Strategies that shift SOV trips to other modes can have a real impact on congestion levels on area roadways if the shift is significant enough. The strategies recommended within this category focus on how programs and projects can increase the likelihood that residents and visitors in the region will take full advantage of the region's multimodal system (or technology) to gain access to jobs, recreation, and essential services. Many of the strategies will support the Connectivity goal area.

Create a Transportation Demand Management Strategic Plan

The Strategic Plan should include background on current conditions and future plans. Goals, objectives, and indicators should be established in the plan. A toolbox that includes specific transportation demand management (TDM) strategies should be included to achieve the plan's goals. The potential application of the TDM toolbox strategies should be specific to the region.

Magnify TDM Strategies

MetroPlan Orlando has an opportunity to play an important role in planning for TDM at the regional level. By encompassing a wide variety of local jurisdictions, MPOs can take a more "holistic" view of TDM and are able to steer valuable resources to TDM initiatives in the form of federal funding for support, implementation, and operation of a variety of TDM programs. Since MetroPlan Orlando is designated as a TMA, the agency must consider TDM strategies as part of the federally mandated Congestion Management Process. FDOT's reThink Your Commute Program leads TDM planning and associated activities in Central Florida. It is recommended that MetroPlan Orlando collaborate with local partners to pursue the following three levels of advancement in the TDM space, advancing from Level 1 to 3 in TDM planning as an MPO over time:

- **Level 1:** Develop a TDM-specific strategic plan to help guide long-term and short-range initiatives. Planning should be coordinated at the local, regional and state levels and address first/last-mile options, vanpool, carpool, and telecommuting.
- **Level 2:** To further refine TDM-related initiatives, the standing TAC and TSM&O committees should be engaged to help guide the overall planning process related to TDM and build awareness and motivation among member jurisdictions that have not pursued TDM.
- **Level 3:** Articulate regional TDM goals by (1) recommending TDM activities to meet these goals, (2) developing metrics to evaluate project-specific and system wide performance, and (3) setting aside funding for TDM initiatives guiding investments in TDM activities.

Adapt Roads to Accommodate All Users

Visitors and residents are more likely to pursue a variety of mode options if they feel they will be accommodated in a safe, convenient and comfortable manner when pursuing non-SOV modes. It is incumbent on transportation professionals to plan, design, operate and maintain streets that will provide a high-quality and safe trip on a variety of modes. It is recommended that planning efforts prioritize implementation of improvements that are in support of the MetroPlan Orlando Complete Streets policy and Active Transportation Plan, and that will provide a high level of access, comfort, and safety for all users of all ages and abilities regardless of their mode of transportation.

Improve Local Street Connectivity/Accessibility

Improving local street connectivity, and in turn accessibility, to essential services will increase the probability of travelers to consider using active transportation or transit to complete their trips. Better access increases convenience, and potentially safety and comfort. Strategies may include adding to the roadway network, adding sidewalks or bicycle lanes, or various transit enhancements to improve accessibility.

Support LYNX/SunRail Optimization Projects

Strategies recommended in this category are intended to encourage mode shift toward public transportation options by improving the user experience with respect to access, efficiency and/or convenience.

- Support LYNX and SunRail planned projects that optimize route structure, service hours and/or frequency.
- Utilize technology to enhance the transit experience. It is recommended that technology deployments are evaluated and/or implemented to enhance operations and to broaden the appeal for transit.

Incorporate TSP on Corridors with High Transit Ridership

Decreasing transit travel times makes transit a more viable option for choice riders. By prioritizing transit vehicles, transit riders can reach their destinations faster, increasing their overall satisfaction with the transportation system. TSP can help alleviate traffic congestion, making it easier for those on transit and persons in vehicles to get around. Faster transit often leads to reduced emissions, creating a healthier environment.

Implement Active Parking Management

Provides travelers with real-time parking information including number of available parking spaces and routes to open spaces. The lack of parking may persuade some to use an alternative transportation mode. Implementing this strategy would improve mobility (travel time and travel time reliability) and system efficiency.

5.2.2 SYSTEM COMMUNICATION

Connectivity is key to any TSM&O strategy. Whether data collection or real time monitoring, devices need to be connected to one another or a central monitoring system such as traffic monitoring center.

Continue Connecting Intersections with Each Other and the Traffic Management Center

Traffic signal interconnection or traffic signal communication allows for signals to synchronize with one another through fiber, copper, or wireless communications. Typically, when signals are connected through a system operated by the TMC, changes in one intersection's signal timing should change other connected intersections signal timing. Progression amongst vehicles is improved when vehicles are able to arrive at consecutive green phases. This improves travel times and throughput on arterials in the three-county region.

Promote interagency communications/interoperability

Interoperability will require bringing together different systems, networks, and organizations to communicate and share information seamlessly. Agencies within MetroPlan Orlando's service area should collaborate on data sharing and standardize data protocols. This standardization should be for the purpose of allowing the traffic management systems to communicate more effectively. This can make operations of the roadway more seamless amongst the cities, counties, and FDOT.

Support Traffic Signal Coordination/Active Arterial Management

Arterial management systems gather real time data. The data is piped into a system to manage traffic signals. Archived data is used to inform arterial management, access management, and signal design. This data can be used to adjust signal timing to lessen the percent of vehicles arriving on red phases and increase the number of vehicles arriving on the green phases.

5.2.3 INFORMATION COLLECTION

Data collection is important because it provides practitioners and decision-makers with the data they need to make recommendations. Collected data can include information on speeds, lane occupancy, queue lengths, and volumes.

Big data plays an important role in a "smart" city or region. Data measuring traffic congestion can be used by transportation planners and public agencies to identify problems, propose countermeasures, assess improvements and develop policies. Transportation professionals can process data from IoT ("Internet of Things") devices and sensors to recognize patterns and needs. The analysis capabilities afforded by the presence of meaningful data stores can reduce the number of road crashes and congestion, help mitigate for incidents that do occur, and help drivers find a parking spot, among other use cases. It is recommended that the region leverage data collection and monitoring to advance "smart" technology and find innovative solutions to some of the region's most pressing challenges.

Expand the Actively Monitored System

Active management of the transportation system is already a priority in the region, with 35% of system miles that are actively monitored or managed. This includes: those with fiber in place; those with coordinated or interconnected signals; those with CCTVs, Bluetooth devices, DMS, electronic display signs, or MVDS in place; and those that are included within the Integrated Corridor Management (ICM) system being managed by FDOT. Expanding the actively monitored system will support various other recommended strategies and continue to integrate technology to improve the flow of vehicle traffic and improve safety.

Deploy Instruments to Collect Data

Traffic detectors collect data about current conditions and can provide counts (vehicles, bikes, and pedestrians), measure speed, detect parking availability, and monitor near miss collisions. This data provides insights about mobility and safety conditions and can be used to inform operational and long-term planning in the region.

Purchase Data
Set aside funding for data purchases to support decision-making. This can include one-time purchases as well as subscription based services. It supplements data actively gathered by instruments that have been deployed in the field.

Adopt Systems to Provide Consistent Reporting
Agencies in the region responsible for traffic operations can benefit from a singular reporting system that informs roadway conditions within their jurisdiction. Data from these agencies can be collected and used to provide information through online reporting, recurring updates, or dashboards. Staff at the respective agencies can use this information in their decision-making.

5.2.4 ARTERIAL MANAGEMENT

Arterial management plays a crucial role in lessening congestion by optimizing traffic flow on major roads. The vast majority of congestion experienced on arterials is due to signalized intersections. Arterial mobility remedies help mitigate congestion by dynamically adjusting signals or retrofitting the arterial geometry.

Evaluate Special Use Lanes
A special use lane on an arterial roadway is a designated lane with a specific purpose other than general traffic flow. By segregating different types of traffic, special use lanes can reduce congestion and improve travel times. These can include lanes that allow for only buses or lanes that allow for only buses and bicyclists. These deployments are most effective on corridors where non-automobile travel is prioritized.

Continue to Support Signal Retiming
Signal retiming along corridors is a relatively low-cost TSM&O strategy that typically results in measurable benefits. Regular signal retiming helps improve traffic flow and account for changes in traffic patterns. MetroPlan Orlando has consistently ranked retiming and coordinating traffic signals as a top priority to mitigate traffic congestion, enhance intersection capacity, make roadways more efficient, and improve air quality and safety.

Assess Feasibility of Reversible Lanes
Lane control signals indicate if a travel lane can be used for directional travel. Signals are installed over a lane and are typically used for reversible lane control. This strategy is most effective where an odd number of lanes exist, or there is a presence of an extended undivided median. Possible candidates to study reversible lane implementation are US 441 from south of the Country Club of Orlando to SR 408 and South Orange Ave from Gore Street to Michigan Street.

Reduce Access Points
Proper access management can limit conflict points and lessen the likelihood of collisions while improving mobility. Driveways, for new development, should be consolidated to provide fewer opportunities for drivers to enter and exit parking facilities. Business and other dwellings should share surface lots, entrances and exits onto the arterial.

Support Alternative Intersection Geometry
Geometric improvements can increase the traffic flow through an intersection and should be evaluated for potential implementation along arterials to improve travel time reliability and/or safety. These types of upgrades may include additional turning lanes, protected turns, turn restrictions, lane widening, implementing alternative intersection geometry configurations, and other methods of improving the intersection's capacity.

Develop Consistent Curb Management
Curb space is a highly coveted resource, contested by a range of users including drivers parking vehicles, bicyclists, pedestrians, street vendors, and transportation network companies (TNCs) like Uber or Lyft handling pick-ups and drop-offs, as well as delivery vehicles. To address this competition effectively, it is advisable for the region to focus on curb management planning. This will enable updates to curb use strategies on a minute-by-minute basis. In downtown and urban areas, implementing a comprehensive curb management strategy can significantly alleviate local street congestion.

Support Employment of Adaptive Signal Control
Adaptive signal control technologies adjusts the timing of red, yellow, and green lights to accommodate changing traffic patterns and ease congestion. Signals adjust to real time conditions. When adaptive signal control is used in an arterial management system, multiple signals can adjust simultaneously.

5.2.5 INTERSTATE AND EXPRESSWAY MANAGEMENT

The over-riding objectives of freeway management programs include minimizing congestion (and its side effects), improving safety, and enhancing overall mobility. Its effectiveness is reliant on the implementation of policies, strategies, and technologies to improve performance of limited access facilities.

Assess Feasibility of Ramp Metering

Ramp metering is a potential tool to address recurring congestion and safety issues. Ramp meters are traffic signals installed on freeway on-ramps to reduce overall freeway congestion by managing the amount of traffic entering the freeway and by breaking up platoons that make merging onto the freeway difficult. The signal timing at ramp metered locations can be adjusted based on traffic volume and speed at any given time. Potential benefits of ramp metering include reducing crashes, breaking up platoons, and increasing vehicle throughput in a cost effective manner.

Implement Congestion Pricing

Congestion pricing is a system where drivers are charged a fee to use an expressway, typically during peak travel times. The goal is to reduce traffic congestion by incentivizing drivers to use alternative routes or allowing travelers to pay for lower travel times. This can be achieved through variable tolls, raising toll prices in the peak period and lowering tolls during the off-peak period. In the case of I-4, managed lanes were constructed within the median and are operated as express lanes. The I-4 express lanes mitigate congestion through static tolling. As demand for the express lanes increases, the operators could adopt variable tolling to lessen the demand.

Expand Installation of Advanced Warning Signs

Dynamic message signs are portable or permanently installed signs that provide real time information to travelers about things like travel times, speed limits, and observed speeds. The messages could be updated on the fly from the regional traffic monitoring center. Corridors that facilitate commutes, (e.g. SR 50, US 17, and John Young Parkway) can be evaluated for the installation of additional warning signs.

Adopt Variable Speed Limits

Variable Speed Limits (VSLs) are dynamic speed limits that adjust in real-time based on traffic conditions. This technology plays a crucial role in managing congestion by smoothing traffic flow. VSLs help prevent sudden braking and accelerating, which can cause traffic to bunch up and create congestion. By gradually reducing speeds as traffic builds, VSLs maintain a more consistent flow.

Program Interchange Improvements

Interchange improvements and/or auxiliary lanes are options that should be evaluated where traffic demand overwhelms available capacity at an interchange or along a freeway corridor, particularly where recurring localized bottlenecks are predictable in cause, location, time of day, and approximate duration. Common locations of bottlenecks include places where the number of lanes decreases, at ramp junctions and interchanges, and where there are roadway alignment changes.

Increase Reliability of Key Truck Routes

As Florida's population grows and freight movement adapts to evolving commercial and consumer demands, it is crucial for freight vehicles to stay on schedule and access local drop-off points safely and efficiently, supporting a complex and resilient supply chain. Enhancing freeway strategies to improve reliability can significantly benefit freight travel in the region. Along roadways where there is heavy truck travel, projects can be prioritized that boost reliability.

Study Part Time Shoulder User

Part time shoulder use (PTSU) is a dynamic strategy intended to temporarily increase roadway capacity when vehicle volumes peak. In this strategy the shoulder is used during peak periods to accommodate through traffic. The shoulder is operated at a speed that is typically lower than the posted speed limit for the freeway, through its utilization more capacity is provided on the facility.

PTSU can assist in postponing the start of congestion. Through encouraging more uniform speeds and increasing capacity, traffic flows more efficiently and smoothly, which can improve travel time reliability. Another benefit of PTSU is increased vehicle volume by temporarily increasing capacity. Since buses are permitted to bypass congestion on primary route corridors, transit service can become more reliable.

Promote Work Zone Management

This involves the management of traffic during construction to reduce delays, maintain safety for motorists and workers, and maintain access for businesses and residents all while completing construction in a timely manner. Work zone management strategies are developed based on project needs, constraints, construction phases, and anticipated traffic impacts. Implementing this strategy would improve safety (crashes and secondary crashes) and mobility (travel time, travel time reliability, and throughput).

5.2.6 SAFETY

Implementing strategies that improve safety will support the Safety objectives developed for both the CMP and for Metroplan Orlando's long-term planning as documented in the 2050 MTP. These strategies also target non-recurring congestion by seeking to reduce traffic incidents and crashes. Recommended strategies include:

Implement Regional and Local Vision Zero Action Plans

Prioritize initiatives and projects from the Vision Zero Safety Action Plan that focus on improving safety for all system users in support of a Vision Zero approach. Vision Zero states that no loss of life or incapacitating injury due to traffic crashes is acceptable. MetroPlan Orlando should advance prioritized projects that follow the tenets of the Safe Systems approach.

Install Intersection Collision Avoidance

As the name implies, intersection collision avoidance aims to reduce the number of crashes at intersections. This involves the use of gap detection, dilemma zone detectors, advance red signal ahead warning flashers, pedestrian/bicyclist detection, and other technologies. Vehicle-to-vehicle (V2V) and Vehicle-to-infrastructure (V2I) communication is anticipated to help aide crash reduction in the future.

Expand Integrated Corridor Management

ICM focuses on optimizing the use of existing infrastructure along corridors (treating each corridor as an entire system). The use of ICM helps maximize capacity of all modes along a corridor using traffic incident management (including use of incident response vehicles), work zone management, signal timings, express lanes, real-time traffic data, and active arterial management. It is recommended that the program continue to be a priority with expansions as appropriate – to include additional arterial corridors and to manage traffic during a variety of incident and event types. Implementing this strategy would improve safety (crashes and secondary crashes), mobility (travel time and travel time reliability), and system efficiency.

6. Evaluation Plan

MetroPlan Orlando will track progress towards the CMP's targets via a Congestion Management Scorecard (see Section 6.1) that is updated and published twice per year, and on an annual basis through the development of a Congestion Management Update memo that provides a "state of the system" summary of how the measures in Table 6-1 have trended over the preceding year. All measures captured in Table 6-1 are eligible for recurring annual monitoring.

FHWA's guidelines call for CMPs to include provisions to monitor the performance of strategies implemented to address congestion. The eighth step of the CMP cycle calls for the monitoring of strategy effectiveness in alleviating congestion on the system. At identified locations where strategies are deployed, MetroPlan Orlando may conduct before and after studies. Through such studies MetroPlan Orlando will be able to assess a strategy's effectiveness.

MetroPlan Orlando will track the performance of each measure annually by accessing reliable data sources and applying consistent methodologies. The annual Congestion Management Update will summarize the direction each indicator is trending in, summarize takeaways from the scorecard, and report findings for any before and after studies completed for projects related to the congestion management strategies noted in Section 5.

Table 6–1: 2050 CMP Targets

Goal	Objectives	Performance Measures	2029 Target
SAFETY	Eliminate deaths and serious injuries on the transportation system	Number of bike and pedestrian fatal crashes	0
		Number of fatal and serious injury crashes	0
		Speeding related crashes	0
		Crash rates	0
	Improve incident clearance times	Average incident clearance time	45 minutes
		Average incident response times	4 minutes
CONNECTIVITY	Increase accessibility for non-drivers	% Population within ½ mile of frequent transit	33%
		% Jobs within ½ mile of frequent transit	50%
	Improve connectivity to key destinations	Daily VMT, per capita	28.2
		% Transit Ridership, by headway	75% 30 minute headways
		% Population within a 10-minute walk/bike ride of essential services	20% walk 50% bike
	Expand bicycle, transit, and pedestrian infrastructure	Annual unlinked trips	20,000,000 LYNX 1,000,000 SunRail
		% of Network with active transportation facilities	90% pedestrian 75% bicycle
RELIABILITY	Improve travel time reliability	% of Reliable interstate miles	>70%
		% of Reliable non-interstate miles	>65%
		% of Speed limit achieved by drivers	85%
	Promote projects that improve reliability	% System connected with fiber	40%
		% of system with connected signals	95%
	Provide travelers with more predictable travel times	Transit on-time performance	90%
COMMUNITY	Maintain Air Quality	Air quality index	<45
		Rates of asthma, obesity and diabetes	<8% asthma < 30% obesity < 10% diabetes
	Decrease reliance on single occupancy vehicles	% of commutes using non-SOV modes	33%
		% of Network with active transportation facilities	90% pedestrian 75% bike
PROSPERITY	Improve reliability for shippers, goods, and commerce	Truck travel time reliability	<2.00
	Enhance mobility on key tourist corridors	Delay on visitor corridors	1,800 hours
	Increase access to jobs, with emphasis on essential service workers	Median commute time	28 minutes
		Annual delay per capita	<11.0 hours

6.1 CMP PERFORMANCE SCORECARD

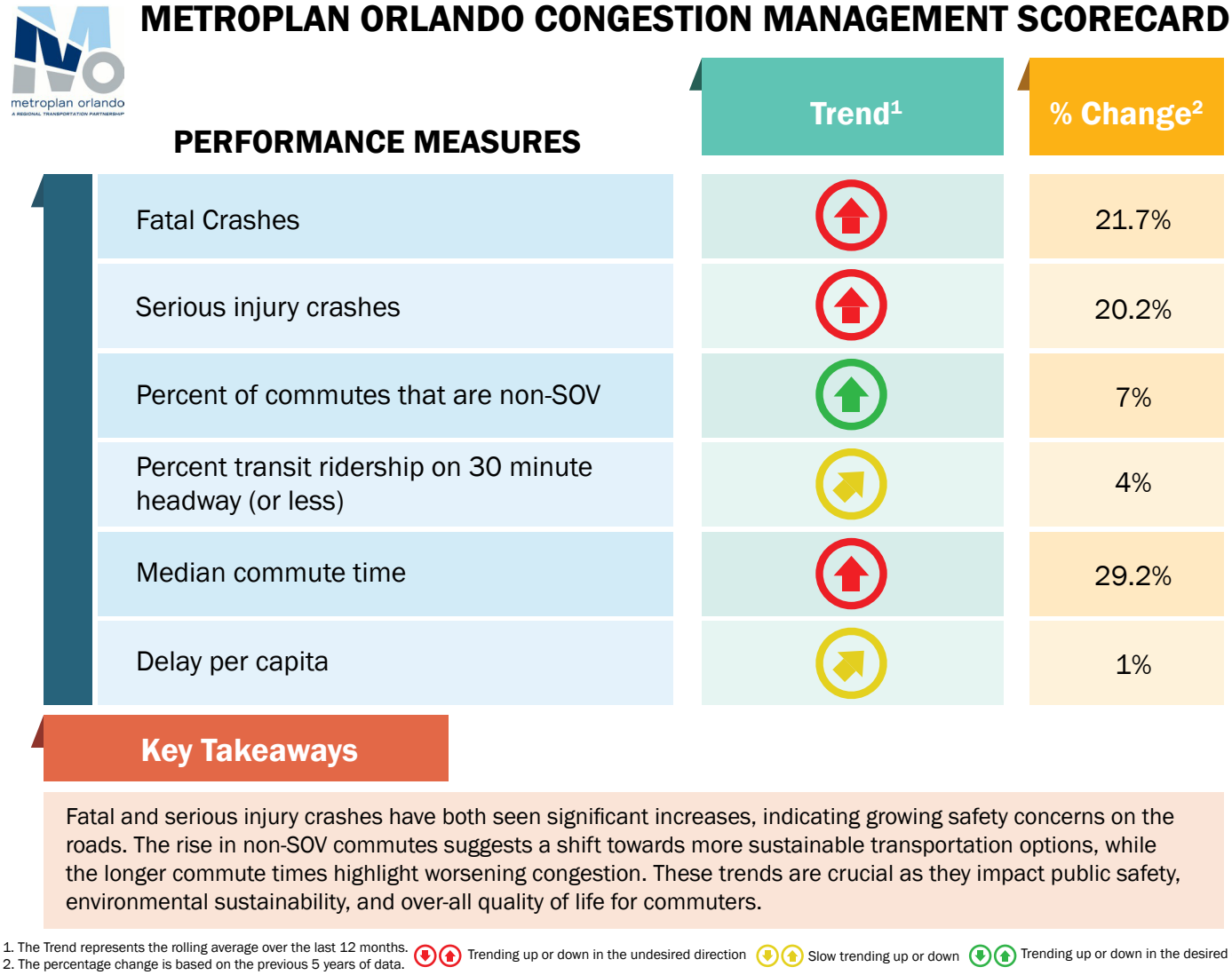
MetroPlan Orlando will develop a CMP Performance Scorecard to monitor and manage progress. Performance scorecards will be updated semiannually to provide an illustration of the progress the region has made toward achieving targets noted in Table 6-1. Several agencies throughout the country use an online, easily accessible, and trackable approach. Some agencies provide this information in the form of dashboards with monthly and even daily refresh rates.

MetroPlan Orlando staff will make the latest performance scorecards available on the agency website and will also include them in Board and Advisory Committee agenda packets to keep local staff and decision-makers informed about progress. Figure 6-1 shows a sample CMP Performance Scorecard for the Safety and Security goal area.

On a semiannual basis, MetroPlan Orlando will compile and analyze all available new data and use the findings of this analysis to update the CMP Performance Scorecard (see example scorecard, Figure 6-1) to provide a snapshot in time of system performance with respect to both measures that impact congestion (crashes, VMT) and those that are impacted by congestion (reliability, delay). and note progress towards the targets for each measure. For those measures where data is available less frequently, the data from the previous reporting period will stand until new data is available.

Every five years, the entire CMP will be reevaluated to determine appropriate adjustments to the various components including the goals and objectives, performance measures, data availability, targets, and recommended strategies.

Figure 6–1: Example Performance Scorecard



APPENDIX

APPENDIX

The 30 corridors on the HIN that received the Safety Score on a per mile basis is summarized in Table A-1. The Safety Score is calculated based on the total number of crashes, the highest level of injury sustained in each crash, and the travel mode of victims. Crashes that result in death or severe injury or include a person outside a vehicle have different factors applied.

Table A–1: MPO Network HIN Corridors

Road Name	From	To	K count	KSI count	Bike KSI	Ped KSI	Motorcycle KSI	Safety Score
John Young Parkway	SR 50	Orange Center Blvd.	12	38	0	10	3	17,478
Sand Lake Road/ McCoy Road	Turkey Lake Rd.	University Blvd.	0	20	0	2	0	17,104
Chickasaw Trail	Frontage Rd.	Lake Underhill Rd.	3	12	0	0	2	14,589
Hiawassee Road	SR 438/Silver Star Rd.	SR 50	4	38	1	11	1	14,547
Oak Ridge Road	Millenia Blvd.	S. Orange Blossom Trail	9	53	5	13	5	14,296
Kirkman Road (SR 435)	SR 50	Raleigh St.	5	36	3	5	4	14,130
S Goldenrod Road (SR 551)	SR 50	Lake Underhill Rd.	7	45	2	3	9	14,129
S Semoran Boulevard (SR 436)	Lee Vista Rd.	TG Lee Blvd.	4	14	0	3	1	14,088
Pine Hills Road	SR 50	Old Winter Garden Rd.	2	21	2	1	0	13,941
Alafaya Trail	SR 50	Lake Underhill Rd.	1	29	0	8	1	13,564
S Kirkman Road (SR 435)	LB McLeod Rd.	Major Blvd.	8	35	0	11	6	13,466
Colonial Drive (SR 50)	Orange Blossom Trail N.	N Bumby Ave.	11	39	0	8	6	13,415
North Lane	Westgate Rd.	N Pine Hills Rd.	1	11	0	3	1	12,946
Hiawassee Road	SR 50	Old Winter Garden Rd.	3	21	0	3	0	12,344
Alafaya Trail (SR 434)	McCulloch Rd.	SR 50	3	58	1	11	6	12,284
Oak Ridge Road (CR 506)	S. Orange Blossom Trail	Orange Ave S.	6	29	2	6	5	12,054
Lee Road	N. Orange Blossom Trail	N. Wymore Rd.	5	35	1	8	8	11,972
University Boulevard	SR 436	Lake Mirage Blvd.	1	24	5	2	4	11,938
Rosalind Avenue	E. Livingston St.	S. Lucerne Cir.	1	12	1	5	3	11,526
S Semoran Boulevard (SR 436)	Lake Underhill Rd.	Lake Margaret Dr.	5	26	1	12	2	11,419
W Irlo Bronson Memorial Highway	Celebration Ave.	Four Winds Blvd.	18	69	4	18	17	11,347

Note: SI = serious injury crash, K = fatal crash, KSI = fatal or serious injury crash

Road Name	From	To	K count	KSI count	Bike KSI	Ped KSI	Motorcycle KSI	Safety Score
W Irlo Bronson Memorial Highway	Celebration Ave.	Four Winds Blvd.	18	69	4	18	17	11,347
S Goldenrod Road (SR 551)	Lake Underhill Rd.	Beatty Dr.	14	80	6	6	7	11,182
N Ronald Regan Boulevard	Eldersprings Cir.	Jones Ave.	3	14	0	3	4	10,951
W First Street (US 17/92)	N. Persimmon Ave.	N. Frence Ave.	3	12	1	5	3	10,856
Edgewater Drive/Highland Avenue	Clarcona Ocoee Rd.	Lee Rd.	0	21	1	5	2	10,652
Conway Road	Curry Ford Rd.	E. Michigan St.	5	9	0	1	3	10,570
Pershing Avenue	Woodgate Blvd.	Goldenrod Rd. S.	3	10	2	1	2	10,554
John Young Parkway	SR 528 Ramps	Lazio Ln.	4	20	0	0	1	10,510
East Lake Mary Boulevard	North of Celery Ave.	SR 46	4	12	0	0	8	10,477
Poinciana Boulevard	US 192	Siesta Lago Dr.	3	20	2	3	2	10,431
Holden Avenue	Rio Grande Ave. S.	Lake Holden Hills Dr.	1	14	1	4	0	10,402
S Orange Blossom Trail	E. Osceola Pkwy.	Ridgewood Ave.	5	20	3	2	4	10,376
US-192/Vine Street	South of Four Winds Blvd.	N. John Young Pkwy.	9	48	0	8	10	10,356
CR 435/Apopka Vineland Road	Balboa Dr.	SR 50	1	10	0	1	1	10,310
Texas Avenue	Americana Blvd.	W. Oak Ridge Rd.	0	14	3	3	0	10,255
Vineland Road	I-4	South of LBV Factory Shores Dr.	5	39	1	6	2	10,156
Orange Avenue	S. Lucerne Cir.	Gatlin Ave.	6	30	1	5	11	10,131
Orange Blossom Trail	Overland Rd.	Rosamond Dr.	3	32	2	3	2	9,988
Ivey Lane	Edgemoor St.	Raleigh St.	2	13	0	5	3	9,944
Orange Blossom Trail	Drage Dr.	S. McGee Ave.	11	33	0	16	2	9,928
Orange Blossom Trail	Lee Rd.	Shader Rd.	2	11	1	2	4	9,902

Note: SI = serious injury crash, K = fatal crash, KSI = fatal or serious injury crash

Road Name	From	To	K count	KSI count	Bike KSI	Ped KSI	Motorcycle KSI	Safety Score
Lancaster Road	S. Orange Blossom Trail	Orange Ave. S.	1	26	4	6	2	9,900
Goldenroad Road	North of Dwell Well Way	SR 50	4	38	8	2	4	9,875
John Young Parkway	LB McLeod Rd.	W. Sand Lake Rd.	10	75	2	9	4	9,873
US-17/92/ Orlando Avenue	South St.	Spartan Dr.	4	16	0	2	2	9,853
S Orange Blossom Trail	Ridgewood Ave.	Neptune Rd.	2	14	2	3	4	9,546
Conroy Road/ Americana Boulevard	West of President Barack Obama Pkwy.	S. Orange Blossom Trail	3	40	2	8	3	9,495
John Young Parkway	Deerfield Blvd.	South of Town Loop Blvd.	0	27	1	1	3	9,488
University Boulevard	Bibb Ln.	Rouse Rd.	9	58	1	5	11	9,410
W Colonial Drive/Martin Luther King Boulevard	Economic Ct.	Good Homes Rd.	8	38	1	10	1	9,406
Westmoreland Drive	SR 526	W. Gore St.	2	11	3	1	1	9,377
West 25th Street	Club Rd.	S. Mellonville Ave.	6	18	1	4	5	9,328
Osceola Parkway	N. Orange Blossom Trail	Florida's Turnpike	0	21	4	1	0	9,281
US-17/92/ Orlando Avenue/French Avenue	North of Longdale Ave.	SR 434	1	12	0	1	4	9,122
E Irlo Bronson Highway/Vine Street	Neocity Way	Pecan St.	4	22	1	6	0	9,118
Altamonte Drive	Montgomery Rd.	Palm Springs Dr.	1	13	0	3	2	9,083
Silver Star Road	Mercy Dr.	East of N. John Young Pkwy.	4	15	2	2	1	9,070
Orange Avenue	Prince St.	Spruce Ave.	4	23	4	1	4	9,055
Orange Blossom Trail	Consulate Dr.	Town Center Blvd.	14	62	3	9	5	9,038
Old Winter Garden Road	N. Hiawassee Rd.	Takoma St.	1	31	3	3	1	8,868

Note: SI = serious injury crash, K = fatal crash, KSI = fatal or serious injury crash

Road Name	From	To	K count	KSI count	Bike KSI	Ped KSI	Motorcycle KSI	Safety Score
SR 434	West of E. Lake Brantley Dr.	Oak St.	5	10	0	5	0	8,843
Fairbanks Avenue	Clay St.	Pennsylvania Ave. S.	0	11	0	2	2	8,816
Old Winter Garden Road	SR 408 Exit Ramp	Orange Blossom Trail N.	7	21	1	8	1	8,698
Aloma Avenue	West of St. Andrews Blvd.	West of Tangerine Ave.	4	21	0	5	4	8,691
SR 434	Pembrook Dr.	Edgewater Dr.	0	25	2	2	1	8,672
Michigan Avenue	E. Donegan Dr.	E. Vine St.	4	10	1	1	2	8,545
Powers Drive	Indian Hill Rd.	SR 438	1	7	0	2	3	8,540
SR 436	US 17-92	Kewannee Trl.	5	11	0	3	2	8,485
John Young Parkway	Sand Lake Rd.	South of SR 528 Ramps	6	40	0	2	0	8,451
Rio Grande Avenue	W. Gore St.	Holden Ave.	3	38	2	6	0	8,446
US-17/92/ French Avenue	W. 20th St.	W. 27th St.	7	12	1	3	1	8,421
Chickasaw Trail	SR 50	Valencia College Ln.	0	12	2	2	1	8,374
Curry Ford Road	West of Frederica Dr.	East of Excalibur Dr.	7	36	2	3	5	8,218
Orlando Avenue	Lake Ave.	W. Fairbanks Ave.	3	14	1	5	1	8,217
Buenaventura Boulevard	County Boundary	Simpson Rd.	7	32	2	1	8	8,171
Simpson Road	Harbor Town Dr.	US 192	5	10	0	5	0	8,139
Wetherbee Road	Sparrow Song Ln.	White Rd.	0	13	0	2	2	8,093
Clark Road	Orange Blossom Trail S.	Orange Ave. S.	5	28	0	3	4	8,093
Hoffner Avenue (SR 15)	Conway Rd.	Goldenrod Rd. S.	5	31	2	2	8	8,083
SR 434	S. Ronald Reagan Blvd.	US 17-92	2	12	0	3	3	8,076
Semoran Boulevard	Lake Margaret Dr.	Hoffner Ave.	4	17	0	4	3	8,053

Note: SI = serious injury crash, K = fatal crash, KSI = fatal or serious injury crash

Road Name	From	To	K count	KSI count	Bike KSI	Ped KSI	Motorcycle KSI	Safety Score
Lake Underhill Road	S. Oxalis Ave.	Econlockhatchee Trl. N.	6	35	0	2	9	7,611
Conway Road	Caitlin Ave.	Hoffner Ave.	1	12	0	2	0	7,501
Hiawassee Road	Beggs Rd.	SR 438/Silver Star Rd.	5	44	1	8	1	7,437
SR 436	Lake Howell Ln.	County Boundary	7	13	1	4	3	7,388
Colonial Drive	N. Avalon Park Blvd.	SR 520	23	70	6	10	7	7,358
Robinson Street	N. Rosalind Ave.	N. Primrose Rd.	0	14	0	3	5	7,204
John Young Parkway	West of Ham Brown Rd.	Palmetto Ave.	9	36	3	5	7	7,052
Turkey Lake Road	Toscana Blvd.	South of Hillenmeyer Way	6	25	0	3	4	6,854
Clarcona-Ocoee Road	Apopka Vineland Rd. N.	Powers Dr. N.	8	32	0	1	1	6,815
Landstar Boulevard/ Fairway Woods	Fairway Woods Blvd.	County Boundary	5	39	1	1	6	6,702
Sand Lake Road	Dr. Phillips Blvd.	Turkey Lane Rd.	0	5	0	1	0	6,682
Irlo Bronson Memorial Highway	Westside Blvd.	East of Inspiration Dr.	7	29	0	6	1	6,653
Colonial Drive	Econlock-hatchee Trl. N.	N. Avalon Park Blvd.	12	126	11	16	14	6,645
International Drive	West of Universal Blvd.	Destination Pkwy.	2	31	0	9	2	6,622
Rock Springs Road N	Faye St.	Welch Rd. E.	3	11	0	1	1	6,606
Semoran Boulevard	Sheeler Ave. S.	Bear Lake Rd.	3	27	2	5	3	6,531
Boggy Creek Road	Tradeport Dr.	E. Wetherbee Rd.	3	24	0	0	4	5,949
Narcoossee Road	Tavistock Lake Blvd.	County Boundary	4	19	1	0	4	5,777
Colonial Drive	N. Bumby Ave.	Econlockhatchee Trl. N.	22	126	7	17	17	5,662

Note: SI = serious injury crash, K = fatal crash, KSI = fatal or serious injury crash

Road Name	From	To	K count	KSI count	Bike KSI	Ped KSI	Motorcycle KSI	Safety Score
Avalon Park Boulevard	SR 50	South of Timber Springs Blvd.	4	28	6	0	1	5,630
US-17/92/ Orlando Avenue/French Avenue	W. 27th St.	W. Lake Mary Blvd.	1	7	0	2	4	5,568
Pleasant Hill Road (SR 531)	Marsh Rd.	South of Granada Blvd.	10	26	1	3	3	5,405
E Irlo Bronson Hwy/Vine Street	West of Florida's Turnpike	Eastern Ave.	8	34	4	5	3	5,168
Winter Garden Vineland Road	Fiquette Rd.	Overstreet Rd.	1	20	2	0	3	5,147
Winter Garden Vineland Road	E. Buena Vista Dr.	S. Apopka Vineland Rd.	1	15	0	2	2	4,590
Boggy Creek Road	E. Osceola Parkway	Buenaventura Blvd.	3	13	0	0	2	4,451
W Colonial Drive	Apopka Vineland Rd. N.	Orange Blossom Trail N.	16	98	5	22	7	4,233
Apopka Vineland Road	North of Buena Vista Woods Blvd.	North of Vineland Ave.	3	21	0	2	1	4,003
Apopka Vineland Road	Windy Ridge Rd.	Sandberry Blvd.	2	23	0	1	0	3,983
Alafaya Trail	Golfway Blvd.	Innovation Way	0	19	0	0	3	3,161
Silver Star Road (SR 438)	Apopka Vineland Rd. N.	Chantelle Ave.	15	111	3	22	4	3,031
Sand Lake Road	Mandarin Dr.	Jetport Dr.	18	107	0	19	5	2,646
Orange Blossom Trail	SR 50	Holden Ave.	25	107	7	31	8	2,530
Semoran Boulevard	County Boundary	SR 408	12	92	2	22	13	2,417
Orange Blossom Trail	Holden Ave.	Florida's Turnpike	21	123	9	34	10	2,315
Colonial Drive (SR 50)	Fort Christmas Rd S.	County Boundary	7	20	1	0	2	1,667
Pine Hills Road	Pinto Way	SR 50	14	99	6	22	8	1,410

Note: SI = serious injury crash, K = fatal crash, KSI = fatal or serious injury crash

The top 30 intersections are also shown on the HIN network, with a summary in Table A-2.

Table A–2: MPO Network HIN Intersections

Intersection Name	Injury Count	SI Count	K Count	Ped KSI	Bike KSI	Safety Score
John Young Parkway & Sand Lake Road	442	32	4	0	0	10,140
Alafaya Trail & Colonial Drive	167	15	0	5	1	10,103
Orange Blossom Trail & Holden Avenue	202	14	2	6	0	10,055
Hiawassee Road at Silver Star Road	153	11	1	7	1	9,630
N Poinciana Boulevard at Irlo Bronson Memorial Highway	240	13	2	3	2	9,399
Pine Hills Road at Silver Star Road	192	15	1	3	1	8,673
Semoran Boulevard & Old Cheney Hwy	60	9	4	9	0	8,509
W Colonial Drive at N Kirkman Road	138	13	0	3	1	7,097
Goldenrod Road at Colonial Drive	163	15	3	2	2	7,040
Simpson Road at Irlo Bronson Memorial Highway	90	6	4	4	0	6,946
Orange Blossom Trail at Gore Street	100	9	1	3	2	6,769
N Kirkman Road at Old Winter Garden Road	155	12	0	1	1	6,724
Goldenrod Road at Curry Ford Road	172	18	0	0	1	6,715
John Young Parkway at Conroy Road	162	10	1	3	0	6,699
Pine Hills Road at North Lane	152	18	1	3	0	6,651
Colonial Drive at Econlockhatchee Trail	111	11	0	3	0	6,480
Powers Drive at Silver Star Road	309	17	2	1	0	6,415
Orange Blossom Trail at Conroy Road/Americana Boulevard	86	11	1	3	1	6,401
Old Cheney Highway/Tucker Avenue at Colonial Drive	60	8	1	1	0	6,386
Goldenrod Road at University Boulevard	110	11	0	1	3	6,224
Alafaya Trail at Lokanotosa Trail	98	11	0	2	1	5,905
Semoran Boulevard at Curry Ford Road	142	3	1	2	1	5,504
S French Street at W 25th Street	103	5	2	2	1	5,459
Hastings Street at Silver Star Road	109	12	3	1	0	5,368
Orange Blossom Trail at Orlando Central Parkway	54	5	2	2	2	5,160
Orange Blossom Trail at Michigan Street	86	11	1	0	1	4,924
Irlo Bronson Memorial Highway at Club Sevilla	3	2	3	4	1	4,812
Forsyth Road at University Boulevard	61	5	0	0	2	4,722
N French Avenue at W 1st Street (US 17/92)	34	2	2	1	2	4,294
Orange Blossom Trail at Premier Row	24	0	4	3	0	3,919

Note: SI = serious injury crash, K = fatal crash, KSI = fatal or serious injury crash

Table A–3: Summary of Performance Measure Calculations

Measure	Calculation
Goal #1: Safety	
Fatal and Serious injury Crashes	$\sum$ *(Fatal+Serious Injury Crashes)*
Rate of Fatal and Serious injury Crashes	$\frac{\sum \textit{(Fatal+Serious Injury Crashes)}}{\textit{100 million VMT}}$
Non-motorized Fatalities and Serious Injuries	$\sum$*Pedestrian Fatalities* + $\sum$*Pedestrian Serious Injuries* + $\sum$*Bicyclist Fatalities* + $\sum$*Bicyclist Serious Injuries*
Speeding-related crashes	$\sum$ *Speeding related Crashes*
Average Emergency Response Time	$\frac{\sum \textit{Response time}}{\sum \textit{Incidents}} \times 100$
Average Incident Clearance Time	$\frac{\sum \textit{Clearance time}}{\sum \textit{Incidents}} \times 100$
Goal #2: Connectivity	
Average Transit Frequency	$\frac{\sum \textit{Headways}}{\sum \textit{Routes}}$
Percent of Population within a Half-mile of transit	$\frac{\sum \textit{Population within a half mile of Transit}}{\sum \textit{Total Population}}$
Percent of Jobs within a Half-mile of transit	$\frac{\sum \textit{Jobs within a half mile of Transit}}{\sum \textit{Total Jobs}}$
Vehicle Hours of Delay per Capita	*($\sum$Vehicle Volume × (Daily or Peak Travel Time – Travel Time at LOS B)) ÷ population*
Goal #3: Reliability	
Level of Travel Time Reliability	$\frac{\textit{Travel Time(80th percentile)}}{\textit{Travel Time(50th percentile)}}$
Percent of Transit System On-Time Performance	$\frac{\sum \textit{On-time Routes}}{\sum \textit{Routes}} \times 100$
% SHS with Average Speeds Greater than Posted Speeds	$\frac{\sum \textit{VMT – (Peak Hour Speed)/(Posted Speed Limit)}}{\sum \textit{VMT}} \times 100$

Measure	Calculation
Goal #4: Community	
% Pedestrian Facility Coverage	$\frac{\sum \textit{Pedestrian Facility Miles in Urban Areas}}{\sum \textit{Non-Limited Access Centerline Miles in Urban Area}} \times 100$
% Bicycle Facility Coverage	$\frac{\sum \textit{Bicycle Facility Miles}}{\sum \textit{Non-Limited Access Centerline Miles}} \times 100$
Goal #5: Prosperity	
Truck Travel Time Reliability	$\frac{\textit{95th Percentile Travel Time}}{\textit{50th Percentile Travel Time}}$

Table A–4: Performance measures that were removed in 2050 CMP

Performance Indicator	Data Source	Network Coverage	2018	2019	2020	2021	2022	2023	Sparklines
Annual trips using shared micromobility (scooters, e-bikes)	Orlando Micromobility Stats Dashboard	All roads	344,149	547,733	690,159	520,233	435,631		
Percentage of TIP funding spent on TSM&O projects	MetroPlan	All roads	1.2%	1.0%	1.5%	1.2%	2.2%	2.0%	
Number of Annual Passenger Miles (Lynx)	LYNX, National Transit Database	Transit network	153,806,000	163,227,601	100,388,374	79,820,254	93,266,038		
Number of Annual Passenger Miles (Sunrail)	LYNX, National Transit Database	Transit network	12,044,600	24,566,657	20,712,830	10,525,426	14,803,269		
Average Weekday Unlinked Trips (LYNX)	Sunrail, National Transit Database	Transit network	79,700	80,308	55,324	44,174	52,862		
Average Weekday Unlinked Trips (Sunrail)	Sunrail, National Transit Database	Transit network	3356	5,789	4,947	2,465	3,362		
Average Weekend Unlinked Trips (LYNX)	Sunrail, National Transit Database	Transit network	44,601	43,736	32,355	26,193	29,965		
Percentage of TMA/SU Funds Allocated for Projects that Support the MetroPlan Orlando Board Emphasis Areas	MetroPlan	All roads	69%	92%	108%	101%	124%		
Access to EV charging stations	U.S. Department of Energy	All roads	671	871	1,142	1,757	2,468	3,080	
Associated cost of annual vehicle hours of delay per capita	FDOT Source Book	SHS	$230.97	$238.60	$135.22	$159.33	$237.71		

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