



2045

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A REGIONAL TRANSPORTATION PARTNERSHIP

2045

Metropolitan Transportation Plan

Technical Series #13
Systems Performance Report

November 2020

What is in this document?

This technical series outlines the System Performance Report which presents the condition and performance of the transportation system with respect to required performance measures, documents performance targets, and reports on progress achieved in meeting the targets in comparison with previous reports.

In accordance with the Planning Rule and as required by the Federal Highway Administration (FHWA) and the Florida Department of Transportation (FDOT), MetroPlan Orlando must publish a **Systems Performance Report** for applicable performance measures and targets as an element of the 2045 MTP.

This document also provides a synopsis on Scenario Planning implications and includes analysis of how each alternative future would impact the performance of the transportation system and how changes in local policies and investments could impact the costs necessary to achieve the identified targets.

The MetroPlan Orlando 2045 MTP is scheduled for adoption on December 9, 2020. As per the Planning Rule, System Performance Report includes the required Highway Safety (PM1), Bridge and Pavement (PM2), System Performance (PM3), Transit Asset Management and Transit Safety targets.

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Introduction

Reforms made by MAP-21 and the FAST Act address transitioning to a performance-based program and include establishing national performance goals for federal-aid highway programs, incorporating performance goals, measures, and targets into the process of identifying needed improvements and project selection. Performance measurement is being implemented to transform the federal-aid highway program and to provide a means to the most efficient investment of federal transportation funds, refocus on national transportation goals, increase the accountability and transparency of the federal-aid highway program, and improve decision-making through performance-based planning and programming.

As proposed in 23 CFR 490, transportation performance measures focus around seven (7) core areas to assess the:

- Highway Safety Improvement Program (HSIP);
- Transit Asset Management (TAM) and Transit Safety
- Pavement and Bridge Condition;
- Performance of the National Highway System (NHS);
- Freight Movement on the Interstate System;
- Traffic Congestion of the Congestion Mitigation and Air Quality (CMAQ) Program; and
- On-Road Mobile Source Emissions of the Congestion Mitigation and Air Quality (CMAQ) Program.

In complying with federal requirements, MetroPlan Orlando's 2045 MTP will incorporate the National Performance Management Measures into the long-range metropolitan planning process as applicable, while outside of the MTP process, MetroPlan Orlando will annually monitor and document the National Performance Management Measures as part of the MPO's larger *Congestion Management Process* and *Tracking the Trends: A System Performance Report*; and as part of the Transportation Improvement Program (TIP) as required by guidance.

On February 12, 2020, MetroPlan Orlando re-adopted Performance Measures 1, 2, and 3 – accepting FDOT's targets and committing to plan/program projects so they contribute toward the accomplishment statewide targets.

On June 22, 2020, MetroPlan Orlando re-adopted LYNX and SunRail Transit Asset Management targets.

Systems Performance Measures

On May 27, 2016, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) issued the Statewide and Nonmetropolitan Transportation Planning; Metropolitan Transportation Planning Final Rule which modified 23 CFR Part 450 and 49 CFR Part 613. Through revisions to the Code of Federal Regulations, this rule detailed how state DOTs and MPOs must implement a suite of related transportation planning and transportation performance management provisions of MAP-21 and the FAST Act.

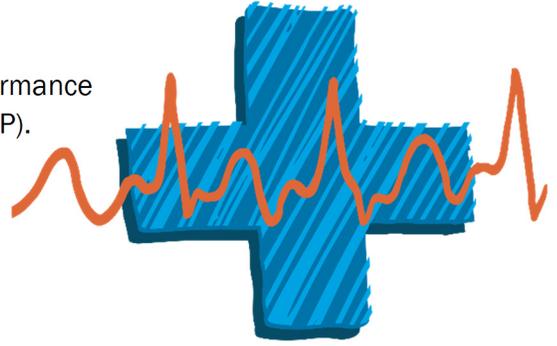


The document is consistent with the Transportation Performance Measures Consensus Planning Document developed jointly by FDOT and the Metropolitan Planning Organization Advisory Council. This document outlines the roles of FDOT, the MPOs, and the public transportation providers in the MPO planning areas to ensure consistency to the maximum extent practicable in satisfying the transportation performance management requirements promulgated by the United States Department of Transportation in Title 23 Parts 450, 490, 625, and 673 of the Code of Federal Regulations (23 CFR).



Safety Measures

Effective April 14, 2016, the FHWA established five highway safety performance measures¹ to carry out the Highway Safety Improvement Program (HSIP). These performance measures are:



- Number of fatalities;
- Rate of fatalities per 100 million vehicle miles traveled;
- Number of serious injuries;
- Rate of serious injuries per 100 million vehicle miles traveled; and
- Number of combined non-motorized fatalities and non-motorized serious injuries.

FDOT publishes statewide safety performance targets in the HSIP Annual Report that it transmits to FHWA each year. Current safety targets address calendar year 2020. For the 2020 HSIP, FDOT established statewide at “0” for each performance measure to reflect Florida’s vision of zero deaths.

MetroPlan Orlando agrees to plan and program projects so they contribute toward the accomplishment of the FDOT safety target of zero and has adopted the same vision-zero target for the MPO planning area.

System conditions reflect baseline performance (2013-2017). The latest safety conditions will be updated annually on a rolling five-year window and reflected within each subsequent system performance report, to track performance over time in relation to baseline conditions and established targets. Table 13.1 outlines the USDOT mandated highway safety performance measures, the Florida and MPO planning area baselines, and performance targets.

Table 13.1 | USDOT Highway Safety (PM1) Measures and Targets

Performance Measures	Statewide Baseline ^A (2013-2017)	MPO ^B (2013-2017)	Calendar Year Targets	
			Statewide	MPO
Number of Fatalities	2,825.4	242	Vision Zero (0)	Vision Zero (0)
Rate of Fatalities per 100 Million VMT	1.36	1.12	Vision Zero (0)	Vision Zero (0)
Number of Serious Injuries	20,929.2	2,157	Vision Zero (0)	Vision Zero (0)
Rate of Serious Injuries per 100 Million VMT	10.36	10.05	Vision Zero (0)	Vision Zero (0)
Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries	3,204.2	395	Vision Zero (0)	Vision Zero (0)

Source: ^A Statewide fatal and serious injury counts obtained estimated using from FDOT’s Crash Analysis Reporting (CAR) system and DHSMV’s Florida’s Integrated Report Exchange System (FIRES) data; Daily Vehicle Miles Traveled (DVMT) obtained from FDOT’s Public Road Mileage and Travel (DVMT) Report. ^B MPO Area crash data obtained from Signal 4 Analytics and DVMT information from Streetlight Data.

Note: System conditions reflect baseline performance, which for this first system performance report is the same as the current reporting period (2013-2017 Five-year rolling average). FDOT and MetroPlan Orlando use different data sources and there may be variations based on utilizing different data sets in the tables of this report.

¹ 23 CFR Part 490, Subpart B



A five-year rolling summary of general highway safety statistics for Florida statewide and MetroPlan Orlando are identified in Table 13.2 and Table 13.3 respectively.

Table 13.2 | Florida Statewide Five-Year Rolling Summary of General Highway Safety Trends, 2012-2018

USDOT Performance Measures	Statewide Baseline Performance (5 Year Rolling Average)		
	2012-2016	2013-2017	2014-2018
Total Fatalities	2,688.2	2,825.4	2,972.0
Total Serious Injuries	20,844.2	20,929.2	20,738.4
Fatality Rate (per HMVMT)	1.33	1.36	1.39
Serious Injury Rate (per HMVMT)	10.36	10.13	9.77
Number of Non-Motorized Fatalities & Serious Injuries	3,294.4	3,304.2	3,339.6

Source: FDOT CAR System, DHSMV FIRES, and FDOT Public Road Mileage and Travel Report

Table 13.3 | MetroPlan Orlando Five-Year Rolling Summary of General Highway Safety Trends, 2012-2018

USDOT Performance Measures	Regional Baseline Performance (5 Year Rolling Average)		
	2012-2016	2013-2017	2014-2018
Total Fatalities	225	242	257
Total Serious Injuries	2,018	2,157	2,166
Fatality Rate (per HMVMT)	1.08	1.12	1.15
Serious Injury Rate (per HMVMT)	9.67	10.05	9.80
Number of Non-Motorized Fatalities & Serious Injuries	378	395	399

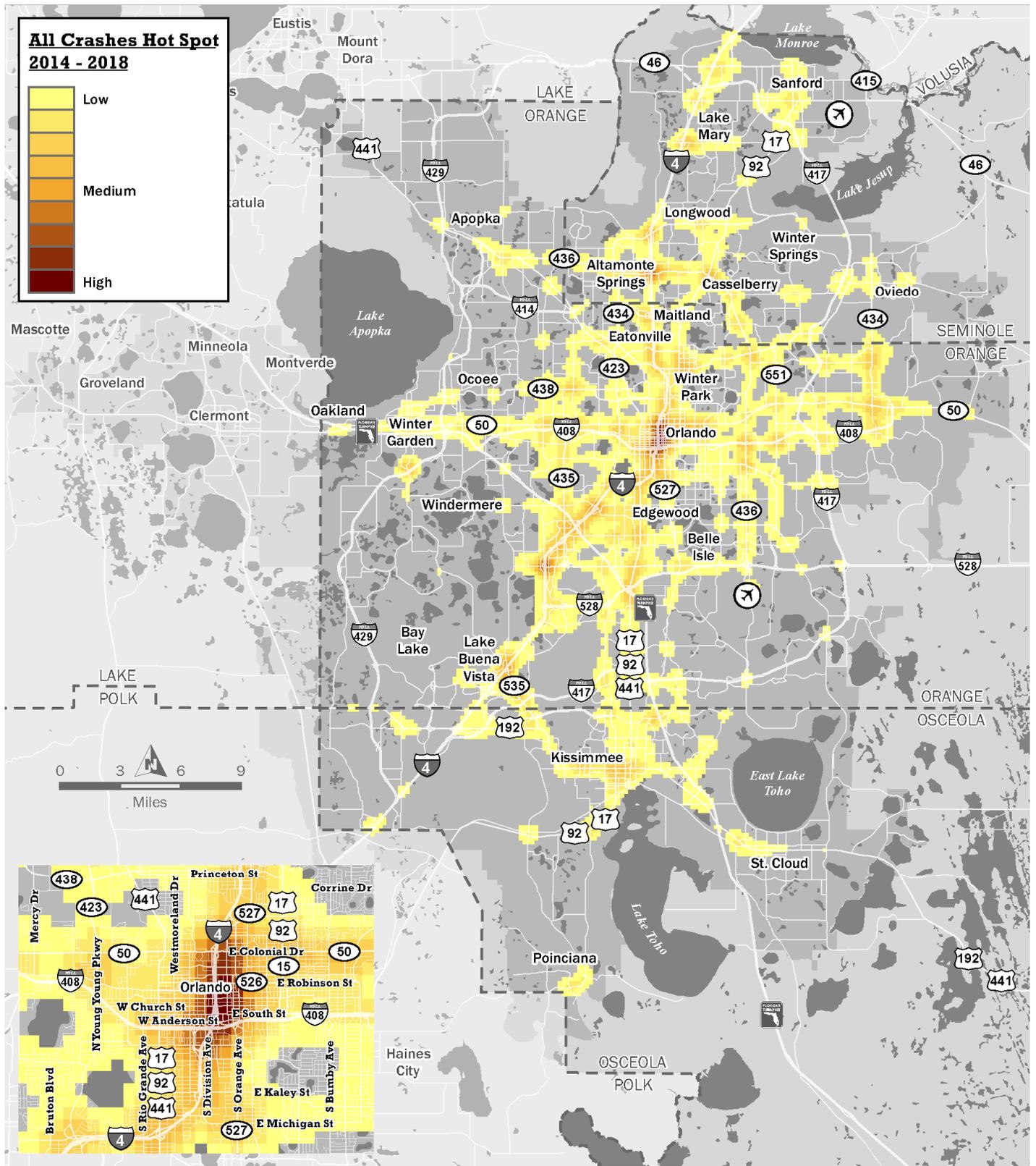
Source: Signal 4 Analytics

Note: Includes data for Orange, Osceola, and Seminole Counties.

The following section includes visual representations of region’s safety data and trends; and information about MetroPlan Orlando’s safety improvement program.



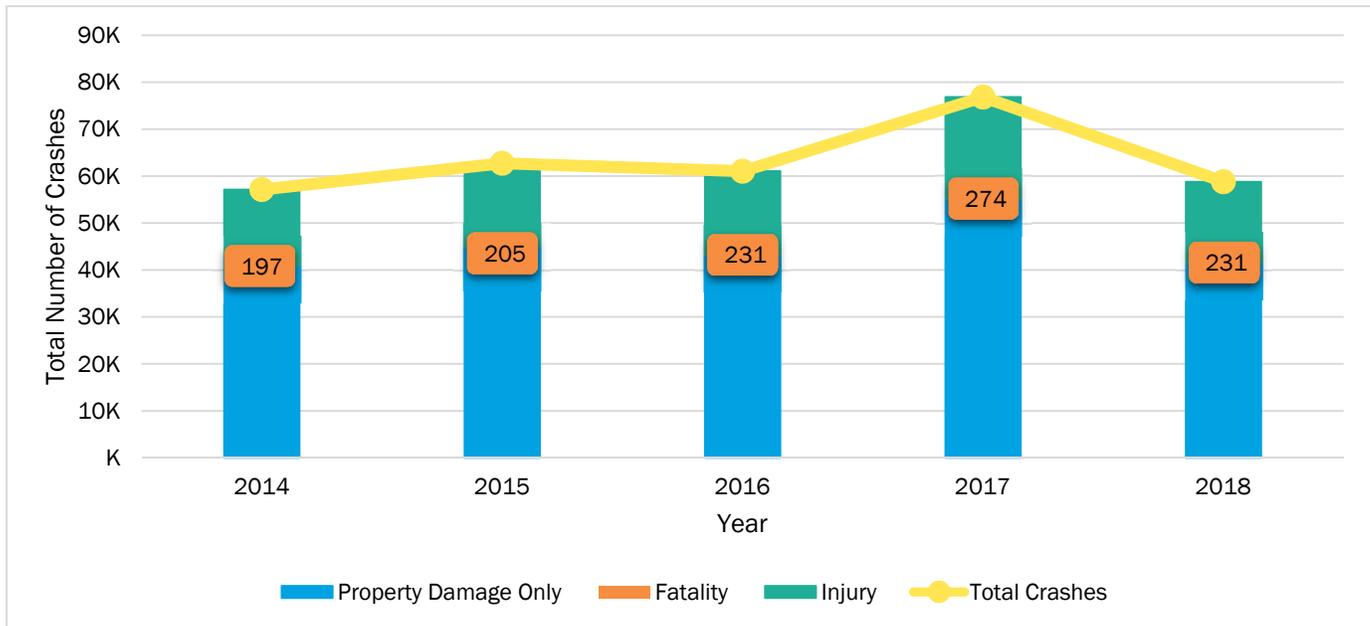
Figure 13.1 | Regional Crash Heat Map, 2014-2018



Source: Signal 4 Analytics 2014-2018



Figure 13.2 | Regional Safety Trends, 2014-2018



Source: Signal 4 Analytics 2014-2018

More information and analysis on trend and existing safety conditions:

Long Range Planning Process

MetroPlan Orlando recognizes the importance of linking goals, objectives, and investment priorities to established performance objectives, and that this link is critical to the achievement of national transportation goals and statewide and regional performance targets. As such, the 2045 MTP reflects the goals, objectives, performance measures, and targets as they are available and described in other state and public transportation plans and processes; specifically the [Florida Strategic Highway Safety Plan \(SHSP\)](#), the Florida Highway Safety Improvement Program (HSIP), and the [Florida Transportation Plan \(FTP\)](#). See *Technical Series #1: Goals & Objectives, Appendix A* for federal and state planning documentation and adoption by reference statement.

The 2045 MTP increases the safety of the transportation system for motorized and non-motorized users as required. The LRTP aligns with the Florida SHSP and the FDOT HSIP with specific strategies to improve safety performance focused on prioritized safety projects, pedestrian and/or bicycle safety enhancements, and traffic operation improvements to address our goal to reduce fatalities and serious injuries.

The long-range planning process and approach utilized to develop the 2045 MTP strongly considered safety and security. The method included an analysis of safety data trends – including the location and factors associated with crashes on fatalities and serious injuries with emphasis on vulnerable users. This process helped identify regional safety issues and potential safety strategies for the MTP and Congestion Management Process (CMP); and prioritize projects for the Transportation Improvement Program (TIP).

Refer to the 2045 MTP’s Goals & Objectives, CMP, Needs Assessment, Scenario Planning, and Project Prioritization technical documentation for more detailed information about *Planning for Safety* in the 2045 MTP.

<https://metroplanorlando.org/2045-mtp/whats-in-the-2045-plan/documents-for-review/>



Coordination, Data Collection & Monitoring

Managing mobility requires the establishment and use of a coordinated, performance-based approach to transportation decision-making to support national goals for the federal-aid highway and public transportation programs. In addition to congestion and reliability issues resulting from traffic volume growth and fluctuations, this report incorporated additional transportation measures used in multimodal performance management. The Congestion Management Process is an essential planning step, which lays out the process for identifying strategies that are needed to reduce congestion.

For many years, the MetroPlan Orlando has led and participated in various partnerships to promote safety awareness and to identify and address safety concerns throughout the community. This includes involvement in the Community Traffic Safety Teams, TSM&O Advisory Board and Best Foot Forward (founding member/sponsor), and coordination with Student Pedestrian Safety Committees.

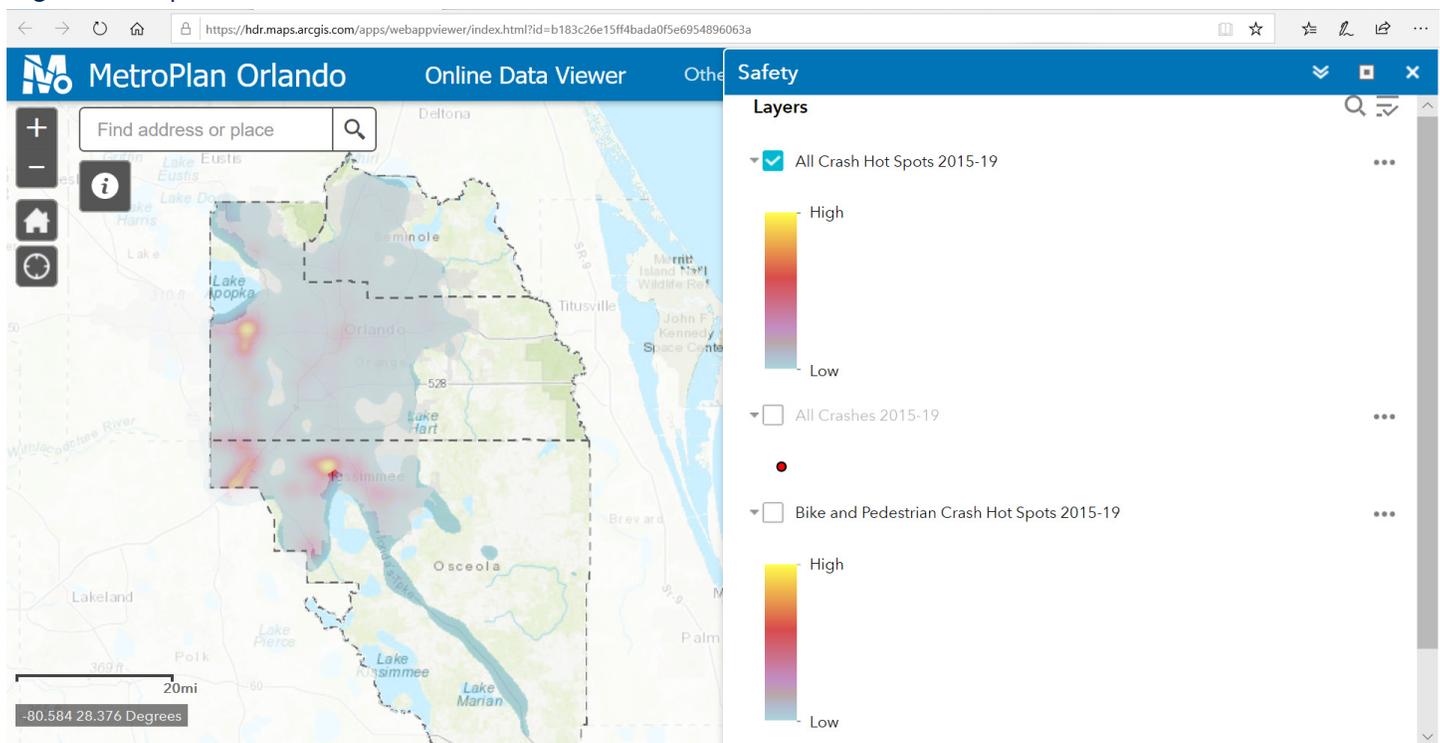
<https://metroplanorlando.org/programs-resources/safety/>

Online Data Viewer

This web-based map (Figure 13.3) provides a tool to view a variety of transportation-related spatial data at a regional scale. Users can obtain attribute information for specific map features by selecting the desired roadway segment.

<https://metroplanorlando.org/maps-tools/dataviewer/>

Figure 13.3 | Screenshot: MPO Online Data Viewer



Source: <https://metroplanorlando.org/maps-tools/>

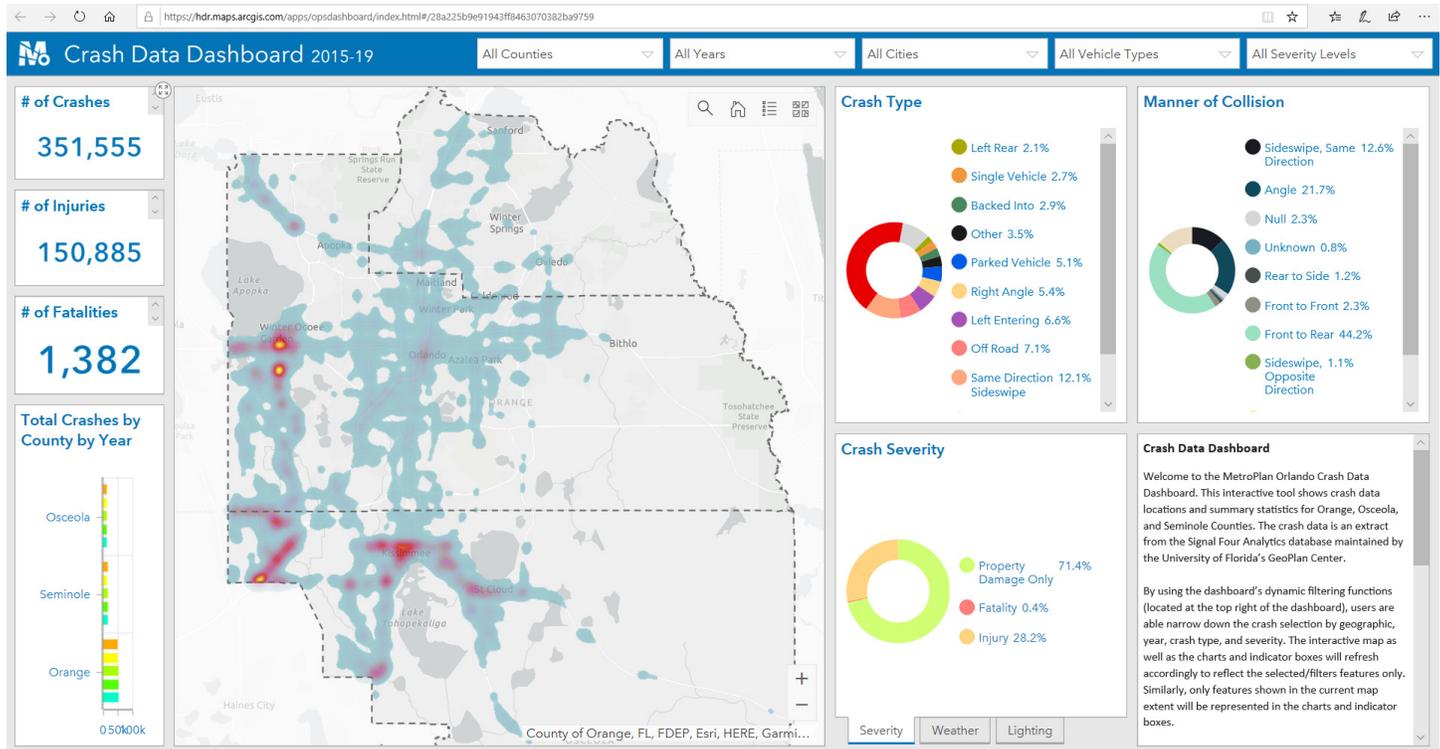


Safety / Crash Data Dashboard

The Crash Data Dashboard is an interactive tool (Figure 13.4) showing crash data locations and summary statistics for the region. It allows users to narrow down the crash selection by geographic area, year, crash type, and severity. The data is updated on a periodic basis to offer the latest information.

<https://metroplanorlando.org/maps-tools/crashdata/>

Figure 13.4 | Screenshot: MPO Online Crash Data Dashboard



Source: <https://metroplanorlando.org/maps-tools/>

Also, as part of the 2045 MTP Existing Conditions analysis, an online Area Profile “StoryMap” was created, to increase public accessibility and to provide a virtual alternative to typical technical documentation.

<https://metroplanorlando.org/maps-tools/existingconditions/>



Other Ongoing MPO Safety Improvement Activities

- **Corridor Safety Studies** – Building upon a crash analysis performed in 2019, these ongoing studies follow a process to identify and mitigate the causes of crashes at high crash locations throughout the planning area. Phases 1 & 2 will prioritize corridors and identify safety problems and potential solutions. Phase 3 will develop conceptual corridor plans to be advanced as safety projects.
- **Bicycle and Pedestrian Safety Action Plan** – Phase 1 identified problematic corridors and critical safety success factors for pedestrians and cyclists; and provides solutions through in depth data analysis of crash trends in the region. Phase 2 will address implementation and is currently underway.
- **Safety Research** – A crash database is maintained and continuously monitored for the Central Florida area to keep a close eye on crash statistics and trends. This process allows for accurate safety measures to be adopted in the effort of preventing future incidents. The following are current projects that have been developed as part of the safety initiative.



Bike Lane Safety Research

Ten bike lane and ten control streets were chosen for crash typing and exposure analysis to estimate relative crash risks for bicyclists using travel lanes, bike lanes, sidewalks, and shared use side paths.

Relevant Research Findings: Traffic Crash Injury Trends and Dangerous By Design Rankings

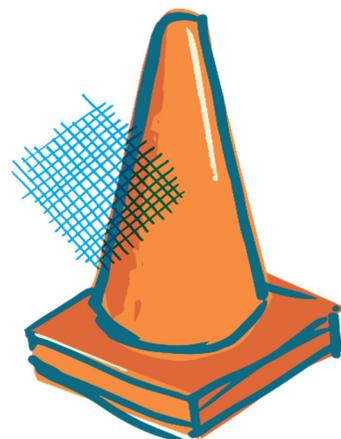
A request was made by the MetroPlan Orlando board to investigate the increase and decrease in relative crash severity and how the results compared to other cities in the Dangerous By Design report. It was found that the percentage increase and then subsequent decrease between 2014 and 2017 was due to changes in how Florida Highway Patrol (FHP) officers were classifying crash injuries. Other law enforcement agencies in the area did not show such an increase. They had shown a steady decrease, from 8% of all injury crashes classified as incapacitating in 2011, to 4% in 2018. This difference held true regardless of roadway classification; whether the crashes were on state arterials or on local neighborhood streets. With FHP responsible for 57% of crash reports during this period, their data has a significant impact on the overall trend.



Pavement and Bridge Condition Measures

In January 2017, USDOT published the Pavement and Bridge Condition Performance Measures Final Rule, which is also referred to as the PM2 rule. This rule establishes the following six performance measures:

- Percent of Interstate pavements in good condition;
- Percent of Interstate pavements in poor condition;
- Percent of non-Interstate National Highway System (NHS) pavements in good condition;
- Percent of non-Interstate NHS pavements in poor condition;
- Percent of NHS bridges (by deck area) classified as in good condition; and
- Percent of NHS bridges (by deck area) classified as in poor condition.



For the pavement measures, five pavement metrics are used to assess condition: *International Roughness Index (IRI)*; Cracking Percent; Rutting; Faulting; and a Present Serviceability Rating (PSR) for lower speed roads. The bridge measure assesses the condition of a bridge's deck, superstructure, substructure, and culverts. Good condition suggests that no major investment is needed, and poor condition suggests major reconstruction investment is needed.

In accordance with USDOT planning rules, MetroPlan Orlando must set four-year targets for all six measures; and can either agree to program projects that will support the statewide targets, or set their own quantifiable targets for the MPO's planning area. *MetroPlan Orlando agrees to plan and program projects so that they contribute toward the accomplishment of the FDOT target.* System conditions reflect baseline performance (2017). Table 13.4 outlines the USDOT mandated pavement and bridge condition performance measures, the Florida and MPO planning area baselines, and performance targets.

Table 13.4 | USDOT Pavement and Bridge Condition (PM2) Measures and Targets

Performance Measures	Florida Statewide				MetroPlan Orlando Area			
	Baseline	Actual	Targets		Baseline	Actual	Targets	
	2017	2019	2-Year	4-Year	2017	2019	2-Year	4-Year
Percent of Interstate pavements in good condition	66.0%	68.5%	NA	≥60%	48.3%	41.7%	NA	≥60%
Percent of Interstate pavements in poor condition	0.1%	0.2%	NA	<5%	0%	3.2%	NA	<5%
Percent of non-Interstate NHS pavements in good condition	76.4%	41%	≥40%	≥40%	47.3%	42.4%	≥40%	≥40%
Percent of non-Interstate NHS pavements in poor condition	3.6%	0.2%	<5%	<5%	0.5%	0.1%	<5%	<5%
Percent of NHS bridges by deck area in good condition	67.7%	65.5%	≥50%	≥50%	72%	78.0%	≥50%	≥50%
Percent of NHS bridges by deck area in poor condition	1.2%	<1%	<10%	<10%	1%	0%	<10%	<10%

Source: Pavement Condition Index (PCI)

Note: MPO Area = Orange, Osceola, and Seminole Counties.



Pavement and Bridge Condition Baseline Performance and Established Targets

This System Performance Report discusses the condition and performance of the transportation system for each applicable target as well as the progress achieved by the MPO in meeting targets in comparison with system performance recorded in previous reports. Because the federal performance measures are new, performance of the system for each measure has only recently been collected and targets have only recently been established. Accordingly, the MetroPlan 2045 MTP System Performance Report highlights performance for the baseline period, which is 2017. FDOT will continue to monitor and report performance on a biennial basis. Future System Performance Reports will discuss progress towards meeting the targets since this initial baseline report.

FDOT established the statewide targets for PM2 on May 18, 2018.

FDOT is mandated by Florida Statute 334.046 to preserve the state's pavement and bridges to specific standards. To adhere to the statutory guidelines, FDOT prioritizes funding allocations to ensure the current transportation system is adequately preserved and maintained before funding is allocated for capacity improvements. These statutory guidelines envelope the statewide federal targets that have been established for pavements and bridges

In addition, MAP-21 requires FDOT to develop a Transportation Asset Management Plan (TAMP) for all NHS pavements and bridges within the state. The TAMP must include investment strategies leading to a program of projects that would make progress toward achievement of the state DOT targets for asset condition and performance of the NHS. FDOT's TAMP was updated to reflect MAP-21 requirements in 2018 and the final TAMP was approved on June 28, 2019.

Further, the federal pavement condition measures require a new methodology that is a departure from the methods currently used by FDOT and uses different ratings and pavement segment lengths. For bridge condition, the performance is measured in deck area under the federal measure, while the FDOT programs its bridge repair or replacement work on a bridge by bridge basis. As such, the federal measures are not directly comparable to the methods that are most familiar to FDOT.

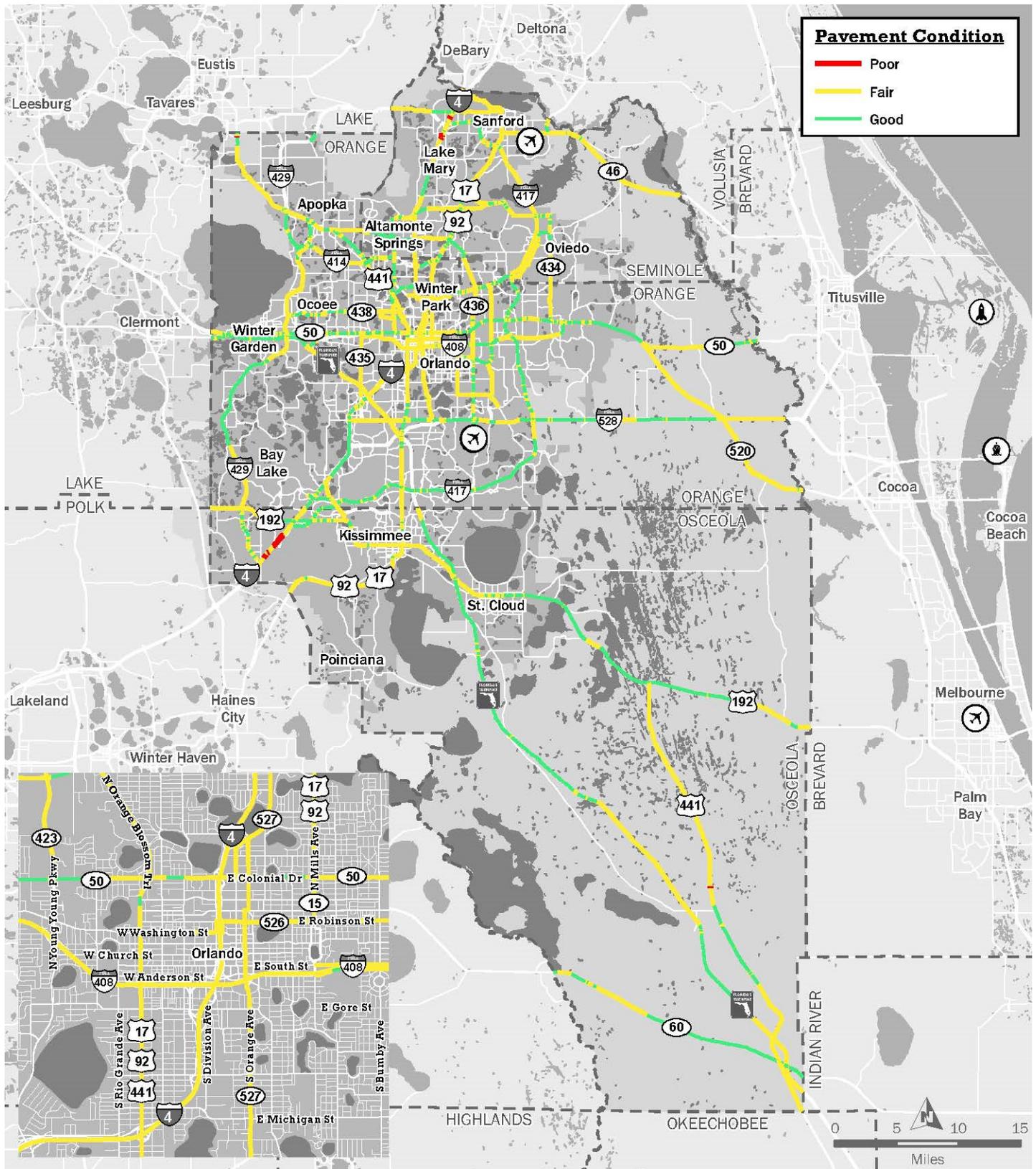
MetroPlan Orlando recognizes the importance of linking goals, objectives, and investment priorities to established performance objectives, and that this link is critical to the achievement of national transportation goals and statewide and regional performance targets. As such, MetroPlan Orlando's 2045 MTP reflects the goals, objectives, performance measures, and targets as they are described in other state and public transportation plans and processes, including the Florida Transportation Plan (FTP) and the Florida Transportation Asset Management Plan.

MetroPlan Orlando's 2045 MTP seeks to address system preservation, identifies infrastructure needs within the metropolitan planning area, and provides funding for targeted improvements. ***MetroPlan Orlando coordinates regularly with FDOT on 3R improvements – in some cases – MPO SU-funds are used to supplement 3R projects to implement Complete Streets and other safety elements within the existing right-of-way.***

MetroPlan Orlando also monitors pavement and bridge conditions as part of the annual System Monitoring Report which facilitates coordination with FDOT and local government partners.



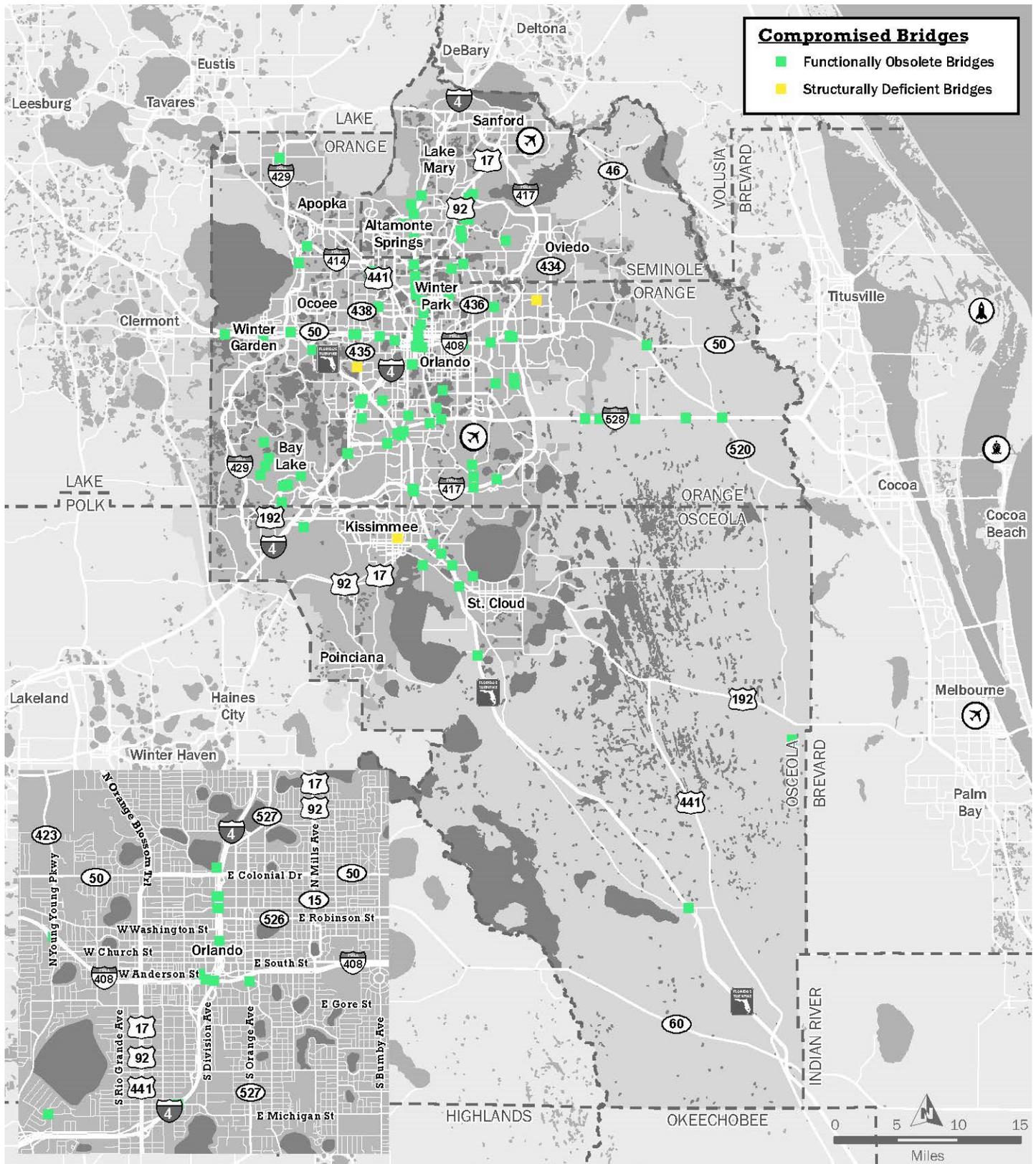
Figure 13.5 | Pavement Condition



Source: FDOT State Materials Office 2019



Figure 13.6 | Compromised Bridges



Source: FDOT Structures Maintenance Office 2019





System Performance, Freight, and Congestion Mitigation & Air Quality Improvement Program (CMAQ) Measures

In January 2017, USDOT published the System Performance/Freight/CMAQ Performance Measures Final Rule to establish measures to assess passenger and freight performance on the Interstate and non-Interstate National Highway System (NHS), and traffic congestion and on-road mobile source emissions in areas that do not meet federal National Ambient Air Quality Standards (NAAQS).

The rule, which is referred to as the PM3 rule, requires MPOs to set targets for the following six performance measures:

- Percent of person-miles on the Interstate system that are reliable, also referred to as Level of Travel Time Reliability (LOTTR);
- Percent of person-miles on the non-Interstate NHS that are reliable (LOTTR);
- Truck Travel Time Reliability index (TTTR);
- Annual hours of peak hour excessive delay per capita;
- Percent of non-single occupant vehicle travel (Non-SOV); and
- Total emissions reduction of on-road mobile source emissions.

For Florida and MetroPlan Orlando, only the two (2) LOTTR performance measures and the one (1) TTTR performance measure applies. As all areas in Florida and the MetroPlan Orlando planning area meet current NAAQS, the remaining three (3) CMAQ-related measures do not currently apply in Florida.

Federal rules require MPOs to establish four-year performance targets for the LOTTR and TTTR performance measures, within 180 days of FDOT setting statewide targets. MPOs can either agree to program projects that will support the statewide targets, or set their own quantifiable targets for the MPO’s planning area. ***MetroPlan Orlando agrees to plan and program projects so that they contribute toward the accomplishment of the FDOT targets.*** System conditions reflect baseline performance (2017). Table 13.5 outlines the USDOT mandated system performance/freight performance measures, the Florida and MPO planning area baselines, and performance targets.

Table 13.5 | System Performance/Freight (PM3) Measures and Targets

Performance Measures	Statewide Baseline (2017)	Statewide Actual (2019)	State + MPO Targets		MPO Baseline (2017)	MPO Actual (2019)
			2-Year	4-Year		
Percent of person-miles on the Interstate system that are reliable (Interstate LOTTR)	84%	83%	≥75%	≥70%	52%	55%
Percent of person-miles on the non-Interstate NHS that are reliable (Non-Interstate LOTTR)	84%	87%	N/A	≥50%	84%	86%
Truck Travel Time Reliability (TTTR)	1.43	1.45	≤1.75	≤2.00	2.62	2.62

Source: National Performance Management Research Dataset (NPMRDS)

Note: MPO Area = Orange, Osceola, and Seminole Counties.



Table 13.6 | Summary of Federal Performance Measures and Targets (1,2,3)

Performance Measures	Statewide Baseline (2013-2017)	MetroPlan Orlando (2013-2017)	State + MPO Targets		MetroPlan Orlando Four-Year Target Accomplished?
			2 Year	4 Year	
PM 1.1 - Number of Fatalities	2,825.4	242	0	0	No
PM 1.2 - Rate of Fatalities per 100 Million VMT	1.36	1.12	0	0	No
PM 1.3 - Number of Serious Injuries	20,929.2	2,157	0	0	No
PM 1.4 - Rate of Serious Injuries per 100 Million VMT	10.13	10.05	0	0	No
PM 1.5 - Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries	3,304.2	395	0	0	No
PM 2.1 - Percent of Interstate pavements in good condition	66.0%	48.3%	N/A	≥60%	No
PM 2.2 - Percent of Interstate pavements in poor condition	0.1%	0%	N/A	<5%	Yes
PM 2.3 - Percent of non-Interstate NHS pavements in good condition	76.4%	47%	≥40%	≥40%	Yes
PM 2.4 - Percent of non-Interstate NHS pavements in poor condition	3.6%	0.5%	<5%	<5%	Yes
PM 2.5 - Percent of NHS bridges by deck area in good condition	67.7%	72%	≥50%	≥50%	Yes
PM 2.6 - Percent of NHS bridges by deck area in poor condition	1.2%	1%	<10%	<10%	Yes
PM 3.1 - Percent of person-miles on the Interstate system that are reliable (Interstate LOTTR)	84%	52%	≥75%	≥70%	No
PM 3.2 - Percent of person-miles on the non-Interstate NHS that are reliable (Non-Interstate LOTTR)	84%	84%	N/A	≥50%	Yes
PM 3.3 - Truck Travel Time Reliability (TTTR)	1.43	2.62	≤1.75	≤2.00	No

Note: MPO Area = Orange, Osceola, and Seminole Counties. FDOT and MetroPlan Orlando have different data sources which may cause some variations in data sets.

Sources: PM1 - FDOT CAR System, DHSMV FIRES, and FDOT Public Road Mileage and Travel Report

PM2 - Pavement Condition Index (PCI) and FDOT Bridge and Pavement Data

PM3 - Source: National Performance Management Research Dataset (NPMRDS)

For more information about MetroPlan Orlando’s performance-based planning process, regional monitoring, and strategies for minimizing congestion, see documentation on *Managing Mobility: A Congestion Management Process*.



Transit Asset Management Measures

On July 26, 2016, FTA published the final Transit Asset Management rule. This rule applies to all recipients and sub-recipients of Federal transit funding that own, operate, or manage public transportation capital assets. The rule defines the term “state of good repair,” requires that public transportation providers develop and implement transit asset management (TAM) plans, and establishes state of good repair standards and performance measures for four asset categories: equipment, rolling stock, infrastructure, and facilities. The rule became effective on October 1, 2018.

Table 13.7 below identifies performance measures outlined in the final rule for transit asset management.

Table 13.7 | FTA TAM Performance Measures

Asset Category	Performance Measure and Asset Class
1. Equipment	Percentage of non-revenue, support-service and maintenance vehicles that have met or exceeded their useful life benchmark
2. Rolling Stock	Percentage of revenue vehicles within a particular asset class that have either met or exceeded their useful life benchmark
3. Infrastructure	Percentage of track segments with performance restrictions
4. Facilities	Percentage of facilities within an asset class rated below condition 3 on the TERM scale



For equipment and rolling stock classes, useful life benchmark (ULB) is defined as the expected lifecycle of a capital asset, or the acceptable period of use in service, for a particular transit provider’s operating environment. ULB considers a provider’s unique operating environment such as geography and service frequency.

Public transportation agencies are required to establish and report transit asset management targets annually for the following fiscal year. Each public transit provider or its sponsors must share its targets, TAM, and asset condition information with each MPO in which the transit provider’s projects and services are programmed in the MPO’s TIP.

MPOs are required to establish initial transit asset management targets within 180 days of the date that public transportation providers establish initial targets. However, MPOs are not required to establish transit asset management targets annually each time the transit provider establishes targets. Instead, subsequent MPO targets must be established when the MPO updates the LRTP.

MetroPlan Orlando agrees to plan and program projects so that they contribute toward the accomplishment of each transit service provider’s target.



MetroPlan Orlando's planning areas is served by two (2) Tier I Transit Service Providers – LYNX and SunRail.

LYNX established the transit asset targets identified in Table 13.8 in 2018. MetroPlan Orlando continues support and re-adopted the TAM targets on February 12th 2020. These targets are based on the condition of existing transit assets and planned investments in equipment, rolling stock, infrastructure, and facilities. The targets reflect the most recent data available on the number, age, and condition of transit assets, and expectations and capital investment plans for improving these assets.

Table 13.8 | FTA TAM Targets for LYNX

Asset Category Performance Measure	Asset Class	FY 2018 Asset Condition	FY 2019 Target
Rolling Stock			
Age - % of revenue vehicles within a particular asset class that have met or exceeded their ULB	Articulated Bus	0%	0%
	Bus	0%	2.5%
	Automobile	100%	75%
	Cutaway	21.3%	17%
	Demand Response Van	0%	1%
	Vanpool Van	3.6%	2.3%
Equipment			
Age - % of non-revenue vehicles within a particular asset class that have met or exceeded their ULB	Automobiles	17.4%	15%
	Trucks and other Rubber Tire Vehicles	71.3%	70%
	Maintenance Equipment	34%	N/A
	Special	100%	N/A
	MIS/IT/Network Systems	58.9%	N/A
	Other Systems	15.5%	N/A
Infrastructure			
% of track segments with performance restrictions (applicable only for Tier I providers)	Bus Guideway	-	-
Facilities			
Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Administration and Maintenance	25%	23%
	Passenger Facilities	0%	0%

Source: LYNX, Transit Asset Management Plan, 2018



SunRail (FDOT/CFRC) established the transit asset targets identified in Table 13.9 in 2018, which MetroPlan Orlando re-adopted in support on February 12th 2020.

Table 13.9 | FTA TAM Targets for SunRail

Asset Category Performance Measure	Asset Class	FY 2018 Asset Condition	FY 2019 Target
Rolling Stock			
Age - % of revenue vehicles within a particular asset class that have met or exceeded their ULB	Locomotives	0%	0%
	Coach Cars	0%	0%
	Cab Cars	0%	0%
Equipment ¹			
Age - % of non-revenue vehicles within a particular asset class that have met or exceeded their ULB	Non-Revenue / Service Automobile	-	-
	Trucks and other Rubber Tire Vehicles	-	-
	Maintenance Equipment	-	-
	Etc.	-	-
Infrastructure			
% of track segments with performance restrictions (applicable only for Tier I providers)	Guideway Elements	1.5%-2%	3%
	Power & Signal Elements	1.5%-2%	3%
	Track elements	1.5%-2%	3%
Facilities			
Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Maintenance Facility (VSMF) and OCC	0%	0%
	Parking Structures Maintenance Facility (VSLMF)	0%	0%
	Passenger Facilities Stations	0%	0%
	Shelter Park and Ride Lots	0%	0%

Source: SunRail, Transit Asset Management Plan, 2018

Note ¹: It is to be noted that SunRail does not need to submit the Equipment SGR target since they do not own or operate any non-revenue equipment. These types of equipment (pick-up trucks, hi-rails, etc.) are owned and operated by Bombardier and Herzog as contractors to SunRail.

These targets for the MPO planning area reflect the targets established by LYNX and SunRail through their Transit Asset Management Plans, as well as the statewide targets established by FDOT for those providers participating in the Group Transit Asset Management. MetroPlan Orlando was consulted in the establishment of regional targets.

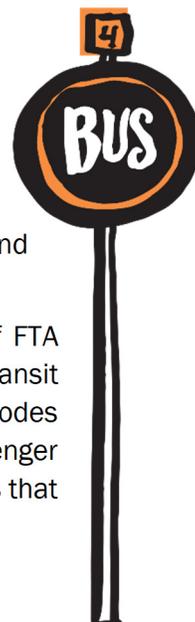
The 2045 MTP directly reflects the goals, objectives, performance measures, and targets as they are described in the other public transportation plans and processes, including the LYNX Transit Development Plan and Transit Asset Management Plan. MetroPlan Orlando also supports the SunRail Transit Asset Management targets. Lynx and SunRail did not submit formal requests for funding to MetroPlan Orlando



Transit Safety Measures

The Federal Transit Administration (FTA) published a final Public Transportation Agency Safety Plan (PTASP) rule and related performance measures as authorized by Section 20021 of the Moving Ahead for Progress in the 21st Century Act (MAP- 21). The PTASP rule requires operators of public transportation systems that receive federal financial assistance under 49 U.S.C. Chapter 53 to develop and implement a PTASP based on a safety management systems approach. Development and implementation of PTASPs is anticipated to help ensure that transit systems are safe nationwide.

The rule applies to all operators of public transportation that are a recipient or sub-recipient of FTA Urbanized Area Formula Grant Program funds under 49 U.S.C. Section 5307, or that operate a rail transit system that is subject to FTA’s State Safety Oversight Program. The rule does not apply to certain modes of transit service that are subject to the safety jurisdiction of another Federal agency, including passenger ferry operations that are regulated by the United States Coast Guard, and commuter rail operations that are regulated by the Federal Railroad Administration.



Transit Safety Performance Measures

The transit agency sets targets in the PTASP based on the safety performance measures established in the National Public Transportation Safety Plan (NPTSP). The required transit safety performance measures are:

- Total number of reportable fatalities.
- Rate of reportable fatalities per total vehicle revenue miles by mode.
- Total number of reportable injuries.
- Rate of reportable injuries per total vehicle revenue miles by mode.
- Total number of reportable safety events.
- Rate of reportable events per total vehicle revenue miles by mode.
- System reliability - Mean distance between major mechanical failures by mode.

Each provider of public transportation that is subject to the rule must certify it has a PTASP, including transit safety targets for the above measures, in place no later than July 20, 2020. However, on April 22, 2020, FTA issued a Notice of Enforcement Discretion that extends the PTASP deadline to December 31, 2020 due to the extraordinary operational challenges presented by the COVID-19 public health emergency. In Florida, each Section 5307 and 5311 transit provider must develop a System Safety Program Plan (SSPP) under Chapter 14-90, Florida Administrative Code. FDOT technical guidance recommends that Florida’s transit agencies revise their existing SSPPs to be compliant with the new FTA PTASP requirements. SunRail is not required to have a PTASP (Part 2. FGTS Not Subject to Chapter 53 of Title 49 Section 5329 United States Code). Table 13.10 identifies the Transit Safety Performance Targets adopted by the LYNX Board on October 22, 2020.

Table 13.10 | LYNX Transit Safety Targets

Performance Indicator	Definition	Target
Fatalities	Total number of reportable fatalities and rate per total vehicle revenue miles by mode (Fixed Route)	0
Injuries	Total number of reportable injuries and rate per total vehicle miles by mode	2.48
Preventable Accident per 100k miles	Total number of preventable accidents and rate per total vehicle miles by mode	2
System Reliability	Mean distance between major mechanical failures Bus-Road	10,000

Source: LYNX, October 2020



Scenario Planning Synopsis

Scenario planning can be applied to long-range transportation plans in a variety of ways, including predictive or “what if” scenarios to test the impacts of specific events; normative scenarios to test the combinations of investments and strategies that would accomplish specific outcomes; and exploratory scenarios to examine how best to prepare for a range of potential future conditions.



The 2045 MTP used an exploratory scenario planning approach. The process included the following steps:

- Development of four alternative futures, each reflecting a combination of assumptions about future demographics, economic, land use and development, technology, and environmental trends;
- Assessment of each alternative future to understand potential implications on Central Florida’s transportation system, including the region’s ability to accomplish its federal transportation performance management targets;
- Identification of potential investment needs associated with each future, and prioritization of these needs into a single 2045 Cost-Feasible Plan;
- Identification of supporting strategies that should be included in the MTP to address emerging issues and opportunities. The emphasis was on identifying strategies that would be priorities across all potential futures; could help shape the future in a direction desired by MetroPlan Orlando and its partners; or could help steer the region away from potentially undesirable future outcomes.

Data Collection and Analysis

MetroPlan Orlando’s scenario development process began with extensive data collection and analysis to understand the national, state, and regional trends impacting the future of transportation in Central Florida. MetroPlan Orlando developed a comprehensive database of regional trends and conditions that served a foundation for the development of potential futures, including:

- Multimodal network, sidewalk/trail network, transit network, and rail network;
- Population and socioeconomic information;
- Visitor information, including total activity levels and major visitor destinations;
- Economic development information, including major industries and activity centers;
- Freight flow information including the location of major freight origins and destinations;
- Current and future land uses;
- Environmental information, including conservation areas and other resources; and
- Transportation system performance information, including safety, bridge and pavement condition, transit asset condition, system reliability, air quality, and related measures.

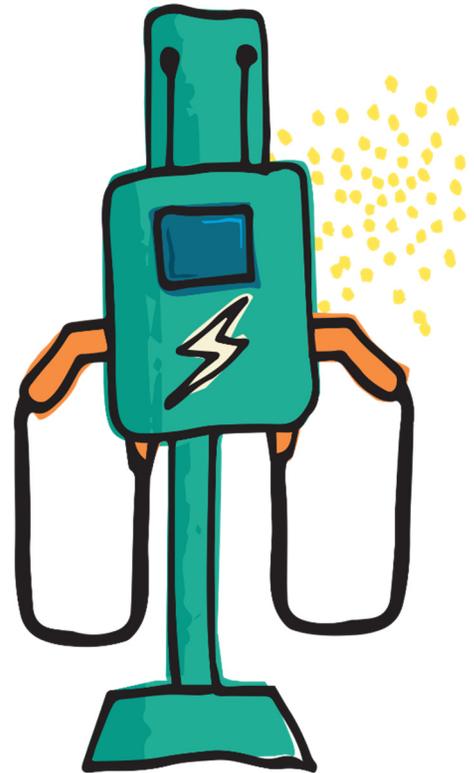


Key Drivers of Change

Through the data collection and analysis process, six key drivers emerged as those factors having the greatest impact on the region's future:

- **Population** - How many new people can the region expect and how quickly will they arrive? Will there be a shift in the region's demographic makeup? Where will these new residents come from?
- **Economy** - What core industries will make up the backbone of the region's economy and how will shifting industry clusters impact transportation?
- **Visitation** - How many visitors can the region expect and where will they come from? How will they get to the region and how will they get around once they arrive? Will the major destinations remain the same or will new destinations emerge?
- **Technology** - How will technology and innovation impact the transportation system? Will automated and connected vehicles reduce or eliminate crashes and improve efficiency? What will cybersecurity impact safety concerns? Will the increasing ease of travel contribute to higher vehicle miles traveled and more congestion? Will improved broadband connectivity lead to increased telepresence?
- **Land Use and Development** - How will land use decisions made today impact the transportation system of the future and vice versa? How should land use and transportation best be integrated to help guide our future?
- **Climate** - How will the impacts of extreme weather events, rising temperatures, changing sea levels, flooding, and other risks affect the region's transportation system?

A range of potential outcomes and how those outcomes could impact the region were identified for each key driver. Each alternative future identified in this scenario planning process was developed based on adjustments to these key drivers to better understand the potential impacts of changes in population, economy, visitation, technology, land use, and climate on the region.



Alternative Futures

Four alternative futures for the MetroPlan Orlando region were developed by adjusting the six key drivers and considering the priorities outlined in the 2045 MTP Goals, Objectives, and Indicators. While each of these potential futures is built around a different theme, there are similarities in the drivers across the futures. For example, Traditional Trends and Technology Transformations use the same BEBR Medium population projections. In addition, within specific futures there are drivers with unique impacts, such as the higher rate of technology adoption in Technology Transformations or the more significant climate impacts in Climate Consequences. Figure 13.7 provides a comparison of the key drivers by scenario illustrating where they have common key drivers and where the key drivers are applied differently.

Figure 13.7 | 2045 MTP Key Driver Adjustments

	Traditional Trends	Disruption Dilemmas	Tech Transformations	Climate Consequences
Population	Increase by 40%	Increase by 20%	Increase by 40%	Increase by 60%
Economy	Moderate growth Tourism/service	Lower growth Healthcare/ Manufacturing	Moderate growth High-tech/research	High growth Construction/tourism
Visitation	Moderate growth	Lower growth	High growth More business travel	High growth Both international and domestic tourism
Technology	Minimum AV/CV impacts	AV/CV focused on targeted AV/CV zones Increased broadband access	High rate of AV/CV adoption Increased broadband access and transit automation	AV/CV focused on targeted AV/CV zones
Land Use and Development	Aligned with existing land use	Lower density Shifts to manufacturing employment centers	Shifts to technology-based employment centers	Higher density along key corridors and in key activity centers
Climate	Moderate sea level rise and frequency of extreme weather events	Moderate sea level rise and frequency of extreme weather events	Moderate sea level rise and frequency of extreme weather events	High sea level rise and increased frequency of extreme weather events

Source: MetroPlan Orlando, 2045 MTP, Technical Series #8 – Scenario Planning Background and Development

These alternative futures and their implications, including potential impacts to federal performance measures, are summarized in Table 13-11 through Table 13-14.



Traditional Trends

Traditional Trends is the baseline future identified for the MetroPlan Orlando region. This future suggests the region will continue its historic trends based on strong growth in population, visitors, and economy and remain focused on the automobile as the primary means for transportation.

Table 13.11 | Scenario Planning - Traditional Trends – Performance Measure Implications

Federal Performance Area	Potential Effect of This Alternative Future on Performance of the System
Highway Safety	Continuation of recent trends in roadway safety. Growth in highway travel and associated congestion continues to place upward pressure on crash, fatality, and serious injury rates, particularly for vulnerable road users. Advancements in automated and connected vehicle technologies partially offset the overall growth rate in travel.
Pavement and Bridge Condition	Continuation of recent trends and forecasts of Interstate and non-Interstate NHS pavement and bridge condition, as identified in FDOT’s Transportation Asset Management Plan. Increasing overall traffic and growth in truck traffic increase wear and tear on existing system.
Travel Time Reliability and Truck/Freight Reliability	Congestion and reliability on key highway corridors are expected to worsen as population, employment and visitation grows. Vehicle miles traveled increase due to additional development on the fringes of the region, creating longer commute times and distances.
Transit Asset Management	Continuation of recent trends and forecasts of state of good repair of transit vehicles, infrastructure, and facilities as identified in the region’s Transit Asset Management plans.
Public Transportation Safety	Continuation of recent trends, with emphasis on working to reduce transit safety events and improve the reliability of transit vehicles

Disruption Dilemma

Disruption Dilemmas was a future designed to consider the impacts potential disruptors, such as economic fluctuations or public health crises, could have on the future of the region’s transportation system. This future assumes the region’s population, visitor, and economic growth are lower and less stable than the baseline. It assumes an overall reduction in travel due a weaker economy, as well as shifts in travel behavior due to a heightened number of people choosing to work remotely or hesitant to use public transportation and shared mobility.

Table 13.12 | Scenario Planning – Disruption Dilemma – Performance Measure Implications

Federal Performance Area	Potential Effect of This Alternative Future on Performance of the System
Highway Safety	Slower population growth and reduction in visitor travel lead to reduced roadway fatalities and serious injuries compared to the Traditional Trends future. Increased walking and bicycling could result in more non-motorized fatalities and serious injuries.
Pavement and Bridge Condition	Lower than expected increases in VMT result in less wear and tear on pavement and bridges, leading to improving asset conditions. However, reduced transportation revenues may impede ability to maintain assets in good condition.
Travel Time Reliability and Truck/Freight Reliability	VMT reductions due to slower growth and increased telework could result in more reliable travel for passenger vehicles and trucks on major corridors in the region. However, customer reluctance to use public transportation, shared mobility, and aviation could increase overall highway travel on major interregional corridors.
Transit Asset Management	With residents more hesitant to use public transportation due to health concerns and reduced transportation revenues, transit providers could have a difficult time maintaining transit assets in a state of good repair.
Public Transportation Safety	Reduction in transit ridership and shift toward smaller vehicles with fewer passengers per vehicle could shift exposure to safety risks; could see an increase in minor incidents but fewer major safety events.



Technology Transformation

Technology Transformations was a future designed to consider the potential impacts large scale technology adoption and implementation could have on the region’s transportation system. This future assumes strong growth in automated and connected vehicles technologies with a high rate of adoption. This future also suggests greater reliance on emerging micro-mobility options and improved broadband access across the region.

Table 13.13 | Scenario Planning – Technology Transformations – Performance Measure Implications

Federal Performance Area	Potential Effect of This Alternative Future on Performance of the System
Highway Safety	Significant increases in automated and connected vehicle deployment expected to lead to dramatic reductions in crashes related to driver error, resulting in vastly improved fatality and serious injury performance.
Pavement and Bridge Condition	Increased reliance on automated and connected increases overall VMT by increasing the ease of travel for students, seniors, disabled persons, and others with limited mobility options today, as well as making extreme commutes a more feasible options for workers wishing to live in rural or other urban areas. The additional VMT puts more wear and tear on infrastructure, leading to worsening pavement and bridge condition unless maintenance keeps pace.
Travel Time Reliability and Truck/Freight Reliability	Technology provides advanced trip planning capabilities and allows for unprecedented network efficiency, allowing improved performance in passenger vehicle and truck reliability overall despite increased VMT. Reliability could decline in some corridors where traffic growth is most significant.
Transit Asset Management	Transit technologies lead to improved network planning, resulting in extended useful life of transit vehicles.
Public Transportation Safety	Increased automation and use of technology could improve overall system safety and security.

Climate Consequences

Climate Consequences was a future designed to consider rapid growth in the region due to in-migration from coastal communities displaced by sea level rise. This future assumes significant extreme weather, precipitation, heat, and flooding impacts, requiring the region to prioritize the resiliency of critical transportation infrastructure

Table 13.14 | Scenario Planning – Climate Consequences – Performance Measure Implications

Federal Performance Area	Potential Effect of This Alternative Future on Performance of the System
Highway Safety	Increases in population leads to greater overall VMT, although transit and active transportation options expand as well. VMT growth as well as additional precipitation and flooding continue to put upward pressure on crash, fatality, and serious injury rates.
Pavement and Bridge Condition	Substantial investment in hardening existing infrastructure and developing new infrastructure will improve the condition of pavement and bridges over time. This may be offset by increased occurrences of extreme weather events that would damage existing facilities.
Travel Time Reliability and Truck/Freight Reliability	The existing roadway network cannot effectively accommodate the increase in population and VMT. Disruptions from extreme weather- as well as construction work zones from repairing or expanding infrastructure- lead to additional nonrecurring congestion, reducing travel reliability for passenger vehicles and trucks.
Transit Asset Management	Higher density development and premium transit services result in increased transit ridership, placing demand on maintaining a state of good repair for transit vehicles and infrastructure.
Public Transportation Safety	Increased ridership and potential for greater operation during weather events could increase exposure to safety risks.



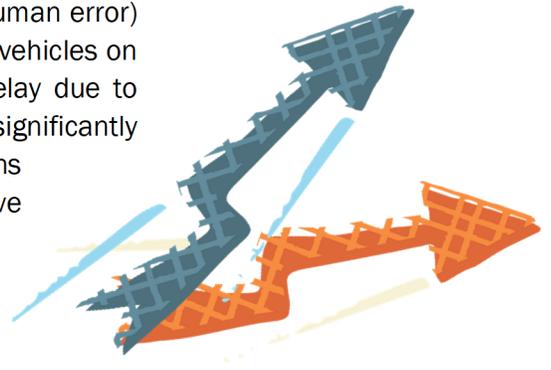
Performance Management Implications

The exploratory process helped MetroPlan Orlando and its partners understand the range of potential futures facing the region, and adjust investment needs, project priorities, and supporting strategies to help “future-proof” the MTP. This included an understanding of the potential implications of future changes and disruptions on the region’s ability to achieve its performance targets. Key takeaways from this process for the 2045 MTP and its implementation include:

- ***The region’s ability to meet its federally required performance targets*** – all of which are established to address performance over periods between one to four years – ***will primarily reflect current trends, rather than the long-term changes and uncertainties explored through the MTP process.*** In particular, the region’s progress toward its annual safety and transit asset management targets, as well as the bridge/pavement and system reliability targets for the first federal performance period ending in 2021, is influenced by current investments and strategies. However, the MTP scenarios provide useful context for understanding the long-term strategies and investment that may be needed to continue to achieve performance goals over time.
- ***The current disruptions experienced by the region’s transportation system and economy due to the pandemic provides an opportunity for a deeper understanding of how significant external events, such as those anticipated in the Disruption Dilemma future, could impact system performance in the region.*** MetroPlan Orlando will collect and review available real-time data to help understand the transportation impacts of the COVID-19 pandemic, which will assist with preparedness for future disruptions.
- ***From a long-term perspective, a key determinant of the region’s progress toward its performance goals is growth in travel, including the distribution among travel modes for both people and freight.*** Growth in VMT for both cars and trucks is correlated with potential performance with regards to safety, pavement/bridge, and system reliability, and growth in transit ridership is a key factor in transit asset management and safety performance. It will be important to understand how travel choices are evolving during and after COVID-19 to help inform future performance and needs analyses. MetroPlan Orlando may wish to develop capabilities for easily developing and testing alternative VMT forecasts to understand these important linkages over time.



- Transportation system performance reflects many different factors, and in some cases a single trend may have multiple impacts, potentially in different directions.** For example, an increase in use of automated and connected vehicles is anticipated to significantly improve safety (due to dramatic reduction in the number of crashes associated with human error) and system efficiency (due to the ability to accommodate more vehicles on a single roadway and the potential to reduce nonrecurring delay due to crashes). However, automated and connected vehicles could significantly increase VMT in parts of the region by providing mobility options for seniors, students, disabled persons, and others who have limited options today and enabling more extreme commutes for people who wish to live on the fringes of the urban area in surrounding areas and commute into Central Florida. In addition, the region may need to accommodate empty vehicles that are searching for parking or circulating after dropping off passengers.
- How the region manages the increased use of technology is likely to be a key determinant of future performance, and the MTP identifies specific research and policy development needs in this area. Similarly, more attention is needed to how the region prepares for, mitigates, responds to, and recovers from extreme weather events, public health crises, and other major disruptions - another area in which the MTP has identified specific strategies.
- MetroPlan Orlando may wish to develop tools to help forecast future safety, asset condition, and reliability** to better understand these impacts and potential choices in future updates. The performance analysis of the 2045 alternative futures was largely qualitative, aside from the technology, travel and land use impacts estimated through the Central Florida Regional Planning Model.
- Because transportation system performance reflects the cumulative impacts of decisions by multiple partners, **MetroPlan Orlando must continue proactive coordination with FDOT, transit providers, local governments, and other partners** to coordinate decisions and investments to accomplish regional goals and objectives.





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