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A REGIONAL TRANSPORTATION PARTNERSHIP

2050 Metropolitan Transportation Plan

Chapter 12 | Roadway Needs Assessment

August 22, 2025

Draft

WHAT IS IN THIS DOCUMENT?

This chapter outlines MetroPlan Orlando's modal needs assessment for roadways. MetroPlan Orlando is planning for future mobility and movement throughout the region as it grows in population, housing, employment, and traffic congestion. This chapter describes the traffic analysis and travel demand forecast modeling process used to identify future congested roadways.

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Legal Information

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12.1 Introduction

The roadway network is the backbone of Central Florida's transportation system. MetroPlan Orlando is responsible for shaping a future system that offers a variety of transportation and travel options for the region. Maintaining and enhancing mobility for the region includes planning for the most common mode of existing transportation: driving.

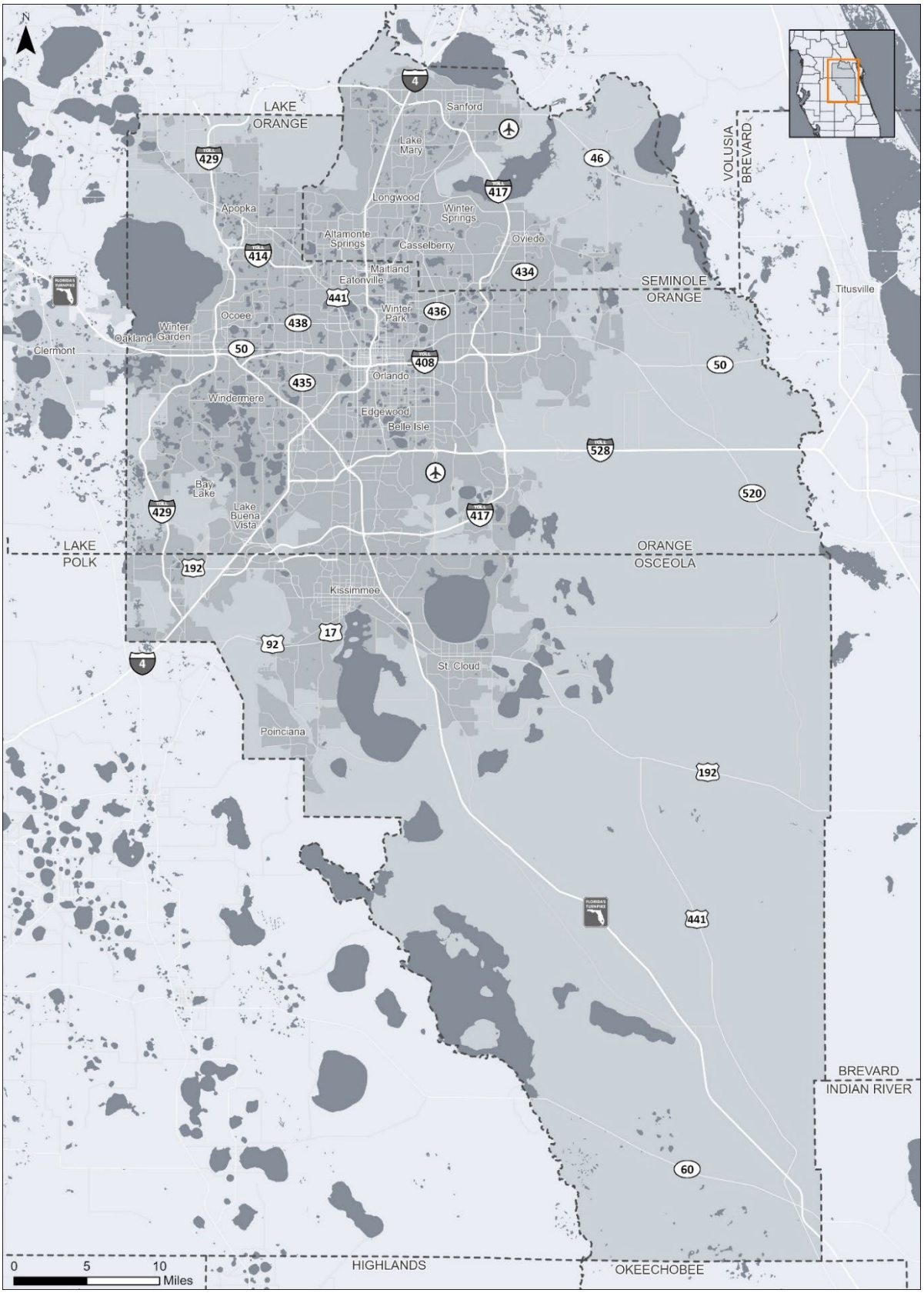
This chapter outlines the process used to analyze the roadway network for segments that are forecasted to become congested with vehicle traffic by 2050. The future 2050 analysis links traffic growth with expected land use changes, associated origin-destination travel patterns, and future roadway improvements already funded for implementation by 2050. The congested roads identified through this analysis process were reviewed with local agencies, and project needs were then developed to address the forecasted congestion.

All roads within the region that are federal aid eligible were analyzed for future traffic demand. Typically, these are functionally classified roadways designated as a minor collector or higher, including:

- Interstates
- Principal Arterials
- Minor Arterials
- Major Collectors
- Minor Collectors

Local roadways, such as residential streets, were not included in this analysis. A map of the MetroPlan Orlando region included in the roadway needs assessment is shown in Figure 12-1.

Figure 12-1 | MetroPlan Orlando Region Included in Roadway Needs Assessment



Source: MetroPlan Orlando

12.2 Roadway Analysis Methodology

Forecasting future 2050 traffic for the region was conducted using a geospatial analysis and included data from the latest approved version of the Central Florida Regional Planning Model (CFRPM). Key pieces of the traffic forecasting methodology are as shown in Figure 12-2.

Figure 12-2 | Traffic Forecasting Methodology

First, MetroPlan Orlando established a base network for analysis. MetroPlan Orlando maintains a robust inventory of roadway characteristics and features, such as existing traffic volume and number of lanes, in a base network called xWave. MetroPlan Orlando uses this network for a variety of other planning purposes and therefore it was selected as the base network for this roadway traffic analysis.

Next, MetroPlan Orlando transferred and applied data from the CFRPM to the base xWave network. The currently approved CFRPM, Version 7, is the regional travel demand model developed by the Florida Department of Transportation (FDOT), District 5. It includes 11 Florida counties to capture regional travel patterns: Brevard, Flagler, Indian River (northern portion only), Lake, Marion, Osceola, Orange, Polk, Seminole, Sumter, and Volusia. This model has been calibrated to a base year (2015) and populated with existing and future (2045) roadway network data and socio-economic (SE) data. This data typically includes key information such as the number of roadway lanes, number of households, and employment counts. The CFRPM uses a traditional "4-step model" framework to estimate:

- Trip generation – how many trips are produced and attracted by various land uses (stores, apartment complexes, etc.)
- Trip distribution – how many trips are outbound (produced) versus inbound (attracted) versus for each land use
- Mode split – what mode of travel is used for each trip (automobile, non-motorized, or transit)
- Network assignment – which roads, or what route, is selected for each trip

The CFRPM model inputs and outputs (results) have been validated, or backchecked, against actual field data. This helps give MetroPlan Orlando the confidence that the model represents real-life conditions as best as possible. Ultimately, the model produces a forecast year (2045) set of traffic data. The MetroPlan Orlando team relied on this output 2045 set of traffic data. To extrapolate 2050 traffic forecasts, traffic growth rates were developed and applied to the available 2045 CFRPM traffic volumes.

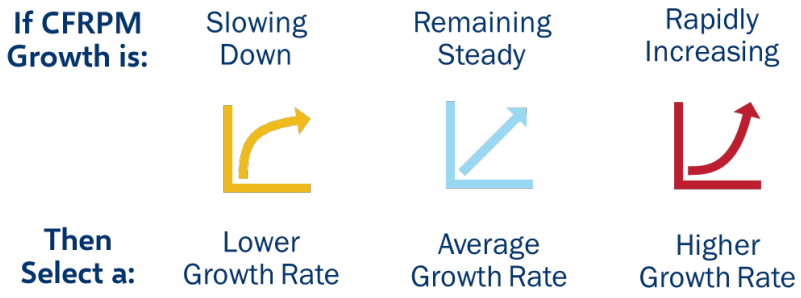
Once 2050 traffic forecasts were developed, the roadway segments were assessed using volume-to-capacity (V/C) ratios to identify which roads were anticipated to be congested in the future.

12.3 Traffic Growth Rates

Traffic growth rates were identified for individual roadway segments within the region and used to extrapolate the 2045 CFRPM data to the MTP's horizon year (plan year) of 2050. To select appropriate growth rates, multiple sources were reviewed including the CFRPM and local comprehensive plans.

Growth rates from the CFRPM were calculated for each roadway facility between the base year (2015) and future years (2045). Other time horizons, such as 2035 to 2045, were also calculated to determine whether traffic growth is expected to increase or slow down as time goes on. This gave MetroPlan Orlando insight into how new housing, employment, or roadways being built in future years may affect travel patterns and traffic demand. The pace of growth was considered when selecting a growth rate for the 2050 forecast to avoid over- or under-projecting future traffic. For example, if growth was slowing down toward 2045, a lower growth rate was selected. If growth was rapidly increasing toward 2045, a higher growth rate was selected. This concept is shown in Figure 12-3.

Figure 12-3 | Growth Rate Selection Example



Local comprehensive plans were also reviewed to identify the expected new development and growth that may be implemented prior to 2050. Locally approved future land use maps were compared against the future land use assumptions in the CFRPM model. If new development was identified in the future land use maps but not in the CFRPM, a higher growth rate was considered since the CFRPM growth rate alone would not have reflected the development. A summary of the growth rates per roadway functional classification are in Table 12-1.

Table 12-1 | Roadway Traffic Growth Rate Summary

Roadway Functional Classification	Average Annual Growth Rate	Minimum Annual Growth Rate	Maximum Annual Growth Rate
Principal Arterial - Interstate	1.2%	0.4%	4.6%
Principal Arterial - Expressway	1.6%	1.1%	2.9%
Principal Arterial - Other	0.9%	0.4%	1.9%
Minor Arterial	1.1%	1.0%	4.5%
Major Collector	1.4%	0.9%	3.5%
Minor Collector	2.1%	1.6%	23.0%
Local	2.2%	0.8%	7.1%

Note: Average Annual Growth Rate is averaged across all roadway segments. It is not the median between the minimum and maximum growth rate shown in the table.

12.4 Forecasted Congestion and Roadway Needs Assessment

For this roadway needs assessment, a congested roadway was defined as any segment where the forecasted 2050 traffic volume is greater than the road's capacity. This was determined using a volume-to-capacity ratio (sometimes referred to as V/C ratio). Any segment with a volume-to-capacity ratio greater than 1.0 is considered to be overcapacity and congested.

Figure 12-4 | Volume-to-Capacity Example

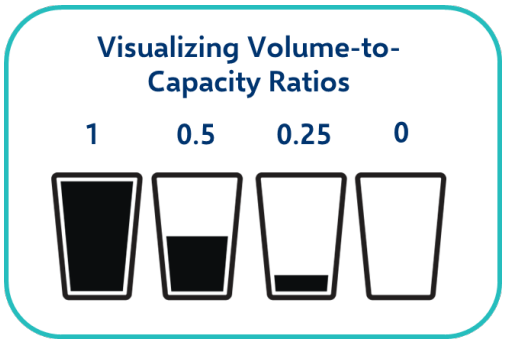


Figure 12-4 depicts the concept of volume-to-capacity ratios using a water glass. When the glass is empty, its V/C ratio is zero. When it's half full, its V/C ratio is 0.5. Once the glass of water is full, its V/C ratio is 1.0 and any more water would cause it to spill. Similarly for roadways, a segment is considered overcapacity if its roadway volume-to-capacity ratio is bigger than 1.0. The volume-to-capacity ratio tells us if the forecasted traffic volume for a particular road is expected to be higher than the road can handle.

The new areas forecasted to be congested by 2050 are shown in Figure 12-5. The areas of future congestion for Orange, Osceola, and Seminole Counties are shown in Figure 12-6 through Figure 12-8. Roadways forecasted to be congested by 2045 are outlined in red and areas anticipated to be newly congested by 2050 are shown in a heat map. The newly congested areas were shared with local government and agency partners for review and concurrence on whether these newly congested areas should be further evaluated to identify future roadway improvements. If roadway improvements were determined as necessary by 2050, the specified roads were included in the roadway needs assessment.

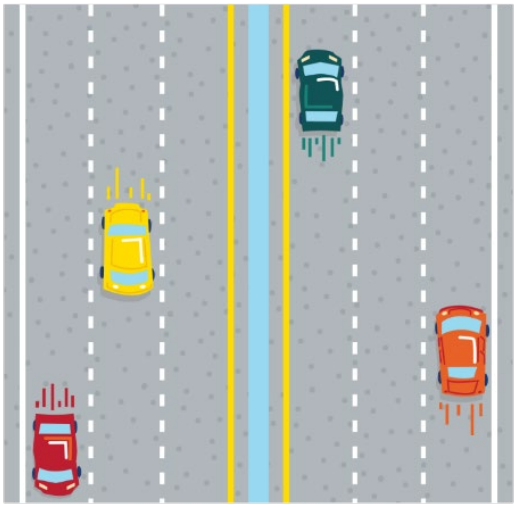
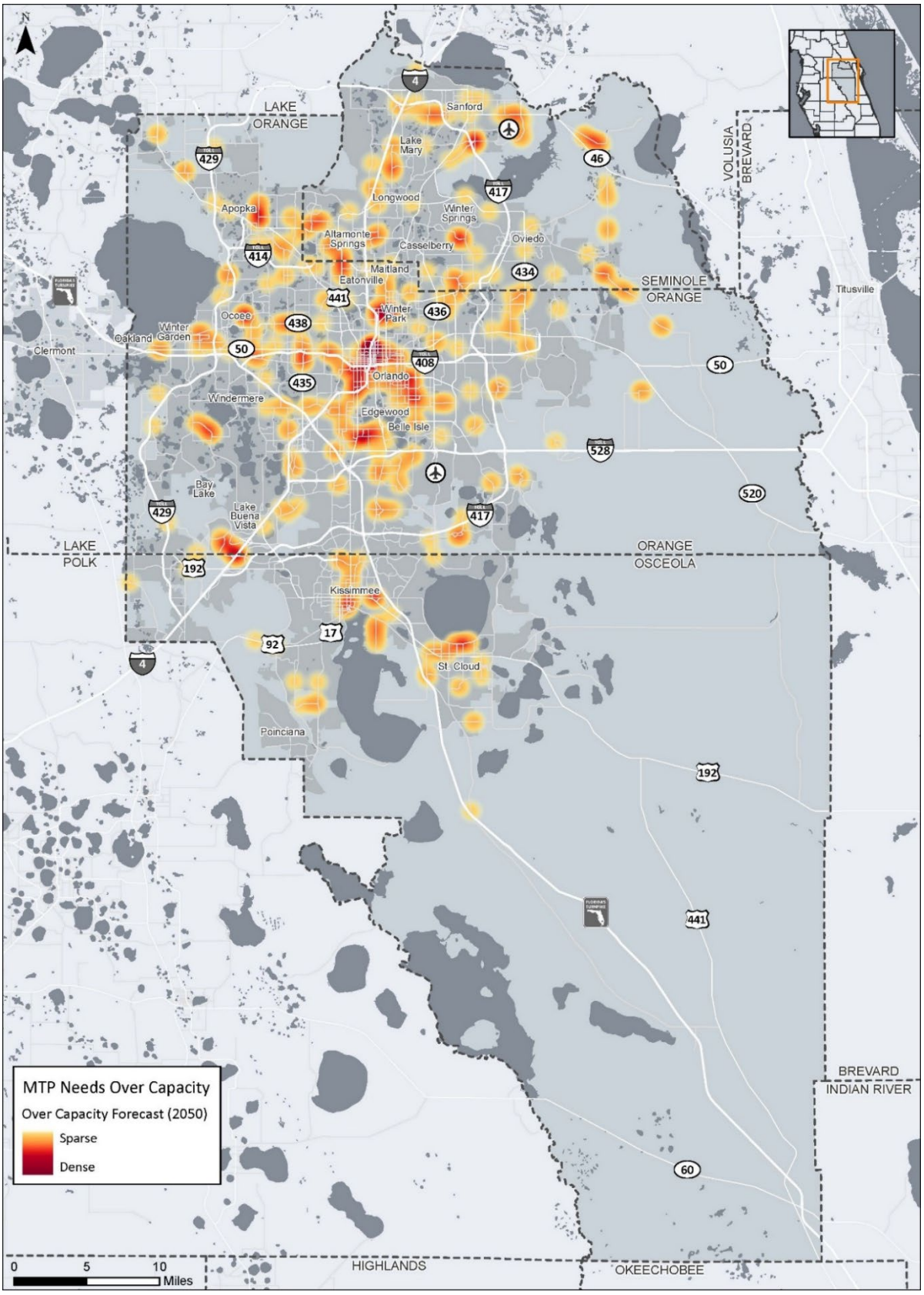
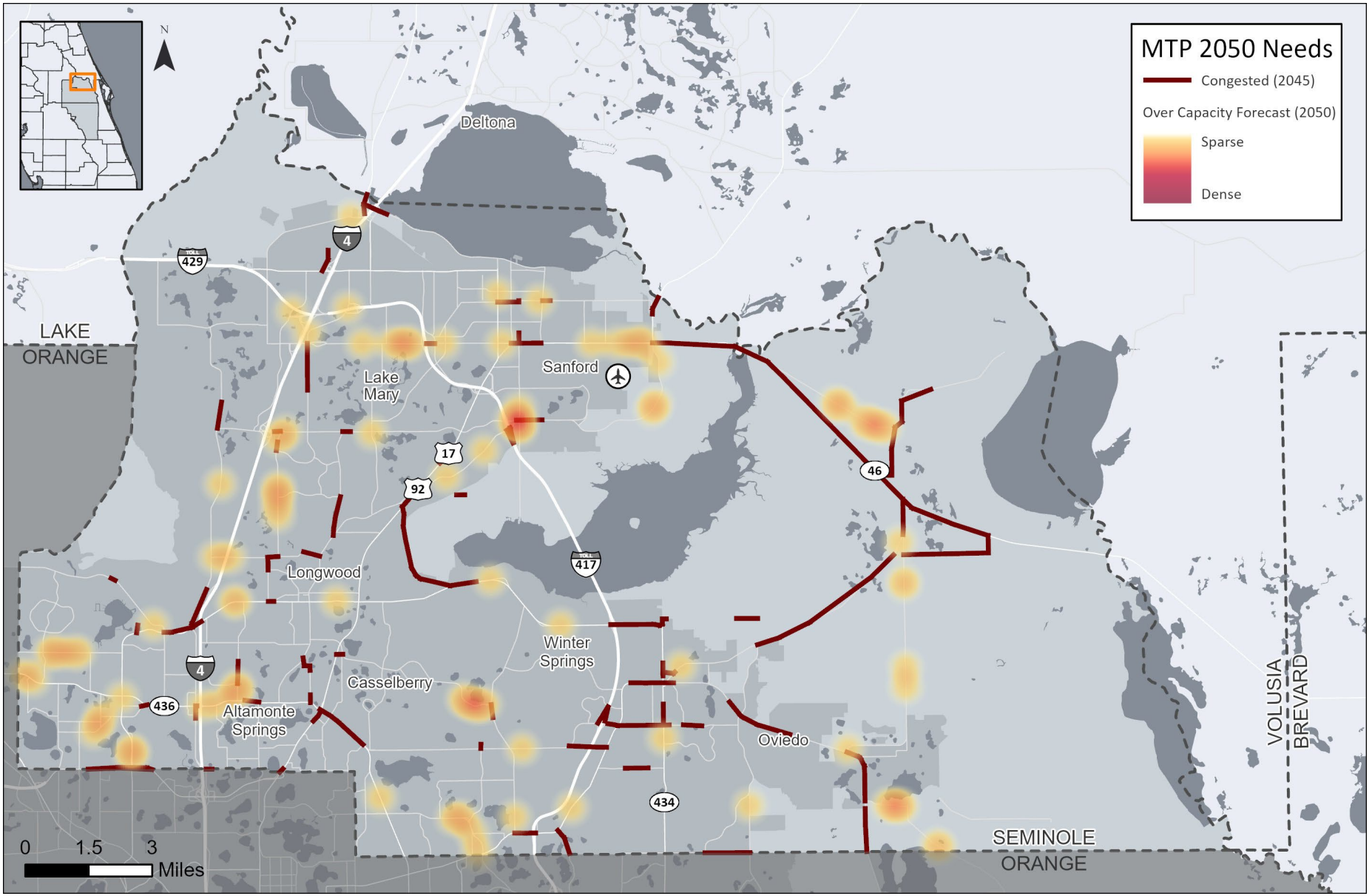


Figure 12-5 | MetroPlan Orlando Regional Congestion Map with Newly Congested Areas by 2050



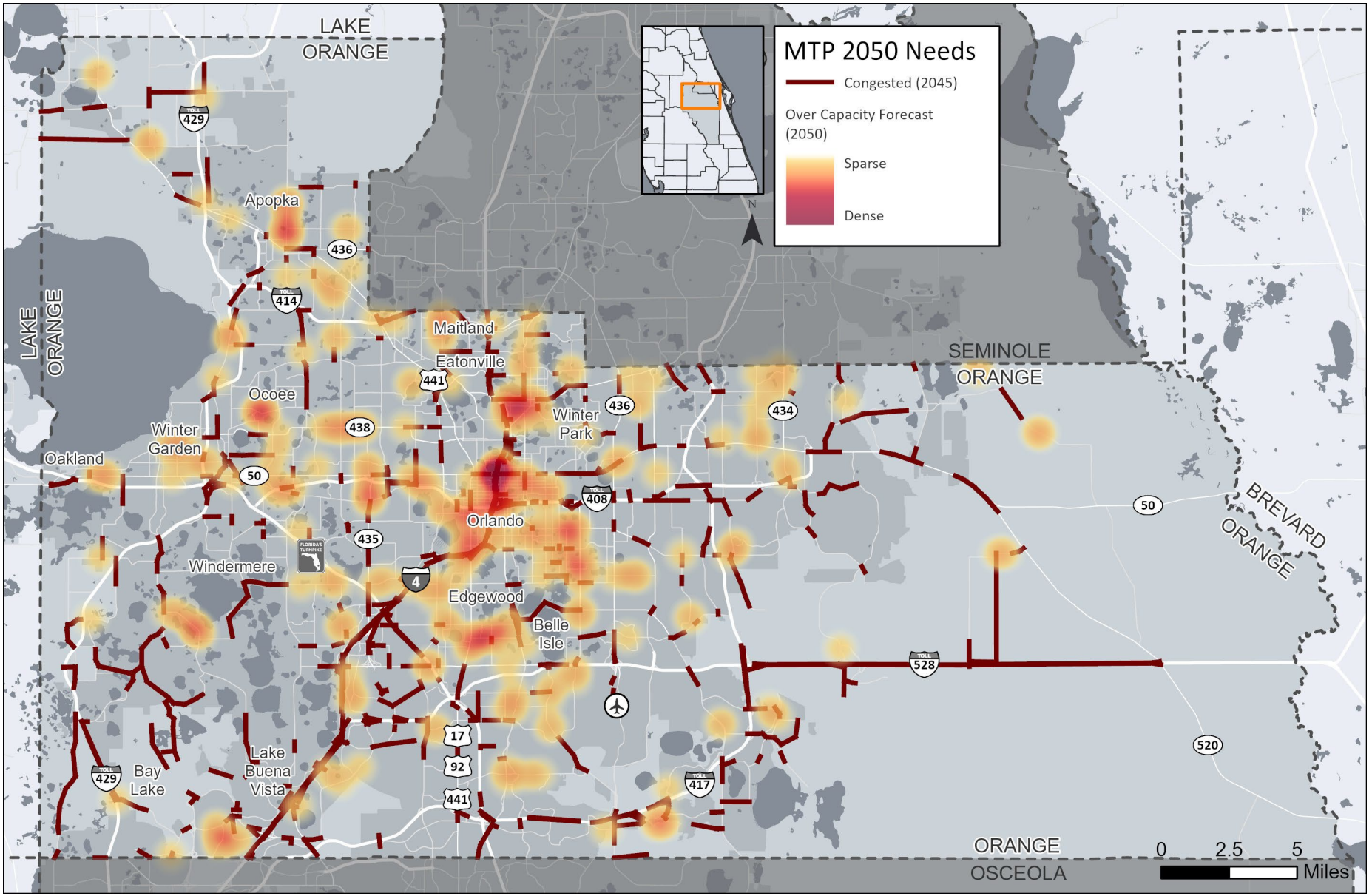
Source: New 2050 Traffic Analysis. Note: Only areas with new congestion between 2045 and 2050 are shown.

Figure 12-6 | Seminole County Future Congestion Map



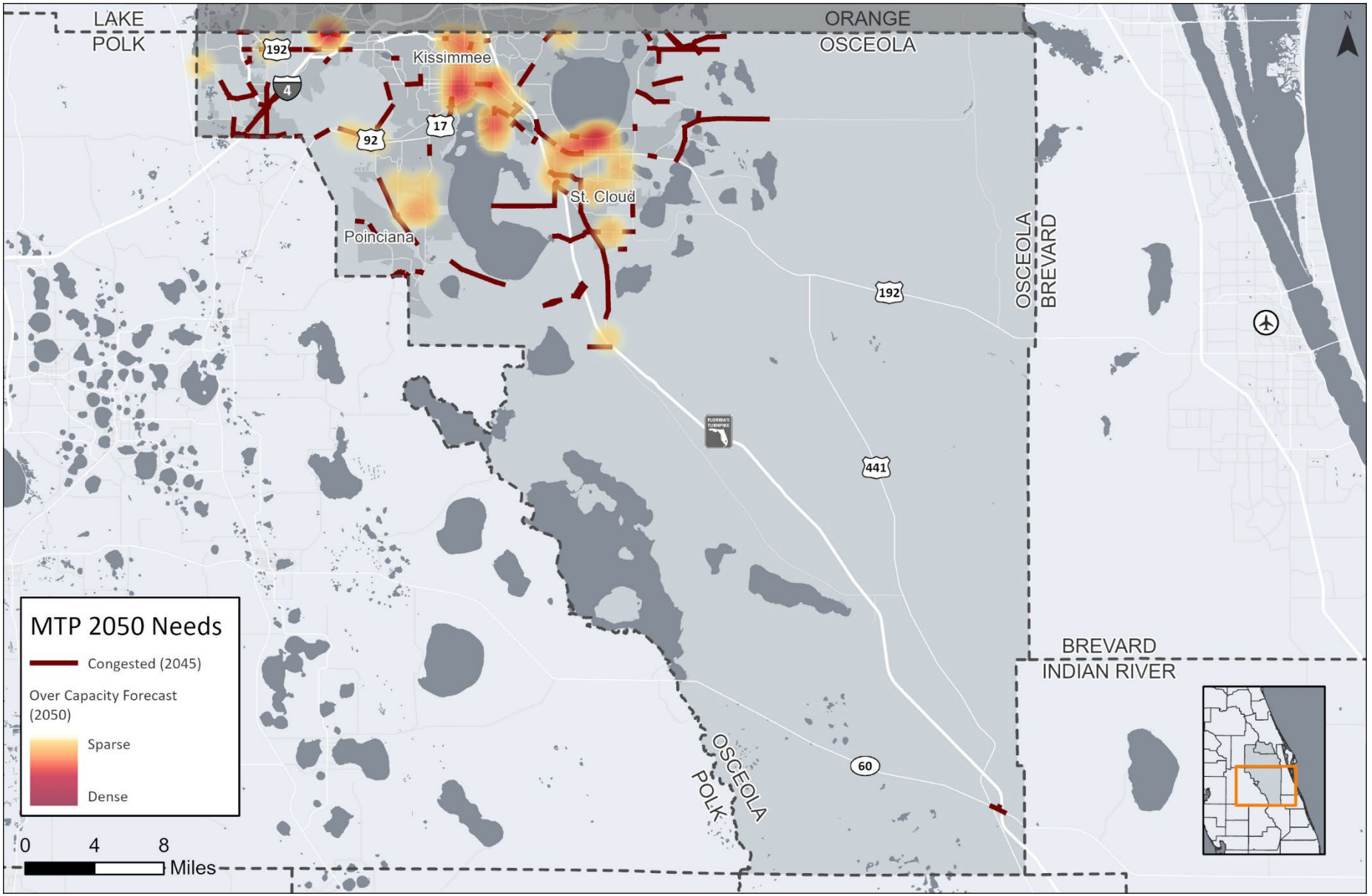
Source: CFRPM (2045), New 2050 Traffic Analysis. Note: Minor gaps may exist in the 2045 data due to model limitations.

Figure 12-7 | Orange County Future Congestion Map



Source: CFRPM (2045), New 2050 Traffic Analysis. Note: Minor gaps may exist in the 2045 data due to model limitations.

Figure 12-8 | Osceola County Future Congestion Map



Source: CFRPM (2045), New 2050 Traffic Analysis. Note: Minor gaps may exist in the 2045 data due to model limitations.

12.5 Moving Forward

MetroPlan Orlando is planning for future mobility and movement throughout the region as it grows in population, housing, employment, and traffic congestion. Central Florida must be prepared to address future roadway needs as growth spurs changes in our travel patterns and behaviors. This roadway needs assessment used a regionally approved travel demand model, municipal comprehensive plans, and local agency insight to understand how future 2050 growth may affect the region's traffic congestion. This insight was used to identify specific roadway needs to be included in the 2050 MTP needs assessment. The project needs identified through this process were further analyzed in the overall MTP multimodal needs assessment (Chapter 13), prioritized (Chapter 16), and ultimately assessed to determine their cost feasibility (Chapter 19).

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