Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area Gainesville Urbanized Area Transportation Study

Year 2045 Long-Range Transportation Plan Update Technical Report 7: Year 2045 Cost Feasible Plan

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Technical Report 7: Year 2045 Cost Feasible Plan



Metropolitan Transportation Planning Organization

For the Gainesville Urbanized Area

YEAR 2045 LONG-RANGE TRANSPORTATION PLAN UPDATE

Technical Report 7

Year 2045 Cost Feasible Plan

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INTRODUCTION

Following adoption of the Year 2045 Needs Plan by the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area in June 2020, the consultant team began work on the Year 2045 Cost Feasible Plan. Development of the Year 2045 Cost Feasible Plan required an evaluation of overall transportation system needs within the context of available financial resources for mobility projects. Priorities for needed mobility projects and the value the community places on investments in various modes of travel are reflected in the community's long-range transportation plan. How an area chooses to spend its limited financial resources presents the clearest picture of its priorities for long-range mobility improvements as a means to achieve community objectives, such as quality of life, economic development, and protecting the environment.

The Year 2045 Cost Feasible Plan was built based on input from the public, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area, and its advisory committees. The Year 2045 Cost Feasible Plan reflects projected transportation revenues available and allocates those revenues to high priority projects identified in the Year 2045 Needs Plan. This report documents the process undertaken in the development and adoption of the Year 2045 Cost Feasible Plan.

7.0 Development and Adoption of Year 2045 Cost Feasible Plan

Development and adoption of the Year 2045 Cost Feasible Plan is the final step in the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area's Year 2045 Long-Range Transportation Plan Update. This report details the process and efforts conducted for the Year 2045 Cost Feasible Plan.

Development of Year 2045 Needs Plan Project Costs

The first step in developing the Year 2045 Cost Feasible Plan for the Gainesville Urbanized Area was to estimate total costs to implement the projects and programs identified in the adopted Year 2045 Needs Plan. Working with the Florida Department of Transportation, Alachua County, and the City of Gainesville, the consultant staff developed costs for all phases of implementation. Costs for projects were developed using the Florida Department of Transportation's (FDOT) Cost per Mile Models for Long-Range Estimating (updated in July 2019). Costs for bridge infrastructure improvements were developed using Volume 1 of the Structures Design Guideline (updated in January 2020) which provides the 2017 Construction Cost Per Square Foot for Bridge Widening projects.

The total cost estimate includes all phases of implementation. The phases include Project Development and Environment (PD&E) studies, Design, Right of Way acquisition, Construction and Construction Engineering Inspection (CEI). The costs for PD&E, Design, Right of Way acquisition and CEI were developed as a percentage of the Construction cost. Industry standard percentages were applied based on the individual project requirements and location.

The total cost estimate for each project, including all implementation phases, was projected for the year 2020 using a 2.6% inflation factor and 2045 using a 3.3% inflation factor as provided in the FDOT Transportation Costs Report (updated in April 2019).

Additional cost information was provided by staff from Alachua County, the City of Gainesville, and the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area for several local projects. Cost estimates for the transit projects were developed using information provided by the City of Gainesville Regional Transit System regarding staffing costs, bus purchases, and construction of transit centers. Finally, the total costs for the various programs in the Year 2045 Needs Plan were developed using a recurring annual fund allocation. As shown on Table 1, the total cost for projects in the Year 2045 Needs Plan is just under <u>\$450 Million</u> in 2020 dollars.

Technical Report 6: Year 2045 Preliminary and Final Needs Plan

Table 1: Year 2045 Needs Plan Projects and Cost Estimates (in Year 2020 Dollars)

Rank	Score	Facility	From	То	Proposed Modification	Project Length in Miles	Construction Cost	Project Development and Environment Cost (5-10%)	Design Cost (10-20%)	Construction Engineering Inspection Cost (15%)	Right of Way Cost (25-100%)	Total Cost (\$ in Millions)	Cumulative Cost (\$ in Millions)	Notes (from FDOT LRE or for clarification)
1*	21.3	NW 83rd Street	NW 23rd Avenue	NW 39th Avenue	Widen to 4 lanes/2 dedicated transit lanes	1.0	\$5,497,096.70	\$462,988.30	\$925,976.65	\$1,388,964.98	\$2,314,941.62	\$10.6	\$10.6	For the purpose of this cost feasible plan the cost was based on Widen 2 Lane Urban Arterial to 4 Lane Divided with 22' Median, 4' Bike Lanes: U20. The total cost of construction for widening and the transit lanes is \$16.7 Million. This cost will also include New Construction Extra Cost for Additional Lane on Urban Arterial: U10 (two additional lanes for transit) + 50% of the right of way cost. The transit costs have been set aside as a separate item.
2	19.6	NW 23rd Avenue	NW 59th Terrace	NW 83rd Street	New Construction 3 lane Complete Street/replace 2 lane rural section	1.5	\$7,194,315.13	\$359,715.76	\$719,431.51	\$1,079,147.27	\$1,798,578.78	\$11.2	\$21.7	New Construction 3 Lane Undivided Urban Arterial with Center Lane and 4' Bike Lanes: U02
3	17.6	SW 62nd Boulevard	SW 20th Avenue	Clark Butler Boulevard	Widen to 4 lanes, with bridge with BRT lanes; median included	0.25	\$7,382,224.54	\$369,111.23	\$738,222.45	\$1,107,333.68	\$7,382,224.54	\$17.0	\$38.7	Cost based on cost per mile as provided in HNTB cost estimate for roadway construction plus the bridge and structure construction cost
4	17.4	NW 98th Street	Newberry Road	NW 39th Avenue	New construction 4 lanes/replace a 2-lane rural section	2.0	\$15,483,010.00	\$1,548,301.00	\$1,548,301.00	\$2,322,451.50	\$3,870,752.50	\$24.8	\$63.5	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
5	16.6	NW 8th Avenue (SR 20)	NW 6th Street	Main Street	Two Lane reduction/Complete Streets	0.4	\$1,960,669.58	\$98,033.48	\$196,066.96	\$294,100.44	N/A	\$2.5	\$66.0	Assume Complete Streets Implementation with Parking, Drainage, C&O. Add 2 Lanes to Existing 2 Lane Undivided Arterial (1 Lane Each Side),with 4' Bike Lanes: U19
6*	14.6	Ft. Clark Boulevard	Newberry Road	NW 23rd Avenue	Widen to 4 lanes/2 dedicated transit lanes	1.0	\$5,497,096.70	\$462,988.30	\$925,976.65	\$1,388,964.98	\$2,314,941.62	\$10.6	\$76.6	For the purpose of this cost feasible plan the cost was based on Widen 2 Lane Urban Arterial to 4 Lane Divided with 22' Median, 4' Bike Lanes: U20. The total cost of construction for widening and the transit lanes is \$16.7 Million. This cost will also include New Construction Extra Cost for Additional Lane on Urban Arterial: U10 (two additional lanes for transit) + 50% of the right of way cost. The transit costs have been set aside as a separate item.
7	14.3	SW 20th Avenue	SW 62nd Boulevard	SW 34th Street	New construction 4 lanes/replace a 2-lane rural section with replacement of current bridge due to deficiency with bridge that spans over SW 38th Terrace	1.75	\$21,634,673.75	\$2,163,467.37	\$3,245,201.06	\$3,245,201.06	\$16,226,005.31	\$46.5	\$123.1	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05 + Bridge Replacement, approximate 39,000 sq ft (500' long with 4-12' lanes, 2-4' bike lanes and a 22' median (total of 78' widening)) at \$192/sq ft (Reinforced concrete with phased construction)
8	14.2	NW 23rd Avenue	NW 83rd Street	Ft, Clarke Boulevard	New construction 4 lanes/replace a 2-lane rural section, including bridge over l-75 + Transit Pre-emption Provisions	0.4	\$7,295,642.00	\$729,564.20	\$1,459,128.40	\$1,094,346.30	\$5,471,731.50	\$16.1	\$139.2	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05 + Bridge Widening, approximate 21,600 sq ft (400' long with 2-12' lanes, 2-4' bike lanes and a 22' median (total of 54' widening)) at \$180/sq ft
9	14.2	SW 62nd Boulevard	Newberry Road	SW 20th Avenue	Widen to 4 lanes with BRT lanes; median included	1.50	\$13,627,169.46	\$681,358.47	\$1,362,716.95	\$2,044,075.42	\$13,627,169.46	\$31.3	\$170.5	Cost based on cost per mile as provided in HNTB cost estimate for roadway construction

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Rank	Score	Facility	From	То	Proposed Modification	Project Length in Miles	Construction Cost	Project Development and Environment Cost (5-10%)	Design Cost (10-20%)	Construction Engineering Inspection Cost (15%)	Right of Way Cost (25-100%)	Total Cost (\$ in Millions)	Cumulative Cost (\$ in Millions)	Notes (from FDOT LRE or for clarification)
10	14.1	Archer Road (SR 24)	Parker Road	SW 75th Street (Tower Road)	New construction 4 lanes/replace a 2-lane rural section	4.0	\$30,966,020.00	\$3,096,602.00	\$6,193,204.00	\$4,644,903.00	\$7,741,505.00	\$52.6	\$223.2	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
11	14.1	SW 8th Avenue	SW 91st Street	SW 20th Avenue	New construction 4 lanes/replace a 2-lane rural section	2.25	\$17,418,386.25	\$1,741,838.62	\$1,741,838.62	\$2,612,757.94	\$8,709,193.12	\$32.2	\$255.4	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
12	11.3	NW 23rd Avenue	NW 98th Street	NW 55th Street	New construction 4 lanes/replace a 2-lane rural section	2.75	\$21,289,138.75	\$1,064,456.94	\$2,128,913.87	\$3,193,370.81	\$5,322,284.69	\$33.0	\$288.4	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
13	11.3	NW 23rd Boulevard	NW 22nd Street	NW 13th Street	New construction 4 lanes/replace a 2-lane rural section, including the widening of bridge over Hog town Creek	1.0	\$9,316,145.00	\$465,807.25	\$931,614.50	\$1,397,421.75	\$4,658,072.50	\$16.8	\$305.2	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05 + Bridge Widening, approximate 8,100 sq ft (150' long with 2-12' lanes, 2-4' bike lanes and a 22' median (total of 54' widening)) at \$180/sq ft
14	11.3	NW 34th Street (SR 121)	NW 31st Boulevard	NW 53rd Avenue	New construction 4 lanes/replace a 2-lane rural section	1.5	\$11,612,257.50	\$1,161,225.75	\$2,322,451.50	\$1,741,838.62	\$5,806,128.75	\$22.6	\$327.8	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
15	11.2	NW 34th Boulevard (SR 121)	NW 53rd Avenue	NW 77 Avenue	New construction 4 lanes/replace a 2-lane rural section	1.75	\$13,547,633.75	\$1,354,763.37	\$2,709,526.75	\$2,032,145.06	\$6,773,816.87	\$26.4	\$354.2	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
16	11.1	SW 23rd Terrace	Williston Road	Hull Road	New construction 4 lanes/replace a 2-lane rural section	1.5	\$11,612,257.50	\$1,161,225.75	\$1,741,838.62	\$1,741,838.62	\$2,903,064.37	\$19.2	\$373.4	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
17	11.1	SW 24th Avenue	SW 43rd Street	SW 34th Street	Widen to 4 lanes	1.0	\$4,901,673.96	\$490,167.40	\$980,334.79	\$735,251.09	\$1,225,418.49	\$8.3	\$381.7	Add 2 Lanes to Existing 2 Lane Undivided Arterial (1 Lane Each Side),with 4' Bike Lanes: U19
18	10.9	Hull Road	SW 20th Avenue	SW 43rd Street	Two- Lane Extension	0.3	\$1,507,635.66	\$150,763.57	\$226,145.35	\$226,145.35	\$753,817.83	\$2.9	\$384.6	New Construction 2 Lane Undivided Urban Arterial with 4' Bike Lanes: U02
19	10.5	Williston Road (SR 331)	SW 40th Street	SW 35th Drive	New construction 4 lanes/replace a 2-lane rural section	0.5	\$3,870,752.50	\$193,537.62	\$387,075.25	\$580,612.87	\$967,688.12	\$6.0	\$390.6	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
20	7.6	NW 34th Street (SR 121)	W University Avenue	NW 31st Boulevard	New construction 4 lanes/replace a 2-lane rural section, including the widening of bridge over Hogtown Creek	2.5	\$24,077,682.50	\$2,407,768.25	\$4,815,536.50	\$3,611,652.37	\$18,058,261.87	\$53.0	\$443.6	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05 + Bridge Widening, approximate 24,300 sq ft (450' long with 2-12' lanes, 2-4' bike lanes and a 22' median (total of 54' widening)) at \$180/sq ft

Year 2045 Long-Range Transportation Plan Update

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Rank	Score	Facility	From	То	Proposed Modification	Project Length in Miles	Construction Cost	Project Development and Environment Cost (5-10%)	Design Cost (10-20%)	Construction Engineering Inspection Cost (15%)	Right of Way Cost (25-100%)	Total Cost (\$ in Millions)	Cumulative Cost (\$ in Millions)	Notes (from FDOT LRE or for clarification)
21	7.5	SW 35th Place	SW 34th Street	SW 27th Street	New construction 4 lanes/replace a 2-lane rural section	0.75	\$5,806,128.75	\$580,612.87	\$580,612.87	\$870,919.31	\$2,903,064.37	\$10.7	\$454.3	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
22	7.5	NW 23rd Avenue	Ft. Clarke Boulevard	NW 98th Street	New construction 4 lanes/replace a 2-lane rural section	0.5	\$3,870,752.50	\$193,537.62	\$387,075.25	\$580,612.87	\$967,688.12	\$6.0	\$460.3	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
23	7.4	NW 53rd Avenue	NW 52nd Terrace	NE 151st Street (not found) SR 24/Waldo Road (I think this is what you meant)	New construction 4 lanes/replace a 2-lane rural section	7.25	\$56,125,911.24	\$5,612,591.12	\$8,418,886.69	\$8,418,886.69	\$14,031,477.81	\$92.6	\$552.9	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
24	7.4	SW 75th Street (Tower Road)	SW 75th Court	SW 8th Avenue	Widen to 4 lanes	3.25	\$15,930,440.37	\$1,593,044.04	\$1,593,044.04	\$2,389,566.06	\$3,982,610.09	\$25.5	\$578.4	Add 2 Lanes to Existing 2 Lane Undivided Arterial (1 Lane Each Side),with 4' Bike Lanes: U19
25	7.1	SW 20th Avenue I-75 Bridge	SW 62nd Avenue	SW 52nd Avenue	New construction 4 lanes/replace a 2-lane rural section, including the widening of bridge over I-75	0.5	\$7,020,032.50	\$702,003.25	\$1,404,006.50	\$1,053,004.87	\$3,510,016.25	\$13.7	\$592.1	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05 + Bridge Widening, approximate 16,200 sq ft (300' long with 2-12' lanes, 2-4' bike lanes and a 22' median (total of 54' widening)) at \$180/sq ft
26	3.8	NW 39th Avenue	SW 143rd Street	NW 105th Street	New construction 4 lanes/replace a 2-lane rural section	2.5	\$19,353,762.50	\$1,935,376.25	\$1,935,376.25	\$2,903,064.37	\$4,838,440.62	\$31.0	\$623.1	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
	TOTAL Cost of 2045 Needs Plan Projects (in 2020 dollars, Millions)									\$449.7				

Development of Financial Plan / Transportation Revenues for Capacity Projects and Programs

This section provides an overview of the financial resources and revenues available for consideration in developing the fiscally-constrained Year 2045 Long-Range Transportation Plan. The financial resources presented are those that are both committed and potential transportation revenues at the federal, state, and local level, including funding sources dedicated to existing maintenance and operations activities for various types of transportation facilities and services in the community. This serves as the basis for defining the revenues available for capital transportation projects to be included in the Year 2045 Cost Feasible Plan. Furthermore, the Fixing America's Surface Transportation Act (FAST Act) requires that long-range transportation plans developed for urbanized areas be financially constrained and that cost feasible plans reflect the "year of expenditure" for each project.

This requirement also calls for revenue to be identified in year of expenditure dollars to reflect the expected rate of inflation. Revenues are provided in 5-year and 10-year phased increments. As such, the Year 2045 Cost Feasible Plan for the Gainesville Urbanized Area was developed in a way that creates five- year and ten-year funding stages. Project costs were then budgeted against forecasted revenues for each period while trying to match the mobility demands of the periods, accounting for the Florida Department of Transportation's project cost inflation factors as provided in the Florida 24, 2019.

State and Federal Revenues for Capacity Programs

The Year 2045 Long-Range Transportation Plan's 25-year total for state and federal revenue sources is \$395.4 million for roadways and ROW projects, in inflation-adjusted revenues, plus an additional \$130.6 million for only transit, for a total of \$526.1 million, as shown below in Table 2. These sources are those that have historically been considered by the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area during preparation of the Long-Range Transportation Plan.

Table 2: State and Federal Funds Available for Capacity Programs

County Level Capacity Program Estimates

State and Federal Funds from the 2045 Revenue Forecast (Millions of Dollars)

Estimates for the Gainesville Metropolitan Transportation Planning Organization

		26-Year Total				
Capacity Programs*	2020	2021-25	2026-30	2031-35	2036-45	2020-2045
Other Roads Construction and ROW	8.4	61.9	75.2	81.1	168.8	395.4
Transit	3.5	19.5	24.6	26.9	56.1	130.6
Total Main Programs	11.9	81.4	99.8	108.1	224.9	526.1

*Estimates for 2018 through 2022 are contained in the FDOT Adopted Work Program #Other Roads estimates do not include projected funding for the TRIP program of the Federal TMA program (SU Fund Code).

^Transit estimates do not include projected funding for the Florida New Starts program.

* Provided by the Florida Department of Transportation in inflated Year of Expenditure Dollars.

Within each revenue category presented in Table 2, there are limitations for the use of these funds. Based on information provided in the Florida Department of Transportation's 2045 Revenue Forecast Handbook, the following guidance is provided:

- Strategic Intermodal System (SIS) Highways Construction & Right-of-Way (ROW) funds may be utilized for construction, improvements, and associated right of way on Strategic Intermodal System (SIS) highways (i.e., Interstate, the Turnpike, other toll roads, and other facilities designed to serve interstate and regional commerce including SIS Connectors).
- Other Arterial Construction/Right-of-Way (ROW) funds may be utilized for construction, improvements, and associated right of way on State Highway System roadways not designated as part of the Strategic Intermodal System (SIS). Also includes funding for the Economic Development Program, the County Incentive Grant Program, the Small County Road Assistance Program, and the Small County Outreach Program.
- Transit funds may be used for technical and operating/capital assistance related directly to transit, paratransit, and ridesharing systems.

Transportation Alternatives Program

Additional federal funds are available to Metropolitan Planning Organizations through the Transportation Alternatives Program. These funds are not included in the estimates for the State Highway System Construction and Right-of-Way shown in Table 2. Guidance regarding planning for these funds in the long-range transportation plan is included in the Florida Department of Transportation's 2045 Revenue Forecast Handbook. Use of these funds in the long-range transportation plan must be consistent with federal and state policy, and is most commonly allocated to bicycle and pedestrian projects. The FAST Act continued funding for Transportation Alternatives projects. Categories impacting MPOs include funds for (1) Transportation Management Areas (TALU funds); (2) areas with populations greater than 5,000 up to 200,000 (TALL funds), and (3) any area of the state (TALT funds). Estimates of Transportation Alternatives Funds are shown further below in Table 3.

Table 3: Transportation Alternatives Funds Estimates

Gainesville Metropolitan Area		Time Pe	26 Year Total ¹			
(Defined as Alachua County)	2020 ¹	2021-25	2026-30	2031-35	2036-45	2020-2045
TALU (Urban); Funds for TMA	N/A	N/A	N/A	N/A	N/A	NA
TALL (<200,000 population); Entire FDOT District	0.69	3.44	3.44	3.44	6.87	17.86
TALT (Any Area); Entire FDOT District	2.78	13.89	13.89	13.89	27.77	72.20

Federal Funds from the 2045 Revenue Forecast (Millions of Dollars)

¹ Rows sometimes do not equal the totals due to rounding.

Transportation Regional Incentive Program

The purpose of the discretionary Transportation Regional Incentive Program is to encourage regional planning by providing state matching funds for projects on regionally significant transportation facilities identified and prioritized by regional partners. These funds are to be used to match local or regional funds on a 50/50 basis or to match up to 50 percent of the total project costs for public transportation projects. Funding estimates for the Transportation Regional Incentive Program were provided by the Florida Department of Transportation only at the districtwide level. For the purposes of estimating, it was assumed that the Gainesville Urbanized Area would likely receive approximately 10 percent of the districtwide revenues. As shown in Table 4, it is expected that the Metropolitan Transportation Planning Organization for the Gainesville Urbanized

Area could receive \$13.5 million in year of expenditure dollars through the year 2045, as that is 10% of District 2's program estimates.

EDOI District		5-Year P	eriod (Fisco	al Years)	26-Year Total ²	
	2020 ¹	2021-25	2026-30	2031-35	2036-2045	2020-2045
District 1	3.1	21.9	32.7	36.4	74.6	168.8
District 2	2.5	17.6	26.3	29.2	59.9	135.5
District 3	1.6	11.6	17.3	19.2	39.3	89.0
District 4	4.1	28.9	43.1	47.9	98.2	222.3
District 5	4.7	32.8	49.0	54.4	111.7	252.6
District 6	2.8	19.7	29.4	32.7	67.0	151.6
District 7	3.3	23.2	34.6	38.4	78.8	178.2
Statewide Total Forecast	22.2	155.8	232.3	258.2	529.5	1,197.9

Table 4: 2045 Revenue Forecast (Millions of Dollars)

¹ Estimates for 2018 through 2022 are contained in the FDOT Adopted Work Program.

² Columns and rows sometimes do not equal the totals due to rounding.

Table 5: Transit - Florida New Starts Program Estimates

State Funds from the 2045 Revenue Forecast (Millions of Dollars)

		26-Year Total				
Statewide Program	2020	2021-25	2026-30	2031-35	2036-45	2020-2045
Statewide Total Forecast	41.8	226.3	259.2	282.4	593.4	1,403.1

Other projects for which funding is uncertain may also be included in the LRTPs as "illustrative" projects.

Table 6: Estimated Revenues from the Transportation Regional Incentive Program

Transportation Regional	Regional Revenue Forecast (Millio	ons of Dollars)			
	2019-2020	2021-2025	2026-2030	2031-2045	Total
Gainesville Urbanized Area	\$0.08	\$0.62	\$0.62	\$1.24	\$2.56

*Provided by the Florida Department of Transportation in inflated Year of Expenditure Dollars

It is important to note that the Florida Department of Transportation has not provided funding for the Transportation Regional Incentive Program in recent years. As such, it was decided that the Year 2045 Long-Range Transportation Cost Feasible Plan would not consider these revenues as available when allocating funds to projects.

Operations and Maintenance of the State Highway System

Forecasted revenues are not provided by the Florida Department of Transportation for non-capacity programs at the metropolitan planning organization level. These programs support and maintain the state transportation system like safety, resurfacing, bridge maintenance and replacement, engineering and design, operations and maintenance and administrative activities. Table 5 contains districtwide estimates for State Highway System Operations and Maintenance expenditures for information purposes. These estimates are provided pursuant to an agreement between the Florida Department of Transportation and the Federal Highway Administration Division Office regarding the reporting of estimates of Operations and Maintenance costs for the State Highway System at the district level in metropolitan planning organization long-range transportation plans.

State Highway System	2045 Revenue Forecast (Millions)*						
Operations & Maintenance	2016-2020	2021-2025	2026-2030	2031-2045	Total		
Districtwide Funds	\$1,982	\$2,023	\$2,216	\$4,868	\$11,089		

Table 7: State Highway System Operations and Maintenance Estimates

*Provided by the Florida Department of Transportation in inflated Year of Expenditure Dollars

Operations and Maintenance of Local Facilities

The City of Gainesville operates the countywide SMARTRAFFIC Advanced Traffic Management System, which includes operations for most traffic signals in the city and county. Alachua County and the City of Gainesville program and budget facility maintenance funds on an annual basis, so these revenues could not be estimated.

Transit Operations and Maintenance

Throughout the long-range transportation plan process, staff from the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area, as well as consultant staff, coordinated with the City of Gainesville Regional Transit System regarding their project priorities. During these discussions, it was learned that existing state and federal transit revenues are primarily used for operating and maintaining the existing system. When adjusted back to current year dollars, the projected revenues dedicated for transit shown in Table 2 slightly decreases in the long term.

Based on these projections, staff from the City of Gainesville Regional Transit System and Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area decided that projected federal and state revenues dedicated to transit would be used to continue supporting operations and maintenance of the existing transit system. As such, transit revenues were not allocated to any new projects in the Year 2045 Cost Feasible Plan. All forecasted revenues will be used to maintain current transit services. Therefore, projected revenues available for transit capital projects to expand the City of Gainesville Regional Transit System's services or service area is limited to the implementation of rapid transit routes noted in the Gainesville Regional Transit System's 10-year Transit Development Plan.

Summary of Projected Revenues Available for Year 2045 Cost Feasible Plan

As noted above, it was determined through the process of developing the Year 2045 Cost Feasible Plan not to allocate all projected revenues to projects and programs identified in the plan. Specifically, it is not known if there will be any available funds from the Transportation Regional Incentive Program, so none were allocated. In addition, projected transit revenues are expected to be used for maintenance and operations of the existing City of Gainesville Regional Transit System. Finally, revenues for the 2019-2020 period were removed, as projects implemented during those two years are covered in the Metropolitan Transportation Planning organization for the Gainesville Urbanized Area's adopted Transportation Improvement Program. Table 8 provides a summary of the projected transportation revenues in year of expenditure dollars to be allocated for projects and programs in the Year 2045 Cost Feasible Plan. Table 8 provides for the summary of project revenues in 2020 dollars.

Year	Other Road ROW (2020 (ds Construction & dollars, in Millions)	(2020 d c	Transit Ilars, in Millions)
2020	\$	8.4	\$	3.5
2021-2025	\$	54.4	\$	17.2
2026-2030	\$	58.2	\$	19.0
2031-2035	\$	55.2	\$	13.3
2036-2045	\$	88.9	\$	29.5
Total	\$	265.1	\$	82.5

Table 8: Summary of Projected Revenues Available for Year 2045 Cost Feasible Plan

Initial Project Ranking

Using the projected revenues by phase through 2045, the estimated projects costs, and the return on investment and evaluation criteria project scoring detailed in Technical Report 6, an initial project ranking list for the Year 2045 Cost Feasible Plan was developed. The list, developed by staff from the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area and the consultant team, was divided up by the State Highway System, Surface Transportation Program, and Transportation Alternatives Program funding categories. It was assumed for the ranking that State Highway System funds could only be spent on projects on the state highway system or adjacent to the state highway system. Furthermore, it was assumed that Transportation Alternatives Program funds could only be spent on bicycle and pedestrian projects. Surface Transportation Program funds are not restricted, and could be used to fund any project in the Year 2045 Needs Plan.

The top projects based on the Evaluation Criteria Project Rankings process noted in prior Technical Report 6 were assigned to the appropriate categories for review and discussion by the advisory committees of the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area. Following input from the various committees, the ranking table was refined. It was determined that projects outside the Gainesville Urbanized Area boundary and projects expected to be funded by non-state and federal sources (local funds, developer projects, University of Florida projects) would be excluded from the rankings.

July 2020 Public Workshop

The third scheduled community public workshop for the Year 2045 Long-Range Transportation Plan was held on Tuesday, July 7, 2020, from 6:00 p.m. to 8:00 p.m., virtually due to conditions imposed by COVID-19. The meeting was part of a series of three community public workshops and two public hearings scheduled to take place during the 2045 Long-Range Transportation Plan update. The workshop was designed to present the Adopted Year 2045 Needs Plan and estimated State Highway System, Transportation Alternatives Program, and Surface Transportation Program revenues through 2045. The Year 2045 Needs Plan includes roadway projects, transit projects, bicycle and pedestrian projects and aspirational projects expected to be completed after 2045.

Approximately 23 people attended the public workshop to learn more about the Year 2045 Long-Range Transportation Plan and to provide comments regarding potential projects to fund in the Year 2045 Cost Feasible Plan. Input provided at the three public workshops and through an online survey was used in developing the final Year 2045 Cost Feasible Plan project list. More information on this meeting is included in Technical Report 1.

7.1 Adoption of Year 2045 Cost Feasible Plan

Using the information gathered at the June 22, 2020 meeting of the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area, the correspondence with the Florida Department of Transportation regarding expenditure of State Highway System funds on local roads, and input received at the July 7, 2020 public workshop, a draft Year 2045 Cost Feasible Plan was developed. The draft plan was presented and discussed with the advisory committees of the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area and revisions were made.

Table 9 presents the Year 2045 Cost Feasible Plan as recommended for approval by the Technical Advisory Committee, Citizens Advisory Committee, and Bicycle/ Pedestrian Advisory Board. The Technical Advisory Committee met on to discuss the plan. The Citizens Advisory Committee met on August 12, 2020 and the Bicycle/Pedestrian Advisory Board met on August 13, 2020 to discuss the Cost Feasible Plan.

Rank	Facility	From	То	Proposed Modification	Project Length in Miles	Construction Cost	Project Development and Environment Cost (5-10%)	Design Cost (10-20%)	Construction Engineering Inspection Cost (15%)	Right of Way Cost (25-100%)	Total Cost (\$ in Millions)	Cumulative Cost (\$ in Millions)	Notes (from FDOT LRE or for clarification)
1*	NW 83rd Street	NW 23rd Avenue	NW 39th Avenue	Widen to 4 lanes/2 dedicated transit lanes	1.0	\$7,607,981.83	\$462,988.30	\$925,976.65	\$1,388,964.98	\$2,314,941.62	\$12.7	\$12.7	For the purpose of this cost feasible plan the cost was based on Widen 2 Lane Urban Arterial to 4 Lane Divided with 22' Median, 4' Bike Lanes: U20. The total cost of construction for widening and the transit lanes is \$16.7 Million. This cost will also include New Construction Extra Cost for Additional Lane on Urban Arterial: U10 (two additional lanes for transit) + 50% of the right of way cost. The transit costs have been set aside as a separate item.
2	NW 23rd Avenue	NW 59th Terrace	NW 83rd Street	New Construction 3 lane Complete Street/replace 2 lane rural section	1.5	\$9,956,932.14	\$497,846.61	\$995,693.21	\$1,493,539.82	\$2,489,233.03	\$15.4	\$28.1	New Construction 3 Lane Undivided Urban Arterial with Center Lane and 4' Bike Lanes: U02
3	SW 62nd Boulevard	SW 20th Avenue	Clark Butler Boulevard	Widen to 4 lanes, with bridge with BRT lanes; median included	0.25	\$10,216,998.77	\$510,849.94	\$1,021,699.88	\$1,532,549.82	\$10,216,998.77	\$23.5	\$51.6	Cost based on cost per mile as provided in HNTB cost estimate for roadway construction plus the bridge and structure construction cost
4	NW 98th Street	Newberry Road	NW 39th Avenue	New construction 4 lanes/replace a 2- lane rural section	2.0	\$25,190,857.27	\$2,519,085.73	\$2,519,085.73	\$3,778,628.59	\$6,297,714.32	\$40.3	\$91.9	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05
5	NW 8th Avenue (SR 20)	NW 6th Street	Main Street	Two Lane reduction/Complete Streets	0.4	\$3,190,009.41	\$159,500.47	\$319,000.94	\$478,501.41	N/A	\$4.1	\$96.1	Assume Complete Streets Implementation with Parking, Drainage, C&O. Add 2 Lanes to Existing 2 Lane Undivided Arterial (1 Lane Each Side), with 4' Bike Lanes: U19
6*	Ft. Clark Boulevard	Newberry Road	NW 23rd Avenue	Widen to 4 lanes/2 dedicated transit lanes	1.0	\$8,943,776.32	\$462,988.30	\$925,976.65	\$1,388,964.98	\$2,314,941.62	\$14.0	\$110.1	For the purpose of this cost feasible plan the cost was based on Widen 2 Lane Urban Arterial to 4 Lane Divided with 22' Median, 4' Bike Lanes: U20. The total cost of construction for widening and the transit lanes is \$16.7 Million. This cost will also include New Construction Extra Cost for Additional Lane on Urban Arterial: U10 (two additional lanes for transit) + 50% of the right of way cost. The transit costs have been set aside as a separate item.

Table 9: Recommended Year 2045 Cost Feasible Plan

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Rank	Facility	From	То	Proposed Modification	Project Length in Miles	Construction Cost	Project Development and Environment Cost (5-10%)	Design Cost (10-20%)	Construction Engineering Inspection Cost (15%)	Right of Way Cost (25-100%)	Total Cost (\$ in Millions)	Cumulative Cost (\$ in Millions)	Notes (from FDOT LRE or for clarification)
7	SW 20th Avenue	SW 62nd Boulevard	SW 34th Street	New construction 4 lanes/replace a 2- lane rural section with replacement of current bridge due to deficiency with bridge that spans over SW 38th Terrace	1.75	\$29,026,228.31	\$2,902,622.83	\$4,353,934.25	\$4,353,934.25	\$21,769,671.23	\$62.4	\$172.5	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05 + Bridge Replacement, approximate 39,000 sq ft (500' long with 4-12' lanes, 2-4' bike lanes and a 22' median (total of 78' widening)) at \$192/sq ft (Reinforced concrete with phased construction)
8	NW 23rd Avenue	NW 83rd Street	Ft. Clarke Boulevard	New construction 4 lanes/replace a 2- lane rural section, including bridge over I-75 + Transit Pre-emption Provisions	0.4	\$11,133,564.56	\$1,113,356.46	\$2,226,712.91	\$1,670,034.68	\$8,350,173.42	\$24.5	\$197.0	New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes: U05 + Bridge Widening, approximate 21,600 sq ft (400' long with 2-12' lanes, 2-4' bike lanes and a 22' median (total of 54' widening)) at \$180/sq ft
9	SW 62nd Boulevard	Newberry Road	SW 20th Avenue	Widen to 4 lanes,with BRT lanes; median included	1.50	\$26,082,402.34	\$1,304,120.12	\$2,608,240.23	\$3,912,360.35	\$26,082,402.34	\$60.0	\$257.0	Cost based on cost per mile as provided in HNTB cost estimate for roadway construction
	TOTAL (in 20	020 dollars, m	nillions)								\$244.3		



Discretionary Fund Eligible Projects

The following table provides for the Discretionary Fund Eligible Project, provided below in ranked priority order based on evaluation criteria as established in Technical Report 6 and adopted by the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area:

Facility	From	То	Proposed Modification
Transit Improvements	Various	Various	Various
Bicycle and Pedestrian Improvements	Various	Various	Various
Park-and-Ride	Tower Road at SW 8th Avenue	-	Construct Park-and-Ride
SW 57th Road	SW 75th Street	SW 63rd Boulevard	New Construction, 2 lanes
NW 83rd Street Extension	Millhopper Road	Santa Fe Northern Boundary	New 2 lane roadway
SW 91st Street / SW 73rd Avenue Extension	Archer Road	SW 88th Street	New Construction, 2 lanes
SW 8th Avenue	SW 91st Street	SW 20th Avenue	New construction 4 lanes/replace a 2-lane rural section
NW 23rd Avenue	NW 98th Street	NW 55th Street	New construction 4 lanes/replace a 2-lane rural section
NW 23rd Boulevard	NW 22nd Street	NW 13th Street	New construction 4 lanes/replace a 2-lane rural section, including the widening of bridge over Hogtown Creek
NW 34th Street (SR 121)	NW 31st Boulevard	NW 53rd Avenue	New construction 4 lanes/replace a 2-lane rural section
NW 34th Boulevard (SR 121)	NW 53rd Avenue	NW 77 Avenue	New construction 4 lanes/replace a 2-lane rural section
SW 23rd Terrace	Williston Road	Hull Road	New construction 4 lanes/replace a 2-lane rural section
SW 24th Avenue	SW 43rd Street	SW 34th Street	Widen to 4 lanes
SW 39th Boulevard	Archer Road	SW 34th Street	Widen to 4 lanes
Hull Road	SW 20th	SW 43rd Street	Two- Lane Extension

Table 10: Discretionary Fund Eligible Projects

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Facility	From	То	Proposed Modification
SW 63rd Boulevard/ SW 67th Avenue	SW 24th Avenue	Archer Road	New Construction, 2 lanes
Williston Road (SR 331)	SW 40th Street	SW 35th Drive	New construction 4 lanes/replace a 2-lane rural section
NW 34th Street (SR 121)	W University Avenue	NW 31st Boulevard	New construction 4 lanes/replace a 2-lane rural section, including the widening of bridge over Hogtown Creek
SW 35th Place	SW 34th Street	SW 27th Street	New construction 4 lanes/replace a 2-lane rural section
NW 23rd Avenue	Ft. Clarke Boulevard	NW 98th Street	New construction 4 lanes/replace a 2-lane rural section
NW 53rd Avenue	NW 52nd Terrace	NE 151st Street (not found) SR 24/Waldo Road	Widen to 4 lanes
SW 75th Street (Tower Road)	SW 75th Court	SW 8th Avenue	Widen to 4 lanes
SW 4th Avenue	SW 13th Street	SE 3rd Street	Widen to 4 lanes
NW 23rd Avenue Extension	NW 98th Street	NW 122nd Street Extension	New Construction, 2 lanes
NW 23rd Avenue Extension	NW 122nd Street	NW 143rd Street	New Construction, 2 lanes
SW 20th Avenue I-75 Bridge	SW 62nd Avenue	SW 52nd Avenue	Widen, 4 lanes with bridge over I-75
NW 39th Avenue	SW 143rd Street	NW 105th Street	Widen to 4 lanes

Year 2045 Cost Feasible Plan Public Hearing

The Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area held an advertised public hearing on August 24, 2020 to discuss and vote on the Recommended Year 2045 Cost Feasible Plan. The project team first outlined the development process of the Year 2045 Long-Range Transportation Plan, including socioeconomic data projections, deficiency analyses conducted on the Year 2045 Existing-plus-Committed and Year 2045 Needs Plan networks, revenue forecasts for state and federal funds, and project rankings of Year 2045 Needs Plan projects. The project team also highlighted the gap between Year 2045 Needs Plan projected costs and the project available revenues for implementation in state and federal funds available, not including resources dedicated to Strategic Intermodal System projects.

Following the presentation, members of the public were afforded an opportunity to comment on the Recommended Year 2045 Cost Feasible Plan. The minutes from the public hearing can be found in the appendix of Technical Memo 1.

Once the public hearing was closed, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area discussed questions to ascertain details of the plan. The Year 2045 Cost Feasible Plan was then voted on and approved. The approval came with direction for staff from the Metropolitan Transportation Planning Organization for the Gainesville Organization to convert the projects in the adopted plan into project phases for the following fiscal year groupings: 2021-25, 2026-30, and 2036-45 using "year of expenditure dollars" in the adopted plan. The adoption language also came with direction to include the following:

- the Strategic Intermodal System information
- Discretionary Fund Eligible Projects
- the list of aspirational projects

Details on the adopted Year 2045 Cost Feasible Plan are described in the following section.

Transportation Improvement Program Projects

The first projects included in the Year 2045 Cost Feasible Plan are those that are funded in the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area's *Transportation Improvement Program: Fiscal Years 2020-21 to 2021-22*. Table 9 depicts these projects as well as the implementation phase or phases that are funded. There are other local projects expected to be completed by 2020, and they are presented in the section of Technical Report 5 describing the Existing- plus-Committed network.

Projects Using State and Federal Funds

The Year 2045 Cost Feasible Plan includes thirteen projects and programs expected to be funded with State and Federal funds. The projects and funding sources are described below.

Strategic Intermodal System Projects

There are four Strategic Intermodal System projects in the Year 2045 Cost Feasible Plan. These include managed lanes on Interstate 75 from the Marion Countyline to Williston Road, Interstate 75 from Williston Road to NW 39th Avenue, and Interstate 75 from NW 39th Avenue to U.S. Highway 441, and Interchange modifications at Interstate 75 and Williston Road.

State Highway System Projects

The majority of funding in the Year 2045 Cost Feasible Plan is in the State Highway System, and only projects on that system can use this funding source.

Surface Transportation Program Projects

Surface Transportation Program funds can be used for any transportation project, including operations and maintenance. The Year 2045 Cost Feasible Plan allocates \$23.5 million (in 2020 dollars) to the widening and extension of SW 62nd Boulevard as a reliever corridor to Interstate 75, and to roadway resurfacing projects in the City of Gainesville and Alachua County.

Transportation Alternatives Program Projects

Transportation Alternatives Program funds are primarily used for bicycle and pedestrian projects. The Year 2045 Cost Feasible Plan allocates all of the \$20.2 million (in 2020 dollars) available through this source to the Bicycle/Pedestrian Program. Funds for this program is intended to be split in half between the City of Gainesville and Alachua County. However, allocation of funding in sequencing will be based on availability of other source funds and completeness of funding for the individual project.

Summary of Projects Using State and Federal Funds

Table 10 provides for the adopted Year 2045 Cost Feasible Plan projects anticipated to use State and Federal funding, and their order of priority. Estimated costs are presented in Year 2020 dollars, except for the Interstate 75 project, which is shown in year of expenditure dollars. In total, the non-Strategic Intermodal System projects are projected to use all of the \$182.1 million in State and Federal funds through the year 2045. Further, it should be noted that continued operations of the existing City of Gainesville Regional Transit System are included in the Year 2045 Cost Feasible Plan, at a cost of \$82.5 million in Year 2020 dollars.

As noted earlier, the motion to adopt the Year 2045 Cost Feasible Plan included language directing staff to divide all projects anticipated to use State and Federal funds into implementation and time phases, and to inflate the project costs to year of expenditure. Following the October 5, 2015 public hearing, the project team broke out the projects by implementation and time phases. Estimated costs for each project were inflated to year of expenditure using inflation factors provided by the Florida Department of Transportation. These factors are:

- 2021 2025 = 1.026 annually
- 2026 2030 = 1.033 annually
- 2031 2045 = 1.033 annually

Table 11: Adopted Year 2045 Cost Feasible Plan Projects Using State and Federal Funds

Rank	Facility	From	То	Proposed	Total Cost (\$	Cumulative Cost
				Modification	in Millions)	(\$ in Millions)
1*	NW 83rd Street	NW 23rd Avenue	NW 39th Avenue	Widen to 4 lanes/2 dedicated transit lanes	\$12.7	\$12.7
2	NW 23rd Avenue	NW 59th Terrace	NW 83rd Street	New Construction 3 lane Complete Street/replace 2 lane rural section	\$15.4	\$28.1
3	SW 62nd Boulevard	SW 20th Avenue	Clark Butler Boulevard	Widen to 4 lanes, with bridge with BRT lanes; median included	\$23.5	\$51.6
4	NW 98th Street	Newberry Road	NW 39th Avenue	New construction 4 lanes/replace a 2- lane rural section	\$40.3	\$91.9
5	NW 8th Avenue (SR 20)	NW 6th Street	Main Street	Two Lane reduction/Complete Streets	\$4.1	\$96.1
6*	Ft. Clark Boulevard	Newberry Road	NW 23rd Avenue	Widen to 4 lanes/2 dedicated transit lanes	\$14.0	\$110.1
7	SW 20th Avenue	SW 62nd Boulevard	SW 34th Street	New construction 4 lanes/replace a 2- lane rural section with replacement of current bridge due to deficiency with bridge that spans over SW 38th Terrace	\$62.4	\$172.5
8	NW 23rd Avenue	NW 83rd Street	Ft. Clarke Boulevard	New construction 4 lanes/replace a 2- lane rural section, including bridge over I-75 + Transit Pre-emption Provisions	\$24.5	\$197.0
9	SW 62nd Boulevard	Newberry Road	SW 20th Avenue	Widen to 4 lanes with BRT lanes; median included	\$60.0	\$257.0

Some of the projects are not expected to be fully funded by 2045. For those projects, remaining costs are assumed to occur beyond 2045. Since inflation factors were not provided beyond 2045, the 2031-2045 factor is applied. Table 11 depicts the phasing of the Year 2045 Cost Feasible Plan projects anticipated to use State and Federal funding. Implementation phases shown in the table include:

- Design
- Right of Way Acquisition (ROW)
- Construction (CEI)
- Construction Engineering Inspection (CEI)
- Transit Operations (TOP)

Regionally Significant Projects

There are several regionally significant projects in the Year 2045 Cost Feasible Plan. These include the widening and extension of SW 62nd Boulevard and the widening of Archer Road (State Road 24). Purpose and Need Statements have been developed for each and are included in the Florida Department of Transportation's Efficient Transportation Decision Making database. A brief description is provided here.

SW 62nd Boulevard

The purpose of this project is to develop a new north-south corridor between State Road 24 (Archer Road) and State Road 26 (Newberry Road) east of Interstate 75. This connector is intended to provide congestion relief to the interstate as well as several arterial roads in the western part of the City of Gainesville. Modifications to the SW 62nd Boulevard corridor will also provide enhanced interconnectivity. The project is being coordinated with significant land use changes in the area, including development of the Urban Village area and redevelopment / expansion of the Butler Plaza shopping centers.

Archer Road (State Road 24)

The purpose of this project is to provide additional east-west mobility through the widening of the existing two-lane Archer Road (State Road 24) from SW 122nd Street to SW 75th Street / Tower Road. The project may include roadway widening to four lanes, intersection modifications, curb and gutter drainage, installation of sidewalks and bike lanes, transit enhancements, and additional roadway lighting.

Table 12: Adopted Year 2045 Cost Feasible Plan Phasing (in Year of Expenditure Dollars)

Rank	Facility	From	То	Proposed Modification	Year of Expenditure	\$ in Millions
1*	NW 83rd Street	NW 23rd Avenue	NW 39th Avenue	Widen to 4 lanes/2 dedicated transit lanes	2030	\$12.7
2	NW 23rd Avenue	NW 59th Terrace	NW 83rd Street	New Construction 3 lane Complete Street/replace 2 lane rural section	2030	\$28.1
3	SW 62nd Boulevard	SW 20th Avenue	Clark Butler Boulevard	Widen to 4 lanes, with bridge with BRT lanes; median included	2030	\$51.6
4	NW 98th Street	Newberry Road	NW 39th Avenue	New construction 4 lanes/replace a 2-lane rural section	2035	40.3
5	NW 8th Avenue (SR 20)	NW 6th Street	Main Street	Two Lane reduction/Complete Streets	2035	\$44.4
6*	Ft. Clark Boulevard	Newberry Road	NW 23rd Avenue	Widen to 4 lanes/2 dedicated transit lanes	2035	\$58.5
7	SW 20th Avenue	SW 62nd Boulevard	SW 34th Street	New construction 4 lanes/replace a 2-lane rural section with replacement of current bridge due to deficiency with bridge that spans over SW 38th Terrace	2040	\$62.4
8	NW 23rd Avenue	NW 83rd Street	Ft. Clarke Boulevard	New construction 4 lanes/replace a 2-lane rural section, including bridge over I-75 + Transit Pre- emption Provisions	2040	\$86.9
9	SW 62nd Boulevard	Newberry Road	SW 20th Avenue	Widen to 4 lanes with BRT lanes; median included	2040	\$146.9

Projects Using Local and Other Funds

In addition to the projects anticipated to use State and Federal funds through the year 2045, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area adopted eight projects that are expected to be funded locally. These projects are to be funded by developers or the University of Florida. The projects were not prioritized and not divided into implementation phases. Since they are not funded through State

and Federal sources, all costs required to complete the project are included. Furthermore, no time phases for implementation were assumed, so project costs were not inflated to year of expenditure. The total estimated cost for the locally funded projects in the adopted Year 2045 Cost Feasible Plan is \$43.14 million.

Aspirational Projects

Finally, while not expected to be funded by the year 2045, the aspirational projects identified in the Year 2045 Needs Plan are included in the Year 2045 Cost Feasible Plan for illustrative purposes. These projects, described in Technical Report 6 include:

Facility	From	То	Proposed Modification
Archer Road (SR 24)	SW 75th Street	SW 45th Street	Dedicated Transit Lane and signal upgrade
Newberry Road (SR 26)	NW 109th Drive	NW 143rd Street	Dedicated Transit Lane in median and signal upgrade
NW 115th Street	NW 39th Avenue	NW 46th Avenue	New construction, 2 lanes and dedicated transit lane
NW 122nd Street/NW 115th Street	Newberry Road	NW 39th Avenue	New construction, 2 lanes and dedicated transit lane
SW 122nd Street	SW 37th Avenue	SW 8th Avenue	Dedicated Transit Lane
SW 122nd Street	Newberry Road	SW 8th Avenue	Dedicated Transit Lane
SW 122nd Street	SW 37th Avenue	SW 8th Avenue	Dedicated Transit Lane
SW 122nd Street	Newberry Road	SW 8th Avenue	Dedicated Transit Lane
Hawthorne Road (SR 20)	SE 27th Street	SE 43rd Street	Dedicated Transit Lanes (Configure existing roadway, add multi-use path)
NW 98th Street	NW 39th Avenue	SpringHills Boulevard	Two- Lane Extension

Table 13: Aspirational Projects

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Facility	From	То	Proposed Modification
NW 98th Street Extension	NW 39th Avenue	NW 46th Avenue	New Construction, 4 lanes
NW 91st Street	4100 Block	SpringHills Boulevard	Two- Lane Extension
SpringHills Boulevard	NW 122nd Street	NW 83rd Street	New Two- Lane Roadway
SpringHills Connector	SpringHills Boulevard	Millhopper Road	New Two- Lane Roadway
NW 91st Street Extension	Terminus	NW 46th Avenue Extension	New Construction, 4 lanes
Newberry Road (SR 26)	I-75	NW 109th Drive	Dedicated Transit Lane in median and signal upgrade
NW 115th Street	NW 39th Avenue	NW 46th Avenue	New construction, 2 lanes and dedicated transit lane
NW 122nd Street/NW 115th Street	Newberry Road	NW 39th Avenue	New construction, 2 lanes and dedicated transit lane
NW 83rd Street	NW 39th Avenue	SpringHills Boulevard	Two- Lane Extension + 2 dedicated transit lanes
NW 46th Avenue	NW 83rd Extension	NW 91st Street Extension	New roadway + 2 Dedicated Transit Lanes
NW 46th Avenue	NW 91st Street Extension	NW 98th Street Extension	New 4 lane roadway + 2 dedicated transit lanes and Bridge over I-75
Archer Road (SR 24)	SW 75th Terrace	SW 91st Street	Widen to 4 lanes and Dedicated Transit Lane
SW 91st Street	Archer Road	SW 46th Boulevard	Dedicated Transit Lane

Florida's Future Corridors

In addition to the aspirational projects identified in the Year 2045 Needs Plan, the Florida Department of Transportation has been studying the potential for new transportation corridors throughout the state. The Future Corridors initiative is a statewide effort led by the Florida Department of Transportation to plan for the future of major transportation corridors critical to the state's economic competitiveness and quality of life over the next 50 years. This initiative builds upon the 2060 Florida Transportation Plan which calls for planning a transportation system that maintains our economic competitiveness by meeting current and future transportation needs for moving people and freight. Five initial study areas were identified, including the Tampa Bay to Northeast Florida Corridor, which may pass through Alachua County. In 2013, the Florida Department of Transportation completed a high-level concept study that assessed and identified long-term mobility and connectivity needs in the area extending from Tampa Bay to Northeast Florida.

One of the recommendations from the Concept Study was that a more detailed evaluation be conducted to assess the feasibility of developing a multimodal transportation corridor between the northern portion of the Tampa Bay region and I-75 between Wildwood and Lake City. In response to this recommendation, the Florida Department of Transportation recently initiated the I-75 Relief Study. A future study was to evaluate new and enhanced multi-modal transportation corridors beginning at I-75 and continuing to Northeast Florida.

Multi-use Corridors of Regional Economic Significance (M-CORES)

The Multi-use Corridors of Regional Economic Significance (M-CORES) program is intended to revitalize rural communities, encourage job creation and provide regional connectivity while leveraging technology, enhancing the quality of life and public safety, and protecting the environment and natural resources. The program was signed into law by Governor Ron DeSantis on May 17, 2019. The intended benefits include, but are not limited to, addressing issues such as:

- Hurricane evacuation
- Congestion mitigation
- Trade and logistics
- Broadband, water and sewer connectivity
- Energy distribution
- Autonomous, connected, shared and electric vehicle technology
- Other transportation modes, such as shared-use nonmotorized trails, freight and passenger rail, and public transit
- Mobility as a service
- Availability of a trained workforce skilled in traditional and emerging technologies

- Protection or enhancement of wildlife corridors or environmentally sensitive areas
- Protection or enhancement of primary springs protection zones and farmland preservation areas

The Florida Department of Transportation (FDOT) was assigned with assembling task forces to study three specific corridors:

- The Suncoast Connector, extending from Citrus County to Jefferson County
- The Northern Turnpike Connector, extending from the northern terminus of Florida's Turnpike northwest to the Suncoast Parkway
- The Southwest-Central Florida Connector, extending from Collier County to Polk County

The Florida Legislature charged each Task Force with providing recommendations and evaluations in a final report by November 15, 2020, which will guide the Florida Department of Transportation in its subsequent study phases through the implementation of high-level needs, guiding principles, and instructions.

While not within the Gainesville Metropolitan Transportation Planning Organization's area, the Suncoast Connect and the Northern Turnpike Connector may have an economic and associated transportation impacts on the Gainesville Urbanized Area. These plans will need to be continuously monitored, and as needed, their effects included into planning for future transportation in the Gainesville Urbanized Area.

Safety Element

The Moving Ahead for Progress in the 21st Century Act (MAP-21) required metropolitan planning organizations to develop Safety Elements as part of their Long-Range Transportation Plans to provide planning guidance on ways to improve safety in all aspects of transportation mobility. This legislation recognizes safety as a separate planning factor, and it is indeed a crucial ongoing issue affecting all modes and users. Statistics bear this out. The Florida Department of Transportation's Safety Office developed the *2015 State of Florida Highway Safety Plan* to improve the safety of Florida's surface transportation system for residents and visitors through focusing funding and other resources strategically on those problem areas where the opportunity for improvement is greatest, as measured by reductions in fatalities and serious injuries. Subsequently, the Fixing America's Surface Transportation Act (FAST Act) provides for safety to continue to be elements of Long-Range Transportation Plans.

The Safety Element of the Year 2045 Long-Range Transportation Plan begins with a discussion of the policy framework in the *2015 State of Florida Highway Safety Plan* followed by an assessment of how the Gainesville Urbanized Area has fared in comparison with other areas of the state and country regarding safety. Results show that

crash rates in Alachua County are slightly lower than the majority of other counties nationwide, but safety (based on crash rates) is still a major concern, especially for vulnerable road users such as bicyclists, pedestrians, motorcyclists, and elderly users. The second section identifies the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area safety principles and strategies for guidance to address safety in future years. The third section identifies the strategies to monitor safety indicators, allocate resources most effectively to priority safety projects and programs, and coordinate with various agencies to improve overall safety on the Gainesville Metropolitan Area transportation network.

Safety Issues and Concerns

The 2015 State of Florida Highway Safety Plan provides a framework for addressing local safety issues and identifying funding sources for implementation. The Safety Office of the Florida Department of Transportation continually reviews statewide crash statistics. This office has identified several emphasis areas on which to focus efforts and resources, based on an analysis of safety problems and current resource allocation in Florida:

- Aggressive Driving
- Intersection Crashes
- Vulnerable Road Users/Bicycles and Pedestrians
- Vulnerable Road Users/Motorcyclists
- Lane Departure Crashes
- Impaired Driving
- At-Risk Drivers/Aging Road Users
- At-Risk Drivers/Teen Drivers
- Distracted Driving
- Traffic Records

The 2015 State of Florida Highway Safety Plan can be accessed at the following website: http://www.dot.state.fl.us/safety/3-Grants/FDOT%20HIGHWAY%20SAFETY%20PLAN%202015.pdf

Data used for development of safety documents, such as crash data from Signal 4 Analytics, is accessed at the following website: <u>http://s4.geoplan.ufl.edu/</u>

Additional information on emergency relief and disaster preparedness can be found at these websites:

- Florida Comprehensive Emergency Plan http://floridadisaster.org/cemp.htm
- Emergency Support Function 1: Transportation - <u>http://floridadisaster.org/documents/CEMP/2014/2014%20Finalized%20ESFs/2</u> <u>014%20ESF%20 1%20Appendix_finalized.pdf</u>

Finally, state and national incident management plans can be accessed at the following websites:

- http://www.fema.gov/national-incident-management-system
- <u>http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf</u>
- http://floridadisaster.org/documents/nrf-core.pdf

Safety in Long-Range Transportation Planning

Of the ten emphasis areas identified in the 2015 State of Florida Highway Safety Plan, several can be addressed in the transportation planning process. Safety issues can be addressed through engineering, enforcement, education, and emergency response. The transportation planning process, as utilized in Long-Range transportation plans, primarily focuses on engineering. The effectiveness of potential safety strategies can be measured through reductions in total crashes, serious injuries, and fatalities.

A key emphasis area in Florida is vulnerable road users. For many years, the state ranked as the worst in the nation for pedestrian safety according to the National Highway Transportation Safety Administration. States were scored by the number of pedestrian fatalities per 100,000 people. Florida has been making some strides over the past few years with a concerted effort by the Florida Department of Transportation and other state agencies to address the issues. In 2014, Florida ranked as the 5th worst state, with 2.46 pedestrian fatalities per 100,000 people. In addition, the state has modified design standards in urban areas to provide safer streets for pedestrians and bicyclists.

In 2013, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area produced the "Incorporating Safety into Transportation Planning" report. The report offers guidance on methods to address safety in the planning process, and specifically, in long range transportation plans.

System Safety Principle and Strategies

As described in Technical Report 5, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area adopted Principles and Strategies for the Year 2045 Long-Range Transportation Plan. Principle 2 is **Increase safety and security for motorized and non-motorized users**. There are five strategies supporting Principle 2, and they are:

Strategy 2.1: Support projects that address safety performance targets and increase safety for all users.

Strategy 2.2: Implement techniques and road design to reduce fatalities and serious injuries.

Strategy 2.3: Support projects that increase safety and security for all users of the nonmotorized transportation system.

Strategy 2.4: Encourage development of alternative fuel sources and multimodal infrastructure to provide continuing transportation services.

Strategy 2.5: Coordinate with appropriate agencies to accommodate incident management and emergency management.

These strategies will help to focus safety programming and funding priorities. Performance measures and targets for each safety strategy can be identified and tracked. Potential measures can be tracked to evaluate progress towards achieving the system safety objectives. To ensure consistency of measurements over time, coordination with the Alachua County Community Traffic Safety Team to set a current baseline data point for each measurement, update the measures, and track progress through development of its project priority lists as well as the Year 2045 Long-Range Transportation Plan.

System Safety Modifications

With its ability to direct state and federal transportation funding, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area can directly influence how and where safety improvements are made in the Gainesville Metropolitan Area. The Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area has a range of funding available for safety projects each year from various sources. The Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area works closely with the Alachua County Community Traffic Safety Team to identify specific safety improvement needs, projects and programs for inclusion in the Transportation Improvement Program.

Table 14: Potential Safety Performance Measures

Mea	sures to address existing and potential satety issues
•	Physical modifications (sidewalks, clearance zones, narrowing roadways, etc
•	Education programs to make travelers more aware of safety risks and rules
	(defensive driving, sharing the road, "slow down/move over," etc.)
•	Education and enforcement programs to reduce risky behaviors (drunk
	driving, seat belt use, etc.)
•	Coordinate with Community Traffic Safety Team to identify projects for
	funding from various safety programs
Mea	sures to increase safety, mobility, accessibility for vulnerable road users
•	Construct new sidewalks, bicycle facilities, and trails
•	Increase outreach and education with law enforcement, prosecutors, and
	iudaes for enforcina traffic laws relating to pedestrians, cyclists, and
	motorcyclists
•	Adopt a Complete Streets policy to ensure the needs of all users are
-	considered/met in roadway design
	considered/merimedaway design
Mea	sures to implement techniques to calm traffic and improve performance
•	Implement access management strategies to encourage trucks to use
	alternate routes
•	Review preferred truck routes through the region
Mea	sures to improve pedestrian and bicyclist safety
•	Implement a 6 E's (Engineering, Education, Enforcement, Encouragement,
	Evaluation & Planning, and Equity) approach to bicycle and pedestrian
	planning
•	Provide education for both motorists and cyclists regarding rules of the road
	and reducing conflicts
	Support Safe Doutes to Schools programs and projects to opeourage children
•	Support Safe Routes to Schools programs and projects to encourage children

The Year 2045 Long-Range Transportation Plan reflects an increased emphasis on transforming the transportation network in the Gainesville Metropolitan Area to a multimodal system. Safety was a major consideration early on, when the Vision, Principles and Strategies were developed. Furthermore, safety was a key component in the evaluation and ranking of the Adopted Needs Plan projects.

The Year 2045 Cost Feasible Plan allocates funds for new roadway connectivity projects and bicycle/pedestrian projects. Additionally, all widened roadways in the Year 2045 Cost Feasible Plan will include pedestrian and bicycle facilities, and funds have been allocated for transit operations, and maintenance of the existing system through allocation of funds for resurfacing. Safety strategies are part and parcel of many complete street and multimodal projects, ranging from dedicated bike lanes and sidewalk/street buffers to access management strategies and enhanced pedestrian crossings. As part of the development of transportation projects, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area and its partners will collect baseline data regarding safety issues and other travel information. This will allow for before-and-after comparisons of the benefits of the implemented transportation projects.

Policy and Coordination Recommendations

Alachua County has an active Community Traffic Safety Team, which includes individuals representing law enforcement, emergency management, transportation planning and traffic engineering, medical services and others. The Alachua County Community Traffic Safety Team reviews safety concerns, promotes traffic safety programs, and reviews a list of safety concerns needing referral to the appropriate agency. The Alachua County Community Traffic Safety Team provides a forum for discussing safety issues and resolving them effectively through interagency coordination and/or funding resources from safety programs. The Alachua County Community Traffic Safety Team Coalition, which meets quarterly to share best practices among Safety Teams.

The Alachua County Community Traffic Safety Team is a Florida Department of Transportation-supported group of professionals working in agencies supporting a transportation system that is safe for people and goods. The Alachua County Community Traffic Safety Team includes representatives from:

State of Florida

- Florida Department of Transportation District 2 Traffic Operation
- Florida Highway Patrol
- University of Florida Facilities Planning & Construction
- University of Florida Police Department
- University of Florida Transportation Institute

Alachua County

- Fire Rescue
- Sheriff's Office
- Public Works Department
- School Board
• Health Department

City of Gainesville

- Bicycle/Pedestrian Advisory Board*
- Fire Rescue
- Police Department
- Public Works Department

Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area

• The Bicycle/Pedestrian Advisory Board, which is staffed by the City of Gainesville, advises Alachua County, the City of Gainesville and the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area on bicycle and pedestrian issues.

The Safety Team meets ten times a year to address safety issues within Alachua County. At times, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area refers transportation safety issues to the Alachua County Community Traffic Safety Team.

Evaluation of the Year 2045 Cost Feasible Plan

The Year 2045 Cost Feasible Plan is a multimodal plan that balances the growing travel demand of the Gainesville Urbanized Area with limited revenues identified for transportation projects through the year 2045. The projects identified for funding address the Long-Range Transportation Plan Planning Factors identified in the Fixing America's Surface Transportation Act (FAST Act) and are consistent with Principles and Strategies adopted by the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area

Long-Range Transportation Plan Planning Factors

As discussed in Technical Report 6, the Year 2045 Long-Range Transportation Plan is required by the Fixing America's Surface Transportation Act (FAST Act) to reflect consideration of the following ten planning factors:

- 1) Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- 2) Increase the safety of the transportation system for motorized and nonmotorized users.
- 3) Increase the security of the transportation system for motorized and nonmotorized users.
- 4) Increase accessibility and mobility of people and freight.
- 5) Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation

improvements and State and local planned growth and economic development patterns.

- 6) Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
- 7) Promote efficient system management and operation.
- 8) Emphasize the preservation of the existing transportation system.
- 9) Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
- 10) Enhance travel and tourism.

These ten planning areas, along with an increased emphasis on safety and performancebased planning were used in developing the adopted Principles and Strategies for this plan update.

Principles and Strategies

The adopted Vision Statement, Principles and Strategies for the Year 2045 Long-Range Transportation Plan are the policy statements of the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area and helped guide the development of the plan update. As discussed in Technical Report 6, the Principles and Strategies were used to develop evaluation criteria used to rank the Year 2045 Needs Plan projects. These project ranking scores were used in the development of the Year 2045 Cost Feasible Plan, thereby tying those projects directly back to the Principles and Strategies.

System Performance of the Plan

As with the Year 2045 Needs Plan, the adopted Year 2045 Cost Feasible Plan was coded into the Gainesville Urban Area Transportation Study regional travel demand model. As shown on Table 14, performance measures from the model were summarized and compared against the Year 2010 base year network, the Year 2045 Existing-plus-Committed network, and the Year 2045 Needs Plan network. As expected, the model results were generally less positive than the results of the Year 2045 Needs Plan network, but better than the Year 2045 Existing-plus-Committed network. Figure 1 depicts projected congestion and roadway deficiencies in the year 2045 assuming all fully funded cost feasible projects are completed.





	Year 2015 Base Network	Year 2045 Existing- plus- Committed Network (EC)	Year 2045 Adopted Needs Plan (A3)	Year 2045 Adopted Cost Feasible (CF)	Hybrid Impact (A3-EC)	Cost Feasible Impact (CF-EC)
Total Number of Links	4,974	5,019	5,227	5,019	208	0
Total Lane Miles	2,167.15	2,175.31	2,433.25	2,194.66	258	19
Total Directional Miles	1,664.88	1,675.35	1,758.55	1,675.35	83	0
Total Volumes All Links	25,865,834	35,993,540	35,220,266	35,871,318	-773,274	-122,222
Total VMT All Links	7,741,868	10,932,634	10,876,006	10,919,606	-56,628	-13,028
Total VHT All Links	191,192	313,992	281,316	308,378	-32,676	-5,614
Original Speed (MPH)	40.03	40	39.54	40.00	-0.46	0.00
Congested Speed (MPH)	38.76	36.79	37.62	36.95	0.83	0.16
Transit Boardings - Local bus	49,612	52,581	47,644	52,398	-4,937	-183
Transit Boardings - Express			1,041	1,525	1,041	1,525
Transit Boardings - BRT			10,256	2,182	10,256	2,182
Total Boarding	49,612	52,581	58,941	56,105	6,360	3,524
Commute Mode Share - Drive Alone	537,596	778,494	776,433	776,829	-2,061	-1,665
Commute Mode Share - Car Pool	450,458	473,309	472,131	472,763	-1,178	-546
Commute Mode Share – Transit	31,019	32,515	36,728	35,476	4,213	2,961
Commute Mode Share - Non-Motorized	87,373	93,194	92,221	92,445	-973	-749

Table 15: Year 2045 Cost Feasible Plan Model Comparison

Implementation of the Year 2045 Long-Range Transportation Plan

Even though the Year 2045 Long-Range Transportation Plan for the Gainesville Urbanized Area is now adopted, there are many steps remaining before projects can be constructed. Projects must continue to be prioritized, funding identified, effects to the social and physical environment must be evaluated in more detail, engineering plans need to be prepared, and in some cases right of way will need to be acquired.

Prioritization of Projects

The Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area included a prioritization ranking of projects when they adopted the Year 2045 Cost Feasible Plan. This prioritization serves as a guide to the Florida Department of Transportation, the City of Gainesville, and Alachua County regarding the importance of each project in the plan. In order to move projects forward to implementation, they must be included in the annual List of Priority Projects adopted by the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area. Currently, the adopted Year 2035 Cost Feasible Plan projects and priorities are included in the Metropolitan Transportation Planning Organization's List of Priority Projects as an appendix. The adopted Year 2045 Cost Feasible Plan projects, expected to be adopted in the summer of 2016.

Phasing of Projects

As projects identified in Long-Range transportation plans move into implementation, funding and other constraints may require some projects to be phased. For the Year 2045 Long-Range Transportation Plan for the Gainesville Urbanized Area, phasing will be necessary to implement all of the projects identified on the multimodal emphasis corridors. Furthermore, it is likely that the widening of State Road 24 (Archer Road), as well as the modifications to State Road 121 (W. 34th Street), will be built in segments. Finally, initial funding limitations may constrict full implementation of the SW 62nd Boulevard extension, meaning that it could initially be constructed as a two-lane facility. It is still the intent of this plan and of the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area that SW 62nd Boulevard be a four-lane facility by the year 2045.

Environmental Mitigation

Transportation projects can significantly impact many aspects of the environment including wildlife and their habitats, wetlands, and groundwater resources. In situations where impacts cannot be completely avoided, mitigation or conservation efforts are required. Environmental mitigation is the process of addressing damage to the environment caused by transportation projects or programs. The process of mitigation is best accomplished through enhancement, restoration, creation and/or preservation projects that serve to offset unavoidable environmental impacts. The mitigation of environmental impacts is addressed in the Florida Department of Transportation's Project Development and Environment Manual, which implements the National Environmental Policy Act of 1969 and related legislation for projects that may use federal funds or require a federal action. These procedures also apply to major projects where state revenues are used.

The Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area is committed to minimizing and mitigating the negative impacts of transportation projects

on the natural and built environment in order to preserve and enhance the quality of life. Environmental mitigation for transportation projects in Florida is completed through a partnership between metropolitan planning organizations, the Florida Department of Transportation, state and federal environmental resource and regulatory agencies, such as the Water Management Districts, and the Florida Department of Environmental Protection. These activities are directed through Section 373 of Florida Statutes, which establishes the requirements for mitigation planning as well as the requirements for permitting, mitigation banking, and mitigation requirements for habitat impacts.

The Florida Department of Transportation maintains wetland mitigation plans with all of the Water Management Districts. As outlined in Section 373.41337 of Florida Statutes, each mitigation plan must focus on land acquisition and restoration or enhancement activities that offer the best mitigation opportunity for that specific region. The mitigation plans are required to be updated annually to reflect the most current work program of the respective Florida Department of Transportation districts, and project lists of any transportation authority in the region.

The Legislature recognized in the establishment of this program that "environmental mitigation for the impact of transportation projects proposed by the Department of Transportation or a transportation authority can be more effectively achieved by regional, long-range mitigation planning rather than on a

Planning for specific environmental mitigation strategies over the life of the long-range transportation plan can be challenging. As discussed in Technical Report 6, initial environmental analyses of the Year 2045 Needs Plan projects were conducted using the Florida Department of Transportation's Environmental Screening Tool. As projects in the Year 2045 Cost Feasible Plan are advanced, the Efficient Transportation Decision Making process should be used to seek input on potential effects to the social and physical environment. Coordination with local, regional, state, and federal resource and regulatory agencies is a major component of the process, and if impacts are identified as a result of a proposed project, mitigation may be required. Specific project level mitigation requirements are determined through the Environmental Resource Permit process administered by the St. Johns River Water Management District. The applicable mitigation banks for this region, which includes several water management districts, are shown on Figure 2.

Automated, Connected, Electric, and Shared-Use (ACES) Vehicle Impacts

Automated, Connected, Electric, and Shared-Use (ACES) Vehicle Impacts considerations were included in the planning process. It should be noted that the Gainesville Urbanized Area has one pilot autonomous shuttle program planned and is operating on a testing process. The pilot started in early January 2020; however, the project was put on hold due to safety considerations from other pilot testing sites when a

passenger was killed. Gainesville's autonomous shuttle project resumed testing in late August 2020. In late September, two autonomous shuttles began transporting passengers, but capacity is limited under social distancing protocols.

Based on the discussion of technology and its potential effects on Gainesville, there are still too many unknowns to provide for highly effective incorporation of such projects into Gainesville's long-range transportation planning. However, as an emerging technology with the potential for high levels of impact on personal and freight travel, the Gainesville Urbanized Area Metropolitan Planning Organization will continue to monitor the development of this technology, and include Automated, Connected, Electric, and Shared-Use Vehicles in future planning. Appendix D includes the Florida Department of Transportation's policy guidance on addressing Automated, Connected, Electric, and Shared-Use Vehicle Impacts in Planning Documents.

Assurances for the Year 2045 Long-Range Transportation Plan

This section details assurances made by the Metropolitan Transportations Planning Organization for the Gainesville Urbanized Area for the Year 2045 Long-Range Transportation Plan. Required elements in the development of the Year 2045 Cost Feasible Plan were addressed as follows:

- The proposed Year 2045 Cost Feasible Plan was compared with the Year 2045 Needs Plan using the evaluation criteria established and documented in Technical Report 6. This evaluation included an impact analysis and identification of transportation programs/projects included in the Year 2045 Needs Plan, but excluded from the Year 2045 Cost Feasible Plan due to revenue constraints.
- The Year 2045 Cost Feasible Plan includes projects to accomplish the Vision, Principles and Strategies identified in Technical Report 5.

Funding identified in the Financial Resources Technical Memorandum from possible funding source(s) were reviewed and considered for inclusion in the Year 2045 Cost Feasible Plan. Should additional funding resources become available, the Year 2045 Cost Feasible Plan will be amended accordingly.

Technical Report 7: Year 2045 Cost Feasible Plan





- The Year 2045 Cost Feasible Plan includes the following items as required by Fixing America's Surface Transportation Act, 23 Code of Federal Regulations 450.322 and Florida Statutes 339.175
- 1. The projected transportation demand of persons and goods in the metropolitan planning area over the period of the transportation plan were identified and considered (10.93 million vehicle miles travelled annually);
- 2. Existing and proposed transportation facilities that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions over the period of the transportation plan;
- 3. Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods were considered;
- 4. Capital investment and other strategies were assessed in order to preserve the existing and projected future metropolitan transportation infrastructure and provide for multimodal capacity increases based on regional priorities and needs;
- 5. All proposed modifications were described in sufficient detail to develop cost estimates;
- 6. Environmental mitigation activities that may have the greatest potential to restore and maintain the environmental functions affected by the proposed Year 2045 Cost Feasible Plan were addressed;
- Pedestrian walkway and bicycle transportation facilities were included in the Year 2045 Cost Feasible Plan;
- 8. Strategies that integrate transportation and land use planning to provide for sustainable development and reduce greenhouse emissions were considered; and
- 9. The Year 2045 Cost Feasible Plan projects were evaluated with regard to the State conservation plans and maps or inventories of natural resources.
- The Year 2045 Cost Feasible Plan includes performance measures and targets. The Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area is coordinating with the Florida Department of Transportation with regard to system performance reporting.
- The Year 2045 Cost Feasible Plan includes a matrix that shows the consistency between each project and the Vision, Principles and Strategies.
- The Year 2045 Cost Feasible Plan uses Fiscal Year 2019/2020 as the base fiscal year and Fiscal Year 2044/2045 as the horizon fiscal year. All projects and their funding, from the base year to the horizon year, are identified.
- The Year 2045 Cost Feasible Plan cost estimates are provided for the operations and maintenance activities are identified for the State Highway System. Local facilities are budgeted annually, so there are no local facility operations and maintenance forecasts. However, as discussed earlier in this report, transit revenues have been

allocated to operations and maintenance of the City of Gainesville Regional Transit System, and Surface Transportation Program revenues have been allocated for resurfacing projects on local roadways.

- The Year 2045 Cost Feasible Plan capacity and regionally significant projects address total project costs by implementation phase in year of expenditure dollars.
- The Year 2045 Cost Feasible Plan projects are listed in year band increments (based upon year of need). Estimates are summarized for the following fiscal year periods: 2020, 2021-2025, 2026-2030, 2031-2035 and 2036-2045.
- Revenues to support the costs associated with the work/phase are demonstrated in the Year 2045 Cost Feasible Plan. Each project includes an estimate of the cost and source of funding for each phase of the project being funded.
- Federal and state participation in the Year 2045 Cost Feasible Plan is shown on each project, as applicable. Projects within the first ten years are notated to identify which projects are planned to be implemented with federal funds.
- For highway projects, the Year 2045 Cost Feasible Plan addresses potential environmental mitigation activities and opportunities which are developed in consultation with federal and state wildlife, land management and regulatory agencies. Since there are no transit capital projects in the Year 2045 Cost Feasible Plan, transit environmental benefits would most likely occur by mode shift.
- Regionally significant projects are included in the Year 2045 Cost Feasible Plan to address and mitigate traffic congestion and provide for the safe mobility of people and goods.
- The Year 2045 Cost Feasible Plan document was prepared in a manner that balances length, clarity and graphics to be user-friendly.
- The Year 2045 Cost Feasible Plan includes procedures which document how modifications to the long-range transportation plan are addressed after adoption. The procedures specifically explain what qualifies as a modification as opposed to an amendment. These procedures are detailed later in this report.
- Several additional elements are required for the adoption of the Year 2045 Cost Feasible Plan. They were addressed as follows:
 - The proposed Year 2045 Cost Feasible Plan was reviewed by the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area Citizens Advisory Committee, Technical Advisory Committee and Bicycle/Pedestrian Advisory Board. The proposed Year 2045 Cost Feasible Plan was presented to the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area at a public hearing.
 - The proposed Year 2045 Cost Feasible Plan included a financial plan that demonstrates how the adopted transportation plan can be implemented.
 - The Year 2045 Cost Feasible Plan included an estimate of unfunded costs in base year dollars.

- On August 24, 2020, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area received a presentation from its staff and consultant on the proposed Year 2045 Cost Feasible Plan, including a discussion of the process by which the plan was developed. The presentation included graphics, and was conducted virtually owing to the public health emergency created by COVID-19. Also, on August 24, 2020, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area conducted a public hearing. A video recording of the public hearing is maintained by the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area.
- On August 24, 2020, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area adopted the Year 2045 Cost Feasible Plan. The adopted Year 2045 Cost Feasible Plan, including all supporting analyses and Geographic Information System materials are available at the following website:
- o http://ncfrpc.org/mtpo/LRTP.html
- The Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area provided copies of the adopted Year 2045 Cost Feasible Plan to the Governor, the Florida Department of Transportation, the Federal Highway Administration and the Federal Transit Administration.

Revisions to the Year 2045 Long-Range Transportation Plan

In addition to updating the long-range transportation plan every five years, there may be times when a metropolitan planning organization needs to revise their plan. The Code of Federal Regulations defines two different types of revisions: administrative modifications and amendments. Administrative modifications to long-range transportation plans include minor changes to project costs, phasing, and funding sources. An administrative modification does not require public review or public comment. Major revisions to long-range transportation plans are handled as amendments. They include adding or removing projects from the plan as well as major changes in scope to projects currently in the plan, project costs, and project phasing. Amendments require public review and comment, and a re-demonstration of fiscal constraint. Note that changes to illustrative / aspirational projects do not require an amendment.

Long-range transportation plans can be amended at any time and there are no restrictions on the number of amendments a metropolitan planning organization can make to an adopted plan. Furthermore, there is no requirement to extend the planning horizon as part of a long-range transportation plan amendment, as this is only required during the plan update process. Finally, Florida Statute requires that any amendments to long-range transportation plans be adopted through a recorded roll call or handcounted vote of a majority of the members present.

Summary

The Year 2045 Long-Range Transportation Plan was developed through a shared vision of how transportation access and mobility can shape future development of the City of Gainesville and Alachua County. Potential Year 2045 Needs Plan projects were identified based on the Vision, Principles and Strategies adopted by the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area. The Vision Statement is: A transportation system that is safe and efficient, serves the mobility needs of people and freight, and fosters economic prosperity while minimizing transportationrelated fuel consumption and air pollution. The Principles supporting the vision address economic vitality, safety and security of the transportation system, increased access and mobility, protection of the environment and improved quality of life, enhanced connectivity, efficient management and operation and preservation of the existing transportation system.

The Year 2045 Needs Plan was adopted on June 22, 2020, with the total cost of all projects estimated to be approximately \$450 million in current (Year 2020) dollars. Following adoption, the project team began developed evaluation criteria, scored the Year 2045 Needs Plan projects, and produced rankings. The rankings were used by the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area to prioritize projects, approximately \$182 million was identified in available transportation revenues through the year 2045. In selecting projects for inclusion in the Year 2045 Cost Feasible Plan, the Metropolitan Transportation Planning Organization Planning Organization for the Gainesville Urbanized Area cost Feasible Plan, the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area relied on technical analyses as well as input from the public and its advisory committees on how projects could support the Vision, Principles and Strategies.

The Year 2045 Cost Feasible Plan was adopted on August 22, 2020. The plan is fiscally constrained to not exceed projected revenues, and funds are allocated to maintaining the existing transportation system, enhancing connectivity, and ensuring a multimodal emphasis on key corridors in the City of Gainesville. Project costs were inflated to year of expenditure, reflecting the anticipated timing of future revenues from state and federal funding sources. Phasing for each of the Year 2045 Cost Feasible Plan projects was also identified to align with the revenue phases and availability of funds. Performance of the Year 2045 Cost Feasible Plan was compared with the Year 2010 Base, Year 2045 Existing-plus-Committed, and Year 2045 Needs Plan using the Gainesville Urbanized Area Transportation Study travel demand model.

Finally, the Year 2045 Long-Range Transportation Plan for the Gainesville Urbanized Area meets all state and federal requirements. It addresses the planning factors from the Fixing America's Surface transportation (FAST Act), includes a safety element, identifies

performance measures and targets, addresses environmental mitigation, and includes procedures for amending the plan.

APPENDIX A: 2045 Forecast of State and Federal Revenues for Statewide and Metropolitan Plans

2045 REVENUE FORECAST \ GAINESVILLE MTPO

WITH STATEWIDE, DISTRICTWIDE AND COUNTY-SPECIFIC PROJECTIONS 2045 Forecast of State and Federal Revenues for Statewide and Metropolitan Plans

Overview

This report documents the Florida Department of Transportation (FDOT) revenue forecast through 2045. Estimates for major state programs for this metropolitan area, for FDOT Districts, and for Florida as whole are included. This includes state and federal funds that "flow through" the FDOT work program. This information is used for updates of Metropolitan Planning Organization (MPO¹) Long Range Transportation Plans (LRTPs) and related documents.

Background

In accordance with federal statute, longstanding FDOT policy and leadership by the Metropolitan Planning Organization Advisory Council (MPOAC), the Office of Policy Planning (OPP) provides projections of future available funding to Florida's 27 MPOs. This data is known as the Revenue Forecast. Consistent data is being applied to the development of the FDOT Strategic Intermodal System (SIS) Highway Cost Feasible Plan.

The department developed a long-range revenue forecast through 2045. The forecast is largely based upon recent federal legislation (e.g., the FAST Act²) and changes in multiple factors affecting state revenue sources and current policies. This 2045 forecast incorporates (1) amounts contained in the department's work program for FYs 2018 through 2022, (2) the impact of the department's objectives and investment policies, and (3) the Statutory Formula (equal parts of population and motor fuel tax collections) for distribution of certain program funds. All estimates are expressed in nominal dollars, also known as year of expenditure (YOE) dollars.

Purpose

This version of the forecast (in word processing or portable document format) provides one specific MPO, and all interested parties, with dollar figures that will be necessary and useful as it prepares its 2045 LRTP. If more detail or particular additional numbers are needed, these may subsequently be delivered in spreadsheet format. This document does not forecast funds that do not "flow through" the state work program. Further information concerning local sources of revenue is available from State of Florida sources, particularly *Florida's Transportation Tax Sources: A Primer,* and the *Local Government Financial Information Handbook.*³

¹ In this document, the general term MPO is used to refer to organizations whose names take different forms, including TPO, TPA and MTPO.

² Fixing America's Surface Transportation (FAST) Act, Public Law 114-94, December 4, 2015.

³ FDOT's tax source primer is available at <u>http://www.fdot.gov/comptroller/pdf/GAO/RevManagement/Tax%20Primer.pdf</u>. The financial information handbook is prepared by the Office of Economic and Demographic Research, part of the Florida Legislature; it is available at <u>http://edr.state.fl.us/Content/local-government/reports/lgfih17.pdf</u>.

This forecast features county level estimates for major FDOT capacity programs, specifically Other Roads and Transit. If an MPO includes more than one county, the county level estimates are totaled to produce an overall MPO estimate. If an MPO's boundary doesn't match county boundaries, the FDOT District will determine appropriate funding totals for that MPO. OPP is available for consultation and support, and Districts are asked to share their method and results with our office. However, final responsibility rests with the appropriate District.

There is a long-term goal to focus planning on metropolitan areas which do not correspond to county or city boundaries. In some cases, analyses and plans are based on census designated urbanized areas (UZAs). But for most sources of funding, it is more practical to define geographic areas by county boundaries.

This forecast does not break down SIS Highway expenditures to the county or District level. SIS Highway expenditures are addressed in the SIS Cost Feasible Plan (CFP), which is under preparation by the FDOT Systems Implementation Office.⁴ Districts always inform MPOs of projects that are proposed to be included in the CFP, and, conversely, CFP projects need to be included in the appropriate MPO LRTP(s) to receive federal funding.

This Forecast lists funding for FDOT programs designed to support, operate, and maintain the state transportation system. The FDOT has set aside sufficient funds in the 2045 Revenue Forecast for these programs, referred to as "non-capacity programs" here, to meet statewide objectives and program needs in all metropolitan and non-metropolitan areas. Specific District level amounts are provided for existing facilities expenditures. Funding for these programs is not included in the county level estimates.

2045 Revenue Forecast (State and Federal Funds)

The 2045 Revenue Forecast is the result of a three-step process:

- 1. State and federal revenues from current sources were estimated.
- 2. Those revenues were distributed among appropriate statewide capacity and non-capacity programs consistent with statewide priorities.
- 3. County level estimates for the Other Roads and Transit programs were developed, along with County, District or Statewide estimates for other funding categories that are of particular interest to the 27 Florida MPOs.

Forecast of State and Federal Revenues

The 2045 Revenue Forecast includes program estimates for the expenditure of state and federal funds expected from current revenue sources (i.e., new revenue sources were <u>not</u> added). The forecast estimates revenues from federal, state, and Turnpike sources included in the Department's 5-Year Work Program.

The forecast does not estimate revenue from other sources (i.e., local government/authority taxes, fees, and bond proceeds; private sector participation; and innovative finance sources). Estimates of state revenue sources were based on estimates prepared by the State Revenue Estimating Conference (REC) in September 2017 for state fiscal years (FYs) 2019 through 2028. Estimates of federal revenue sources were based on the Department's Federal Aid Forecast for FYs 2018 through 2027. Assumptions about revenue growth are shown in Table 1:

⁴ Formerly known as the Systems Planning Office.

Revenue Sources	Years	Assumptions*
State Taxes (includes fuel taxes,	2019-2028	Florida REC Estimates; these average in the range
tourism-driven sources,		from 2.5% to 3.0% per year
vehicle-related taxes and	2029-2045	Annual 1.93% increase in 2029, gradually decreasing
documentary stamp taxes)		to -0.44% in 2045
Federal Distributions	2018-2027	FDOT Federal Aid Forecast
(Total Obligating Authority)	2028-2045	Annual 0.0% increase through 2045
Turnpike	2018-2028	Turnpike Revenue Forecast
	2029-2045	Annual 1.93% increase in 2029, gradually decreasing
		to -0.44% in 2045

Table 1Revenue Sources and Assumptions

* Note all growth rates show nominal, or year of expenditure, dollar figures. Consistent with REC assumptions, a constant annual inflation rate of 2.60% is projected forward indefinitely. Therefore, *an assumption of nominal growth of 1.93% signifies a real decline of about 0.65% per year.*

A summary of the forecast of state, federal and Turnpike revenues is shown in Table 2. The 2045 *Revenue Forecast Guidebook* contains inflation factors that can be used to adjust project costs expressed in "present day cost" to "year of expenditure" dollars.

Table 2 Forecast of Revenues 2045 Revenue Forecast (Millions of Dollars)

(Percentages reflect percentage of total period funding produced by that source. For example, Federal

funding is projected to provide 24% of all funding for the period of 2021 through 2025)

Major	Time Periods (Fiscal Years)									
Revenue Sources	2020 ¹	2021-2025 ¹	2026-2030	2031-2035	2036-2045	26-Year Total ² 2020-2045				
Federal	2,353	10,884	11,878	12,108	24,217	61,440				
	28%	24%	23%	21%	20%	22%				
State	5,263	27,311	34,040	38,164	80,399	185,178				
	62%	61%	65%	66%	66%	65%				
Turnpike	814	6,572	6,688	7,861	16,518	38,453				
	10%	15%	13%	14%	14%	13%				
Total ²	8,430	44,768	52,606	58,133	121,134	285,071				

¹ Based on the FDOT Adopted Work Program for 2018 through 2022.

² Columns and rows sometimes do not equal the totals due to rounding.

Estimates for State Programs

Long range revenue forecasts assist in determining financial feasibility of needed transportation improvements, and in identifying funding priorities. FDOT policy places primary emphasis on

safety and preservation. Remaining funding is planned for capacity programs and other priorities.

The 2045 Revenue Forecast includes the program funding levels contained in the July 1, 2017 Adopted Work Program for 2018 through 2022. The forecast of funding levels for FDOT programs for 2020-2045 was developed based on the corresponding Program and Resource Plan (PRP), which includes the Adopted Work Program and planned funding for fiscal years 2023-2026. This Revenue Forecast provides information for Capacity and Non-Capacity state programs. The information is consistent with "Financial Guidelines for MPO Long Range Plans" moved forward by the Metropolitan Planning Organization Advisory Council Policy and Technical Committee on July 13, 2017.

The Revenue Forecast entails long-term financial projections for support of long-term planning. The forecast is delivered well in advance of the 5-year LRTP adoption schedule, roughly 18 months in advance of the first required adoption. This forecast is considered satisfactory for the remainder of the 5-year cycle; in other words, it is useful for MPOs whose adoptions come at the end of the cycle, about 3¹/₂ years after the first MPOs. However, FDOT reserves the right to consider adjustments to the Revenue Forecast during the LRTP adoption cycle, if warranted.

Capacity Programs

Capacity programs include each major FDOT program that expands the capacity of existing transportation systems (such as highways and transit). Table 3 includes a brief description of each major capacity program and the linkage to the program categories used in the PRP.

Statewide Forecast for Capacity Programs

Table 4 identifies the statewide estimates for capacity programs in the 2045 Revenue Forecast. \$285 billion is forecast for the entire state transportation program from 2020 through 2045; about \$149 billion (52%) is forecast for capacity programs.

Metropolitan Forecast for Capacity Programs

Pursuant to federal law, transportation management area (TMA) funds and certain Transportation Alternatives (TALU) funds are projected based on current population estimates. These 2 categories only apply to federally designated TMAs; 15 of the State's 27 MPOs qualify for these funds. District estimates for certain Transportation Alternatives (TA) funds and the Other Roads program were developed using the current statutory formula.⁵ For planning purposes, transit program funds were divided between Districts and counties according to population.

⁵ The statutory formula is 50% population and 50% motor fuel tax collections.

TABLE 3

Major Capacity Programs Included in the 2045 Revenue Forecast and Corresponding Program Categories in the Program and Resource Plan (PRP)

2045 Revenue Forecast Programs	PRP Program Categories
<u>SIS Highways Construction & ROW</u> - Construction, improvements, and associated right of way on SIS highways (i.e., Interstate, the Turnpike, other toll roads, and other facilities designed to serve interstate and regional commerce including SIS Connectors).	Interstate Construction Turnpike Construction Other SIS Highway Construction SIS Highway Traffic Operations SIS Highway Right of Way (ROW) SIS Advance Corridor Acquisition
Other Arterial Construction/ROW - Construction, improvements, and associated right of way on State Highway System roadways not designated as part of the SIS. Also includes funding for local assistance programs such as the Transportation Regional Incentive Program (TRIP), and the County Incentive Grant Program (CIGP).	Arterial Traffic Operations Construction County Transportation Programs Economic Development Other Arterial & Bridge Right of Way Other Arterial Advance Corridor Acquisition
<u>Aviation</u> - Financial and technical assistance to Florida's airports in the areas of safety, security, capacity enhancement, land acquisition, planning, economic development, and preservation.	Airport Improvement Land Acquisition Planning Discretionary Capacity Improvements
<u>Transit</u> - Technical and operating/capital assistance to transit, paratransit, and ridesharing systems.	Transit Systems Transportation Disadvantaged – Department Transportation Disadvantaged – Commission Other; Block Grants; New Starts Transit
<u>Rail</u> - Rail safety inspections, rail-highway grade crossing safety, acquisition of rail corridors, assistance in developing intercity and commuter rail service, and rehabilitation of rail facilities.	Rail/Highway Crossings Rail Capacity Improvement/Rehabilitation High Speed Rail Passenger Service
Intermodal Access - Improving access to intermodal facilities, airports and seaports; associated rights of way acquisition.	Intermodal Access
<u>Seaport Development</u> - Funding for development of public deep- water ports projects, such as security infrastructure and law enforcement measures, land acquisition, dredging, construction of storage facilities and terminals, and acquisition of container cranes and other equipment used in moving cargo and passengers.	Seaport Development
<u>SUN Trail</u> – FDOT is directed to make use of its expertise in efficiently providing transportation projects to develop a statewide system of paved non-motorized trails as a component of the Florida Greenways and Trails System (FGTS), which is planned by the Florida Department of Environmental Protection (FDEP).	Other State Highway Construction Other State Highway ROW Other Roads Construction Other Roads ROW Other SIS Highway Construction SIS Highway ROW

Table 4Statewide Capacity Program EstimatesState and Federal Funds from the 2045 Revenue Forecast (Millions of Dollars)

Major Programs		Time Periods (Fiscal Years)					
	2020 ¹	2021-25 ¹	2026-30	2031-35	2036-45	2020-2045	
SIS Highways Construction & ROW	2,199	12,940	12,490	13,933	28,971	70,534	
Other Roads Construction & ROW	885	6,483	7,918	8,550	17,783	41,618	
Aviation	211	1,143	1,433	1,596	3,354	7,738	
Transit	417	2,306	2,881	3,154	6,580	15,339	
Rail	178	850	1,255	1,425	2,985	6,692	
Intermodal Access	40	262	345	379	791	1,816	
Seaports	114	622	837	938	1,970	4,481	
SUN Trail	25	125	125	125	250	650	
Total Capacity Programs	4,068	24,731	27,284	30,100	62,684	148,868	
Statewide Total Forecast	8,430	44,768	52,606	58,133	121,134	285,071	

¹ Based on the FDOT Tentative Work Program for FYs 2018 through 2022.

² Columns and rows sometimes do not equal the totals due to rounding.

Estimates for the Other Roads and Transit program categories for this metropolitan area are included in Table 5.

Table 5County Level Capacity Program EstimatesState and Federal Funds from the 2045 Revenue Forecast (Millions of Dollars)

Estimates for the Gainesville Metropolitan Transportation Planning Organization

	Time Perio	26-Year Total				
Capacity Programs*	2020	2021-25	2026-30	2031-35	2036-45	2020-2045
Other Roads Construction & ROW	8.4	61.9	75.2	81.1	168.8	395.4
Transit	3.5	19.5	24.6	26.9	56.1	130.6
Total - Main Programs	11.9	81.4	99.8	108.1	224.9	526.1

* Estimates for 2018 through 2022 are contained in the FDOT Adopted Work Program.

Other Roads estimates do not include projected funding for the TRIP program of the Federal TMA program (SU Fund Code).

^ Transit estimates do not include projected funding for the Florida New Starts program.

A few programs fund capacity projects throughout the state on a competitive basis. The two most prominent programs for MPOs are the Transportation Regional Incentive Program (TRIP) and the Florida New Starts Transit Program. Formerly, TRIP was referred to as a Documentary Stamp Tax program, but there are currently multiple sources of funding. With the economic recovery, the forecast funding for TRIP is now over five times the level of 5 years ago. Also, amounts for the federally funded TMA program (Fund Code SU) are provided in Table 6, and not included in Table 5. Neither TRIP, Florida New Starts or TMA funds are included above.

Table 6 Transportation Management Area (TMA) Funds Estimates (Known as SU Funds in FDOT Work Program) Federal Funds from the 2045 Revenue Forecast (Millions of Dollars)

Gainesville Metropolitan Area		26-Year Total				
(Defined as Alachua County)	2020	2021-25	2026-30	2031-35	2036-45	2020-2045
TMA/SU Funds	N/A	N/A	N/A	N/A	N/A	N/A

Projects which would be partially or entirely funded by TRIP or FL New Starts cannot be counted as "funded" in LRTPs. This is because there is no guarantee of any specific project receiving TRIP or FL New Starts funding in the future. Both programs are competitive, and only a small percentage of potentially eligible projects receive funding. However, these projects can be included in LRTPs as "illustrative" projects.⁶ If MPOs have specific questions, they should consult with their District liaison and planning staff; District staff will contact the OPP, Work Program, or other Central Office staff as needed. Conditional estimates of TRIP funds by District are in Table 7. Statewide estimates of FL New Starts funds are in Table 8.

The FAST Act continued funding for Transportation Alternatives projects. Categories impacting MPOs include funds for (1) Transportation Management Areas (TALU funds); (2) areas with populations greater than 5,000 up to 200,000 (TALL funds), and (3) any area of the state (TALT funds). Estimates of Transportation Alternatives Funds are shown further below in Table 9.

Table 7Districtwide Transportation Regional Incentive Program EstimatesState Funds from the 2045 Revenue Forecast (Millions of Dollars)

EDOT District		26-Year Total ²				
	2020 ¹	2021-25	2026-30	2031-35	2036-2045	2020-2045
District 1	3.1	21.9	32.7	36.4	74.6	168.8
District 2	2.5	17.6	26.3	29.2	59.9	135.5
District 3	1.6	11.6	17.3	19.2	39.3	89.0
District 4	4.1	28.9	43.1	47.9	98.2	222.3
District 5	4.7	32.8	49.0	54.4	111.7	252.6
District 6	2.8	19.7	29.4	32.7	67.0	151.6
District 7	3.3	23.2	34.6	38.4	78.8	178.2
Statewide Total Forecast	22.2	155.8	232.3	258.2	529.5	1,197.9

¹ Estimates for 2018 through 2022 are contained in the FDOT Adopted Work Program.

² Columns and rows sometimes do not equal the totals due to rounding.

⁶ Other projects for which funding is uncertain may also be included as illustrative projects.

Table 8Transit - Florida New Starts Program EstimatesState Funds from the 2045 Revenue Forecast (Millions of Dollars)

Charles and a Data service		26-Year Total				
Statewide Program	2020	2021-25	2026-30	2031-35	2036-45	2020-2045
Statewide Total Forecast	41.8	226.3	259.2	282.4	593.4	1,403.1

Table 9Transportation Alternatives Funds EstimatesFederal Funds from the 2045 Revenue Forecast (Millions of Dollars)

Gainesville Metropolitan Area		26 Year Total ¹				
(Defined as Alachua County)	2020 ¹	2021-25	2026-30	2031-35	2036-45	2020-2045
TALU (Urban); Funds for TMA	N/A	N/A	N/A	N/A	N/A	NA
TALL (<200,000 population); Entire FDOT District	0.69	3.44	3.44	3.44	6.87	17.86
TALT (Any Area); Entire FDOT District	2.78	13.89	13.89	13.89	27.77	72.20

¹ Rows sometimes do not equal the totals due to rounding.

Other projects for which funding is uncertain may also be included in the LRTPs as "illustrative" projects.

Non-Capacity Programs

Non-capacity programs refer to FDOT programs designed to support, operate and maintain the state highway system: safety, resurfacing, bridge, product support, operations and maintenance, and administration. Table 10 includes a description of each non-capacity program and the linkage to the program categories used in the Program and Resource Plan.

County level estimates are not needed for these programs. Instead, FDOT has included sufficient funding in the 2045 Revenue Forecast to meet the following statewide objectives and policies:

- **Resurfacing program:** Ensure that 80% of state highway system pavement meets Department standards;
- **Bridge program:** Ensure that 90% of FDOT-maintained bridges meet Department standards while keeping all FDOT-maintained bridges open to the public safe;
- **Operations and maintenance program:** Achieve 100% of acceptable maintenance condition standard on the state highway system;
- **Product Support:** Reserve funds for Product Support required to construct improvements (funded with the forecast's capacity funds) in each District and metropolitan area; and
- Administration: Administer the state transportation program.

The Department has reserved funds in the 2040 Revenue Forecast to carry out its responsibilities and achieve its objectives for the non-capacity programs on the state highway system in each

TABLE 10

Major Non-Capacity Programs Included in the 2045 Revenue Forecast and Corresponding Program Categories in the Program and Resource Plan (PRP)

2045 Revenue Forecast Programs	PRP Program Categories
<u>Safety</u> - Includes the Highway Safety Improvement Program, the Highway Safety Grant Program, Bicycle/Pedestrian Safety activities, the Industrial Safety Program, and general safety issues on a Department-wide basis.	Highway Safety Grants
<u>Resurfacing</u> - Resurfacing of pavements on the State Highway System and local roads as provided by state law.	Interstate Arterial and Freeway Off-System Turnpike
<u>Bridge</u> - Repair and replace deficient bridges on the state highway system. In addition, not less than 15% of the amount of 2009 federal bridge funds must be expended off the federal highway system (e.g., on local bridges not on the State Highway System).	Repair - On System Replace - On System Local Bridge Replacement Turnpike
<u>Product Support</u> - Planning and engineering required to "produce" FDOT products and services (i.e., each capacity program; Safety, Resurfacing, and Bridge Programs).	Preliminary Engineering Construction Engineering Inspection Right of Way Support Environmental Mitigation Materials & Research Planning & Environment Public Transportation Operations
<u>Operations & Maintenance</u> - Activities to support and maintain transportation infrastructure once it is constructed and in place.	Operations & Maintenance Traffic Engineering & Operations Toll Operations Motor Carrier Compliance
Administration and Other - Resources required to perform the fiscal, budget, personnel, executive direction, document reproduction, and contract functions. Also includes the Fixed Capital Outlay Program, which provides for the purchase, construction, and improvement of non-highway fixed assets (e.g., offices, maintenance yards). The "Other" category consists primarily of debt service.	Administration Fixed Capital Outlay Office Information Systems Debt Service

District and metropolitan area. Table 11 identifies the statewide estimates for non-capacity programs. About \$136 billion (48% of total revenues) is forecast for non-capacity programs.

Table 11Statewide Non-Capacity Expenditure EstimatesState and Federal Funds from the 2045 Revenue Forecast (Millions of Dollars)

Major Categories		26-Year Total ¹				
Major Categories	2020	2021-25	2026-30	2031-35	2036-45	2020-2045
Safety	141	820	826	825	1,659	4,271
Resurfacing	633	4,354	4,150	4,241	8,756	22,135
Bridge	1,035	1,051	2,403	2,946	6,122	13,556
Product Support	1,302	6,576	6,709	7,096	14,614	36,299
Operations and Maintenance	1,384	7,442	8,596	9,162	18,939	45,523
Administration and Other	429	2,770	2,891	2,819	5,559	14,468
Statewide Total Forecast	4,923	23,013	25,576	27,089	55,650	136,251

¹ Columns and rows sometimes do not equal the totals due to rounding.

Table 12 contains District-wide estimates for State Highway System (SHS) existing facilities expenditures for information purposes. Existing facilities expenditures include all expenditures for the program categories Resurfacing, Bridge, and Operations and Maintenance (O&M). In the previous Revenue Forecast, these expenditures were described as SHS O&M, but the expenditures on the Resurfacing and Bridge categories, in combination, are about as much as those for O&M. These existing facilities estimates are provided pursuant to an agreement between FDOT and the Federal Highway Administration (FHWA) Division Office.

Table 12State Highway System Existing Facilities Estimates by DistrictState and Federal Funds from the 2045 Revenue Forecast (Millions of Dollars)

Major Programs	Time Periods (Fiscal Years)					26-Year Total ¹
	2020	2021-25	2026-30	2031-35	2036-45	2020-2045
District 1	457	1,922	2,267	2,446	5 <i>,</i> 060	12,151
District 2	606	2,551	3,009	3,247	6,716	16,129
District 3	495	2,084	2,458	2,652	5 <i>,</i> 487	13,176
District 4	410	1,728	2,038	2,199	4,549	10,924
District 5	561	2,362	2,785	3,006	6,217	14,931
District 6	203	854	1,007	1,087	2,248	5,399
District 7	319	1,345	1,586	1,712	3,541	8,503
Statewide Total Forecast	3,051	12,847	15,150	16,348	33,817	81,214

Note: Includes Resurfacing, Bridge, and Operations & Maintenance Programs.

¹ Columns and rows sometimes do not equal the totals due to rounding.

Advisory Concerning Florida's Turnpike Enterprise

Within the framework of FDOT, Florida's Turnpike Enterprise (Turnpike) is given authority, autonomy and flexibility to conduct its operations and plans in accordance with Florida Statute and its Bond Covenants. The Turnpike's traffic engineering consultant projects Toll Revenues and Gross Concession Revenues for the current year and the subsequent 10-year period, currently FYs 2018-2028. The consultant's official projections are available at http://www.floridasturnpike.com/documents/reports/Traffic%20Engineers%20Annual%20Report/1_Executive%20Summary.pdf.

Projections of Turnpike revenues within the State of Florida Revenue Forecast beyond FY2028 are for planning purposes, and no undue reliance should be placed on these projections. Such amounts are generated and shared by the FDOT Office of Policy Planning (OPP) for purposes of accountability and transparency. They are part of the Revenue Forecast process, which serves the needs of MPOs generating required Long Range Transportation Plans (LRTPs).

MPOs do not program capital projects or make decisions concerning Turnpike spending. OPP projections are not part of the Turnpike's formal revenue estimating process and are not utilized for any purpose other than to assist MPOs and perform related functions. Such amounts do not reflect the Turnpike's requirement to cover operating and maintenance costs, payments to bondholders for principal and interest, long-term preservation costs, and other outstanding Turnpike obligations and commitments.

REVENUE FORECAST FOR THE GAINESVILLE MTPO LONG RANGE PLAN UPDATE

2045 Forecast of State and Federal Revenues for Statewide and Metropolitan Plans APPENDIX B: Florida's Future Corridors – Tampa Bay to Northeast Florida Study Area Concept Report

Florida's Future Corridors

Tampa Bay to Northeast Florida Study Area Concept Report

SUMMARY REPORT



Florida Department of Transportation Office of Policy Planning

October 2013

Florida's Future

What is the Future Corridors Initiative?

The Future Corridors initiative is a statewide effort led by the Florida Department of Transportation (FDOT) to plan for the future of major transportation corridors critical to the state's economic competitiveness and quality of life over the next 50 years. This initiative builds upon the 2060 Florida Transportation Plan which calls for planning a transportation system that maintains our economic competitiveness by meeting current and future transportation needs for moving people and freight.

Florida's Future Corridors Initial Study Areas



Tampa Bay-Northeast Florida Study Area Concept Report

Tampa Bay and Northeast Florida are two of Florida's largest regions. Both have large, diverse economies and growing transportation needs. Between these two regions, Gainesville and Ocala are emerging in importance as regional employment centers, particularly in innovation and logistics industries. Surrounding rural areas support a mix of agriculture, forestry, mining, recreation, and manufacturing industries, and are collaborating on economic development strategies.

More than 5.1 million people and 2.1 million jobs are located within an 18-county study area spanning 260 miles from Tampa to Jacksonville.¹ Following a deep recession, the study area's economy is rebounding and is expected to return to stronger growth. If recent trends continue, the region's population could expand nearly 70 percent by 2060.²

Freight, business, visitor, commuting, and personal trips in the study area heavily depend on the highway system. Tampa and Jacksonville are the two largest urban centers in Florida without a direct limited-access highway connection today. Travel between these two regions primarily occurs via I-75 and I-10, I-75 and U.S. 301, or I-4 and I-95. Many of the rural counties are not well connected to the Interstate highways or other limited-access highways today.



This report identifies potential transportation strategies to help connect Tampa Bay and Northeast Florida and support the future growth of these two regions, as well as the less urbanized North Central Florida region that lies between them. It is part of a broader statewide effort, known as Florida's Future Corridors initiative, through which the Florida Department of Transportation (FDOT) is working with state, regional, local partners, and other stakeholders to plan for the future of the major transportation corridors critical to the state's economic competitiveness and quality of life.

¹ U.S. Department of Commerce, Bureau of the Census, 2010; U.S. Department of Commerce, Bureau of the Economic Analysis, 2010. For the purposes of this report, the study area includes, north to south and west to east, Columbia, Baker, Duval, Suwannee, Union, Bradford, Clay, St. Johns, Gilchrist, Alachua, Levy, Marion, Citrus, Sumter, Hernando, Pasco, Pinellas, and Hillsborough counties. Data reported are for all the counties listed, including portions of the counties not in the study area boundary.

² Florida Department of Transportation projection, based on University of Florida Bureau of Business and Economic Research forecast, 2013.



FAST FACTS

- 18 counties, 80 cities
- 10,115 square miles of land area
- 5.1 million people, 2.1 million jobs
- Includes 7 counties designated as part of the North Central Florida Rural Area of Critical Economic Concern
- 5 major military installations
- 56 colleges and universities
- 3,310 centerline miles on the State Highway System, including 1,162 of centerline miles on Florida's Strategic Intermodal System (SIS)
- 1,229 centerline miles of freight rail and 88 freight terminals, including 4 SIS freight rail terminals
- 80 miles of passenger rail via Amtrak, with stations in Jacksonville and Tampa
- 3 deepwater seaports (Tampa, St. Petersburg, and Jacksonville) with 2 additional seaports in adjacent counties and 1 seaport under study in Citrus County
- 4 commercial service airports, 16 regional or general aviation airports, and a spaceport at Cecil Field
- Intercity bus service provided by Greyhound, including 8 stations

Economic Trends: The Case for Connectivity

Population growth throughout most of the study area has exceeded the state and national growth averages during the past few decades. This trend is expected to continue in the future, as the region benefits from its appeal to workers, families, retirees, and visitors; historic strengths in natural resources, military, education, tourism, and distribution; and emerging strengths in innovation industries and services. As the study area grows and changes, connectivity becomes increasingly important at multiple levels.

Trade and visitor connections to global markets. Two major deepwater seaports, the Port of Tampa and the Port of Jacksonville, bookend the study area. The Port of Tampa is the top seaport in Florida by tonnage, and Jacksonville ranks among the East Coast's leading seaports for containers and automobiles. Both ports, as well as nearby Port Manatee and the Port of Fernandina, are expanding facilities to prepare for growing trade flows to serve markets in Florida and in the eastern United States. Citrus County is studying the feasibility of creating Florida's 15th deepwater seaport at Port Citrus.



Trade and Logistics Hubs

Sources: InfoGroup, 2010; Florida Department of Transportation.

Regional distribution centers cluster around these seaports as well as along the I-75 corridor. I-75 and the parallel CSX "S" line form part of a major north-south trade corridor connecting Central and South Florida to Atlanta and the Midwest. The importance of this trade corridor will grow with the expansion of the South Florida seaports and with CSX's effort to develop a major intermodal logistics center in Winter Haven.

I-75 also is an important tourism corridor connecting the Midwest and Eastern United States to Central Florida – the nation's largest visitor destination – as well as Tampa Bay. Pinellas, Hillsborough, and Duval rank among Florida's 10 most visited counties. About one-half of all visitors to Florida arrive via automobile, with I-75 as one of the key gateways.

Interregional connectivity to create Florida's megaregion. The Florida peninsula has the opportunity to become one of 10 to 12 "megaregions" that lead the United States in growth and competitiveness over the next few decades (see map below). Florida's competitiveness in large part reflects the size and diversity of its large metropolitan regions – the ability to link Southeast



Florida's global business hub to Central Florida's internationally known destinations and the diverse industries of Tampa Bay and Florida. Northeast Florida's Interstate highways are the major arteries sustaining this megaregion – but the missing link today is a direct connection between Tampa and Jacksonville. A closer link between these two markets could create substantial benefits not only for the study area, but also for the state as a whole.

Business, labor, and university connections to create strong industry clusters. The study area's economy is shifting from a traditional emphasis on natural resources, tourism, military, distribution, and basic manufacturing to a more diverse mix of industries that also includes technology, finance, and services. Much of the transportation system in the region initially was developed to connect farmlands, forests, and mines to production centers and seaports in urban areas. Today, life sciences, aerospace, and logistics industry clusters are emerging across the region. Their global competitiveness relies on connections between leading-edge businesses, suppliers, skilled labor, and research universities. Many of these clusters are organizing across traditional boundaries, such as the "High-Tech Corridor" connecting businesses, universities, and colleges from Tampa to Gainesville to Orlando (see map on next page).



Major Research and Technology Employers

Sources: InfoGroup, 2010; National Center for Education Statistics, College Navigator, 2012; Federal Laboratory Consortium for Technology Transfer, 2012.

Enhanced regional connections to existing and emerging urban centers. The Tampa Bay and Northeast Florida counties are projected to account for 4 out of 5 new residents locating in the study area over the next 50 years. Regional visions in both areas call for a shift in future growth toward more compact centers, with Tampa, St. Petersburg, and Jacksonville becoming more prominent cities. Well-developed intercity passenger rail and regional transit systems are critical foundations for this vision. Even as the study area reemphasizes these large urban regions, emerging centers of population and employment are gaining strength along the Suncoast to the north of Tampa Bay (Pasco, Hernando, and Citrus counties) and along the I-75 corridor from Wildwood to Gainesville (see map next page). The combined population of Sumter, Marion, and Alachua counties soared from 138,000 in 1960 to 672,000 in 2010; if current trends continue, it will nearly double to 1.3 million by 2060. This group of cities may become more connected to both Tampa Bay and Central Florida. Neither of these emerging regions are well connected to the rest of the study area or the rest of Florida, and they generally rely on a single limited-access highway corridor.

Projected Trend Population Growth

1960-2010



Source: Florida Department of Transportation projection, May 2013.

Improved access from rural areas to regional employment centers and external markets. Seven counties in the study area are classified as Rural Areas of Critical Economic Concern due to historically high levels of poverty and unemployment: Baker, Bradford, Columbia, Gilchrist, Levy, Suwannee, and Union. There is potential for a significant acceleration of population and employment growth if economic development initiatives are successful, with the higher rates of growth most likely in rural counties that border established urban areas and those that serve as regional employment centers. The potential development of large tracts of land under single ownership, including those owned by Plum Creek Timber; Rayonier, Inc.; Foley Land and Timber Company; and Bascom Southern across a band of counties from the Gulf Coast to the Atlantic Coast could be a gamechanger for rural North Central Florida. Most of this region is not well connected to the rest of the state today. A collaborative visioning process led by the North Central Florida Regional Planning Council will help determine where growth and connectivity are needed.

Potential Mobility and Connectivity Needs

The study area's transportation system faces several challenges in meeting the evolving mobility and connectivity needs of residents, visitors, and businesses in the coming decades:

- Freight mobility. Freight and trade flows to, from, and through the study area are anticipated to grow rapidly, reflecting the strong anticipated growth in population, visitors, and economic activity; the region's central location as a logistics platform for the rest of the state; and the overall growth anticipated in global trade through Florida's seaports and airports. This will place greater pressure on the region's major truck routes, freight rail system, seaports, air cargo facilities, and intermodal logistics centers. Strategic investments in the capacity and connectivity of these systems will be critical.
- Highway delay and reliability. The highway system, particularly the limited-access corridors, does not have the capacity to accommodate future growth in population, employment, and visitors, assuming vehicle miles traveled resumes its long-term growth trend. If current development and travel patterns continue, 38 percent of urban highway miles and 22 percent of rural and transitioning area highway miles will be congested in peak periods by 2035 even after accounting for expenditures in FDOT's SIS Cost-Feasible Plan (maps on page 9). This means FDOT must work with regional and local partners to maximize the efficiency of its existing highway system; promote alternatives to highways for both commuting and longer distance trips; encourage strategies for reducing growth in travel demand; and identify strategic investments in new highway capacity that support regional visions for the future.
- **Highway safety.** Crash rates are significant along major highways within the study area (see map on next page). The crash rate along I-75 near Gainesville and between Ocala and Wildwood are as high as those along Interstates in the state's largest urban areas, reflecting the mix of cars and trucks and local and long-distance traffic using I-75. Portions of U.S. 19, U.S. 301, and U.S. 17 also have high crash rates.




Crash Rates on Strategic Intermodal System Highways

Source: Florida Department of Transportation.

Congestion on SIS Highways 2011 and 2035



Source: Florida Department of Transportation.

- **Modal options.** Passenger rail and public transit systems today do not have the connectivity or quality of service needed to become a competitive travel option in many parts of the study area, particularly for long-distance travel. Amtrak currently operates daily intercity passenger service along an inland route from Jacksonville through Orlando to Lakeland and Tampa. Eight fixed-route transit systems operate in the study area, but none currently operate a large-scale commuter rail system. A continued focus on coordinating transit investment with urban development decisions is critical to implementing the regional visions for Northeast Florida and Tampa Bay with their emphasis on more compact centers connected with multimodal corridors.
- Limited options. The only options for high-speed, high-capacity travel between Tampa Bay and Jacksonville are I-4 to I-95 (a route subject to delays due to congestion on I-4 in Central Florida), or I-75 to I-10 (a longer route). There is no direct limited-access highway alternative to I-75 for travel between Tampa Bay and Georgia or Northwest Florida. Because the highway system has few redundancies, a crash, incident, or even planned construction activities and special events can result in severe delays. This issue increases in significance during emergency events.
- Connectivity to emerging economic centers. Nearly one out of every four jobs in the study area is located more than five miles from a limited-access highway, an asset desired by most businesses. The location of potential development sites identified in Comprehensive Economic Development Strategies, regional visions, and developments of regional impact all point to the potential for significant new economic development to occur in the Suncoast area north of Tampa, the string of smaller urbanized areas along I-75 from Alachua to Sumter counties, Clay and Baker counties to the west of Jacksonville, and targeted regional employment centers in rural areas such as Lake City.³ Some of these sites are well situated on or near existing highway or rail lines, but others are not well connected today. Further analysis is needed to determine the significance of these connectivity "gaps" to the regional economy.

I Community and Environmental Context

The study area's mobility and connectivity needs must be addressed within the context of a diverse natural and human environment. Both the Tampa Bay and Northeast Florida regions have developed long-range visions to guide future plans and investment decisions. These regional visions emphasize protecting and conserving natural resources and agricultural lands, promoting quality communities, including compact urban centers, providing mobility choices, and encouraging economic competitiveness (see maps on



next page). The North Central Florida Regional Planning Council will initiate a regional visioning process covering Gainesville, Ocala, and surrounding rural counties in 2014. These visions and principles can guide future corridor planning decisions.

³ Data collected from statewide and regional plans may not reflect all current local plans or proposals.

Adopted Regional Visions for Tampa Bay (left) and Northeast Florida (right)



Sources: "OneBay, A Shared Regional Vision for Tampa Bay," 2010; "First Coast Vision," 2011.

Building on the framework of the regional visions, the study area includes 80 cities comprising hundreds of unique communities and neighborhoods. Each community brings its own historic, cultural, and social resources. Consistency with community visions and local government comprehensive plans can help ensure that the unique character and resources of each community are appropriately considered as corridor decisions are made. Early coordination also can help ensure that transportation corridor investments support community goals and avoid or minimize negative impacts on individual communities and their resources.



The natural environment is a critical foundation of the region's economy and quality of life. Access to high-quality beaches, lakes, rivers, parks, forests, and preserves is an important draw for residents and visitors. The study area's location spanning the Florida peninsula makes it a connecting point for important and fragile natural systems and wildlife corridors, such as those connecting the Green Swamp, Paynes Prairie, Ocala National Forest,

Osceola National Forest, and Okefenokee Swamp. Also important is the study area's location in multiple watersheds, including the Suwannee-Santa Fe River system, the Withlachoochee River system, and the Tampa Bay watershed. FDOT must work collaboratively with its environmental partners to ensure that as new transportation corridors are considered, they are located in places that would not sever important connections in natural systems, or that they are designed to allow wildlife to safely pass.

Careful decisions are needed about not only where corridor improvements or new corridors are located, but also how these improvements are coordinated with economic development and land use decisions. Working at a 50-year regional scale provides opportunities for joint decision-making to achieve mutual objectives, such as coordinated purchases of land for both transportation and wildlife corridors.

FDOT is working with partners to build upon a wealth of community and environmental data, including information on existing managed lands in public ownership (see map on next page); critical water resources; wetlands (see map on next page); public and private lands protected from impacts by state or federal law; specific parcels identified as priorities for conservation, via easements or direct acquisition by the public or private sector; and historic, cultural, archeological, and other resources. The same data sets are included in multiple initiatives to rank the ecological significance of lands and water resources in Florida, including the Critical Land and Waters Identification Project (CLIP).



FDOT will leverage this data in combination with partner input to support sound decision-making about corridors. Data sources and analyses will become progressively more detailed in later stages of the process.



Managed Lands and Water Resources Snapshot in the Study Area

Sources: Florida National Areas Inventory, Florida Department of Environmental Protection, Florida Fish and Wildlife Conservation Commission.

Potential Strategies to Address Future Transportation Needs

Interstate 75 Corridor Transformation

I-75 should be reinforced and transformed so it can continue to serve as a vital trade corridor and regional lifeline over the next 50 years. Building on the recent I-75 Transportation Alternatives Study and the I-75 Sketch Interstate Plan, options for modernizing and optimizing the I-75 corridor could include:

- Incorporating managed lanes in the right-of-way to separate particular types of traffic, such as trucks, express buses, or drivers willing to pay a toll;
- Implementing truck-only lanes, enhanced truck parking and staging areas, and other features to accommodate increasing truck volumes; and
- Improving the management and operations of I-75 using advanced roadway, vehicle, and information technologies.



Intercity Passenger Rail Service

Potential enhancements to Amtrak service and the Florida East Coast Railway's planned All Aboard Florida service are among the options for improving passenger rail service between Tampa and Jacksonville via Orlando. This backbone eventually could extend to other urbanized areas and link to regional commuter rail and urban transit systems to form a multimodal network connecting the major centers within Tampa Bay, Central, North Central, and Northeast Florida. To realize this vision, FDOT, private-sector rail operators, and regional and local partners should work together to resolve operational issues, fill connectivity gaps among existing and proposed systems, and provide sufficient capacity to ensure frequent and reliable intercity passenger rail service.



Improvements to Freight Rail Connectivity and Access

An efficient and reliable freight rail system is important not only to provide an option for freight moving to and from the study area, but also to provide an alternative for through traffic such as trade moving to or from the Southeast Florida seaports. CSX is investing in track improvements and a major logistics hub in nearby Winter Haven. A long-term regional rail investment strategy could help identify additional connectivity needs to seaports, intermodal logistics centers, and major shippers and receivers. A proactive investment strategy could provide sufficient capacity for moving both people and freight; support future economic development; and determine where freight rail lines may need to be relocated to reduce impacts on communities.



Interstate 75 Relievers

Several concepts could provide an alternative to I-75 in the eastern portion of the study area and improve connectivity to growing parts of the region:

- The northern extension of the Suncoast Parkway from Hernando to Citrus County, which has been planned for the past decade;
- The Nature Coast Parkway, a proposed northern extension of Florida's Turnpike from Sumter to Levy County;



- An extension of the Suncoast Parkway beyond Citrus County on an existing or new alignment, connecting to I-75 near Ocala, Gainesville, or Lake City to provide a more direct limited-access route between Tampa Bay and the central to northern portion of the study area, as well as to Georgia; and
- Enhanced use of rail and waterway corridors.

Specific corridor locations should be determined based on the outcomes of regional visioning efforts and based on projections of future travel demand and travel patterns. Over time, multimodal improvements could be linked together in a coordinated fashion to form one or more continuous I-75 relievers throughout this study area.

Closing Regional Connectivity Gaps

The location of employment centers, developments of regional impact, sector plans, and targeted development sites identified by the regional planning councils in their Comprehensive Economic Development Strategies suggest potential regional connectivity gaps where existing or future economic centers may not be well served by the existing multimodal transportation network. These include connections between:

- Hillsborough and Citrus counties, to link priority development sites, including Port Citrus to Tampa Bay;
- Citrus and Hernando counties and I-75 and Florida's Turnpike, to connect fast-growing Suncoast communities to Central Florida and Northeast Florida; and
- Gainesville/Ocala and Jacksonville, to link growing regional business centers to a nearby major market.



Several alternatives, ranging from general concepts to specific facilities, have been proposed to fill these connectivity gaps. Additional analysis is needed to determine which of these gaps are of statewide significance and to assess alternative solutions, including improvements to existing highway and rail facilities and development of new facilities to close the gaps. As these regional gaps are closed, the entire study area could move toward a more complete connection all the way from Tampa Bay to Jacksonville.

Table 1 (on the next page) compares these alternative strategies to adopted statewide, regional, and local policies and visions. The purpose of the matrix is to help determine which strategies could move forward into further study, and where more information is required.

Table 1. Policy Screening of Alternative Strategies

	Interstate 75 Corridor Transformation	Intercity Passenger Rail Improvements	Freight Rail Connectivity and Access	Interstate 75 Relievers	Closing Regional Connectivity Gaps
Statewide Mobility and Co	onnectivity Need				
Has potential to address statewide mobility or connectivity needs	•	•	•	•	•
Consistency with 2060 Flo	orida Transportation	Plan Goals			
Economic Competitiveness	•	•	•	•	•
Community Livability	٠	•	0	0	0
Environmental Stewardship	•	•	•	0	0
Safety and Security	٠	•	٠	•	٠
Maintenance and Operations	•	•	٠	٠	٠
Mobility and Connectivity	٠	•	٠	•	•
Implementation					
Solutions are consistent with regional or community visions or equivalent local plans	•	•	•	•	٠
Information is available to inform future stages	•	•	•	•	•
Support exists from state, regional, and local partners to continue study	0	0	0	0	0

Key: • *Alternative is ready to move into Future Corridors evaluation stage.*

• Additional work needed, and/or issue will need to be closely monitored as alternatives advance through the *Future Corridors planning and screening process.*

Framework for Moving Forward

FDOT has identified the following steps to continue corridor planning activities in the study area:

1. Support development of a regional vision for North Central Florida and the integration of this vision with those of surrounding regions. During the past five years, both the Tampa Bay and Northeast Florida regions participated in collaborative processes to develop and begin implementation of long-range visions. The area between Tampa Bay and Northeast Florida has not yet developed a long-range vision. Because of the importance of transportation to the region's future, FDOT should participate in a regional vision for North Central Florida, working under the leadership of the North Central Florida Regional Planning Council. As this vision is completed, it can provide strategic guidance to future corridor planning decisions, particularly those involving new facilities or significant upgrades to existing facilities. The North Central Florida regional vision also must be integrated with the One Bay and First Coast visions to provide an overall structure for examining the connectivity needs between Tampa Bay and Northeast Florida. The large number of transportation partners in the study area underscores the need for continued collaboration on long-term visions and investment plans at an interregional scale.

Study Area Partners

- 18 counties
- 80 cities
- 8 metropolitan planning organizations (MPO)
- 1 regional transportation authority
- 8 transit authorities
- 1 expressway authority
- 2 Class I railroads, 1 Class II railroad, and 1 shortline railroad
- 6 deepwater seaports
- 4 commercial service airports
- 2 regional visioning groups
- 4 regional planning councils
- 3 water management districts
- Economic development
 organizations
- Public and private utilities
- Landowners
- Business interests
- Environmental interests
- 2. Develop an integrated strategy for the future transformation of Interstate 75 to meet the needs of the next 50 years. FDOT has conducted multiple studies to identify both short- and long-term improvements to I-75, including operational improvements, interchange modifications, additional travel lanes to bring the entire corridor up to at least six lanes, and managed lanes. Building on this work, FDOT should adopt and program an ongoing series of improvements to transform I-75 to meet the mobility needs of the next 50 years. An ultimate plan for the entire I-75 corridor could define a comprehensive, long-term package of investments to maximize the efficiency of moving people and freight within the constraints of existing development and natural features adjacent to the right-of-way.
- 3. Work with the rail industry to develop long-term strategies for continued enhancements to freight and passenger service. CSX's recent commitment to enhance its S line connecting Tampa Bay to Northeast Florida and the national rail network, as well as to create a major intermodal hub at Winter Haven, is a positive step for the region's future. FDOT should continue to work with CSX and other freight railroads to develop long-term rail investment strategies, including plans for access to seaports, intermodal logistics centers, and major shippers and receivers in the region. At the same time, FDOT should continue to work with rail providers and regional and local partners to advance opportunities to enhance intercity passenger rail service between Tampa and Jacksonville, as well as to identify long-term strategies for extending intercity or commuter rail to other cities.

4. Conduct an evaluation study for developing a parallel multimodal corridor between the Suncoast and the northern portion of I-75. FDOT should explore extensions of the Suncoast Parkway or Florida's Turnpike to provide longer-distance alternatives to I-75. An extension of the Suncoast Parkway beyond the planned Phase II in Citrus County to connect back into I-75 near Ocala, Gainesville, or Lake City could provide a limited-access alternative for trips between Tampa Bay, these communities, and points north. This concept could provide significant relief to I-75 while also improving connectivity to growing urbanized areas and creating economic development opportunities in the rural areas. There are multiple alternatives for addressing this need, including upgrades to existing highways as well as development of new multimodal corridors. The Nature Coast Parkway, a proposed northern extension of Florida's Turnpike into Levy County, also could help improve connectivity in this portion of the study area.

FDOT should move this segment of the study area forward into the Evaluation stage of the Future Corridors planning process. An Evaluation study would provide a structured approach for convening partners to accomplish the following:

- Identify likely future land use and economic development patterns in the pilot area;
- Identify future mobility and connectivity needs in light of these patterns, considering both statewide and regional needs;
- Evaluate and build consensus around alternative strategies for addressing the mobility and connectivity needs;
- Develop model processes for coordinating future corridor planning with conservation plans, economic development plans, local government comprehensive plans, MPO long-range transportation plans, expressway authority master plans, and others; and
- Test potential public/private partnerships with expressway authorities, railroads, public and private landowners, and utilities; develop sample agreements.
- 5. Conduct initial analyses to better document mobility and connectivity needs in the eastern portion of the study area. FDOT should begin initial technical work to document mobility and connectivity needs in the eastern portion of the study area. This task should include a synthesis of adopted and developing regional visions and plans to understand connectivity needs between Ocala/Gainesville and Jacksonville. A key issue is where a corridor should connect to the Jacksonville area, recognizing the location of the seaport, airport, intermodal rail freight terminals, Cecil Commerce Center to the north and west of Jacksonville, and the planned development of the First Coast Outer Beltway. FDOT should examine how to use existing facilities such as U.S. 301 and SR 21 to meet these needs, as well as how to avoid or minimize impacts to surrounding natural resources. Potential connectivity solutions should be addressed not only in terms of how well they meet regional needs, but also whether they could link with new or enhanced corridors to the east of I-75 to provide a complete corridor from Tampa Bay to Jacksonville.

Future Corridor Planning Process



How Will Future Corridors Be Planned?

FDOT has developed a three-stage process for planning future statewide corridors (figure above):

- Prepare a high-level **Concept** report to identify anticipated statewide connectivity and mobility needs in the study area; determine whether a significant transportation corridor investment in the study area is consistent with statewide policies and available regional and community visions and plans for future growth; identify key community and environmental issues to be considered in future stages; and identify a framework for moving forward in this study area.
- Conduct an **Evaluation** study on one or more segments of the full study area to identify and assess potential alternative solutions to the anticipated mobility and connectivity needs; work with partners to build consensus around potential solutions; and develop an action plan for future work on viable corridors.
- Use FDOT's established **Project Development** processes to conduct more detailed analyses of specific alternative corridor improvements, continue coordination with partners, and advance projects into implementation.

For more information, please go to www.FLFutureCorridors.org or contact the Project Administrator Huiwei Shen at (850) 414-4800 or huiwei.shen@dot.state.fl.us.

Florida's Future Corridors Initiative October 2013



APPENDIX C: Gainesville MTPO Mobility Profile

Year 2045 Long-Range Transportation Plan Update

GAINESVILLE MTPO MOBILITY PROFILE

FDO

produced by Florida Department of Transportation Forecasting and Trends Office

published 2020

Gainesville MTPO Boundary - 2018



Travel Time Reliability



Daily Vehicle Hours of Delay

3,500 NATIONAL HIGHWAY SYSTEM







Percent Miles Daily Truck Miles Traveled Heavily Congested Daily Vehicle Miles Traveled



GAINESVILLE MTPO MOBILITY TRENDS 2016-2018



2016 2017 2018 **Travel Time Reliability** 2018 2016 2017 1.82 1.79 2.03 Planning 1.21 1.21 Time 1.12 1.12 1.13 1.13 Index **On-Time** Arrival 97% 97% 94% 97% 87% 84% 76% 94% **97%** INTERSTATE NON-FREEWAY STRATEGIC INTERMODAL SYSTEM FREEWAYS **Percent Miles Daily Vehicle Daily Truck Daily Vehicle** 2016 2017 **Hours of Delay Heavily Congested Miles Traveled Miles Traveled** 2018 NATIONAL HIGHWAY SYSTEM FREEWAYS 274.6K 2.3M NATIONAL 9% HIGHWAY 2.1M 10% 246.9K 3,500 SYSTEM <100 6% 2.2M 197.9K 4,300 <100 4,300 400 STATE 8% 309.0K 2.9M HIGHWAY 9% 281.3K 2.8M SYSTEM 6% 233.9K 2.8M STATE HIGHWAY SYSTEM NON-FREEWAYS FREEWAYS <1% 207.2K **0.8M** 5,600 5,600 <1% 178.8K 0.7M <1% 0.7M 6,700 135.1K 6,700 6,100 5,700 NON-FREEWAYS 9% 101.8K 2.1M 2.1M 10% 102.5K 6% 98.8K 2.1M NOTE: Profile is based on MTPO Boundary

Forecasting & Trends Office

DEFINITIONS

Travel Time Reliability: (1) the percent of trips that succeed in accordance with a predetermined performance standard for time or speed; and/or (2) the variability of travel times that occur on a facility or a trip over a period of time.

Planning Time Index: The 95th percentile travel time divided by free flow travel time. A planning time index of 1.5 means a 20-minute trip at free flow speed takes 30 minutes - an informed traveler should plan for the extra 10 minutes to arrive on time.

Vehicle On-Time Arrival: The percentage of freeway trips traveling at greater than or equal to five mph below the posted speed limit. In the urbanized areas of the seven largest MPOs, on-time arrival is defined as the percentage of freeway trips traveling at least 45 mph. For arterials, travel time reliability is defined as the percentage of trips traveling greater than or equal to 20 mph.

Truck On-Time Arrival: The percentage of freeway trips by combination trucks traveling at greater than or equal to 5 mph below posted speed limit. In the urbanized areas of the 7 largest MPOs, on-time arrival is defined as the percentage of freeway trips by combination trucks traveling at least 45 mph.

Daily Vehicle Hours of Delay: Delay is the product of directional hourly volume and the difference between travel time at "threshold" speeds and travel time at the average speed. The thresholds are based on Level of Service (LOS) B as defined by FDOT.

Average Travel Speed: The length of the highway segment divided by the average travel time of all vehicles traversing the segment, including all stopped delay times.

Percent of Travel Meeting LOS Target: The percentage of travel meeting FDOT's LOS standards is determined by summing the vehicle miles traveled on roadways operating acceptably and then dividing by the total system vehicle miles traveled.

Person Miles Traveled Daily: Person miles traveled consists of the total number of miles traveled by people using the SHS or other components of it. This is calculated by adding each roadway segment's vehicle miles traveled multiplied by average vehicle occupancy.

Percent Miles Heavily Congested: Heavy congestion is a situation in which average travel speeds are in the range from 20-44 mph for freeways and equal to or worse than the LOS standards for arterials and highways.

Daily Truck Miles Traveled: (for all trucks class 4 through 13): The total number of miles traveled daily by trucks using a roadway system.

Daily Vehicle Miles Traveled: The total number of miles traveled daily by vehicles using a roadway system.

Three roadway systems are reported: National Highway System (NHS), State Highway System (SHS), and Strategic Intermodal System (SIS)



Sources

FDOT Traffic Characteristics Inventory, FDOT Roadway Characteristics Inventory, 2020 Quality/Level of Service Handbook, and HERE vehicle probe speed

FDOT Supplied MPO Mobility Performance Measure Analyses for 2018 (Gainesville MTPO)

							Date:	10/13/2020		
Gainesville (MPO/TPO Boundary)		Annual Measures ¹				Rotating Measures ²				
Networks/Measures	A: Daily vehicle miles traveled (Millions)	B: Daily truck miles traveled (Thousands)	C: On-Time Arrival (Vehicle) ³	D: Planning Time Index ³	E: Daily vehicle hours of delay (Thousands)	F: Percent miles heavily congested	G: Person miles traveled (Millions)	H: On-Time Arrival (Truck) ³	l: Average Travel Speed	J: Percent Travel Meeting LOS Criteria ³
A: National Highway System	2.3	274.6			3.5	9%	4.0		45	89%
B. State Highway System	2.9	309.0			5.6	8%	5.1		42	90%
C: Strategic Intermodal System ⁴	1.5	242.4	76%	1.79	0.6	1%	2.7	71%	51	99%
D. Freeways	0.8	207.2	97%	1.12	0.0	<1%	1.3	93%	69	>99%
E. Interstates	0.8	207.2	97%	1.12	0.0	<1%	1.3	93%	69	>99%
F: Non-freeways (SHS)	2.1	101.8			5.6	9%	3.8		33	86%

Gainesville (Urbanized Area)

Networks/Measures	A: Daily vehicle miles traveled (Millions)	B: Daily truck miles traveled (Thousands)	C: On-Time Arrival (Vehicle) ³	D: Planning Time Index ³	E: Daily vehicle hours of delay (Thousands)	F: Percent miles heavily congested	G: Person miles traveled (Millions)	H: On-Time Arrival (Truck) ³	l: Average Travel Speed	J: Percent Travel Meeting LOS Criteria ³
A: National Highway System	2.2	260.9			3.5	10%	3.8		44	88%
B. State Highway System	2.7	292.7			5.6	9%	4.8		41	89%
C: Strategic Intermodal System ⁴	1.5	234.7	82%	1.66	0.6	1%	2.6	77%	51	>99%
D. Freeways	0.7	200.2	97%	1.12	0.0	<1%	1.3	93%	69	>99%
E. Interstates	0.7	200.2	97%	1.12	0.0	<1%	1.3	93%	69	>99%
F: Non-freeways (SHS)	2.0	92.5			5.6	9%	3.5		31	85%

Alachua (County Boundary)

	A: Daily vehicle miles traveled	B: Daily truck miles traveled	C: On-Time Arrival	D: Planning Time	E: Daily vehicle hours of delay	F: Percent miles	G: Person miles traveled	H: On-Time Arrival	I: Average Travel	J: Percent Travel Meeting LOS
Networks/Measures	(Millions)	(Thousands)	(Vehicle) ³	Index ³	(Thousands)	heavily congested	(Millions)	(Truck) ³	Speed	Criteria [®]
A: National Highway System	5.0	822.9			3.7	4%	8.9		55	95%
B. State Highway System	6.0	887.5			5.9	4%	10.6		52	94%
C: Strategic Intermodal System ⁴	3.7	753.7	76%	1.79	0.7	<1%	6.6	71%	60	>99%
D. Freeways	2.3	593.9	98%	1.11	0.0	<1%	4.1	95%	70	>99%
E. Interstates	2.3	593.9	98%	1.11	0.0	<1%	4.1	95%	70	>99%
F: Non-freeways (SHS)	3.7	293.5			5.9	5%	6.5		42	91%

¹These six Annual Measures are reported each year.

²These four Rotating Measures change every other year. Odd year measures consist of 1) Percent Sidewalk Coverage, 2) Percent Bicycle Lane Coverage, and 3) Average Job Accessibility within a 30-minute car trip and 4) within a 30-minute transit trip.

³Measures C, D, H, and J are captured in the peak hour, which is from 5 to 6 pm.

⁴SIS On-Time Arrival and Planning Time Index exclude freeways.



Annual MPO Performance Measures by MPO Population Size

2018 Gainesville MTPO Population 212,400

Florida Department of Transportation Mobility Measures Program provides valuable information on performance measures for all 27 MPOs in Florida. On an annual basis the MPOs receive reports on ten measures, six measures annually and four rotating measures biennially for the entire MPO boundary, urbanized area within the MPO, and for counties within the MPO. The annual measures, in combination with the rotating biennial measures, cover the spectrum of mobility dimensions and multiple modes. These measures can be used however each MPO sees fit such as in the development of an MPO's Long Range Transportation Plan, Congestion Management Process, or State of the System Report. The following tables provide high, median, and low ranges for the State Highway System within the MPO boundary. MPOs are categorized as large, medium and small based on their population. The MPOs were distributed into the seven largest, ten medium, and ten small-sized MPOs. For more information, please contact Monica Zhong at Monica.Zhong@dot.state.fl.us or (850) 414-4808.

SHS Daily Vehicle Hours of Delay in Thousands, 2018	Vehicle Hours of Delay (Thousands)	Low	Median	High
	Small-Sized MPO (Population ¹ below 367,300)	0.3	1.2	5.6
GAINESVILLE MTPO	Medium-Sized MPO (Population ¹ 367,300 to 795,300)	0.8	4.5	7.7
0.0	Large MPO ² (Population ¹ over 795,300)	13.2	51.1	212.6
SHS Percent Miles Heavily Congested, 2018	Percent Miles Heavily Congested	Low	Median	High
	Small-Sized MPO (Population ¹ below 367,300)	<1%	<1%	8%
GAINESVILLE MIPO	Medium-Sized MPO (Population ¹ 367,300 to 795,300)	<1%	1%	4%
	Large MPO ² (Population ¹ over 795,300)	4%	14%	35%

¹2018 MPO Population is derived from FDOT Forecasting and Trends Office

²Seven Largest MPOs include Broward MPO, Hillsborough MPO, MetroPlan Orlando, Miami-Dade TPO, North Florida TPO, Palm Beach TPA, and Forward Pinellas

2018 Gainesville MTPO

Population 212,400



SHS Daily Vehicle Miles Traveled in Millions, 2018	Vehicle Miles Traveled (Millions)	Low	Median	High
	Small-Sized MPO (Population ¹ below 367,300)	1.7	4.2	6.3
GAINESVILLE MTPO	Medium-Sized MPO (Population ¹ 367,300 to 795,300)	4.0	8.4	12.5
2.3	Large MPO ² (Population ¹ over 795,300)	10.1	28.0	34.7
SHS Daily Truck Miles Traveled in				
Thousands, 2018	Truck Miles Traveled (Thousands)	Low	Median	High
	Small-Sized MPO (Population ¹ below 367,300)	168.1	416.2	893.4
	Medium-Sized MPO (Population ¹ 367,300 to 795,300)	377.5	910.8	1,440.5
000.0	Large MPO ² (Population ¹ over 795,300)	390.1	1,797.0	3,006.0
Freeway On-Time Arrival, 2018	On-Time Arrival	Low	Median	High
	Small-Sized MPO (Population ¹ below 367,300)	86%	96%	98%
GAINESVILLE MTPO 97%	Medium-Sized MPO (Population ¹ 367,300 to 795,300)	85%	89%	98%
5170	Large MPO ² (Population ¹ over 795,300)	63%	86%	88%
Freeway Planning Time Index, 2018	Planning Time Index	Low	Median	High
	Small-Sized MPO (Population ¹ below 367,300)	1.11	1.13	1.34
GAINESVILLE MTPO	Medium-Sized MPO (Population ¹ 367,300 to 795,300)	1.12	1.20	1.48
1.12				

¹2018 MPO Population is derived from FDOT Forecasting and Trends Office ²Seven Largest MPOs include Broward MPO, Hillsborough MPO, MetroPlan Orlando, Miami-Dade TPO, North Florida TPO, Palm Beach TPA, and Forward Pinellas



Forecasting & Trends Office

APPENDIX D: Policy Guidance on Addressing Automated, Connected, Electric, and Shared-Use Vehicle Impacts in Planning Documents

Year 2045 Long-Range Transportation Plan Update

Addressing Automated, Connected, Electric, and Shared-Use Vehicle Impacts in Planning Documents



OFFICE OF POLICY PLANNING

Florida Department of Transportation

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1. PURPOSE

Metropolitan areas, across the nation and around the world, are facing a technology revolution that could fundamentally change how people and goods move from place to place. This seismic shift in transportation and mobility, combined with the uncertainty associated with COVID-19, will bring new opportunities and challenges. Automated, Connected, Electric and Shared-use (ACES) vehicles are expected to make travel safer and more efficient, and greatly improve mobility, particularly for older adults and other underserved populations. ACES could also have adverse consequences, such as longer commutes, increased traffic, higher vehicle costs or create an even wider gap in mobility through access and use of transportation technology.

This document is intended to support state and local planning agencies, such as metropolitan planning organizations (MPOs), by providing language and ideas that they may incorporate in their policies, projects or other planning documents to meet current state transportation planning requirements regarding ACES vehicles. The intent of this document is to foster collaboration with the Florida Department of Transportation's (FDOT) efforts to improve safety and mobility, preserve existing infrastructure, and enhance economic competitiveness, with MPO plans and emerging mobility opportunities. References for ACES-based planning are found in state statutes that require emerging technologies to be reflected in transportation infrastructure and financial planning (Section 339.175 (7), Florida Statutes;

".... The long-range transportation plan must, at a minimum:...

(c) Assess capital investment and other measures necessary to:

1. Ensure the preservation of the existing metropolitan transportation system including requirements for the operation, resurfacing, restoration, and rehabilitation of major roadways and requirements for the operation, maintenance, modernization, and rehabilitation of public transportation facilities; and

2. Make the most efficient use of existing transportation facilities to relieve vehicular congestion, improve safety, and maximize the mobility of people and goods. Such efforts must include, but are not limited to, consideration of infrastructure and technological improvements necessary to accommodate advances in vehicle technology, such as autonomous technology and other developments."

This document may also be used as a resource for Florida's MPOs as they update their Long-Range Transportation Plans (LRTPs). Guidance on how to achieve solutions to the different technology challenges, is presented, and in many cases is addressed through specific discussion points in technical advisory committees. Example language can be incorporated or modified as appropriate for each MPO given their uniqueness in needs, challenges, and circumstances. Technology advancement, public acceptance, market penetration, and supporting infrastructure investment will likely vary between metropolitan areas. For MPOs that are using a scenario planning process as part of the LRTP update, this document provides narrative options for each ACES technology that align with the spectrum of different technology futures – ranging from very little change in existing conditions, to a complete shift in transportation mobility that is ACES dependent. Each MPO can also consider aligning emerging technology solutions with common LRTP goals and objectives, and apply representative language provided in this document as desired. MPOs can also leverage the results from funded projects to be better positioned to compete for, or become a partner in future opportunities, by incorporating emerging ACES technology to address transportation challenges they now face or may face in the future.



This approach also allows MPOs to incorporate language that reflects different rates of change for each technology. For instance, the influence of electric vehicles in one area may be realized sooner than that of automated, connected, or shared-use vehicles. Sample language is therefore provided for each technology that reflects the diversity of these mutually exclusive technology futures.

The document is organized as follows:

- » Section 2 provides a brief history of emerging technology activities for MPOs;
- » Section 3 demonstrates how the approach aligns with current FDOT policies;
- » Section 4 provides a summary of how recent Florida MPO LRTP updates have incorporated emerging technologies into their plans; and
- » Sections 5 8 provide example policies and how they can be used to achieve LRTP goals:
 - Section 5 addresses automated vehicles;
 - Section 6 addresses connected vehicles;
 - Section 7 addresses electric vehicles; and
 - Section 8 addresses shared-use vehicles.



2. BACKGROUND

The Fixing America's Surface Transportation (FAST) Act, signed December 4, 2015, identifies emerging technologies as a potential component to achieve many of the safety and mobility performance goals for the nation's transportation system. Several FAST Act programs, such as the Advanced Transportation and Congestion Management Technologies Deployment Program and the Technology and Innovation Deployment Program, look to further advance how emerging technologies can positively impact the transportation system.

The uncertainty regarding the timing and impact of ACES vehicles provides a unique challenge to transportation planners and planning agencies. The impact these technologies could have on safety, congestion, mobility, transportation funding, and travel patterns are as potentially profound as they are uncertain. To help MPOs begin the process of integrating the impacts these technologies have into long range transportation plans, FDOT completed the Guidance for Assessing Planning Impacts and Opportunities of Automated, Connected, Electric and Shared-Use Vehicles in September 2018¹. Within this document, three categories with six different future emerging technology scenarios involving connected vehicles (CV) and autonomous vehicles (AV) were identified that correlated to Federal Highway Administration (FHWA) guidance (**Figure 1**).

Figure 1: FHWA 2035 CV/AV Scenarios



Source: HNTB.

In general, the level of Connected and Automated Vehicle integration in each scenario is generally categorized to be the following:

Slow Roll - limited AV and CV market penetration, primarily defined by demonstration or pilot projects and Advanced Driver Assistance System (ADAS) features such as lane keeping assist, adaptive cruise control, parking assist or valet features, and limited segments of facilities offering connected vehicle safety messaging.

AV Managed Lane Network - a small percentage of the overall vehicle fleet have complete autonomous driving capability. Their presence is focused within the AV network laneage. Many vehicles in this scenario utilize some form of ADAS features.

Ultimate Driver Assist - Very few vehicles have any advanced AV features. Most AV uses are through activities described within the Slow Roll scenario. A larger percentage of vehicles include CV features in an effort to improve safety and operational performance on the transportation network.

Niche Market - AV penetration is similar to the AV Managed Lane Network scenario, with AV use confined to specific neighborhood streets or communities, and minimal use of CV features.

Competing Fleets - A significant percentage of vehicles have AV driving capabilities but have limited vehicle to vehicle communications.



RoboTransit - A significant percentage of vehicles have AV and CV driving and communication capabilities.

Additional information concerning the vehicle penetration assumptions can be found in Table 14 of FDOT's *Guidance for Assessing Planning Impacts and Opportunities of Automated, Connected, Electric and Shared-Use Vehicles* report.

This document builds upon the impacts and considerations identified in the guidance document, and provides specific language and ideas for LRTP goals, objectives, performance measures, policies, prioritization processes, or projects that MPOs can incorporate into their planning documents as they desire. As technology and its integration into transportation infrastructure advances, refinements to the supporting language and the most appropriate scenario for the region can be updated as needed.



3. ALIGNMENT WITH CURRENT POLICIES

It is important to understand how ACES are integrated in current transportation policies, plans, and focus areas. The Florida Transportation Plan is the state's long-range transportation plan. The FDOT MPO Program Management Handbook provides guidance on how activities that may be necessary to incorporate ACES into planning documents can be achieved. The "Vital Few" helps guide FDOT's approach to developing transportation investment priorities. These guidance documents and principles embrace ACES and address emerging issues associated with rapidly changing technology.

3.1. Florida Transportation Plan

The Florida Transportation Plan (FTP) is important because it not only sets a long-range vision for the future, but also guides today's transportation policies and decisions. Addressing emerging issues, such as new technologies, is one of the top focus areas within the FTP. To address ACES and other emerging transportation technologies in the FTP update, the FTP Steering Committee established an ACES Subcommittee to provide policy guidance on emerging technologies. Subcommittee recommendations will be incorporated into the new FTP, scheduled for release in December 2020. The updated Vision element, released in May 2020, identified Innovation as a key driver for guiding how people work, interact and travel. "Private enterprises are at the forefront of new mobility options and services, ranging from shared vehicles to micromobility, from automated vehicles to alternative fuels. Public/ private partnerships are advancing new infrastructure and services, sharing risk and reward."²

3.2. FDOT MPO Program Management Handbook

The **FDOT MPO Program Management Handbook** provides guidance to MPOs for the development of their Long-Range Transportation Plans. Section 4.2.2³. of the handbook, titled "State Requirements for the LRTP", states that MPOs should "Assess capital investment and other measures necessary to make the most efficient use of existing transportation facilities to relieve vehicular congestion, improve safety, and maximize the mobility of people and goods. Such efforts must include, but are not limited to, consideration of infrastructure and technological improvements necessary to accommodate advances in vehicle technology, such as autonomous technology and other developments."⁴

3.3. Vital Few

The Vital Few represent the focus areas within investment priorities, such a safety and system preservation, set forth by FDOT Secretary Thibault as an overarching approach to developing transportation improvements. Namely, the Vital Few include:

- ✓ developing a strong workforce,
- ✓ improving safety,
- enhancing mobility,
- \checkmark and inspiring innovation.

From an ACES perspective, this could include planning activities, such as, but not limited to:

- » Developing and coordinating policies and training to guide the department's extensive public involvement processes
- » Coordinating corridor planning policies
- » Coordinating policy and programming for the Strategic Intermodal System (SIS)
- » Coordinating policy and programming for the Shared Use Nonmotorized (SUN) Trail Network
- » Coordinating and establishing statewide standards for transportation system modeling to support long range planning



- » Collecting and maintaining core statistics, measures and trends to inform transportation planning, programming and development
- » Coordinating and reporting state and federal performance measures
- These activities are oftentimes initiated at the MPO level. Early integration of ACES considerations, when combined with a holistic regional strategy to ACES development can provide opportunities for ACES components to be incorporated into identified infrastructure improvements that incorporate Vital Few guidance and investment priorities.



4. RECENTLY ADOPTED MPO LRTP LANGUAGE

ACES can be incorporated into LRTPs in varying ways given that:

- » Different regions have different needs and solution preferences and therefore priorities.
- » ACES adoption and market penetration will vary across regions,
- » Florida Statues are not prescriptive on how to include ACES in MPO LRTPs, and therefore encourage approaches tailored to regional needs.

Seven MPOs, Transportation Planning Agencies (TPAs) and Transportation Planning Organizations (TPOs) that adopted LRTP updates in 2019 included ACES or emerging technologies into their longrange plans and are summarized below. This collection of activities, policies, and documents provide some of the latest thinking of how various agencies have addressed ACES. The approach and final products understandably vary as ACES adoption and community demographics reflect different needs and solution preferences.

4.1. Palm Beach TPA

In addition to surveying residents on their willingness to utilize AVs, the Palm Beach TPA identifies Transportation Systems Management and Operations (TSM&O) strategies ranging from traffic and transit management to technologies aimed at active travelers, work zones, and newly adopted vehicle technologies such as ACES vehicles. The TPA is also dedicated to assisting Palm Tran's move towards an electric vehicle transit fleet. They have identified one of their goals as "Preserve the Environment" with a performance measure of 75% electric vehicles in the rubber-tire transit fleet by 2030 and 100% by 2045.

The Palm Beach TPA LRTP further identifies a State Roadway Enhancements and Modifications (STREAM) Program and a Local Initiatives (LI) Program wherein funding prioritization includes design, right-of-way acquisition, and construction/implementation for ACES implementation projects such as technology investments (adaptive traffic signals, autonomous and connected vehicle systems), as well as Palm Tran purchase of electric buses and charging stations.

4.2. Miami-Dade TPO

The Miami-Dade TPO 2045 LRTP devotes significant discussion to ACES. The document provides general information about the different types of technological advancements and how they are already being applied in different areas of the United States. The TPO also recognized that the Miami-Dade County EV infrastructure policy includes a zoning ordinance for EV parking.

The LRTP states,

"New and emerging technologies do and will change the way we do things. There are a multitude of emerging technologies that will become staples over the next few decades. The Miami-Dade TPO embraces emerging technologies and is excited about these technologies that will:

- » Provide new mobility choices for Miami-Dade residents and visitors
- » Increase the safety of the transportation system
- » Improve the efficiency of our transportation system
- » Minimize environmental impacts and conserve energy
- » Connect our communities to essential services
- » Increase accessibility
- » Provide services for all
- » Provide economic benefits



The TPO recognizes that the planning process must be agile and adaptable with the implementation of new technologies, as policy and funding permit. The TPO will work collaboratively with federal, state, and local agencies and private sector to identify technologies that will improve the transportation system and create innovative mobility choices for all."

The TPO also discusses a Strategic Miami Area Rapid Transit (SMART) plan which supports the TPO's Vision by providing mobility options in Palm Beach County that are both strategic and far-reaching, creating a system of multiple transportation options by leveraging existing infrastructure, and integrating technology at the highest levels. The SMART plan milestone achievements include an On-Demand Carpooling Initiative, an EASY Card New Technology Initiative, and Dynamically Routed Transit.

4.3. Hillsborough MPO

The Hillsborough County MPO generally prioritizes technology advancements with statements in the LRTP such as:

- » "It's TIME Hillsborough 2045 Plan presents a high-level system approach to funding transportation investments that prioritize innovation, technology, and mobility for everyone."
- "This vision promotes safe and reliable transportation options by funding vehicle replacement and providing recommendations on where new technology options could contribute to a worldclass transportation system."
- » "Hillsborough County can lead the charge in the Tampa Bay Area as an incubator for new technologies for a rapid transit system."

This transportation plan's Smart Cities Investment Program sets aside funding for transportation technologies that are expected to provide significant improvements to the transportation network. The MPO has allotted 11% of their fiscal program from 2026 to 2045 to Smart Cities, which would incorporate ACES and other technological implementations. The Smart Cities program funds strategies to alleviate congestion and improve delays at key intersections. This is done by implementing appropriate design treatments at intersections and deploying existing and emergent technologies to improve traffic flow. The anticipated performance outcomes for the Smart Cities program are:

- » Improve 220 miles in road network coverage
- » Reduce delay by 44%
- » Improve travel time reliability by 20%

The MPO realizes the relationship between technology and transportation is becoming increasingly intertwined. "As populations continue to grow, resulting in more complex transportation issues, the transportation industry is turning towards emerging technologies to design solutions that safeguard the wellbeing of citizens and improve travel time reliability." The Hillsborough MPO has made great strides in advancing ACES within different transportation systems. In partnership with the University of South Florida (USF), the Hillsborough MPO sponsored a feasibility study for a transit circulator on the USF campus. The circulator provided service to remote parking areas via a low speed driverless shuttle while reducing nighttime security concerns.

The MPO also collaborated with the Tampa Hillsborough Expressway Authority (THEA) on the ongoing CV Pilot project with USDOT. This project involves 10 buses, 8 streetcars, 1000 'volunteer cars', and 46 roadside traffic units equipped with vehicle to vehicle (V2V) and vehicle to infrastructure (V2I) technology for wireless communication between vehicles, traffic signals and crosswalks. The project goal was two-fold, 1) Improve user experience for drivers, transit riders, and pedestrians in downtown area, and 2) Enhance safety, reduce congestion and lower vehicle emissions. Successfully demonstrated, analysis shows that these technologies can:

» Reduce backups on the Selmon Expressway



- » Improve on-time performance of Hillsborough Area Regional Transit (HART) buses through transit signal priority
- » Reduce streetcar conflicts on Channelside Drive
- » Improve pedestrian crossing safety on East Twiggs Street
- » Optimize traffic flow on Meridian Avenue, North Nebraska Avenue, and Florida Avenue

4.4. North Florida TPO (NFTPO)

In 2017, residents in the region participated in the Path Forward Travel Survey. Key takeaways relative to ACES were:

» 83% of survey respondents agreed that "we should invest more on technology implementations to improve traffic safety/efficiency", and "using technology to improve traffic flow and traveler information" was ranked as one of the top three most critical transportation issues.

NFTPO's 2045 LRTP "begins to consider the needs of Mobility on Demand services and Automated/ Connected/ Electric/Shared (ACES) vehicles." Goal 6, to "preserve and maintain our existing system," provides a nexus to ACES by proposing to "maintain signing and pavement markings to accommodate all users including automated vehicles," and "maintain technology/infrastructure introduced to accommodate connected vehicles." Goal 9 is defined to ensure North Florida is ready for connected and autonomous vehicles and internet of things (IoT) technologies that support transportation. The LRTP states"the North Florida Region will continue to embrace emerging technologies, including connected and automated vehicles, Internet of Things (IoT) components and advanced data management and analytics, preparing the transportation infrastructure in the region for these advances in transportation technology."

The TPO acknowledged FDOT's Office of Policy Planning efforts in providing "Guidance for Assessing Planning Impacts and Opportunities of Automated, Connected, Electric and Shared-Use (ACES) Vehicles" that outlines 33 elements that TPOs in Florida should consider in their short, medium and long-range planning. "These elements should be adopted by the TPO in future work efforts." Objectives of the TPO to ensure North Florida is ready for Connected and Autonomous vehicles (CAV) and Internet of Things are listed as:

OBJEC	OBJECTIVE 9.1: Deploy a regional data exchange						
Perforr	mance Measure						
9.1.1	Complete Phase 1 of the data exchange						
9.1.2	Develop a CV module for CV data storage and analytics						
OBJE	OBJECTIVE 9.2: Prepare infrastructure for connected and automated vehicles						
Perforr	mance Measure						
9.2.1	Miles of V2I technology (DSRC, C-V2X, or 5G)	Increase miles of V2I technology					
9.2.2	Miles of fiber optic cable	Increase miles of fiber optic cable					
OBJECTIVE 9.3 Implement cybersecurity measures and best practices throughout the system to protect user privacy and data and to ensure safe operations.							
Performance Measure							
9.3.1	Complete Cybersecurity Plan						
9.3.2	Develop and Implement Strategy for Security Credential Management Plan (SCMS)						


OBJECTIVE 9.4: Develop and implement policies that support connected and automated vehicles *Performance Measure*

9.4.1 Complete a Connected and Autonomous Vehicle Policy Plan

OBJECTIVE 9.5: Deploy strategies to support First Mile/Last Mile travel options.

Performance Measure

9.5.1 Complete First Mile/Last Mile Plan

OBJECTIVE 9.6: Incorporate CAV into the North Florida Travel Demand Model

Performance Measure

9.6.1 CAV included in the North Florida Travel Demand Model

OBJECTIVE 9.7: Implement scenario planning activities surrounding Connected, Automated, Electric, and Shared vehicles to determine the impacts on network usage, funding and other performance measures. *Performance Measure*

9.7.1 Develop scenarios surrounding ACES

9.7.2 Develop scenario planning methodology to determine impacts on the network usage, funding, and other performance measures

OBJECTIVE 9.8: Consider Autonomous Vehicle only lanes or zones to support enhanced mobility opportunities resulting from automated vehicles.

Perforr	nance Measure
9.8.1	Complete a study on autonomous vehicle only lanes or zones.

The 2045 LRTP included an exercise where the market penetration of CAVs was considered. A low and high market penetration scenario was considered and impacts on travel statistics were evaluated.

The 2045 LRTP also considered the impact to travel demand and vehicle miles traveled that Connected Automated Vehicles (CAVs) will have on the network. Using the activity-based Northeast Florida Regional Planning Model developed for the 2045 LRTP update, the research took an Exploratory Modeling and Analysis approach, which is a systematic approach to perform sensitivity analyses using models when users cannot assert many of the model inputs with confidence. The approach adopts the travel demand model to simulate households' decisions whether to purchase CAVs instead of conventional vehicles and to simulate travelers' decisions whether to use CAV-based carsharing and TNC services. The dynamic network model used for the exercise simulates operating characteristics of CAVs, depending on network vehicle mix, and simulates the performance of CAV-only infrastructure under different demand scenarios. The integrated model system simulated dozens of different scenario combinations to explore the possible outcomes and find critical input assumptions while identifying future policy directions.

The purpose of this analysis is to understand the relative difference with respect to transportation planning needs between business as usual, moderate adoption of CAVs and TNCs or shared mobility providers like Uber and Lyft, and rapid adoption of CAVs and TNCs in the North Florida TPO region. The document states, "As the outlook and expected saturation rate for CAVs is better defined, so will the exercise of evaluating the impacts of disruptive technology such as CAVs on the transportation system."

The emerging issues discussed include Mobility as a Service (MaaS), AV, micro-mobility, micro-transit, and Electric Hybrid Vehicles. The integration of various modes of transportation services into a single



mobility service, MaaS, may result in a shift away from personally owned vehicles to shared-use vehicles. As for AV, the TPO included the Ultimate Urban Connector ($U \oplus C$) project that will introduce autonomous vehicles along a key transportation corridor in Downtown Jacksonville. The TPO expects that as electric passenger cars continue to gain in popularity, half of new cars produced will be electric by 2040.

4.5. Forward Pinellas

The Forward Pinellas LRTP, Advantage Pinellas, represents the first allocation of resources for active transportation and technology in the Forward Pinellas LRTP. Advantage Pinellas includes goals and objectives to support investments in technology to improve traffic management and system performance using Intelligent Transportation Systems (ITS). Funding is allocated in the Advantage Pinellas LRTP as a percentage for future ITS applications and other technological solutions that may be available in the coming years. The Plan dedicates close to 100-percent of the federal flexible funding sources to projects that address safety, accessibility, transit and technology to develop a more sustainable transportation system that is less reliant on single occupant motor vehicle travel.

To address these transit and technology targets for a more sustainable system, they have also begun to integrate autonomous and electric buses into their system as described below.

- The MPO opted to model the impacts of three different market saturation scenarios: a low » level, medium level and a high level of saturation. It was agreed that given the uncertainty of the market penetration for automated and connected vehicles, it was not possible to select a single scenario to advance with the 2045 Plan. The MPO will regularly evaluate how the transportation network may be impacted by ACES as new projects are considered for future funding.
- In partnership with the City of St. Petersburg, the Pinellas Suncoast Transit Authority (PSTA) plans to implement an autonomous shuttle demonstration project to understand how the technology could benefit and impact commuters in St. Petersburg. This demonstration project includes infrastructure improvements, including the operation of two autonomous public shuttles in downtown St. Petersburg. PSTA is working with a third-party operator to assess the route for the demonstration project and prepare documentation to submit to the National Highway Traffic Safety Administration (NHTSA) for these shuttles to be approved for operation on a public roadway.
- During the fourth quarter of 2019, PSTA completed an AV feasibility study and concept plan » for autonomous shuttle services in Clearwater and Dunedin. The purpose of the feasibility study and concept plan was to examine the potential for a self-driving shuttle service implementation and to define the potential infrastructure, capital and operating requirements necessary to support additional pilot projects. A third-party operator has since performed additional analysis of the routing options to prepare application packages to submit to NHTSA in order for these shuttles to be approved for operation on public roadways.
- PSTA is a member of an Automated Bus Consortium with more than twelve other transit » agencies and state DOTs throughout the country. PSTA and the other consortium agencies submitted a grant proposal to the FTA's Integrated Mobility Innovation to receive funding to plan potential use cases for fully autonomous fixed-route buses.

4.6. Broward MPO

The Broward MPO LRTP, Commitment 2045, defines mobility technology as "a relatively recent issue related to advances in automotive and infrastructure technology . . ." The LRTP discusses ACES in that "each approach may be implemented independently, and mobility benefits are enhanced if implemented together" and that "advances in automotive technology such as autonomous vehicles may help to prolong independent living for those who do not live near public transit, provided the cost is not significant."



Commitment 2045 states:

"Mobility Technology, in all of its forms, is the future for transportation, and each form faces similar unknowns. Until there is a better understanding of how autonomous vehicles/connected vehicles (AV/CV) will be delivered (e.g., shared or individual ownership), it is difficult to assess their impacts on the transportation system. Shared vehicles may reduce auto ownership rates and trip lengths but may not reduce the number of trips on the network. Similarly, if people buy their own self-driving car, conditions will be similar to, if not worse than, the current conditions, as more people who currently are unable to drive can use private cars in lieu of public transportation to complete their travel needs. Equity is also a concern for Mobility Technology, specifically in regard to the costs, and is something that will need to be considered as progress is made.

Due to the private sector development of much of this technology, government agencies are in a response mode. The MPO can encourage advancement of this issue by prioritizing the installation of sensors and communication devices along roadways and other transportation infrastructure, provided that infrastructure owners are willing and appropriate funding sources are available. For the next Metropolitan Transportation Plan (MTP) update, the prioritization criteria should be revisited to determine if there is a need to better address these types of projects.

This issue was addressed in several ways in this MTP. First, several municipalities in Broward County submitted projects for consideration that were autonomous circulators. Although these projects were prioritized as part of the Needs Assessment, they were left out of the Cost Feasible Plan due to a lack of ongoing operations and maintenance funding by the proposers. Through the Scenario Planning effort, the impact of AV/CV vehicles on the transportation network was tested; however, it did not consider an increase in the number of trips; rather, it reflected the potential additional capacity that could be provided if AV/CV corridors were in place by 2045."

Broward MPO, using the Southeast Regional Planning Model, prepared a technology scenario that converted existing managed lanes to technology corridors and identified arterial corridors that would accommodate ACES vehicles. Additional modifications to model variables were made to reflect the benefits anticipated with the implementation of autonomous and connected vehicles, including increased roadway capacity, reduced traffic signal delay, and reduced transit wait times.

The results of this scenario planning blended roadway and transit investments, and resulted in slightly reducing travel demand, improving accessibility to jobs, and was the best performing scenario for congestion and safety improvements while still allowing for driver-operated vehicles in separated lanes. Unique projects considered in this scenario included the installation of traveler wayfinding and ITS components, ethernet to fiber-optics signal components, as well as cellular to fiber-optics signal components.

4.7. Pasco County MPO

The Pasco County MPO recognizes the emergence of ACES in its LRTP, MOBILITY 2045, by stating: "Technology also takes a large leap forward in MOBILITY 2045 as automated, connected, electric, and shared (ACES) vehicle impacts on the landscape are being considered. These technologies along with traffic signal and intelligent transportation system (ITS) implementation will impact roadway capacity, land use, and the safety of future transportation system users."

Within their Congestion Management Program, the MPO discusses considerations including CV enhancements along ITS corridors and identifying future technology projects that provide safety and mobility benefits for the users of the transportation system.



5. AUTOMATED VEHICLE PLANNING

The next four chapters provide additional details on potential planning approaches and considerations for each of the four emerging technologies within ACES vehicles. The first part of the acronym, Automated, is covered in this chapter, followed by Connected vehicles in the next chapter, and so on. Each chapter provides a brief perspective on technology planning implications, opportunities moving forward, and how they may be incorporated into the different planning scenarios in the future, as appropriate.

The shift to AV use is typically driven by planning and operational improvement goals such as:

- » Safety striving to reduce the estimated 94% of crashes due to driver error
- » Mobility providing critical mobility options for people with disabilities, seniors, and children
- » Connectivity providing first mile/last mile (FM/LM) connections to transit for improved operational efficiency.
- The overlap of AVs with the CV, EV, and SV market is also evident through initial offerings and public demonstrations. While AVs are independent of connectivity, many early-use cases function with some level of connectivity to demonstrate operational efficiency or safety features such as connectivity with signal systems. Likewise, almost all AVs demonstrated are driven by electric propulsion. Finally, while individual vehicle manufacturers are developing their own versions of AVs, most public demonstrations involve a shared-use component, such as low speed transit shuttles.

While this particular technology has the opportunity to provide the highest transportation benefit, it offers the most unknowns in areas such as market penetration rate, immediate and long-term use cases, secondary engineering and planning impacts, and influence on travel behavior. These factors and areas of uncertainty are aspects to consider when developing an approach to an AV future.

This uncertainty in AV utilization creates undefined opportunities and challenges in areas such as:

- » Congestion people may shift from transit use to personal AV trips and/or new additional trips may be generated by zero occupant vehicle trips
- » Health more people may travel from door to door, decreasing the use of sidewalks and bike lanes, potentially leading to increased difficulty in justifying investment in those facilities
- » Jobs retraining people who drive for a living (buses, trucks, etc.) and associated mechanics to use more advanced technology and developing additional opportunities for logistics or dispatch in a future comprised predominantly of AVs
- » Data depending on the vehicle ownership model, additional data privacy, security, ownership, and personal safety needs to be defined
- » Land Use people may live farther from job centers and other destinations
- » Development garages may become obsolete, curb space re-imagined, and parking lots repurposed

Uncertainty can lead to both positive and negative impacts, as outlined in a recent National Association of City Transportation Officials report, summarized in **Table 5.1**.



Tab	Table 5.1 · AVs Impact on Cities			
	POSITIVE	NEGATIVE		
Safety	Federal and state governments adopt objective safety performance standards that protect all right-of-way users, including those in urban areas. Excess road space, created by more efficient AVs, is used to build better, safer places for people walking and on bikes.	Governments fail to hold companies accountable to fully comply with traffic laws. These failures result in no improvement in today's street safety record, while creating new risks and hazards.		
Transit	New technologies allow transit to cover more of the city, bridging the gap to lower- density places. Trip planning apps and other information/communications tools allow for smarter transit AV planning and route development. Mobility becomes smarter, while also becoming more equitable and reliable.	Privatized AV services detract from public transportation options rendering them unable to compete or operate efficiently. This results in fewer services to underserved or transportation disadvantaged populations.		
Pricing	State and local governments partner to charge a fair price for travel and parking, mitigating congestion and helping to fund a more equitable transportation system.	Due to the low price, many individuals travel more, burdening cities, themselves, and the environment with the negative externalities of unfettered driving.		
Privacy	Consumer data protection legislation is passed that defines journey data as personally identifiable information (PII). Governments gain the benefits of increased data for planning and regulation while people preserve their right to control how it will be used and who will see it.	Governments fail to define journey data as PII or enact comprehensive data protection legislation. As a result, companies and governments alike acquire unprecedented access to the private actions and movements of citizens.		
Data	Federal, state, and local regulators require public and private sector actors to share data. Access to more robust mobility data allows governments to make better investments in transportation infrastructure, facilitating balanced, multi-modal transportation.	The federal government determines that private companies control the data that automated vehicles generate, reinforcing a business model based on data sales and consumer loyalty. Companies grant 'free' rides in exchange for data (and travel routes that take customers past certain stores).		
Freight	Coordinated freight management reduces the number of large AV vehicles in and around urban areas. Freight distribution centers enable most deliveries to take place via e-bikes or other small, high-efficiency AV modes.	High speed platoons of autonomous freight vehicles make roads increasingly dangerous or impassable. In cities, sidewalk bots proliferate, taking away valuable space from pedestrians and cyclists. Delivery drones increase noise in urban areas to unhealthy levels. Unemployment rises as AV-based freight services put people out of work.		
Streets	Cities and the private sector together embrace streets as public spaces, fostering design and engineering practices that balance walking, biking, driving, and transit. AV-only lanes are reserved solely for automated mass transit.	AV lanes take street space from other uses. As individuals choose private AVs over transit and travel costs plummet, congestion increases, and pedestrians and cyclists become relegated to walkways above or below grade for their own safety.		
Curbs	Cities pass new curbside management plans committing any space savings to public use. Cities use curbside space for parklets, green infrastructure, bus lanes, bike lanes, and small- scale vendors and kiosks. re: National Association of City Transportation Officials, "Blu	Curbs become increasingly cluttered as companies compete, unimpeded, for space to pick up and drop off passengers. Jeprint for Autonomous Urbanism", 2 nd Edition.		



A recent national survey found that 60% of people polled have limited to no understanding about automated vehicles.⁵ This unfamiliarity with AVs may mean the most vulnerable populations, such as seniors, those with low-incomes, and other disadvantaged populations may need additional assistance preparing for an AV abundant world. This may lead to greater mobility issues and a proliferation of more of the negative outcomes noted in **Table 5.1**. Pilots, education, and public outreach will be critical to ensure the public can shape how AV systems are deployed.

5.1. AV Planning Issues

Knowing that various AV vehicles will be available in the future makes it important for states and MPOs to invest in planning for these futures. There are several aspects on how regions can prepare for AVs. A number of these items are addressed here and offer potential policy or program implications. A good resource that outlines several considerations for agencies when developing their AV vision is *Preparing Communities for Autonomous Vehicles*⁶ by the American Planning Association, released in 2018.

Shared Use versus Private Ownership

To achieve full benefit from AVs, they will need to be shared, thus decreasing the number of vehicles on the road. Alternatively, if most or all AVs are privately owned and operated, increased congestion will result in the form of higher numbers of single-occupancy and "zero-occupancy" trips.

Policies such as traditional bus-only lanes or closer proximity of charging areas to major destinations are potential avenues to incentivize shared-use of AVs vs. the private ownership model. In contrast, VMT fees that could replace motor fuel taxes, congestion pricing, and parking strategies would disincentivize low occupancy AV operations through higher per-mile or operations costs.

Land-Use

One concern of increased reliance on AVs is that it will help exacerbate urban sprawl as people may be willing to live farther away from employment if the stress from commuting is reduced through AV control. *Preparing Communities for Autonomous Vehicles* identified an opportunity for "sprawl repair" where suburban districts may become more efficient for transit using mobility hubs to offer different options through various partnership models, mobility options, and improved access to major activity centers and neighborhood services.

Developing a mobility plan for suburban areas with traditional low transit use, or currently inefficient transit operations, can help prepare these communities for future AV integration. This may include developing a transition plan as the market penetration and use of AVs increases.

Regions may consider converting parking garages from vehicle storage to vehicle recharging or potential urban warehousing for e-commerce growth to repurpose/maximize the use of existing infrastructure as AVs gain popularity. This may include developing a transition plan as the market penetration and use increases.

Entities anticipating future reliance on significant AV use need to understand that the technology alone may not be enough to influence market penetration. Land use zoning codes, particularly those associated with parking requirements, can also impact AV usage. As AVs proliferate, zoning codes will need to account for more passenger loading and unloading. Parking minimums, typically found with many commercial and residential developments, may no longer be necessary. Retail space needs may also decrease as consumers shift to smaller showroom/pick up spaces and e-commerce increases in retail use.



Right-of-Way Size and Usage

Autonomous vehicles may require less road space than traditional vehicles, as they improve vehicle lane-keeping and operate with less following space. If narrower or reduced lanes are implemented, opportunities to enhance bike lanes, scooter lanes, pedestrian paths, transit ways, on-street parking, or pick up/drop off opportunities are possible. However, lane width may continue to be contingent on vehicle design due to freight vehicles still requiring current lane dimension standards. Lane widths may also remain unchanged if passenger AV widths stay the same or even widen to provide reconfigured vehicle interior space to allow for greater passenger movement or activities such as exercising, working, or sleeping if human driving is no longer required, or in order to reduce pavement rutting.

Potential policies can be developed that would articulate priorities for space freed up by modified right of way usage if narrower lanes or reduced lanes are possible.

As previously mentioned, parking needs may be dramatically different in an AV future. Accounting for and understanding the time demand differences of pick up/drop off both for passengers and freight will play an important part in successfully accommodating AV needs.

Cities and business districts should take an inventory of available curb space, how it is allocated and used both now and potentially in the future to develop a plan that accommodates AV needs, maximizes safety, and minimizes operational inefficiencies. This may include developing a transition plan as the market penetration and use increases.

Transportation Engineering

To provide a high level of location and operational guidance to AVs, traffic signals, signs, and pavement markings during normal operations and maintenance of traffic requirements may need to be modified for improved AV operations.

Policies and programs involving pavement markings, sign and signal maintenance can help communities become more AV ready. Additionally, working with AV vendors to understand where their systems are having difficulty in safely operating, such as in urban canyons, may help identify where additional sensor or other communication infrastructure is necessary.

Related Infrastructure

By removing the responsibility of human driving with fully autonomous vehicles, occupants will likely be tempted to turn to other activities, such as reading, work, or phone calls in order to fully appreciate the benefits of travelling in an AV. High-speed communications services will be important both to the vehicles and their occupants. Similarly, as most AVs being developed are also EVs, understanding the potential impact to the power grid at recharge locations will be crucial.

Analysis of communication capabilities such as available 5G bandwidth and signal strength, as well as power grid reliability, redundancy, accessibility and capacity, will be an important component of AV penetration.

Liability

While liability may be more closely associated with connected vehicles and associated data/messaging, as the progression of technology unfolds, understanding and planning for the liability associated with communications between AVs will be important, as well as the responsibility of the driver/operator/ vehicle and roadway owner and maintainer.



Developing the framework for data privacy, ownership, communication, storage, and use will be critical to maintain an appropriate understandability of liability concerns as the technologies advance and are utilized.

Economy

Understanding the potential impact of AVs in the local economy is important. Not only can it lead to a significant reduction in jobs for truck drivers, delivery people, taxi drivers, and transit workers, it can lead to an increased demand for concierge services, inventory control, logistics providers, artificial intelligence developers, roboticists, application developers, electrical engineers and technicians, network architects, systems engineers, data scientists, and different repair/maintenance skills.

This change in the labor market can be offset by a focused attention to workforce development, to train for the needs of tomorrow, and retrain those whose skills are in less demand.

Equity

As the shift to AVs matures, it is possible that public transportation could be supplanted by the private sector through personally owned shared use AVs, which could leave residents of low-income neighborhoods with fewer or less affordable mobility options or options that do not accept cash. While AVs could increase mobility for persons with disabilities and seniors, these gains are not assured, especially for those in rural areas. It is also possible that an over-reliance on AV solutions without proper planning could worsen transportation equity issues. For instance, shared use AVs requiring mobile summoning or payment may create digital inequities for those without a mobile phone, with poor cell or high-speed internet service or without a banking account.

A dependence on AV use to increase mobility for all users also requires analysis to ensure drop off/pick up areas have appropriate way finding and wheelchair ramp infrastructure.

Working with providers to ensure AV solutions do not increase the digital and mobility divide will be critical to address equity issues as AV use increases.

5.2. Example AV Inclusion in Planning Activities

How states and MPOs have synthesized these factors into planning activities and documents vary. In addition to the recent Florida MPO examples provided in Section 4, there are other good examples from across the nation on how other regions are adapting to different potential futures specific to AV, three of which are the Washington D.C. Comprehensive Plan⁵, the City of Seattle Comprehensive Plan⁶ and the New York State Association of MPOs (NYSAMPO) Transportation Systems Management and Operations (TSM&O) Working Group⁷. These three areas identified best practices in planning processes, provided example policies, and provided implementable actions for planning reports and activities.

Washington D.C

The City of Washington, D.C. formed an AV Working Group comprised of agencies focused on transportation, rights of persons with disabilities, environmental issues, and public safety. The group was established "to develop policy and regulatory guidance to ensure AVs enhance the District by improving safety, efficiency, equity, and sustainability while minimizing negative impacts on residents, workers, and visitors."

Many of the issues described in Section 5.1 can be found in **Table 5.2** below.



Table 5	Table 5.2 · Comprehensive Plan Standards for Sustainable Places and AVs		
	Principle/ Process/ Attribute	Best Practice	AV Considerations
1	Livable Built Environment	1.4 Provide complete streets serving multiple functions.	Develop street design standards integrating AVs into complete streets serving all users, including pedestrians, bicyclists, and transit riders. Prioritize shared over private AVs and address the impacts of curbside pickup and drop-off on other modes.
2	Harmony with Nature	2.4 Enact policies to reduce carbon footprints.	Encourage/incentivize use of shared electric or other energy- efficient AVs. Incorporate convenient electric charging stations into transportation infrastructure, with the long- term goal of providing wireless charging for the AV fleet.
3	Resilient Economy	3.3 Plan for transportation access to employment centers.	Use AVs to improve access to employment centers, particularly for populations that may not have personal vehicles.
4	Interwoven Equity	4.5 Provide accessible, quality public services, facilities, and health care to minority and low-income populations.	Include policies and actions using AVs to expand access and mobility for all ages, abilities, and incomes. Address the digital divides and impacts on the transit-dependent populations.
		4.7 Plan for workforce diversity and development.	Identify and provide training in new job opportunities for those impacted by AV technology (e.g., bus, truck, taxi, and delivery drivers).
5	Healthy Community	5.2 Plan for increased public safety through the reduction of crime and injuries.	Ensure that AVs operate safely for all users. Leverage the potential safety benefits of AVs to support Vision-Zero goals of no fatalities or serious injuries involving road traffic.
6	Responsible Regionalism	6.5 Promote regional cooperation and sharing of resources.	Working with the regional and other local planning agencies, develop a regional AV strategy coordinating infrastructure changes; regulatory, pricing, and other policy mechanisms; effects on regional land use and employment patterns, etc.
7	Authentic Participation	7.4 Develop alternative scenarios of the future.	Develop scenarios for the future deployment of AVs and evaluate their impacts on community values and goals.
8	Accountable Implementation	8.6 Establish implementation indicators, benchmarks, and targets.	Incorporate performance metrics for factors such as transit ridership, safety, access for underserved populations, etc., to track the effects of AV deployment.
9	Consistent Content	9.1 Assess strengths, weaknesses, opportunities, and threats (SWOT).	Address the potential effects of AVs as part of the SWOT analysis and use to inform community discussions on planning implications and responses.
10	Coordinated Characteristics	10.3. Be innovative in the plan's approach.	Address AVs and other technological change/disruption (e.g., future-oriented language promoting adaptability, innovation, and experimentation).

Source: Washington D.C. Comprehensive Plan, 2019.



City of Seattle Comprehensive Plan

The City of Seattle identified a policy framework for AVs that is human centered in its design and contains five distinct actions:

- 1. Integrate automated mobility concepts and policy direction into Seattle DOT's pedestrian, transit, bicycle, and freight master plans.
- 2. Develop an automated mobility modal plan to establish Seattle's first functional classification system for autonomous vehicles and a network of peak period smart lanes dedicated to Level 4 and Level 5 automated vehicles.
- 3. Evaluate signal operations and traffic control warrants under an automated mobility paradigm.
- 4. Develop a transition to Full Automated Mobility Phasing Plan to seamlessly shift between human-driven vehicles and fully automated vehicles.
- 5. Update minimum street design standards in Seattle's public ROW improvements manual, Streets Illustrated, to reflect changes in automated vehicle form factors.

Policies around these actions can be found in **Table 2** of their Comprehensive Plan, as included below in **Table 5.3**.

Table 5.3 • Highlights of Seattle's Preliminary Automated Mobility Policy Framework		
Торіс	Example Policy	
Equity and Accessibility	EA1. Ensure the benefits of automated mobility are equitably distributed across all segments of the community and that the negative impacts of automated mobility are not disproportionately borne by traditionally marginalized communities.	
Pilots and Partnerships	PP1: Develop strategic pilot partnerships to test automated vehicle technology in Seattle's climate, hilly terrain, and urban traffic conditions.	
Infrastructure and Street Design	 IS1: As vehicle ownership decreases and reliance on shared automated vehicle fleets increases: Capitalize on system efficiencies to implement our transit, bicycle, and pedestrian master plans. Capitalize on opportunities to invest in placemaking features and expand the pedestrian realm. Identify and phase-in corridors and zones dedicated to transit, walking, and high-occupancy automated vehicles only. 	
Mobility Economics	 ME1: Developed a tiered and dynamic per-mile road use pricing mechanism for automated vehicles operating in highly congested areas and corridors of Seattle: Tier 1 (elevated surcharge): Zero-occupant automated vehicles Tier 2 (bus surcharge): Single-occupant automated vehicles Tier 3 (reduced surcharge): Automated vehicles using smart lanes with less than three passengers Tier 4 (no surcharge): Automated vehicles using smart lanes with three or more passengers Tier 5 (additional surcharge on Tiers 1 - 3): Peak travel period surcharge for all nonpublic transit vehicles trips with less than three passengers, including freight 	
Land Use and Building Design	LB1: Ensure automated vehicles advance our land-use goals and capture the value of transit- oriented development.	



NYSAMPO TSM&O Working Group Plan

The NYSAMPO TSM&O Working Group developed the report titled, Establishing a Regional Planning Framework for Connected and Automated Vehicles that includes recommendations around infrastructure, service, congestion management, freight, travel demand modeling and Transportation Improvement Plan (TIP) activities for AVs, or as they are typically described, CAVs. Highlights include:

Infrastructure-Related:

- » CAV-supportive field instrumentation for ITS planning, architecture, and deployment for all modes including corrective/preventive road and bridge maintenance.
- » Expand "Complete Streets", "Universal Design", and "Access Management" to include CAVsupportive technologies and infrastructure elements.
- » Apply CAV needs to change the function, design, and placement of traffic signals, signage, striping, lighting, and other roadway elements.

Service-Related:

- » Monitor developments through attendance at CAV-related conferences, workshops, and technical training programs.
- » Convene roundtables to discuss the anticipated community impacts and stakeholder preparation.
- » Identify CAV technologies to enhance Transportation Management Center (TMC) operations and incident-scene safety for victims, first-responders, and the traveling public through Traffic Incident Management (TIM) policies and procedures.
- » Plan how CAV may impact land use and demand for transportation services differently for urban, inner-ring suburban, outer-ring suburban, rural areas, and unique areas such as redevelopment or tourist-focused areas.
- » Identify what public services (i.e., data from sensors, weather reports) can improve navigation and wayfinding capabilities.
- » Develop strategies and programs for ensuring the availability of ride-sharing services to all segments of the population.
- » Assess the impacts of CAV technologies on transit services.
- » Identify data sets and how to address format, use, access, coverage, security, and privacy issues.
- » Identify future agency staffing needs and activities related to CAV.

Congestion Management Process (CMP)

- » Use data generated by CAV to monitor congested locations and validate travel demand models.
- » Emphasis on travel time reliability for congestion management initiatives.
- » Monitor potential shifts in travel patterns and times to determine potential secondary impacts on commuter patterns, freight shipment and delivery services, special event-related disruptions, incident-related disruptions.
- » Evaluate programs to maximize road usage and potentially shift operational priorities during periods of less demand.

Goods Movement/Freight Planning

- » Consider the evolution of freight planning from CAVs. Changes could include:
 - Goods distribution shifting to a more decentralized distribution network that minimize stores and deliver products from warehouses directly to consumer's homes.



- Truck platooning for signal timing for improved safety and efficiency.
- Roaming stores as businesses could develop AV fleets to roam within designated areas.
- Increased emphasis on overnight or just-in-time delivery services.

Transportation Improvement Program (TIP)

- » Consider AV impact or influence in project selection criteria
- » Consider AV impact on available funding sources.

5.3. Summary

The impacts of AVs are likely to be profound, whether they are a major part of the transportation system in 5 years or 50 years. Planning for their integration can help encourage their proliferation by preparing all stakeholders for AV use when the technology and market are ready. Regardless of the implementation timeframe, several best practices have emerged that regions can employ to help prepare for their inclusion into the transportation system. These best practices for states, MPOs, and jurisdictions include:

- » Establish an interagency AV Working Group to address anticipated AV needs for the region.
- » Collect an inventory of curb usage (freight, resident, parking meter, etc.) to prepare for likely increases in pick up/drop off needs.
- » Examine current funding sources used for transportation, because AVs will likely reduce gas tax collections and potential parking or traffic violation revenues that are applied to transportation infrastructure or transit operations.
- » Identify transportation underserved areas, why there are challenges, and how AVs may be a part of the solution to improving equitable mobility in these underserved areas.
- » Develop an EV charging plan that contemplates the needs of AV as the market matures.
- » Introduce pilot projects to familiarize the public with AV capabilities.
- » Analyze regional workforce components as driver-focused services such as taxi drivers, delivery drivers, etc., may have less demand, while also examining the local educational and training needs of the future AV enabled workforce.
- » Initiate a communication and public outreach or education plan specific to AV.
- » Develop a regional data plan that considers how the data will be collected and used, who has access to parts or all of the data, how often it is updated and verified, how it can be secured, and how privacy concerns can be addressed.

For MPOs using scenario planning techniques described earlier, **Tables 5.4 - Tables 5.9** offer information that could be included within common LRTP goals. The actions identified are meant to provide a sense of what is possible as many AV functions rely strongly on other emerging technology functions, such as EV or CV. Many proposed actions reflect a dependence on the other technologies. For instance, there are similarities between actions listed in the Competing Fleets and Robo-Transit scenarios since the main difference between these two situations is CV-related and not AV. Therefore, the AV approaches for both scenarios will be similar. The activities listed in the lesser AV-intensive scenarios such as Managed Lane Network and Niche Market can also serve as a transition plan to the more intense AV use scenarios such as Competing Fleets and Robo-Transit.



Table 5.4 · FHWA Scenario - Slow Roll		
Goal	Action	
Safety and Security	 Introduce AV pilot projects in low speed, dedicated right of ways 	
Maintenance and Operations	 Initiate a curb inventory database to determine optimum pick up/drop off locations for AVs balanced with changes in freight delivery needs Enhance signage, signals and pavement markings for improved machine vision 	
Mobility and Connectivity	 Create alternative payment and communication systems for areas with poor high-speed internet availability or usage, or for lower income communities 	
Economic Competitiveness	 Establish an AV Working Group to focus on improving access to employment centers for transportation deficient or transit dependent areas 	
Community Livability	 Set up a regional data framework Develop a transition plan that uses emerging technology to address equity issues Create a Complete Streets plan that addresses safety and operations around pick up/drop off locations 	
Environmental Stewardship	• Produce a regional EV charging plan that considers the needs of AVs as the market matures	



Table 5.5 · FHWA Scenario - AV Managed Lane Network		
Goal	Action	
Safety and Security	 Identify AV only network and enforcement actions. Initial routes could include traditional High Occupancy Vehicle (HOV) or Bus Rapid Transit (BRT) lanes. Develop AV safety performance metrics to help prioritize future AV lane investments on high crash corridors 	
Maintenance and Operations	 Initiate a curb inventory database to determine optimum pick up/drop off locations for AVs based on origin-destination analysis Enhance signage, signals and pavement markings for improved machine vision Develop AV lane operational performance metrics that can help prioritize investments in congested corridors or along congested travel patterns 	
Mobility and Connectivity	 Connect lower income neighborhoods to job centers utilizing AV network and ensure benefits are equitably distributed across all segments of the population Create alternative payment and communication systems for areas with poor high-speed internet availability or usage or lower income communities 	
Economic Competitiveness	 Build signal priority systems for AVs Promote AVs for first mile/last mile to broaden transit availability Update existing planning documents to include AV mobility plans Establish an AV Working Group to focus on improving access to employment centers for transportation deficient or transit dependent areas 	
Community Livability	 Craft a public awareness campaign informing community of AV benefits Identify a local champion as a resource for trends, opportunities, and information Set up a regional data use, access, security, and privacy plan that can foster improved AV lane safety and operations Develop a transition plan that uses emerging technology to address equity issues Create a Complete Streets plan that addresses safety and operations around pick up/drop off locations 	
Environmental Stewardship	 Produce a regional EV charging plan that considers the needs of AVs as the market matures Investigate the viability of wireless charging along AV networks Consider a tiered revenue plan to help reduce congestion along certain corridors or during certain durations 	



Table 5.6 • FHWA Scenario - Ultimate Driver Assist		
Goal	Action	
Safety and Security	 Introduce AV pilot projects in low speed, dedicated right of ways 	
Maintenance and Operations	 Incorporate AV pilots into the ITS Master Plan Initiate a curb inventory database to determine optimum pick up/drop off locations for AVs based on origin-destination analysis 	
Mobility and Connectivity	 Create alternative payment and communication systems for areas with poor high-speed internet availability or usage or lower income communities 	
Economic Competitiveness	 Establish an AV Working Group to focus on improving access to employment centers for transportation deficient or transit dependent areas 	
Community Livability	 Set up a regional data use, access, security, and privacy plan that can foster improved AV lane safety and operations Develop a transition plan that uses emerging technology to address equity issues Create a Complete Streets plan that addresses safety and operations around pick up/drop off locations 	
Environmental Stewardship	• Produce a regional EV charging plan that considers the needs of AVs as the market matures	



Table 5	.7 • FHWA Scenario - Niche Service Growth
Goal	Action
Safety and Security	 Identify AV only routes in niche areas like business parks, campus environments, shopping centers or major destinations to reduce short distance trips and/or develop pilot projects in mixed traffic Identify barriers that allow for flexible, experimental design or zoning that would encourage AV only operations Develop AV safety performance metrics that can help prioritize future AV lane investments on high crash corridors
Maintenance and Operations	 Incorporate into the ITS Master Plan Enhance signage, signals and pavement markings for improved machine vision Conduct a cross-departmental technology audit to identify types of technologies needed to support AVs. Develop AV operational performance metrics that can help prioritize investments in congested travel patterns
Mobility and Connectivity	 Create alternative payment and communication systems for areas with poor high-speed internet availability or usage or lower income communities Reroute transit to serve as mobility hubs into AV niche areas Consider transition plans for mixed use to predominantly AV use in niche markets Connect lower income neighborhoods to job centers utilizing AV network and ensure benefits are equitably distributed across all segments of the population Initiate a curb inventory database to determine optimum pick up/drop off locations for AVs based on area travel flows Ensure benefits are equitably distributed across all segments of the population
Economic Competitiveness	 Promote the safety, mobility, environmentally friendly, and service to all aspects of AV niche areas Promote AVs for first mile/last mile to broaden transit availability Analyze workforce development issues associated with potential retraining needs for driver-based professions and workforce development needs associated with AV use and maintenance Update existing planning documents to include AV mobility plans Develop AV Working Group to focus on improving access to employment centers and transportation deficient areas Address digital divides for transit-dependent
Community Livability	 Focus on land development designs that still prioritize the pedestrian and bicyclists and their interaction with AVs Develop a regional data use, access, security, and privacy plan that can foster improved AV lane safety and operations Create a Complete Streets plan that incorporates AV only lanes into distinct travel patterns Craft a public awareness campaign informing community of AV benefits Identify a local champion as a resource for trends, opportunities, and information Develop a transition plan that uses emerging technology to address equity issues
Environmental Stewardship	 Produce a regional EV charging plan that considers the needs of AVs as the market matures Investigate the viability of wireless charging along AV networks



Table 5.8 · FHWA Scenario - Competing Fleets		
Goal	Action	
Safety and Security	 Create a short, medium, and long-term strategy for integrating AV impacts across internal job functions for faster policy development and strategic positioning for investments and integration Develop redundant communication plan with ample capacity for reliable AV operations Identify barriers that allow for flexible, experimental design or zoning that would encourage AV only operations Develop AV safety performance metrics that prioritize AV lane investments on historic high crash locations, especially between human-driven vehicles and pedestrians/bicyclists 	
Maintenance and Operations	 Incorporate AV needs into ITS Master Plan Enhance signage, signals and pavement markings for improved machine vision Conduct a cross-departmental technology audit to identify types of technologies needed to support AVs Develop AV operational performance metrics that can help prioritize investments in congested travel patterns 	
Mobility and Connectivity	 Create alternative payment and communication systems for areas with poor high-speed internet availability or usage or lower income communities Reroute transit to serve as mobility hubs into AV niche areas Consider transition plans for mixed use to predominantly AV use in niche markets Develop a dynamic curb inventory to determine optimum time-based pick up/drop off locations for AVs that balances business, residential, commuter, and freight needs Ensure benefits are equitably distributed across all segments of the population 	
Economic Competitiveness	 Promote the safety, mobility, environmentally friendly, and service to all aspects of AV niche areas Analyze workforce development issues associated with potential retraining needs for driver-based professions and workforce development needs associated with AV use and maintenance Update documents for AV mobility plan Develop AV Working Group to focus on improving access to employment centers, major destinations and transportation deficient areas Craft a public awareness campaign informing community of AV benefits Identify a local champion as a resource for trends, opportunities, and information 	
Community Livability	 Focus on land development designs that still prioritize the pedestrian and bicyclists and their interaction with AVs Set up a regional data use, access, security, and privacy plan that can foster improved AV lane safety and operations Develop a transition plan that uses emerging technology to address equity issues Create a Complete Streets plan that incorporates AV only lanes 	
Environmental Stewardship	 Produce a regional EV charging plan that includes reuse of available space in parking garages and considers the needs of AVs as the market matures Produce a regional EV charging plan Investigate the viability of wireless charging along AV networks Develop a tiered revenue plan to help reduce congestion along certain corridors or during certain durations 	



Table 5.9 · FHWA Scenario - Robo-Transit			
Goal	Action		
Safety and Security	 Create a short, medium, and long-term strategy for integrating AV impacts across internal job functions for faster policy development and strategic positioning for investments and integration Develop redundant communication plan with ample capacity for reliable AV operations Identify barriers that allow for flexible, experimental design or zoning that would encourage AV only operations Develop AV safety performance metrics that prioritize AV lane investments on historic high crash locations, especially between human-driven vehicles and pedestrians/bicyclists Develop AV operational performance metrics that prioritize investments in congested corridors or congested travel patterns. 		
Maintenance and Operations	 Incorporate AV needs into ITS Master Plan Consider re-use of existing infrastructure such as parking garages for parking or urban warehousing Enhance signage, signals and pavement markings for improved machine vision Develop a dynamic curb inventory to determine optimum time-based pick up/drop off locations for AVs that balances business, residential, commuter, and freight needs 		
Mobility and Connectivity	 Create alternative payment and communication systems for areas with poor high-speed internet availability or usage or lower income communities Develop modified typical sections to potentially include narrower lanes Ensure benefits are equitably distributed across all segments of the population 		
Economic Competitiveness	 Build signal priority system for AVs Analyze workforce development issues associated with retraining needs for driver-based professions and workforce development needs associated with AV use and maintenance Establish an AV Working Group to focus on improving access to employment centers, major destinations and transportation deficient or transit dependent areas Update existing documents to include an AV mobility plan Craft a public awareness campaign informing community of AV benefits Identify a local champion as a resource for trends, opportunities, and information 		
Community Livability	 Focus on land development designs that still prioritize the pedestrian and bicyclists and their interaction with AVs Set up a regional data use, access, security, and privacy plan that can foster improved AV lane safety and operations Develop a transition plan that uses emerging technology to address equity issues Create a Complete Streets plan that incorporates AV only lanes 		
Environmental Stewardship	 Produce a regional EV charging plan that includes reuse of available space in parking garages Investigate the viability of wireless charging along AV networks Develop a tiered revenue plan to help reduce congestion along certain corridors or during certain durations 		



6. CONNECTED VEHICLE PLANNING

Next, CV planning, especially when considering effective vehicle to infrastructure or vehicle to anything, requires careful consideration and planning. According to the United States Department of Transportation (USDOT), "for the past decade, USDOT has been researching and testing a system of vehicles that can sense the environment around them and communicate with other vehicles and with infrastructure. This vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication will enable safety, mobility, and environmental advancements that current technologies are unable to provide. The technology is expected to reduce unimpaired vehicle crashes by 80 percent, while also reducing the nearly 7 billion extra hours that Americans spend traveling due to traffic."⁸

6.1. CV Planning Issues

Connected Vehicle (CV) or CAV is the term used by the infrastructure owners and operators (IOO) for infrastructure connectivity with the internet of things (IoT), including AVs. The IOOs' biggest focus is to stay current with changing technologies such as the predominance of dedicated short-range communication (DSRC) and/or cellular vehicle-to-everything (C-V2X) for infrastructure readiness. Infrastructure readiness includes the deployment of technologies to communicate traffic information messages such as signal phase and timing, vehicle priority messages, and incident/congestion messages, etc. to CAVs.

Florida, California, Michigan, Pennsylvania, and Colorado have all developed plans for CAV technology advancement in their states. In January 2019, the FDOT adopted the Connected and Automated Vehicles (CAV) Business Plan⁹ to establish its approach to technology in transportation and demonstrate the FDOT's commitment to using CAV technologies to achieve safety, mobility, and economic goals. The CAV Business Plan contains seven priority focus areas designed to mainstream the program, that in many instances can also be applied to MPOs and other jurisdictions for long term planning implications.

- 1. Policies and Governance develop and communicate an institutionalized framework for planning, designing, and deploying
- 2. Program Funding prioritize and allocate funding
- 3. Education and Outreach create a unified message and awareness as well as provide opportunities for preparing current and future workforce
- 4. Industry Outreach and Partnerships foster economic development and leveraging relations with industries, universities, and others
- 5. Technical Standards and Specifications Development create a framework for consistent infrastructure preparedness, including general facility design, software updates, and hardware upgrades
- 6. Implementation Readiness create a statewide CAV-ready environment for deployment of infrastructure and meeting any identified needs
- 7. Deployment and Implementation move from planning to full-scale CAV deployment and implementation using various applications to achieve safety, mobility, and economic goals in Florida.

6.2. Summary

These seven focus areas of the business plan can then be woven into the common components of planning documents to create a definable course of action to achieve a future CV vision. These potential policies, programs, or projects are reflected in **Tables 6.1** through **6.6**.



While many CV applications are still in the proving stage, the basic infrastructure planning required for either small scale or broad implementation of one or more CV applications is essentially the same from a public policy perspective. The key will be identifying the issue that CV applications could help address, determining whether to approach it from a DSRC or 5G (or both) perspective, refining the foundation through ITS architecture, and then maximizing the effectiveness of the applications through public systems such as TMC operations.

Table 6.1 · FHWA Scenario - Slow Roll		
Goal	Action	
Safety and Security	 Identify high-crash corridors where CV-enabled messages can help reduce potential crashes. Prioritize CV infrastructure with maintenance activities. Introduce measures to deploy a security management system to enhance the security of the initial deployment projects. Pilot V2I applications for vehicle safety to include packages from the ARC-IT tool from USDOT. Test the effectiveness of vehicle safety and security on each deployment project. 	
Maintenance and Operations	 Develop measures and mechanisms for device maintenance and operations in the infrastructure agency's business process Develop CAV applications performance measures for operations and maintenance Identify funding and train resources to deploy, maintain, and operate CAV components Include CAV into maintenance and device replacement budgets Develop investment strategies based on priority areas Develop asset management process to auto track life cycle and replacement strategies 	
Mobility and Connectivity	 Consider CAV in all future capacity improvement projects as part of the ITS and fiber communications infrastructure Develop plans for upgrading existing infrastructure and leveraging existing infrastructure Develop infrastructure readiness standards and specifications to include signing, pavement markings, and other infrastructure enhancements. 	
Economic Competitiveness	 Establish a CV Working Group to focus on improving access to employment centers for transportation deficient or transit-dependent areas Work with community schools to develop a training curriculum and develop workforce Develop plans for engaging private industry to work with IOO Share data between public and private industries for work collaborations and research support Develop policies around insurances and liability sharing 	
Community Livability	 Develop a walkable and well-connected community to support pedestrian and bicyclist movements Identify vehicle to bike/pedestrian high crash locations that could be reduced through CV technology Develop plans for parking, pick up, drop off, and an intermodal connectivity center to promote last mile connectivity using CAV applications 	
Environmental Stewardship	 Develop a plan for environmentally friendly CAV infrastructure supporting operational decision- making using CAV data for project such as freight signal priority systems Develop dynamic pick up/drop off locations to minimize congestion 	



Table 6.2 · FHWA Scenario - Managed Autonomous Lane (MAL) Network			
Goal	Action		
Safety and Security	 Prepare a plan for CAV infrastructure deployment for the management with safety packages supporting dedicated MAL network lanes Develop safe transactional data infrastructure plan to support data and operational security Develop mapped zones for the MAL network for auto incident management notifications 		
Maintenance and Operations	 Develop asset management inventory for MAL network with CAV infrastructure capability Develop lanes with enhanced signage, signals, lane separators, gate operations, and pavement markings for improved machine vision Develop performance measures for a corridor to prioritize investments in priority/congested corridors Define performance measures for MAL network for operational and maintenance requirements 		
Mobility and Connectivity	 Develop a mobility plan for the region using MAL network for multimodal transportation and delivery Develop regional connectivity corridors serving various populations across various context classifications Improve broadband connectivity and internet availability for the priority corridors and regions Implement infrastructure level mobility targets to serve the regions and cities 		
Economic Competitiveness	 Implement user fees based on occupancy and miles traveled by enhancing MAL connectivity to the road users Consider developing a transit network lanes and vehicle platoon network to support mass passenger movements. Consider incorporating CAV and other vehicle categories in the regional congestion management plans. Establish regional training centers for workforce development in CAV technology implementation, operations, and maintenance. Identify strategies for private industry engagement to design, operate, maintain, and finance the MAL network 		
Community Livability	 Develop a community outreach plan/campaign for CAV deployment and campaign informing the community of CAV benefits Identify a local champion as a resource for trends, opportunities, and information Identify strategies for CAV in MAL network as a package specific to the region such as low-income regions, student housing, commercial zones, etc. Develop a transition plan that uses emerging technology to address equity issues Create a Complete Streets plan that addresses safety and operations around pick up/drop off locations 		
Environmental Stewardship	 Track MAL network emissions compared to the other networks Consider a tiered revenue plan to help reduce congestion along certain corridors or during certain durations 		



Table 6.3 · FHWA Scenario - Ultimate Driver Assist (UDA)			
Goal	Action		
Safety and Security	 Introduce CV pilot projects where vehicles can communicate with each other and Roadside Units (RSUs), and alert/assist drivers in imminent crash situations, such as merging traffic, cars in drivers' blind side, sudden braking of the leading vehicle. Warn drivers of existing and impending queues Recommend target speeds in response to congestion, incidents, and road conditions to maximize throughput and reduce crashes Develop a traffic incident management plans for UDA by working with law enforcement agencies and other first responders Develop plans for managing and mitigating cybercrimes utilizing UDA 		
Maintenance and Operations	 Incorporate CAV infrastructure supporting UDA in the ITS Master Plan and agencies operations and maintenance plans Develop performance measures for the UDA vehicles operating in the CAV enabled network Identify separate funding for maintenance and operations for the UDA related infrastructure growth, similar to managed lanes 		
Mobility and Connectivity	 Create alternative payment and communication systems for areas with poor high-speed internet availability or usage or lower-income communities Equip signalized intersections to be enabled with technologies for blind and disabled pedestrians' mobile device crossing activation Develop a plan to support various demographics for mobility and connectivity 		
Economic Competitiveness	 Establish a CAV Working Group to focus on improving access to employment centers for transportation deficient or transit-dependent areas Train the workforce to manage and repair CVs for improved operations 		
Community Livability	 Develop a transition plan that uses emerging technology to address equity issues and minimize greater digital divides Create a Complete Streets Plan that addresses safety and operations around pick up/drop off locations 		
Environmental Stewardship	 "Eco-lanes" similar to today's HOV lanes for high occupancy, low emission vehicles that are CV- enabled Connected Eco-Driving, Eco-Cooperative Adaptive Cruise Control 		



Table 6.4 · FHWA Scenario - Niche Service Growth		
Goal	Action	
Safety and Security	 Identify CAV routes in areas of high congestion and multimodal utilization like Central Business Districts (CBDs) Identify transit routes where CAV applications can warn transit bus operators when pedestrians are in the intended path of the bus Identify safety applications focused around all forms of multimodal transportation, especially freight and transit Develop CAV safety performance metrics to belp prioritize corridors and enhance security. 	
Maintenance and Operations	 Incorporate into the ITS Master Plan and CAV strategy deployments Create asset management and tracking applications to auto notify life cycle and replacement Identify CV applications in transit/freight corridors where applications of Transit/Freight Signal Priority (T/FSP) can be utilized, coordination can be established among public/private transportation providers and travelers to improve the probability of successful transit/freight transfers Develop maintenance tracking mechanism ties to performance measures Develop CV operational performance metrics to help prioritize investments in congested corridors or along the congested travel patterns 	
Mobility and Connectivity	 Develop a unified payment system for CAV and other modes of transportation Dynamic rerouting of transit to serve as mobility hubs into CAV niche areas Develop strategies around adding communication options such as dedicated short-range communications, cellular V2X, and others. Consider transition plans for mixed-use to predominantly CAV use in niche markets Connect lower-income neighborhoods to job centers utilizing CAV network and ensure benefits are equitably distributed across all segments of the population 	
Economic Competitiveness	 Promote CAVs for first mile/last mile to broaden transit availability Analyze workforce development issues associated with potential retraining needs for driver-based professions and workforce development needs associated with CAV use and maintenance Update existing planning documents to include CAV mobility plans Develop CAV Working Group to focus on improving access to employment centers and transportation deficient areas Develop a private industry partnership opportunity for areas such as data sharing, vehicle operations, infrastructure development, etc. 	
Community Livability	 Focus on land designs that still prioritize the pedestrian and bicyclists and their interaction with CAVs Develop a regional data use, access, security, and privacy plan that can foster improved CAV safety and operations Create a context-sensitive plan to foster niche service growth that incorporates CAV only lanes into distinct travel patterns Develop a public awareness campaign informing community of CAV benefits Develop a transition plan that uses emerging technology to address equity issues 	
Environmental Stewardship	 Investigate a need for the development of a committee or board championing environmental issues Develop standards and specifications that support environmental benefits agenda Develop strategies for citywide and regionwide air quality goals around vehicle emissions Identify targets based on penetration level for ACES Develop infrastructure supporting following measures - smart parking, smart wayfinding to EV charging, dynamic curb management, etc. Develop strategies supporting auto notification of the air quality to the cities and regions 	



Table	Table 6.5 • FHWA Scenario - Competing Fleets		
Goal	Action		
Safety and Security	 Create a short, medium, and long-term strategy for integrating CAV impacts across internal job functions for faster policy development and strategic positioning for investments and integration Develop a strategy for CAV safety and security that complement other ACES fleets to work in conjunction Identify strategies for CAV network data security Develop plans for traffic incident management for both freeways, managed lanes, and non-freeway network Develop CAV safety and security performance measures that complement other AES Fleets 		
Maintenance and Operations	 Incorporate CAV infrastructure upgrades into the ITS and CAV deployment plan to ensure maintenance and operations of the system Develop strategies for CAV pavement markings, signs, and other infrastructure components Conduct a fleet penetration analysis for CAV to strategize on identifying funds for O&M for future years Develop CAV performance measures to prioritize funding for CAV infrastructure O&M 		
Mobility and Connectivity	 Plan for CAV infrastructure upgrades to support mobility and prioritize connectivity Reroute transit to serve as mobility hubs into AV niche areas Consider transition plans for mixed-use to predominantly CAV use Develop CAV infrastructure support such as signal priorities and smart signals with infrastructure upgrades Ensure benefits are equitably distributed across various context classifications 		
Economic Competitiveness	 Promote the safety, mobility, environmentally friendly, and service to all aspects of CAV niche areas Analyze workforce development issues associated with potential upgrades to the infrastructure and working with vehicle onboard units Update documents for CAV deployment plan and include private sectors Develop CAV focus group by region to support various CAV applications per their regional needs Conduct a stakeholder engagement plan and developing workforces Identify a local champion as a resource for trends, opportunities, and information 		
Community Livability	 Focus on land designs that still prioritize the pedestrian and bicyclists and their interaction with CAV and infrastructure Develop strategies such as machine learning and artificial intelligence to make infrastructure safer and livable Develop a transition plan that uses emerging technology to address equity issues Create a context-sensitive CAV deployment for the region 		
Environmental Stewardship	 Produce a regional CAV working group focused on environmental issues of the region Investigate the viability of a carbon zero infrastructure upgrade that also supports competing fleets Develop a tiered revenue plan to help reduce congestion along certain corridors or during certain durations and peak hours that also supports other competing fleets Provide financial incentives for systems to communicate versus compete against one another for improved operations and to help transition to a robo-transit future 		



Table 6.6 • FHWA Scenario - Robo-Transit		
Goal	Action	
Safety and Security	 Create a short, medium, and long-term strategy for robo-taxi penetration by region with CAV infrastructure Develop security systems to prevent hacking of the robo-taxi and implement identity trust system Implement infrastructure maps to be used for robo-taxi for the safe operations and communications with the roadway infrastructures Develop an incident management plan with robo-taxi and auto-notification to the first responders Develop the CAV rules of the road digitally for the robo-taxi and human-machine interactions Develop operational and safety metrics for CAV infrastructure deployment for robo-taxi 	
Maintenance and Operations	 Incorporate into the CAV deployment plan and statewide and regional ITS architectures Consider re-use of existing infrastructure such as parking garages or lots for the robo-taxi temporary staging and charging Develop dedicated lanes for robo-taxies that outnumbers the human driver lanes Collect infrastructure-related information from the robo-taxi using CAV infrastructure Use robo-taxi data for operational decision making for signals and freeway ramps Eliminate several infrastructure components such as dynamic message signs, signals, narrow lanes, no guardrails, etc. 	
Mobility and Connectivity	 Develop regional hubs for pick-ups and drop-offs of the passengers Equip the roadway infrastructures with high-end communication infrastructure and help support robo-taxi operations Identify zones and regions for rob-taxi operations with connectivity to health care centers, employment centers, educational institutes, etc. 	
Economic Competitiveness	 Develop private agency partnerships for rob-taxi operations and maintenance Train the workforce to operate and manage infrastructure and robo-taxies Establish a CAV Working Group to focus on improving access to employment centers, major destinations, and transportation deficient or transit-dependent areas Update existing documents to include in CAV mobility plan and congestion management plans for the region Develop a public awareness campaign informing the community of AV benefits Identify a local champion as a resource for trends, opportunities, and information 	
Community Livability	 Focus on land designs based on context classification and regional needs to operate robo-taxies Develop a plan for regional data use, access, security, and privacy plan that can foster improved CAV lane safety and operations Develop a transition plan that uses emerging technology to address equity issues Create a regional model with performance measure tracking specific to the region 	
Environmental Stewardship	 Produce a regional robo-taxi operations plan to move people and goods Investigate robo-taxi emissions or carbon footprint to ensure participation Develop a tiered revenue plan to help reduce congestion along certain corridors or during certain durations 	



7. ELECTRIC VEHICLE PLANNING

The third component of ACES, electric vehicles, also requires careful planning and foresight. Recent analysis has indicated that the shift to EV use is driven by improvement factors such as:

- Driving Experience Many electric vehicles provide better performance and acceleration than » internal combustion engine (ICE) powered vehicles while offering nearly silent operation.
- Economy With battery costs declining as they become more efficient, EVs are expected to » soon reach price parity with ICE vehicles and eliminate the need for oil changes and brake service. Battery electric vehicles provide superior "well-to-wheel" efficiency compared to fossil fuels, even when utilities generate electricity with coal, translating to lower energy costs of operation. In combination with simpler drivetrains, life cycle cost of ownership savings can justify higher initial vehicle purchase costs.
- Environment Higher energy efficiency translates to lower greenhouse gas emissions, as well » as zero emissions at the point of use. The environmental benefits of electrification depend largely on the source of electricity used to charge vehicles. Based on the energy mix in Florida, a mid-sized EV sedan produces less than half the carbon dioxide emissions per mile of a similar ICE-powered vehicle.¹⁰ When powered by renewable sources, transportation can become marginally carbon neutral.

While EVs represented only five percent of new car sales in late 2019, market share is growing rapidly as batteries become cheaper, more models become available, and range anxiety is reduced with expanding charging infrastructure. By 2030, battery-powered electric vehicles (BEVs) and plug-in hybrids (PHEVs) will seize almost a quarter of the market.¹¹ This suggests that approximately one in ten light-duty vehicles on the road in 2030 will be a BEV or a PHEV. Other hybrids are expected to be in the fleet as well, increasing average fuel economy and displacing purely ICE-powered vehicles until they represent a minority of new vehicle sales by 2030. Some governments, including 14 countries and 20 cities, are complementing market forces by announcing bans of ICE sales by 2030 or later.

On-board energy storage is only part of the ecosystem needed to support transportation electrification. Widespread adoption of EVs will place new stresses on power grids that were largely designed to support daytime peak energy use, such as air conditioning of buildings on warm afternoons. Charging equipment is the final link between the source of energy, such as a utility that burns fossil fuels or a solar panel array, and the battery.

To provide convenience and freedom from range anxiety comparable to ICE vehicles, public charging infrastructure will need to expand to nearly the level of ubiquity that gas stations offer today. However, EV chargers need not be concentrated in public retail sites like gas pumps. Likewise, EVs are topped off frequently rather than filled only when empty.

Most charging is done at home. A fully developed EV charging infrastructure will include residential chargers in private homes, shared chargers in multi-family buildings and workplaces, public chargers at shopping centers and other attractions, fleet chargers at municipal facilities and logistics centers, taxi chargers at central garages and shared use mobility hubs, transit chargers at bus garages and along bus routes, truck chargers at local delivery hubs and interstate truck stops, and personal mobility device chargers operated by bikeshare and scooter share companies.

7.1. EV Planning Issues

How regions prepare for EVs involves many different aspects. Much of the shift to electric vehicles will be market-driven when cost parity is reached. There are important roles for MPOs and their stakeholders in facilitating adoption and addressing potentially negative effects, including disruption to traditional motor fuel tax-based transportation funding sources.



Public Charging Infrastructure

Many EV owners charge their vehicles at home using Level1or Level2 charging equipment. In combination with chargers that may be available at workplaces or other destinations, range anxiety can be managed for most urban trips. Although EV motorists may be able to avoid paying for electricity costs away from home and thereby keep per-mile expenses to a minimum, the vehicles' greater efficiency allows for considerable use of for-profit charging networks, such as ChargePoint, before per-mile operating costs approach those of ICE-powered vehicles. To facilitate EV adoption for households in multifamily buildings or that rely on street parking, there is a role for municipalities, electric utilities, and private EV charging network operators to expand availability of shared or public chargers to on-street and off-street parking areas. There is a role for MPOs and other planning agencies to broker the creation of shared charging facilities in areas with concentrations of multi-family housing, such as neighborhood EV carsharing or parking co-ops. Additionally, as a result of the VW Emissions Test Settlement, Electrify America plans to spend its \$2 billion funding allotment by 2026 over several cycles and aims to install chargers 70 miles apart on all major roadways.¹²

Policies that provide or enable the use of funding and technical assistance for municipalities, utilities, and private partners as they implement EV charging in the public right-of-way or in off-street parking facilities can help to accelerate EV adoption.

Monetizing access to public parking facilities for privately provided EV chargers could also generate revenue to offset declining parking revenues as automation and shared mobility advance (see Chapters 5 and 8).

Zoning ordinances, minimum parking requirements, building codes, permitting processes, and other regulations can also create barriers to implementation of EV charging infrastructure. For example, many cities are updating their zoning ordinances to clarify that EV charging spaces count toward minimum parking requirements or even counting them as more than one space to provide an incentive for EV adoption.¹³ Some municipalities are even requiring Level 2 chargers to be installed in a share of all new parking spaces.

Policies that coordinate introduction of on-street charging infrastructure with recovery of street space for other uses as AV adoption reduces parking demand (see Chapter 5) can help to accelerate EV adoption while generating revenue for charging infrastructure or other uses.

Policies that streamline permitting by designating an EV charging infrastructure coordinator, classifying Level 3 charging stations as accessory uses that do not trigger zoning reviews, providing concurrent building code and electrical code reviews, and making the permitting process transparent and electronic can reduce barriers to buildout of public and private EV charging networks.

Power Grid Modernization

As a general rule of thumb, the impact of a Level 2 charger is comparable to adding an average sized home to the local grid. Thus, adding 100 EVs (100 home equivalents) to a city is negligible. However, adding 20 PEVs (20 home equivalents) to a subdivision with 100 residences is a 20 percent increase in load requirements and may require upgrades to the subdivision's localized distribution infrastructure.¹⁴

Many states are allowing utilities to introduce "time of use" EV charging rate structures that provide incentives for charging during off-peak hours and coordination of charging times and current draws between locations to manage spikes in demand.



Policies that incorporate utilities as partners in the definition of needs and implementation of supporting power grid infrastructure can speed buildout of public and private charging networks.

Transit Electrification

The same motivations driving motorists to electrify apply to transit agencies: improved performance, reduced operating costs, and environmental benefits. Recent advances in battery technology have made full-size 40-foot and 60-foot buses practical to operate throughout a driver shift on a single charge, sometimes augmented by en-route or end-of-route top-offs. Key considerations for transit agencies in electrification studies include the degree to which vehicle capabilities allow operation of each bus route without supplemental charging, modifications to schedules needed to accommodate shorter shifts or longer layovers for charging, infrastructure requirements beyond the confines of maintenance garages, and the net life cycle cost savings after appropriate strategies have been developed for each route.

Policies that provide funding for transit electrification can reduce transit operating costs while enhancing transit's image as an environmentally responsible way to travel.

Electrification also applies to the growing ecosystem of shared mobility solutions that support fixedroute bus services. Many of these services work best when they come together at mobility hubs where charging infrastructure for buses, autonomous shuttles, paratransit vans, shared taxis, personal automobiles, shared e-bikes and e-scooters, and even personal electronic devices can support operation of the ecosystem.

Planning activities that identify sites for potential mobility hubs, monitor electrificationinduced opportunities to acquire land (e.g., from consolidation or closure of gas stations) and develop funding programs to support mobility hub development can help to realize opportunities to make the transit ecosystem work better.

Fleet Electrification

As electrification scales to a wider variety of vehicle types and sizes, fleet operators can realize operating cost savings and other benefits of EVs. Different fleets will find acceptable solutions in the marketplace at different times based on vehicle capabilities and specific operating requirements. Some fleets that already have proven business cases include public and private motor pools that use conventional light duty cars and trucks, taxis, shuttle buses, school buses, and urban delivery vehicles.

Policies that establish timelines and incentives to shift taxi, ridesharing, and local delivery fleets to EVs, such as reduced or waived license fees, curb access fees, and congestion charges, can help to accelerate EV adoption.

Viable applications of BEV technology to long-haul trucks are expected to be on the market in the next few years. Particularly when combined with automation and platooning, electric over the road trucking offers the potential of significant cost savings that could drive rapid adoption.

Planning activities that identify locations and provide funding for improvements at interchange points near major highway interchanges and truck stops to support EV truck recharging, driver changes, and transitions from automated long-haul trips to human-driven local deliveries (see Chapter 5) could promote local economic development.



Transportation Funding

By 2030, EV adoption will have material effects on motor fuel tax revenues. Through the 2030s, accelerating EV adoption driven by market forces and government mandates is likely to erode the tax base further. Currently, more than half of states have already enacted EV registration fees ranging from \$50 to more than \$300 per year to make up for some of the lost revenue. Debate exists that lower taxation is needed to drive EV adoption and realize their benefits to society. Others argue that EVs only accelerate the need for alternatives to motor fuel taxes, such as vehicle miles traveled (VMT) fees which may reduce EV-buying incentives. Regardless, VMT fees have other advantages for funding transportation infrastructure and managing congestion that are likely to result in federal and state policies requiring vehicles to support revenue collection before EVs represent the majority of the vehicle fleet. Because AVs are inherently equipped to track their mileage on different roads, automation is likely to accelerate this trend (see Chapter 5).

Policies that build on VMT fees or other alternatives to motor fuel taxes as federal and state mandated revenue collection mechanisms are introduced can help local transportation agencies mitigate declining revenues from EV use over time.

Planning activities to define and implement variable VMT pricing to manage congestion, encourage equitable ridesharing service delivery in low-income neighborhoods, zerovehicle, transportation disadvantaged, and achieve other local policy goals can improve both transportation system performance and equity.

VMT fees also provide opportunities to use pricing to address social goals including congestion management and equity. For example, variable pricing of roads based on traffic volumes or implementation of cordon charges to limit vehicles entering downtown areas become relatively easy to implement when vehicles are capable of tracking their own location, calculating fees, and reporting revenue obligations to authorities. Likewise, providing fee waivers or discounts to reduce the cost of travel or encourage EV taxi service in low-income neighborhoods is feasible in ways not possible with today's motor fuel taxes.

Equity

The cost savings that electrification offers can help to reduce disparities in transportation options between low-income households and others. At the same time, the local environmental benefits of less noise and emissions can improve community health outcomes.

Policies that make EVs available to low-income households, such as through subsidized vehicle purchase or financing incentives, carsharing, shared charging co-ops can advance transportation equity goals.

7.2. Example EV Inclusion in Planning Activities

States and MPOs have synthesized these factors into planning activities and documents in varying ways. Examples from across the nation on how states and regions are adapting to an electric transportation future include:

Federal Clean Cities Community Readiness Studies

The U.S. Department of Energy launched a series of 16 projects led by MPOs and other local agency grantees in 2011 under the Clean Cities Community Readiness and Planning for Plug-In Electric Vehicles and Charging Infrastructure program that produced a body of work that is still largely relevant today. A compilation of key findings and lessons learned provides links to specific studies that contain information relevant to MPOs seeking to expand availability of charging infrastructure, understand power grid modernization requirements, identify locations for public charging stations, develop model ordinances and permitting processes, and conduct stakeholder and public education programs.¹⁵



Most importantly, the studies provided:

- » Detailed recommendations and sample code language to overcome regulatory barriers to installation of charging infrastructure, including at multi-family buildings and large employers,
- » Geographic evaluations of the number of charging stations needed, where stations should be sited, and what level of power stations should provide,
- » The role of electric power utilities in planning for potential impacts of EV adoption on the electrical grid, including impacts on local distribution infrastructure and on the ability of existing generation capacity to meet electricity demand, designing rate structures to manage electricity demand, and serving as a provider of charging stations,
- » Development of communications programs to increase familiarity with EVs and to train municipal personnel, first responders, electricians, automobile dealerships, automotive technicians, parking attendants, fleet managers, and the tourism industry on their roles in supporting EV readiness and adoption in their communities.

Statewide Planning Studies

A number of state DOTs have performed studies to educate the public and other stakeholders on the benefits of EV adoption, promote EV adoption as a competitive economic advantage, develop statewide charging networks for long-distance travel, manage progress toward climate goals, and provide a framework for state funding programs. **Table 7.1** summarizes the content of selected statewide planning studies. Additionally, Florida Statutes 339.287 and 338.236 requires the FDOT to create a master plan for the development of electric vehicle supply equipment along the State Highway System by July 1, 2021.

Table 7.1 · Example Statewide EV Planning Studies					
State	Study	Describe EV Benefits	Define Charging Locations	Explore Utility Impacts	ldentify Funding Programs
СА	California Plug-In Electric Vehicle Infrastructure Projections: 2017- 2025 ¹⁶		Х	Х	
MN	Accelerating Electric Vehicle Adoption ¹⁷	Х	Х		
OH	Electric Vehicle Charger Siting Study ¹⁸	Х	Х	Х	Х

Smart City Initiative

Smart Columbus is the Smart City initiative for the Columbus, Ohio region. The city was awarded the \$40 million USDOT Smart City Challenge in 2016, which also came with a \$10 million private grant from the Paul G. Allen Family Foundation. Smart Columbus has developed a "Playbook" of initiatives to advance smart mobility across the city and region, with a heavy emphasis on accelerating EV adoption.¹⁹ Actions include:

- » Fleet Electric Vehicle Adoption Helping public and private sector organizations make the switch to EVs to save money and cut their carbon footprint.
- » Ride & Drive Roadshow Putting consumers behind the wheel of EVs to demonstrate the benefits of electrification.
- » Electrified Dealer Program Partnering with automobile manufacturers and dealers to increase the availability of EV models in the region.
- » Electric Vehicle Charging Infrastructure Growing the region's network of electric vehicle charging stations.



» Grid Modernization & Decarbonization - Partnering with power providers to reduce greenhouse gas emissions and modernize the electric grid.

These actions are intended to be easily incorporated by other areas when developing their own EV plans.

7.3. Summary

Electrification of surface transportation is expected to advance a wide range of goals in MPO long-range transportation plans. With adoption now past the early phases and becoming widespread, there is less uncertainty about the timeframe when impacts can be expected and when supporting infrastructure can be justified. MPOs are now able to advance a group of actions that are appropriate under a range of adoption scenarios.

In some cases, MPOs serve as conveners and thought leaders to assemble stakeholders as they take their respective roles in electrification. In other cases, MPOs serve as technical resources in studies of power grid modernization needs, regional charging network implementation, and other issues that can also bring public money to the table as appropriate. MPOs are also well positioned to be active stakeholders in the transition from transportation funding based on motor fuel taxes to VMT fees or other alternatives.

For those MPOs using scenario planning techniques as described earlier, **Table 7.2** offers information that could be included within common LRTP goals. The actions identified can be included in any of the FHWA scenarios. As many EV functions rely strongly on other emerging technology functions, such as AV, many proposed actions reflect this dependence on the different technologies. In some cases, such as more rapid adoption of shared AV fleets in Niche Service Growth, Competing Fleets, or Robo-Transit scenarios, the main difference will be more emphasis on siting maintenance bases and evaluating the power grid impacts of concentrated charging locations for large fleets of electric vehicles.

Table 7.2 · All FHWA Scenarios			
Goal	Action		
Safety and Security	 Facilitate training of first responders in the proper treatment of EVs involved in crashes, floods, and other emergencies. 		
tions	• Facilitate studies of regional electric power generation and transmission grid capacity, regional EV charging needs, role of renewable energy and emerging energy storage technologies in addressing gaps, and public charging infrastructure needs.		
d Operat	• Broker partnerships between transportation agencies, electric utilities, fleet operators, and other stakeholders to leverage transportation and other funding programs to address EV charging infrastructure gaps.		
ance an	• Develop funding programs to convert municipal motor pool, maintenance vehicles, school buses, and other fleets to EVs, including financing approaches based on life cycle cost savings, in partnership with utilities and clean energy agencies.		
ainten	• Facilitate studies and funding partnerships to convert transit systems to electric buses and vans, potentially in combination with automation (see Chapter 5) and bus rapid transit features.		
Ŵ	• Build on VMT fees or other alternatives to motor fuel taxes as federal and state mandated revenue collection mechanisms are introduced to preserve revenue streams for maintenance and operations.		



Mobility and Connectivity	 Designate a regional EV charging coordinator to manage public education programs, coordinate with municipalities and fleet operators on charging infrastructure buildout and fleet conversions, and manage funding programs. Develop model zoning ordinances, permitting processes, parking requirements, and other regulations to help municipalities remove barriers to charging infrastructure installation. Convene member local governments to establish timelines and incentives to shift taxi, ridesharing, and local delivery fleets to EVs, such as reduced or waived license fees, curb access fees, and congestion charges. Consider center city bans of ICE-powered vehicles in combination with provision of adequate charging infrastructure and transit options. Define and implement variable VMT pricing to manage congestion, encourage equitable ridesharing service delivery in low-income neighborhoods, and achieve other local policy goals can improve both transportation system performance and equity.
Economic Competitiveness	 Provide technical assistance in the conversion of private fleets and provision of associated EV charging facilities, including support for securing federal grants or other public funding as appropriate, to private fleet operators, including major employers, trucking companies, logistics firms, utilities, and other partners. Develop low-income EV purchase and carsharing programs to expand the benefits of lower cost electric mobility to households that have difficulty financing a new vehicle. Coordinate with VMT fee waivers or other pricing policies for essential workers or low-income communities to address equity issues as appropriate.
Community Livability	 Provide funding and technical assistance to municipalities, utilities, and private partners as they implement EV charging in the public right-of-way or in off-street parking facilities. Conduct or support studies to coordinate introduction of on-street charging infrastructure with recovery of street space for other uses as AV adoption reduces parking demand. Work with municipalities to establish timelines and incentives for conversion of taxi, rideshare, and local delivery fleets to EVs.
Environmental Stewardship	• All of the above activities promote favorable environmental outcomes by advancing the shift to EVs



8. SHARED-USE VEHICLE PLANNING

A shared-use vehicle is a vehicle, bicycle, or other travel mode as an innovative transportation strategy that enables users to have short-term access to a mode of transportation on an as-needed basis. SUVs will likely have a broad impact on everything from travel characteristics, land use, and everything in between. The shift to shared-use vehicles (SUV) is driven by improvement factors such as:

- » The potential to dramatically change the transportation landscape and influence how the public moves throughout our cities and regions.
- » Shift vehicle ownership models and better utilize vehicle fleets.
- » Maximize use of public right-of-way (ROW) and reduce space requirements for parked vehicles.

SUV adoption addresses many of the standard MPO LRTP goal categories identified in the *Guidance* for Assessing Planning Impacts and Opportunities of Automated, Connected, Electric and Shared-Use Vehicles (September 2018) as described in **Table 8.1.**

Table 8.1 • Standard MPO Long-Range Transportation Goal Categories		
Goal	Action	
Safety and Security	Ideally, all shared vehicle fleets will become autonomous and connected thus providing safer alternatives to traditional vehicles. By evaluating origin-destination patterns for shared-use vehicles such as bikes or scooters, planning agencies may determine that revised typical sections may be appropriate to allow for, or encourage, more shared-use utilization derived from typicals that provide physical separation from other traffic. Similarly, dedicating on-street curb parking for shared-use vehicles can provide additional safe operating and storage areas.	
Maintenance and Operations	Shared-use vehicles have the potential to reduce individual operating costs by spreading the cost of ownership as well as operations and maintenance of various modes across a pool of users. Shared use models are rapidly being implemented through micromobility in scooter and bicycle sharing. As this shift continues into other vehicular modes, point to point travel is expected to improve in efficiency and reliability without the need to park. Designating bike or scooter corrals and enforcing regular corral device parking maintenance will help provide improved maintenance and operations both for the shared use vehicle systems and the roadway network.	
Mobility and Connectivity	Shared-use services aim to expand and enhance mobility and connectivity for all users. Shared-used services may particularly be used to expand mobility for users with limited transportation options today. For example, on-demand transit has the ability to enhance "first and last mile" barriers to fixed route transit, paratransit systems can be improved to be more tailored to individual's trip needs while maximizing vehicle efficiency, and transit paradigms may shift as shared AVs become a cheaper alternative to long or mid-sized low productivity fixed-route options. Planning agencies should evaluate where shared-use vehicles can help provide affordable mobility options for transportation underserved areas in an effort to improve neighborhood connectivity.	
Economic Competitiveness	Shared-use models will help AVs, CVs, and EVs become more accessible to a wider range of users who otherwise may not have access to existing transportation or advanced vehicle technologies. These ownership models can also help reduce overall costs thus making them more competitive against private ownership models. Reduction in congestion and improved travel time reliability will support economic growth potential of areas by allowing efficient and reliable mobility, as well as, potentially increasing available land for development through reduced parking needs and requirements.	



Environmental Community Stewardship Livability Shared use of vehicles will minimize the overbuilding of private vehicle infrastructure needs. Developing an effective shared-use vehicle plan will focus to be put on the mobility of people (rather than vehicles) at the center of transportation planning and decision-making. Improved physical, digital, and financial access to shared transportation will make mobility more accessible by all users and improve overall community livability.

As efficiencies are improved through shared-use models and EV technology, regions can achieve a reduction in pollutants. SUVs are also expected to reduce physical infrastructure needs, further reducing environmental impact

8.1. SUV Planning Issues

The shift to shared-use models will be driven by cost efficiencies for both consumers and fleet operators. There are important roles for MPOs and their stakeholders to play in facilitating adoption of shareduse models and addressing potentially negative effects, including transit market creep, limited shift to shared rides from single-occupant trips, and "empty" trips or vehicle-miles traveled with no passengers.

Incentive Zoning

Finding and leasing parking spaces in urban areas can be difficult and time consuming for carsharing operators. For developers, each parking space can cost upwards of tens of thousands of dollars to construct.

Providing designated, on-street parking spaces is one example of how city planners can support shared mobility. Cities can also ease zoning regulations and parking minimums to promote the inclusion of shared mobility in new developments.

Commonly referred to as incentive zoning for shared mobility, these policies can be categorized as (1) policies that enable reduced parking and (2) policies that allow increased density. Policies that allow reduced parking include parking reductions (downgrading the required number of spaces in a new development) and parking substitution (substituting general-use parking for shared modes, such as carsharing parking and bikesharing kiosks).²⁰

Travel Demand Management

In addition to amending local zoning and building codes, variances, and special use permits, shared mobility can be incorporated as part of transportation demand management (TDM) planning. Many TDM measures offer similar incentives to developers and property owners for the inclusion of shared mobility and other TDM measures in residential, commercial, and mixed-use projects.

Developers can be granted bonuses for the inclusion of other on-site amenities, such as bicycle parking, bicycle lockers, showers, and preferential or free parking for carpools and vanpools.

Insurance

Municipalities looking to employ shared mobility in their communities should pay close attention to insurance policies affecting these services. Insurance regulations can make shared modes cost prohibitive or they can prohibit operations in a jurisdiction altogether. Although these policies may not fall directly under the purview of local jurisdictions, local governments should understand the critical role these policies have on shared mobility, especially if urban planners want to encourage shared mobility and the environmental, social, and transportation benefits often associated with several shared modes.²¹



Public Right-of-Way

Allocation of public right-of-way is one of the primary methods that regional and municipal entities can influence shared used mobility and growth. Various local governments and public agencies across the U.S. have deployed a combination of formal and informal policies to allocate ROW to shared use modes.

Policies can address how shared-use modes and services are defined; allocation of curb space, lanes, and parking; management of operators and service providers; valuation of ROW, and administration issues including permitting, maintenance, enforcement, and signage.

SUV Taxation

Uncertainty around the prevalence of shared-use modes, primary users, and trip definition has led to a wide variety of ways shared-use modes to be taxed at a state and local level. Shared-use modes often encounter local and state sales taxes on transportation and mobility, rental car taxes, transaction fees and per-use excise taxes, and miscellaneous taxes applied to shared mobility.

MPOs can help inventory and translate policies across the region, as well as help to support policy and legislation that more clearly defines SUVs, particularly related to taxation policy.

Equity and Access

SUVs have the potential to expand mobility options for a wide range of the population that is currently limited by the cost of transportation or access to transportation. Shared-use mobility can be especially valuable to low-income and moderate-income communities that spend a large portion of household income on transportation costs. The majority of transportation costs in traditional transportation models comes from the cost of private vehicle ownership. SUVs across a variety of modes can help reduce transportation costs and expand mobility for users. However, current pilots and SUV models across the country are mostly utilized by younger, well-educated, and upper-income consumers.²² Many communities are beginning to incentivize or require operators to deploy in certain markets and ensure that services are accessible to special populations (low-income, unbanked, English-as-a-second language, etc.). Four common equity challenges associated with shared mobility include:

- » **Un- and Under- Banked Households:** Services may require debit or credit cards for fare payment or may require a credit hold to use a service (Shaheen & Cohen, 2018).
- » **Digital Divide:** Shared mobility services may require a smartphone or high-speed data packages to access services. Low-income and rural households may not be able to afford a smartphone or data access or lack data coverage to access services.
- Accessibility: Not all shared mobility services may be accessible for people with disabilities. This could include wheelchair accessible vehicles or accessible shared micromobility devices, accommodations for service animals, incorporating universal design into all modes and appbased services, and preventing shared mobility services from blocking ADA curbs and ramps.
- » Low-Income Affordability: Shared mobility can be expensive in comparison to walking, cycling, and public transportation. SUVs should be affordable to low-income households and neighborhoods.²³

Data Collection, Analysis, and Dissemination

Access to data and information on SUVs and services allows public agencies to better understand and plan for SUVs. Data can generally be classified into two types: real-time data (continuous access to a live feed of data) and historical data (data reported in periodic intervals and stored for future review).²⁴Access to private data is, therefore, a major interest of MPOs planning the ways in which people travel and how travel characteristics may be changing.²⁵



Data collection can be difficult due to differences in service models, collection methods, private contracts, and security concerns. Agencies are addressing data sharing through a variety of different models including:

- » Data Sharing as a Requirement for Permits
- » Open Source Data Sharing
- » Third Party Data Sharing

8.2. Example SUV Inclusion in Planning Activities

How MPOs have synthesized these planning factors into policies can vary. In addition to the recent Florida MPO examples provided in Section 4, there are other good examples from across the nation on how regions are adapting to and fostering shared-use models.

SANDAG Regional Plan 2021

The San Diego Association of Governments (SANDAG) structured their 2021 regional plan around "5 Big Moves" (**Figure 2**). This initiative includes an emphasis on SUVs identified in the plan as "Flexible Fleets." The 5 Big Moves embody transformative transportation strategies that reimagined the future of transportation in San Diego. The 5 Big Moves include:

Figure 2: SANDAG's 5 Big Moves



- » Complete Corridors: Smart, connected routes that accommodate all modes of transportation
- » Transit Leap: A complete network of high-capacity, high-speed, and high-frequency transit services
- » Mobility Hubs: places of connectivity where a variety of travel options come together for a seamless travel experience
- » Flexible Fleets: On-demand, shared, electric vehicles that connect to transit and provide personalized transportation
- » Next Operating System (OS): The "brain" of the transportation network that manages systems in real time.

Portland, Oregon

Portland, Oregon has included shared mobility into long-range planning by beginning with data collection which guides forecasting. In Portland, shared mobility modes were added to travel surveys as the MPO and Portland Metro (Metro) began the next cycle of model updates. This will allow the regional model to analyze how shared mobility users might respond to changes in pricing, expansion in service areas, new transit services, or new bicycle and pedestrian facilities. Metro is planning to pair the household survey data with other data sources they are exploring as TNC providers and bikesharing is already in widespread use in the region. Metro is exploring use of data gathered by the Portland Bureau of Transportation (PBOT) and the Port of Portland for TNC regulatory purposes, as well as data from the transit provider, Tri-County Metropolitan Transportation District of Oregon (TriMet), the City of Portland, and other agencies that have agreements with ridesourcing companies. They hope to use this data to assess what modes TNC trips might be substituting.

In addition to updating the type of data collected, Portland Metro has begun to consider changing the frequency at which they collect data, possibly substituting the 5-10 year travel survey with something more that combines data from multiple annual surveys with smaller sample sizes to keep results up to date.


8.3. Summary

SUV's emerging growth coupled with innovative and undefined service models have increased the need for public policy guidance. Many different partners are needed when developing new shared use policies. **Figure 3** shows the factors (within the blue circles) and diversity of groups (within the red circles) needed to represent the diverse interests of stakeholders.

Figure 3: Shared Use Vehicle Partners



A key planning implication of SUV models revolves around the rate at which shared-use vehicles or fleets are adopted by the larger market in the future. As described in the Guidebook (Table 14, FDOT MPO ACES Guidebook), several of the scenarios project a relatively small deployment of SUV trips (around 20% in urban areas and 5-10% in rural areas). On the higher end of the FHWA scenario spectrum, assuming "maximum plausible change" (Competing Fleets and Robo Transit) shareduse models are deployed on a much wider scale and represent the majority of trips in the region (85%). Based on these FHWA scenario definitions, SUV policies are organized into two main groups of policies, as seen in **Figure 4**.





Tables 8.2 and **8.3** provide sample shared use policies that are aligned with the two levels of shared use vehicle trips within FHWA's six scenarios. These tables are intended to be a menu of policy options that align with LRTP vision and goals. **Table 8.3** includes all of the policies in **Table 8.2** unless otherwise stated.



Table 8.2 · Menu of Shared-Use Mobility Policies Aligned with Level 1 FHWA Scenarios

- » Slow Roll
- » Enhanced Driver Experience (Managed Automated Lane Network & Ultimate Traveler Assist)
- » Driver Becomes Mobility Consumers (Niche Service Growth)

Data Collection, Analysis, and Dissemination Policies - MPOs can lead thoughtful discussions surrounding shared-use models and serve as a knowledge center for pilots and programs throughout the state.

- > Develop an inventory of programs and pilots. Objectively review programs and disseminate lessons learned and successful service models.
- > Negotiate access to shared mobility usage data to understand origin-destination patterns and equity issues.
- > Use model and off-model approaches to estimating shared mobility impacts.

Information Technology Policies

> Work with private industry (carshare/ rideshare/ micromobility) for shared access to ridership data.

Safety Policies

- > Change speed limits (highway, arterials) to better accommodate SUV or consider different limits on SUV-only lanes
- > Update training criteria to improve awareness about the advantages, limitations, and operation of shared vehicles.

Public ROW Policies - MPOs can guide the conversation around public right-of-way (ROW) allocation and management. Appropriate space allocation and policies for shared-use mobility can help facilitate and grow demand and access to shared-use modes. Policy considerations include:

- > Transparent process for allocating space, particularly when multiple operators are seeking ROW from public agencies.
- Strategic limits or thresholds should be identified for space allocation for shared-use modes. This may include general guidelines or regulations that designate minimum space allocations for multiple modes of travel (public transit, freight movement, pedestrians, bicycles, general purpose traffic, and shared transportation options) or it may include regulation of curb space, pickup/drop off zones, or high-demand transportation areas/corridors.

Operational Partnerships

- > Partnerships to enhance SUV services similar to today's carpooling programs.
- > Partnerships for public agency promotion of SUV similar to today's carpooling programs.



Safety and Security

Equ poli	ity & Access Policies - Shared-use models can expand mobility and equity, but cies and programs should also be designed to address regional goals and objectives.
>	Develop payment options that are available for un- and under-banked households.
>	Support households who may not have access to data plans through public infrastructure with free Wi-Fi.
>	Ensure that providers are complying with ADA accessibility guidelines for people with disabilities. For example, ensure wheelchair accessible vehicles or accessible shared micromobility devices, accommodations for service animals, incorporating universal design into all modes and app-based services, and preventing shared mobility services from blocking ADA curbs and ramps.
>	Set performance targets and work with providers to gather data and track equity targets. Examples include demographics of shared mobility users, spatial distribution of locations served, demographics of areas served, and cost per trip or cost per mile.
Mot >	bility & Alternative Modes Policies Promote the development of uses and facilities that enable and encourage mobility by
	alternative modes to the automobile; including businesses that sell, service, rent, and share bicycles or scooters or offer rideshare, flex vehicle leasing and rental services.
Ded 〉	licated Lanes Policies Highway and arterial lanes as appropriate for the exclusive use of shared use vehicles
Tax >	ing Policies Tax policies on SUVs to reduce TNC demand, mitigate congestion, and increase revenue for a variety of purposes. This is an opportunity to regulate the supply of TNC's to better meet community demand.
>	Region or Mega-region consistency for SUVs to register with a regulatory agency (e.g. public utilities commissions, departments of insurance, parking authorities) to legally operate.
Roa 〉	Id and Curb Management Policies Priority curb space for car sharing, alternative fuel vehicles, urban delivery fleets (e-trikes/bikes), etc.
>	Dynamic or static pricing of curbside parking/drop off/pick up, including urban deliveries
>	Deploy active curbside management
Mul	ti-Purnose Fleets Policies

> Examine innovative opportunities to combine goods movements and passenger services



Economic Competitiveness

Mobility and Connectivity

	 Parking Policies Regional parking policy for "On-street pricing (all vehicles, or by type, "Off-street parking pricing (public and private; lots, park n ride, shopping centers; all vehicles, or by type)
ity	 Allocation, caps, fees and permits and enforcement.
_ivabil	 Reduce the minimum automobile parking requirements for buildings with bike parking or program and infrastructure for SUVs.
unity l	 Regional Travel Demand Management (TDM) Policies Fee on shared-vehicle trips based on occupancy if done by the transit agency.
חשנ	> Subsidies for private transportation services- microtransit, vanpool, SUVs, etc.
Con	 Subsidy on micromobility to and from transit
	> Subsidies for all riders or specific groups (students, youth, elderly, low-income, etc.).
	Equity and Accessibility Policies > Pick up/Drop off by curb ramps with appropriate way finding for improved accessibility for those with disabilities
ital ip	 Connect shared mobility to land use planning
onmen /ardsh	 Develop programs and facilities, such as bike or scooter share, that encourage short trips to be made by walking or biking.
Envire Stew	> Encourage car share, bike share, or scooter share programs within planned development areas through partnership with car sharing or bike sharing entities.



Table 8.3 · Menu of Shared-Use Mobility Policies Aligned with Level 2 FHWA Scenarios							
» Driver Becomes Mobility Consumers (Competing Fleets + Robo Transit)							
Safety and Security	No additional considerations						
Maintenance and Operations	No additional considerations						
Mobility and Connectivity	 Equity & Access Policies - Shared-use models can expand mobility and equity, but policies and programs should be designed to address regional goals and objectives. Facilitate equity programs and partnerships between lower levels of government and private vendors. MPOs can also facilitate knowledge transfer by integrating shared mobility vendors into the regional planning process as technical advisory committee members. Finally, MPOs can deploy pilot projects to identify how shared mobility can help regions achieve equity goals. Subsidies for shared mobility (e.g., first- and last-mile subsidies for paratransit and connections to public transit). Any certified connected system gets signal priority. 						
Economic Competitiveness	> Tax or other price incentives for higher use or service with disadvantaged community.						
Community Livability	> Integrated payment between modes.						
Environmental Stewardship	 > Tax incentives for fleet mix being EV. > Decrease in single-occupant drivers. > Increase in transit mode share. > Increase in zero-vehicle households. 						



ENDNOTES

- 1 Florida Department of Transportation, Office of Policy Planning. "Guidance for Assessing Planning Impacts and Opportunities of Automated, Connected, Electric and Shared-Use Vehicles" September 2018. Accessed at https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/planning/policy/metrosupport/resources/fdot_ mpoguidebook_20181005.pdf?sfvrsn=7d194ed6_2
- 2 2045 Florida Transportation Plan Vision Element, May 2020, Florida Department of Transportation Office of Policy Planning
- 3 FDOT MPO Program Management Handbook, Florida Department of Transportation. Accessed at www.fdot.gov/planning/ policy/documents.shtm
- 4 Florida Statutes 339/175(7)(c)(2)
- 5 American Planning Association, "Preparing Communities for Autonomous Vehicles", February 2018. Accessed at https:// www.planning.org/publications/document/9144551/
- 6 Seattle Department of Transportation. New Mobility Playbook. Version 1.0. September 2017. Preliminary Automated Mobility Policy Framework, Appendix C. Accessed at https://www.seattle.gov/Documents/Departments/SDOT/ NewMobilityProgram/AppendixC.pdf
- 7 NYSAMPO TSMO Working Group, "Establishing a Regional Planning Framework for Connected and Automated Vehicles", October 2017. Accessed at https://www.ampo.org/wp-content/uploads/2018/04/Establishing-a-Regional-Planning-Framework-for-CAV-NYSAMPO.pdf
- 8 U.S. DOT, Intelligent Transportation Systems Joint Program Office, ITS Research Fact Sheets, "Planning for the Future of Transportation: Connected Vehicles and ITS" Accessed at https://www.its.dot.gov/factsheets/pdf/ PlanningFutureTransportation_FactSheet.pdf
- 9 Connected and Automated Vehicles (CAV) Business Plan https://fdotwww.blob.core.windows.net/sitefinity/docs/defaultsource/traffic/doc_library/pdf/fdot-cav-business-plan-2019.pdf?sfvrsn=45b478ff_0
- 10 U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. Beyond Tailpipe Emissions Calculator. Accessed at https://www.fueleconomy.gov/feg/Find.do?action=bt2. Example comparisons of mid-sized EV and ICE sedans, default assumptions, and Florida location.
- 11 Boston Consulting Group. "Who Will Drive Electric Cars to the Tipping Point?", January 2, 2020
- 12 Northeast States for Coordinated Air Use Management (NESCAUM). Preparing Our Communities for Electric Vehicles: Facilitating Deployment of DC Fast Chargers, June 2019. Accessed at https://vtccc.w3.uvm.edu/wp-content/ uploads/2019/10/Jesse-WayDCFC-Permit-Streamlining-Slides-Bi-State-Connector-2019-JW.pdf
- 13 Northeast States for Coordinated Air Use Management (NESCAUM). Preparing Our Communities for Electric Vehicles: Facilitating Deployment of DC Fast Chargers, June 2019. Accessed at https://vtccc.w3.uvm.edu/wp-content/ uploads/2019/10/Jesse-WayDCFC-Permit-Streamlining-Slides-Bi-State-Connector-2019-JW.pdf
- 14 North Carolina Advanced Energy Corporation. Community Planning Guide for Plug-In Electric Vehicles, November 2014. Accessed at https://pluginnc.com/wp-content/uploads/2016/06/17-CommunityHandbook_V4_final.pdf
- 15 U.S. Department of Energy. A Guide to the Lessons Learned from the Clean Cities Community Electric Vehicle Readiness Projects, January 2014. Accessed at https://afdc.energy.gov/files/u/publication/guide_ev_projects.pdf
- 16 California Energy Commission. California Plug-In Electric Vehicle Infrastructure Projections: 2017-2025: Future Infrastructure Needs for Reaching the State's Zero Emission-Vehicle Deployment Goals, March 2018. Accessed at https://www.nrel.gov/docs/fy18osti/70893.pdf
- 17 Minnesota Department of Transportation, Minnesota Pollution Control Agency, and Great Plains Institute. Accelerating Electric Vehicle Adoption: A Vision for Minnesota, 2019. Accessed at http://www.dot.state.mn.us/sustainability/docs/mnev-vision.pdf
- 18 Ohio Department of Transportation. Ohio Electric Vehicle Charger Siting Study, May 2020. Forthcoming.
- 19 City of Columbus. Smart Columbus Operating System. Accessed at https://smart.columbus.gov/
- 20 Planning for Shared Mobility, PAS Report 583, Adam Cohen and Susan Shaheen, March 2018, p. 44. Accessed at https://escholarship.org/content/qtOdk3h89p/qtOdk3h89p.pdf
- 21 Planning for Shared Mobility, PAS Report 583, Adam Cohen and Susan Shaheen, March 2018, p.46. Accessed at https://escholarship.org/content/qtOdk3h89p/qtOdk3h89p.pdf
- 22 Shared Use Mobility Center. "Shared-Use Mobility Reference Guide." October 2016. Accessed at https:// sharedusemobilitycenter.org/wp-content/uploads/2016/10/Reference-Guide-Editsweb-version-10.24.2016.pdf
- 23 Shaheen, S. "Mobility On Demand and Transportation Equity." March 2018. Accessed at: https://medium.com/moveforward-blog/mobility-on-demand-and-transportation-equity-768fd91d3597
- 24 Shaheen, S, A Cohen, M Randolph, E Farrar, R Davis, and A Nichols. "Shared Mobility Policy Playbook." December 2019. Accessed at https://escholarship.org/uc/item/9678b4xs
- 25 U.S. DOT Office of Planning, Environment, and Realty, FHWA. "Integrating Shared Mobility into Multimodal Transportation Planning: Improving Regional Performance to Meet Public Goals." February 2018. Accessed at https://www.planning.dot.gov/documents/SharedMobility_Whitepaper_02-2018.pdf







APPENDIX E: : Gainesville Metropolitan Transportation Planning Organization Long-Range Transportation Plan System Performance

Year 2045 Long-Range Transportation Plan Update

Appendix E: Gainesville Metropolitan Transportation Planning Organization Long-Range Transportation Plan System Performance

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1 - PURPOSE

This document provides the system performance element for the Gainesville Metropolitan Transportation Planning Organization's Long-Range Transportation Plan (LRTP) to meet the federal transportation performance management rules. Updates or amendments to the LRTP must incorporate a System Performance Report that addresses these measures and related information no later than:

- May 27, 2018 for Highway Safety measures (PM1);
- October 1, 2018 for Transit Asset Management measures;
- May 20, 2019 for Pavement and Bridge Condition measures (PM2);
- May 20, 2019 for System Performance measures (PM3); and
- July 20, 2021 for Transit Safety measures.

2 - BACKGROUND

Pursuant to the Moving Ahead for Progress in the 21st Century Act (MAP-21) Act enacted in 2012 and the Fixing America's Surface Transportation Act (FAST Act) enacted in 2015, state departments of transportation (DOT) and metropolitan planning organizations (MPO) must apply a transportation performance management approach in carrying out their federally required transportation planning and programming activities. The process 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.

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 (The Planning Rule).¹ This rule details how state DOTs and MPOs must implement new MAP-21 and FAST Act transportation planning requirements, including the transportation performance management provisions.

In accordance with the Planning Rule, the Gainesville Metropolitan Transportation Planning Organization must include a description of the performance measures and targets that apply to the MPO planning area and a System Performance Report as an element of its Long-Range Transportation Plan (LRTP). The System Performance Report evaluates the condition and performance of the transportation system with respect to required performance targets, and reports on progress achieved in meeting the targets in comparison with baseline data and previous reports. For MPOs that elect to develop multiple scenarios, the System Performance Report also must include an analysis of how the preferred scenario has improved the performance of the transportation system and how changes in local policies and investments have impacted the costs necessary to achieve the identified targets.²

There are several milestones related to the required content of the System Performance Report:

- In any LRTP adopted on or after May 27, 2018, the System Performance Report must reflect Highway Safety (PM1) measures;
- In any LRTP adopted on or after October 1, 2018, the System Performance Report must reflect Transit Asset Management measures;
- In any LRTP adopted on or after May 20, 2019, the System Performance Report must reflect Pavement and Bridge Condition (PM2) and System Performance (PM3) measures; and
- In any LRTP adopted on or after July 20, 2021, the System Performance Report must reflect Transit Safety measures.

The Gainesville Metropolitan Transportation Planning Organization 2020-2045 Long-Range Transportation Plan was adopted on August 24, 2020. Per the Planning Rule, the System Performance Report for the Gainesville Metropolitan Transportation Planning Organization is included for the required Highway Safety

² Guidance from FHWA/FTA for completing the preferred scenario analysis is expected in the future. As of June 2020, no guidance has been issued.



¹ The Final Rule modified the Code of Federal Regulations at 23 CFR Part 450 and 49 CFR Part 613.

(PM1), Bridge and Pavement (PM2), System Performance (PM3), Transit Asset Management, and Transit Safety targets.

3 - HIGHWAY SAFETY MEASURES (PM1)

Effective April 14, 2016, the FHWA established five highway safety performance measures³ to carry out the Highway Safety Improvement Program (HSIP). These performance measures are:

- 1. Number of fatalities;
- 2. Rate of fatalities per 100 million vehicle miles traveled (VMT);
- 3. Number of serious injuries;
- 4. Rate of serious injuries per 100 million VMT; and
- 5. Number of non-motorized fatalities and non-motorized serious injuries.

The Florida Department of Transportation (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 annual report, FDOT established statewide at "0" for each performance measure to reflect Florida's vision of zero deaths.

The Gainesville Metropolitan Transportation Planning Organization adopted/approved safety performance targets on August 24, 2020. Table 3.1 indicates the areas in which the MPO is expressly supporting the statewide target developed by FDOT, as well as those areas in which the MPO has adopted a target specific to the MPO planning area.

Table 3.1.	Highway	Safety	(PM1)) Targets
1 4010 0111	11.5.1.4.9	carecy	(1 4 5000

Performance Target	Gainesville Metropolitan Transportation Planning Organization agrees to plan and program projects so that they contribute toward the accomplishment of the FDOT safety target of zero
Number of fatalities	✓
Rate of fatalities per 100 million VMT	✓
Number of serious injuries	✓
Rate of serious injuries per 100 million VMT	✓
Number of non-motorized fatalities and non-motorized serious injuries.	✓

³ 23 CFR Part 490, Subpart B



Statewide system conditions for each safety performance measure are included in Table 3.2, along with system conditions in the Gainesville Metropolitan Transportation Planning Organization metropolitan 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.

	Florida St (Fiv	atewide Baselin ze-Year Rolling	e Performance Average)	Calendar Year 2020 Florida Performance
Performance Measures	2012-2016	2013-2017	2014-2018	Targets
Number of Fatalities	2,688.2	2,825.4	2,972.0	0
Rate of Fatalities per 100 Million VMT	1.33	1.36	1.39	0
Number of Serious Injuries	20,844.2	20,929.2	20,738.4	0
Rate of Serious Injuries per 100 Million VMT	10.36	10.13	9.77	0
Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries	3,294.4	3,304.2	3,339.6	0

Table 3.2.	Highway	Safety ((PM1)	Conditions an	nd Performance
		carety (Contantionio a	

Coordination with Statewide Safety Plans and Processes

The Gainesville Metropolitan Transportation Planning Organization 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 Gainesville Metropolitan Transportation Planning Organization 2045 LRTP 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).

- The 2016 Florida Strategic Highway Safety Plan (SHSP) is the statewide plan focusing on how to accomplish the vision of eliminating fatalities and reducing serious injuries on all public roads. The SHSP was developed in coordination with Florida's 27 metropolitan planning organizations (MPOs) through Florida's Metropolitan Planning Organization Advisory Council (MPOAC). The SHSP guides FDOT, MPOs, and other safety partners in addressing safety and defines a framework for implementation activities to be carried out throughout the state.
- The FDOT HSIP process provides for a continuous and systematic process that identifies and reviews traffic safety issues around the state to identify locations with potential for improvement. The goal of the HSIP process is to reduce the number of crashes, injuries, and fatalities by eliminating certain predominant types of crashes through the implementation of engineering solutions.

• Transportation projects are identified and prioritized with the MPOs and non-metropolitan local governments. Data are analyzed for each potential project, using traffic safety data and traffic demand modeling, among other data. The FDOT Project Development and Environment Manual requires the consideration of safety when preparing a proposed project's purpose and need, and defines several factors related to safety, including crash modification factor and safety performance factor, as part of the analysis of alternatives. MPOs and local governments consider safety data analysis when determining project priorities.

LRTP Safety Priorities

The Gainesville Metropolitan Transportation Planning Organization 2045 LRTP 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 LRTP identifies safety needs within the metropolitan planning area and provides funding for targeted safety improvements. The Gainesville MTPO has developed a project selection process that [insert MPO placeholder description of selection/prioritization process. The process may include an assessment that gives preference to projects with increased safety performance and/or will result in the prioritization of projects that are likely to reduce fatalities and serious injuries.]

The Gainesville Metropolitan Transportation Planning Organization 2045 LRTP will provide information from the FDOT HSIP annual reports to track the progress made toward the statewide safety performance targets. The MPO will document the progress on any safety performance targets established by the MPO for its planning area.



4 - PAVEMENT AND BRIDGE CONDITION MEASURES (PM2)

Pavement and Bridge Condition Performance Measures and Targets Overview

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:

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

The four pavement condition measures represent the percentage of lane-miles on the Interstate and non-Interstate NHS that are in good condition or poor condition. The PM2 rule defines NHS pavement types as asphalt, jointed concrete, or continuous concrete. Five metrics are used to assess pavement condition:

- International Roughness Index (IRI) an indicator of roughness; applicable to asphalt, jointed concrete, and continuous concrete pavements;
- Cracking percent percentage of the pavement surface exhibiting cracking; applicable to asphalt, jointed concrete, and continuous concrete pavements;
- Rutting extent of surface depressions; applicable to asphalt pavements only;
- Faulting vertical misalignment of pavement joints; applicable to jointed concrete pavements only; and
- Present Serviceability Rating (PSR) a quality rating applicable only to NHS roads with posted speed limits of less than 40 miles per hour (e.g., toll plazas, border crossings). States may choose to collect and report PSR for applicable segments as an alternative to the other four metrics.

For each pavement metric, a threshold is used to establish good, fair, or poor condition. Using these metrics and thresholds, pavement condition is assessed for each 0.1 mile section of the through travel lanes of mainline highways on the Interstate or the non-Interstate NHS. Asphalt pavement is assessed using the IRI, cracking, and rutting metrics, while jointed concrete is assessed using IRI, cracking, and faulting. For these two pavement types, a pavement section is rated good if the rating for all three metrics are good, and poor if the ratings for two or more metrics are poor.

Continuous concrete pavement is assessed using the IRI and cracking metrics. For this pavement type, a pavement section is rated good if both metrics are rated good, and poor if both metrics are rated poor.

If a state collects and reports PSR for any applicable segments, those segments are rated according to the PSR scale. For all three pavement types, sections that are not good or poor are rated fair.

The good/poor measures are expressed as a percentage and are determined by summing the total lane-miles of good or poor highway segments and dividing by the total lane-miles of all highway segments on the applicable system. Pavement in good condition suggests that no major investment is needed and should be considered for preservation treatment. Pavement in poor condition suggests major reconstruction investment is needed due to either ride quality or a structural deficiency.

The bridge condition measures refer to the percentage of bridges by deck area on the NHS that are in good condition or poor condition. The measures assess the condition of four bridge components: deck, superstructure, substructure, and culverts. Each component has a metric rating threshold to establish good, fair, or poor condition. Each bridge on the NHS is evaluated using these ratings. If the lowest rating of the four metrics is greater than or equal to seven, the structure is classified as good. If the lowest rating is less than or equal to four, the structure is classified as poor. If the lowest rating is five or six, it is classified as fair.

The bridge measures are expressed as the percent of NHS bridges in good or poor condition. The percent is determined by summing the total deck area of good or poor NHS bridges and dividing by the total deck area of the bridges carrying the NHS. Deck area is computed using structure length and either deck width or approach roadway width.

A bridge in good condition suggests that no major investment is needed. A bridge in poor condition is safe to drive on; however, it is nearing a point where substantial reconstruction or replacement is needed.

Federal rules require state DOTs and MPOs to coordinate when setting pavement and bridge condition performance targets and monitor progress towards achieving the targets. States must establish:

- Four-year statewide targets for the percent of Interstate pavements in good and poor condition;
- Two-year and four-year targets for the percent of non-Interstate NHS pavements in good and poor condition; and
- Two-year and four-year targets for the percent of NHS bridges (by deck area) in good and poor condition.

MPOs must establish four-year targets for all six measures. MPOs can either agree to program projects that will support the statewide targets or establish their own quantifiable targets for the MPO's planning area.

The two-year and four-year targets represent pavement and bridge condition at the end of calendar years 2019 and 2021, respectively.

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, this first Gainesville Metropolitan Transportation Planning Organization 2045 LRTP 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.



Table 4.1 presents baseline performance for each PM2 measure for the State and for the MPO planning area as well as the two-year and four-year targets established by FDOT for the State.

Performance Measures	Statewide (2017 Baseline)	Statewide 2019 Actual	Statewide 2-year Target (2019)	Statewide 4-year Target (2021)	Gainesville MTPO (2017 Baseline)	Gainesville MTPO 2019 Actual	Gainesville MTPO 4- year Target (2021)
Percent of Interstate pavements in good condition	66.0%		n/a	≥60%			
Percent of Interstate pavements in poor condition	0.1%		n/a	<5%			
Percent of non-Interstate NHS pavements in good condition	76.4%		≥40%	≥40%			
Percent of non-Interstate NHS pavements in poor condition	3.6%		<5%	<5%			
Percent of NHS bridges (by deck area) in good condition	67.7%		≥50%	≥50%			
Percent of NHS bridges (by deck area) in poor condition	1.2%		<10%	<10%			

Table 4.1. Pavement and Bridge Condition (PM2) Performance and Targets

FDOT established the statewide PM2 targets on May 18, 2018. In determining its approach to establishing performance targets for the federal pavement and bridge condition performance measures, FDOT considered many factors. 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.

In consideration of these differences, as well as the unfamiliarity associated with the new required processes, FDOT took a conservative approach when setting its initial pavement and bridge condition targets.

The Gainesville Metropolitan Transportation Planning Organization agreed to support FDOT's pavement and bridge condition performance targets on August 24, 2020. By adopting FDOT's targets, the Gainesville Metropolitan Transportation Planning Organization agrees to plan and program projects that help FDOT achieve these targets.

On August 24, 2020, the Gainesville Metropolitan Transportation Planning Organization established the fouryear pavement and bridge condition targets shown in Table 4.1 for the MPO's planning area. In setting the MPO's targets for the pavement and bridge condition performance measures, the Gainesville Metropolitan Transportation Planning Organization considered many factors.

The Gainesville Metropolitan Transportation Planning Organization 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 Gainesville Metropolitan Transportation Planning Organization's 2045 LRTP 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.

- The FTP is the single overarching statewide plan guiding Florida's transportation future. It defines the state's long-range transportation vision, goals, and objectives and establishes the policy framework for the expenditure of state and federal funds flowing through FDOT's work program. One of the seven goals defined in the FTP is Agile, Resilient, and Quality Infrastructure.
- The Florida Transportation Asset Management Plan (TAMP) explains the processes and policies affecting pavement and bridge condition and performance in the state. It presents a strategic and systematic process of operating, maintaining, and improving these assets effectively throughout their life cycle.

The Gainesville Metropolitan Transportation Planning Organization 2045 LRTP seeks to address system preservation, identifies infrastructure needs within the metropolitan planning area, and provides funding for targeted improvements. Key goals are addressed in Technical Reports 6 and 7 of this LRTP.

On or before October 1, 2020, FDOT will provide FHWA and the Gainesville Metropolitan Transportation Planning Organization a detailed report of pavement and bridge condition performance covering the period



of January 1, 2018 to December 31, 2019. FDOT and the Gainesville Metropolitan Transportation Planning Organization also will have the opportunity at that time to revisit the four-year PM2 targets.

5 - SYSTEM PERFORMANCE, FREIGHT, AND CONGESTION MITIGATION & AIR QUALITY IMPROVEMENT PROGRAM MEASURES (PM3)

System Performance/Freight/CMAQ Performance Measures and Targets Overview

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:

National Highway Performance Program (NHPP)

- 1. Percent of person-miles on the Interstate system that are reliable, also referred to as Level of Travel Time Reliability (LOTTR);
- 2. Percent of person-miles on the non-Interstate NHS that are reliable (LOTTR);

National Highway Freight Program (NHFP)

3. Truck Travel Time Reliability index (TTTR);

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

- 4. Annual hours of peak hour excessive delay per capita (PHED);
- 5. Percent of non-single occupant vehicle travel (Non-SOV); and
- 6. Cumulative 2-year and 4-year reduction of on-road mobile source emissions (NOx, VOC, CO, PM10, and PM2.5) for CMAQ funded projects.

In Florida, only the two LOTTR performance measures and the TTTR performance measure apply. Because all areas in Florida meet current NAAQS, the last three measures listed measures above pertaining to the CMAQ Program do not currently apply in Florida.

LOTTR is defined as the ratio of longer travel times (80th percentile) to a normal travel time (50th percentile) over all applicable roads during four time periods (AM peak, Mid-day, PM peak, and weekends) that cover the hours of 6 a.m. to 8 p.m. each day. The LOTTR ratio is calculated for each roadway segment, essentially comparing the segment with itself. Segments with LOTTR \geq 1.50 during any of the above time periods are considered unreliable. The two LOTTR measures are expressed as the percent of person-miles traveled on the Interstate or non-Interstate NHS system that are reliable. Person-miles consider the number of people traveling in buses, cars, and trucks over these roadway segments. To obtain person miles traveled, the vehicle miles traveled (VMT) for each segment are multiplied by the average vehicle occupancy for each type of vehicle on the roadway. To calculate the percent of person miles traveled that are reliable, the sum of the number of reliable person miles traveled is divide by the sum of total person miles traveled.

TTTR is defined as the ratio of longer truck travel times (95th percentile) to a normal travel time (50th percentile) over the Interstate during five time periods (AM peak, Mid-day, PM peak, weekend, and overnight)



that cover all hours of the day. TTTR is quantified by taking a weighted average of the maximum TTTR from the five time periods for each Interstate segment. The maximum TTTR is weighted by segment length, then the sum of the weighted values is divided by the total Interstate length to calculate the Travel Time Reliability Index.

The data used to calculate these PM3 measures are provided by FHWA via the National Performance Management Research Data Set (NPMRDS). This dataset contains travel times, segment lengths, and Annual Average Daily Travel (AADT) for Interstate and non-Interstate NHS roads.

The PM3 rule requires state DOTs and MPOs to coordinate when establishing performance targets for these measures and to monitor progress towards achieving the targets. FDOT must establish:

- Two-year and four-year statewide targets for percent of person-miles on the Interstate system that are reliable;
- Four-year targets for the percent of person-miles on the non-Interstate NHS that are reliable⁴; and
- Two-year and four-year targets for truck travel time reliability

MPOs must establish four-year performance targets for all three measures within 180 days of FDOT establishing statewide targets. MPOs establish targets by either agreeing to program projects that will support the statewide targets or setting quantifiable targets for the MPO's planning area.

The two-year and four-year targets represent system performance at the end of calendar years 2019 and 2021, respectively.

PM3 Baseline Performance and Established Targets

The System Performance Report discusses the condition and performance of the transportation system for each applicable PM3 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, this LRTP 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.

Table 5.1 presents baseline performance for each PM3 measure for the state and for the MPO planning area as well as the two-year and four-year targets established by FDOT for the state.

⁴ Beginning with the second performance period covering January 1, 2022 to December 31, 2025, two-year targets will be required in addition to four-year targets for the percent of person-miles on the non-Interstate NHS that are reliable measure.

Performance Measures	Statewide (2017 Baseline)	Statewide 2019 Actual	Statewide 2-year Target (2019)	Statewide 4-year Target (2021)	Gainesville MTPO (2017 Baseline)	Gainesville MTPO 2019 Actual	Gainesville MTPO 4- year Target (2021)
Percent of person-miles on the Interstate system that are reliable	82.2%		≥75.0%	≥70.0%			
Percent of person-miles on the non- Interstate NHS that are reliable	84.0%		n/a	≥50.0%			
Truck travel time reliability index (TTTR)	1.43		≤1.75	≤2.00			

Table 5.1. System Performance and Freight (PM3) - Performance and Targets

FDOT established the statewide PM3 targets on May 18, 2018. In setting the statewide targets, FDOT reviewed external and internal factors that may affect reliability, conducted a trend analysis for the performance measures, and developed a sensitivity analysis indicating the level of risk for road segments to become unreliable within the time period for setting targets. One key conclusion from this effort is that there is a lack of availability of extended historical data with which to analyze past trends and a degree of uncertainty about future reliability performance. Accordingly, FDOT took a conservative approach when setting its initial PM3 targets.

The Gainesville Metropolitan Transportation Planning Organization agreed to support FDOT's PM3 targets on August 24, 2020. By adopting FDOT's targets, the Gainesville Metropolitan Transportation Planning Organization agrees to plan and program projects that help FDOT achieve these targets.

On August 24, 2020, the Gainesville Metropolitan Transportation Organization established the four-year targets shown in Table 5.1 for the MPO's planning area. In setting the MPO's PM3 target, Gainesville Metropolitan Transportation Organization considered many factors.

The Gainesville Metropolitan Transportation Planning Organization 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 Gainesville Metropolitan Transportation Planning Organization 2045 LRTP 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 Freight Mobility and Trade Plan.

• The FTP is the single overarching statewide plan guiding Florida's transportation future. It defines the state's long-range transportation vision, goals, and objectives and establishes the policy framework for the expenditure of state and federal funds flowing through FDOT's work program. One of the seven goals of the FTP is Efficient and Reliable Mobility for People and Freight.



• The Florida Freight Mobility and Trade Plan presents a comprehensive overview of the conditions of the freight system in the state, identifies key challenges and goals, provides project needs, and identifies funding sources. Truck reliability is specifically called forth in this plan, both as a need as well as a goal.

The Gainesville Metropolitan Transportation Planning Organization 2045 LRTP seeks to address system reliability and congestion mitigation through various means, including capacity expansion and operational improvements, as detailed in Technical Reports 6 and 7 of the LRTP.

On or before October 1, 2020, FDOT will provide FHWA and the Gainesville Metropolitan Transportation Planning Organization a detailed report of performance for the PM3 measures covering the period of January 1, 2018 to December 31, 2019. FDOT and the Gainesville Metropolitan Transportation Planning Organization also will have the opportunity at that time to revisit the four-year PM3 targets.

6 - TRANSIT ASSET MANAGEMENT MEASURES

Transit Asset Performance

On July 26, 2016, FTA published the final Transit Asset Management rule. This rule applies to all recipients and subrecipients 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 6.1 below identifies performance measures outlined in the final rule for transit asset management.

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

Table 6.1. FTA TAM	Performance Measures
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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.

When establishing transit asset management targets, the MPO can either agree to program projects that will support the transit provider targets or establish its own separate regional transit asset management targets for the MPO planning area. In cases where two or more providers operate in an MPO planning area and establish different targets for a given measure, the MPO has the option of coordinating with the providers to establish a single target for the MPO planning area, or establishing a set of targets for the MPO planning area that reflects the differing transit provider targets.

To the maximum extent practicable, transit providers, states, and MPOs must coordinate with each other in the selection of performance targets.

The TAM rule defines two tiers of public transportation providers based on size parameters. Tier I providers are those that operate rail service or more than 100 vehicles in all fixed route modes, or more than 100 vehicles in one non-fixed route mode. Tier II providers are those that are a subrecipient of FTA 5311 funds, or an American Indian Tribe, or have 100 or less vehicles across all fixed route modes, or have 100 vehicles or less in one non-fixed route mode. A Tier I provider must establish its own transit asset management targets, as well as report performance and other data to FTA. A Tier II provider has the option to establish its own targets or to participate in a group plan with other Tier II providers whereby targets are established by a plan sponsor, typically a state DOT, for the entire group.

A total of 20 transit providers participated in the FDOT Group TAM Plan and continue to coordinate with FDOT on establishing and reporting group targets to FTA through the National Transit Database (NTD) (Table 6.2). The participants in the FDOT Group TAM Plan are comprised of the Section 5311 Rural Program and open-door Section 5310 Enhanced Mobility of Seniors & Individuals with Disabilities FDOT subrecipients. The Group TAM Plan was adopted in October 2018 and covers fiscal years 2018-2019 through 2021-2022. Updated targets were submitted to NTD in 2019.



Table 6.2. Florida Group TAM Plan Participants

District	Participating Transit Providers	
1	Good Wheels, Inc Central Florida Regional Planning Council	DeSoto County Transportation
2	Suwannee Valley Transit Big Bend Transit Baker County Transit Nassau County Transit	Ride Solutions Levy County Transit Suwannee River Economic Council
3	Tri-County Community Council Big Bend Transit Gulf County ARC	Calhoun Transit Liberty County Transit JTRANS Wakulla Transit
4	No participating providers	
5	Sumter Transit Marion Transit	
6	Key West Transit	
7	No participating providers	

The MPO has the following Tier I and Tier II providers operating in the region:

None.

7 - TRANSIT SAFETY PERFORMANCE

The Federal Transit Administration (FTA) published a final Public Transportation Agency Safety Plan (PTSAP) 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 PTSAPs is anticipated to help ensure that public transportation 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:

- 1. Total number of reportable fatalities.
- 2. Rate of reportable fatalities per total vehicle revenue miles by mode.
- 3. Total number of reportable injuries.
- 4. Rate of reportable injuries per total vehicle revenue miles by mode.
- 5. Total number of reportable safety events.
- 6. Rate of reportable events per total vehicle revenue miles by mode.
- 7. 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.

Once the public transportation provider establishes targets, it must make the targets available to MPOs to aid in the planning process. MPOs have 180 days after receipt of the PTASP targets to establish transit safety targets for the MPO planning area. In addition, the Gainesville Metropolitan Transportation Organization must reflect those targets in any LRTP and TIP updated on or after July 20, 2021.

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.



Transit Provider Coordination with States and MPOs

Key considerations for MPOs and transit agencies:

- Transit operators are required to review, update, and certify their PTASP annually.
- A transit agency must make its safety performance targets available to states and MPOs to aid in the planning process, along with its safety plans.
- To the maximum extent practicable, a transit agency must coordinate with states and MPOs in the selection of state and MPO safety performance targets.
- MPOs are required to establish initial transit safety targets within 180 days of the date that public transportation providers establish initial targets. MPOs are not required to establish transit safety targets annually each time the transit provider establishes targets. Instead, subsequent MPO targets must be established when the MPO updates the TIP or LRTP. When establishing transit safety targets, the MPO can either agree to program projects that will support the transit provider targets or establish its own regional transit targets for the MPO planning area. In cases where two or more providers operate in an MPO planning area and establish different targets for a given measure, the MPO has the option of coordinating with the providers to establish a single target for the MPO planning area, or establishing a set of targets for the MPO planning area that reflects the differing transit provider targets.
- MPOs and states must reference those targets in their long-range transportation plans. States and MPOs must each describe the anticipated effect of their respective transportation improvement programs toward achieving their targets.

Over the course of 2020-2021, the Gainesville Metropolitan Transportation Organization will coordinate with public transportation providers in the planning area on the development and establishment of transit safety targets. LRTP amendments or updates after July 20, 2021 will include the required details about transit safety performance data and targets.