Tampa Bay Commuter Assistance Program Regional Development Plan

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Tampa Bay Commuter Assistance Program Regional Development Plan

FDOT Project G0O94 FPN 440687-1-84-18

Technical Memorandum 4

In Completion of Task 4

Findings and Recommendations

Prepared for:

Florida Department of Transportation

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Disclaimer

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation.

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16. Abstract While Florida transit agencies are required to develop a 10-year transit development plan intended to support the development of an effective multi-modal transportation system, no such requirement exists for commuter assistance programs (CAP), including transportation management organizations (TMO). The CAP program, including the TMOs, operate with one-year planning horizons making long-term plans and initiating projects with longer returns on investment impractical. Over 20 percent of Tampa Bay residents use some form of transportation other than solo driving. These groups may be underrepresented by local and regional transportation plans that focus primarily on capital investments that favor solo driving. This Commuter Assistance Program Regional Development Plan (CAPRDP) for the Tampa Bay region provides recommendations for integrating transportation demand management (TDM) and commuter assistance into long range transportation planning. It provides recommendations based on an assessment of existing conditions, a stakeholder outreach process, and a review of national promising practices in TDM. This report describes actions and tools that can be used at the state, regional, and local levels, working with the regional commuter assistance program and the TMOs, to improve mobility for all transportation system users, and maximize the use of the existing capacity of the system.			
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Executive Summary

Why Does the Tampa Bay Region Need a Commuter Assistance Program?

Commuter assistance programs (CAP) and the use of transportation demand management (TDM) strategies are typically only discussed and implemented within the context of traffic congestion reduction. CAPs are a tool that offer much more than that. Now more than ever before, the circumstances and recent events in society point to a growing urgency to change the way we build our communities and operate our transportation systems, calling us to use all the strategies at our disposal, to the fullest extent. Unusual circumstances are characterized by heightened uncertainty due to the COVID-19 pandemic, political change, issues of societal equity, and the impact of climate change.

The Future

This Tampa Bay Commuter Assistance Program Regional Development Plan highlights the need, and recommended steps for the region to maximize the use of its *existing* transportation capital facilities. This is for serving the safe, equitable, and efficient mobility of travelers, rather than focusing most of our resources on reducing motor vehicle delay. CAPs use TDM strategies to enable and incentivize more people to make better decisions about how they travel, before their trips even begin. Providing effective transportation choices supports better travel decisions by more people. This helps them avoid traffic congestion, save money, and remain safer while traveling.

TDM strategies and the CAP and transportation management organizations (TMO) that implement them are an essential complement to judicious multimodal capital investments and traffic flow improvements. Selecting the right combinations of TDM strategies to target specific travel markets, locations and time frames, accomplishes several important goals. TDM maximizes the use of the existing system, saving taxpayer dollars and affording communities more lead time to expand the physical transportation network when needed. TDM provides important tools to improve transportation equity for all travelers. It sends market signals to reinvest in more sustainable urban form and land development, supporting more vibrant and livable communities. It supports and improves health and safety of the public. It supports efforts to decrease non-renewable resource consumption, preserve green space, and reduce greenhouse gas (GHG) emissions. TDM uses data and smart technologies to deliver customer service.

Project Purpose

The overall purpose of this project has been to develop a Commuter Assistance Program Regional Development Plan (CAPRDP) for the Tampa Bay area that provides guidance for the application of TDM strategies, both regionally and to serve activity centers. The CAPRDP especially emphasizes its potential to support the achievement of the Regional Transit Network Vision of the new TBARTA Regional Transit Development Plan (TDP).

Plan Development Method

Previous tasks to develop the CAPRDP included Task 1, an inventory of current TDM efforts and smart technologies, Task 2, containing the results of stakeholder interviews and engagement; and Task 3, a

national review of promising, emerging, and evidence-based practices, and challenges and opportunities.

Recommendations from Technical Memorandum 3 included setting aside funds for implementation of a Transportation Management Plan that includes both traffic management and TDM, as part of the I-275 highway reconstruction project. Traffic mitigation activities could be started in preparation of reconstruction, then continued thereafter. These include use of vehicle occupancy detection technologies to enable effective managed lanes, allowing HOV2+ to use HOV lanes free, and collaboration with local governments to implement parking management strategies at the destination end of the trip. Parking management includes coordinated parking pricing by location, time of day and day of week. It also includes provisions for unbundling parking from residential and commercial leases in coordination with employers offering parking cash out to employees, and preferential parking for carpools and vanpools.

Recommendations from Technical Memorandum 3 also include commuter assistance campaigns promoting route detours to avoid the reconstruction corridor completely, and employer outreach promoting vanpooling, telecommuting, and flexible work hours. Recommended regulatory approaches include implementing a transit benefits ordinance, with local governments coordinating this implementation regionally. It is recommended that FDOT develop a funding mechanism for developing and implementing innovative TDM strategies, similarly to the Public Transit Service Development Program for public transportation. As local governments update their comprehensive plans and regulations, it is recommended that local governments consider the merits of form-based zoning to promote mixed use development and greater proximity of housing to jobs. Like other regions nationwide, it is recommended to articulate and elevate the use of TDM strategies as a major principle of transportation system development and operation, for the purpose of maximizing the use of existing highway capacity before further expansion. Like other regions nationwide, it also is recommended to apply TDM strategies not just to peak hour commute trips to reduce traffic congestion, but also to other trip purposes to further enhance mobility.

This Technical Memorandum 4 constitutes the final report representing the work accomplished in Task 4 and contains the elements of a CAPRDP, based on the earlier tasks of literature review, interviews, best practice identification, and a SWOT (strengths, weaknesses, opportunities, threats) analysis. This Plan includes recommendations for institutional arrangements, proposed goals and objectives, and resource requirements.

Draft recommendations for the application of TDM strategies were shared and discussed with the Transportation Management Organization Coordinating Group (TMOCG) during a series of work scope pre-implementation meetings held April 14, April 23, May 1, and May 8, 2020. Because of the limitations as well as the opportunities created by circumstances surrounding the pandemic, a follow-up project sponsored by FDOT District Seven began regional outreach in the form of a campaign called Love To Ride Tampa Bay. As more people in the Tampa Bay area are wishing to bicycle, the Love To Ride campaign provides a behavior change program to encourage more people to ride a bicycle. The Love To Ride Tampa Bay program builds upon the engagement work initiated in the previous year to

accelerate its mobility and active transportation programs across the FDOT District Seven region. Love To Ride provides a proven successful bike solution for area partners, including Bike/Walk Tampa Bay, the regional commuter assistance program Commute Tampa Bay, the TMOs in the region, our institutional partners and area businesses.

As a living document, this plan should be used as a point of departure to facilitate efforts for collaborative planning. It is the expectation that monitoring and evaluation will document the efforts of the TMOs and Commute Tampa Bay CAP operated by the Tampa Bay Area Regional Transit Authority (TBARTA), to ensure accountability for the commuter assistance program activities in their service areas, foster continual improvement, and provide justification for future investments.

Recommendations

Some of the main recommendations of this CAPRDP begin at the statewide level and include the following.

- Adopt a District policy that recognizes the important role of the FDOT Commuter Assistance Program in achieving the Florida Transportation Plan (FTP) 2045.
- Establish performance targets for achieving modal shares and person throughput for public transit, telework, bicycling, walking, and ridesharing, including the use of vanpooling and carpooling in the FTP. Direct all other statewide plans to contain objectives regarding how the plans will contribute toward achieving the performance targets.
- Recognizing that transportation is a means to an end, name telework as a vital transportation strategy in the FTP, which moves the work to the worker, rather than transporting the worker to an employment site.
- Recognizing that the development of the transportation system requires not only physical infrastructure, but also programmatic and institutional infrastructure, the FTP should direct the review of state funding sources and federal funding sources allocated by the state, such as Congestion Mitigation and Air Quality (CMAQ) funds, to enable greater flexibility for the use of those funds to be used to reliably support operational expenditures necessary for commuter assistance, such as incentivization strategies.
- Among the selected transportation industry leaders, stakeholders, representatives of the Florida Transportation Commission (FTC), academic representatives, key FDOT leadership, and FTC staff who conduct the annual Performance and Production Review Measures (PPRM) review, it is recommended to include experts in the field of transportation demand management.
- It is recommended that FDOT develop a Statewide Commuter Assistance Program Plan and provide permanent programmatic funding for accomplishing objectives at the District level. This will raise the profile of how commuter assistance supports the FTP. This Plan would address the following.

    1. Describe how it directly relates to and supports the other statewide plans, such as the Strategic Highway Safety Plan (SHSP) and others.
    2. Describe its uniquely essential contribution to supporting the FTP that none of the other plans address.

3. Establish a corresponding longer-term planning horizon, with objectives describing how it will support the achievement of modal performance targets contained in the FTP 2045.
4. Provide direction for the update and execution of the FDOT Policy 725-030-008, establishing procedures and guidelines for the Commuter Assistance Program.
5. Provide direction for the execution of and adherence to FDOT Policy 000-725-050, adopted in 2007 to ensure that FDOT considers TDM strategies in all FDOT studies, plans, programs, and functional areas.
6. Provide general guidelines how the Commuter Assistance Program in each District will be implemented in conjunction with other strategies and activities, including those in MPO plans and studies, local government comprehensive plans, locally prepared feasibility studies, and Transit Development Plans.
7. Allocate long term federal funding sources, such as use of Congestion Mitigation and Air Quality (CMAQ) for commuter assistance programs at the District level and for partner transportation management organizations to supplement state and local funding.
8. Identify and recommend other statewide funding sources that can reliably fund the ongoing Commuter Assistance Program.
9. It is recommended that FDOT develop a funding mechanism for developing and implementing innovative TDM strategies, similarly to the Public Transit Service Development Program for public transportation.
10. Integrate FDOT's commuter assistance toolbox of transportation demand strategies with physical system development and with traffic operations, including adding vanpool routes to system maps
11. Adopt safety objectives to expand outreach and communications campaigns to increase public awareness of at-risk road users and improve user behaviors.
12. Work with the commuter assistance programs of each District, and their partner transportation management organizations that promote emerging technologies, such as Mobility-as-A-Service (MaaS) apps that deliver trip planning, integrated fare payment, vehicle occupancy detection, congestion pricing and rewards. Incentivization enhances safety, mobility, accessibility, and reduces bottlenecks. MaaS technologies help travelers use the greater array of modal options.
13. Engage the commuter assistance programs of each District, and their partner transportation management organizations to support community resilience through their programs, services, incentives, information and partnerships. Resilience strategies include enhancing travel choices that generate less GHG emissions or none at all. Commuter assistance strategies support individual traveler resilience by encouraging them to know about and choose from among all their options. Commuter assistance information campaigns can help reduce or avoid bottlenecks, by managing demand during emergencies, such as hurricanes.

At the regional level, it is recommended that the MPOs consider establishing an MPO TDM Committee, composed of commuter assistance service providers, transit representatives, transportation systems management and operations (TSM&O) representatives, corridor planning representatives from FDOT and the county, and individual citizens who are customers of commuter assistance services. The purpose of the TDM Committee would be to identify and recommend demand management strategies

for consideration in the MPO Long Range Transportation Plan (LRTP) and the Transportation Improvement Program (TIP). Demand management strategies also should be recognized as a priority for regional mobility in the West Central Florida Regional Long Range Transportation Plan.

For integrating TDM into the LRTP process, the following recommendations draw upon the Federal Highway Administration's (FHWA) *Desk Reference*.[1] The *Desk Reference* also cites the use of the Institutional Capability Maturity Model proposed by FHWA in its *Guide for Improving Capability for Systems Operation and Management*.[2] Based upon the level of integration of TDM into the current planning processes of an agency, the Institutional Capability Maturity Model recommends a series of actions that guide integration from an ad hoc approach to a better defined level. For those agencies with greater TDM planning experience, higher-level actions are recommended for managing demand to optimize the outcomes for systems operation and management. Each step is discussed in the body of this report.

1. Introduce the principle of managing demand as high up in the metropolitan long-range transportation planning process as possible, as part of vision and goals.
2. Select performance metrics that are appropriate to measure the progress toward achieving the overall LRTP vision and goals, and for which the capability exists to measure the selected metrics through data collection and analysis. Establish desired performance targets.
3. Work with stakeholders to develop one or more SMART (specific, measurable, achievable, realistic, timebound)[3] objectives relating to the use of TDM, which contribute toward moving the LRTP performance metrics in the direction of desired outcomes.
4. To account for underlying growth, evaluate existing conditions projected into some future planning year and/or forecasted future traffic, based upon known or anticipated trends. Measure performance metrics for existing conditions and estimate values for performance metrics for future projected or forecast conditions.
5. Develop alternative scenarios by selecting a TDM strategy/action or set of TDM strategies/actions that can contribute toward achieving each of the objectives in the LRTP. In the case of a Project Development and Environment (PD&E) study for a project or corridor improvement, it would address the stated Purpose and Need. These alternative scenarios would constitute a long range TDM component to the LRTP. It would be the Tampa Bay CAPRDP.

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[1] Gopalakrishna, Deepak (Battelle), Eric Schreffler (ESTC), Don Vary (Wilbur Smith Associates), David Friedenfeld (Wilbur Smith Associates), Beverly Kuhn (Texas Transportation Institute), Casey Dusza (Texas Transportation Institute), Rachel Klein (Battelle), Alexandra Rosas (Battelle). *Integrating Demand Management into the Transportation Planning Process: A Desk Reference*. Prepared for Federal Highway Administration, Office of Operations. FHWA-HOP-12-035. Washington, D.C. August 12, 2012. https://ops.fhwa.dot.gov/publications/fhwahop12035/index.htm

[2] Parsons Brinckerhoff. *Guide for Improving Capability for Systems Operation and Management*. Strategic Highway Research Program (SHRP) II. Report S2-L06-RR-2. 2011.

[3] U.S. DOT. Federal Highway Administration. "Advanced Metropolitan Planning for Operations: An Objectives-driven, Performance-based Approach—A Guidebook. SAIC. FHWA-HOP-10-026. 2010.

6. Apply evaluation tools, such as the TRIMMS™ and HEAT models to the alternative scenarios to estimate performance outcomes. Compare against performance targets and re-evaluate performance targets to make sure they are realistic.
7. Determine which entity or combined collaboration of entities will implement each TDM strategy.
8. Incorporate the selected TDM strategy or strategies into the long-range cost feasible plan.

Proposed Goals for the CAPRDP

Below are proposed goals for the Tampa Bay Area Commuter Assistance Program Regional Development Plan.

1. Support the Regional TDP Vision Network and the TBARTA Regional Rapid Transit System.
2. Provide a comprehensive and consistent long-term approach to commuter assistance, including transportation management organizations (TMOs) to:
   - Provide individuals and employers with travel choices and support for traveling to work, school, and other destinations that meet their needs.
   - Improve the operational performance of the multimodal transportation system serving Tampa Bay by increasing vehicle occupancies and preferential treatment of higher occupancy transportation and non-motorized travel to maintain safe and reliable travel for all.
   - Foster safe and healthy communities by reducing emissions and promoting active transportation.
   - Help create economic opportunities for all by improving access to jobs and other destinations.
   - Broaden the vision for use of TDM to better serve other trip purposes than just the commute.
   - Integrate TDM as part of construction mitigation programs.

Discussion:

- Because this is a Regional Development Plan and much attention has been recently placed on the Regional TDP and TBARTA RRT, this is an opportunity to coordinate with, support, and build upon those efforts. To achieve community goals, the focus is on the needs of travelers. Progress may come as the result of changes in policies, introduction of technologies, and better integration of transportation options.
- The future of public transit will be a regional public transportation system. The passage of the 2018 Hillsborough Citizen Referendum to support public transit, walking, bicycling, and improved safety without adding highway capacity demonstrates public support for mobility options.
- The Commuter Assistance Program does not compete with public transit. Commuter assistance supports and complements public transit.
- The Regional TDP provides that while the realization of the Vision Network will take years, commuters need transportation services now. The Commuter Assistance Program is uniquely positioned to address service gaps now.
- MPO funding sources provide flexibility for funding commuter assistance services.

Proposed CAPRDP Guiding Principles

The following are proposed Guiding Principles for the development of a CAPRDP.

1. First, **optimize** how we use our **existing** transportation system.
2. Intensify **"high interaction" outreach** and "high touch" customer service, knowing that "high tech" by itself will not solve all our transportation problems.
3. Provide **more choices** to improve mobility for more people, recognizing that people have varying travel needs. For example, a large share of the population does not drive.
4. Take a "**Customer First**" approach, with a focus on the individual traveler experience, not just systemwide benefits (such as reducing traffic congestion).
5. Prioritize improving service for **existing customers**, because a satisfied customer is more likely to continue using the service. Existing customers define the strongest markets for CAP services and provide the most relevant feedback for continual improvement of services.
6. **Build upon** the existing effective services and programs that are already in place now.
7. **Incentivize**, don't penalize. Service improvements and incentives should be rolled out prior to the introduction of disincentives.
8. **Employers** have more control over travel choices and their consequences than they might think. For example, employers can provide work schedule flexibility to accommodate transit, provide travel options beyond free or subsidized parking, and extend telework options to more of the workforce.

Estimating Impacts of TDM Strategies

To estimate the impacts of various proposals, the research team applied the latest Trip Reduction Impacts of Mobility Management Strategies (TRIMMS) model and Health Economic Assessment Tool (HEAT) to estimate the impacts of bicycling and walking. TRIMMS was developed by CUTR with funding support from the National Center for Transit Research, the Florida Department of Transportation and the US Department of Transportation. HEAT was developed by the World Health Organization to conduct economic assessments of the health impacts of walking or bicycling.

Some further recommendations are the following.

- ✓ To advance competitive modal travel options, adopt use of the mode share performance metric regardless that the region presently achieves federal National Ambient Air Quality Standards (NAAQS) attainment status. It is recommended that the person trip rate or vehicle trips per 100 commuters also be used to reflect multimodal use, in combination with other TDM metrics, including motor vehicle miles traveled per capita.
- ✓ Set ambitious performance targets for more commuters and travelers to choose modes other than solo driving, including public transportation, bicycling, walking, carpooling, vanpooling, and telecommuting, and provide funding to achieve those targets, accordingly.
- ✓ Allocate CMAQ funding for commuter assistance activities.
- ✓ Improve public transit service to existing customers first.
- ✓ Re-allocate transportation funding to gain capacity via transit and other demand management strategies, including preventing transit service from being cut.
- ✓ With coordination assistance from the TBARTA, local governments should adopt transit benefits ordinances and parking management programs to further support use of public transportation.

- ✓ Adopt transportation performance standards that promote progress toward achieving comparable or equivalent levels of service across modes, from the customer's perspective. For example, set performance targets to reduce the difference in transit trip travel time relative to private car trip travel time.
- ✓ Broadband access and affordability in the region are problems for which a public/private dialogue at the state, regional, and local levels should be sought, especially during this time of renewed commitment to equity. Broadband access and affordability provide an option to physical travel.

Table ES1 below summarizes the recommendations discussed in this Technical Memorandum 4. Table ES1 organizes them in the categories of Statewide, I-275 reconstruction, Goal Setting, Long Range Transportation Plan, Transit Service, and Regulatory. Each recommendation identifies the entity that would carry out the recommendation and also how TBARTA's Commute Tampa Bay Commuter Assistance Program (CAP) and the transportation management organizations (TMO) also would respond. Table ES1 also provides the page numbers where one may find a discussion involving the recommendations, presented in bold in this report.

TDM represents a cultural shift in the way we plan, build, operate, and use our transportation system. This CAPRDP proposes that this region should coordinate a combination of capital facilities, TSM&O, and sustained investment in the TDM toolbox of programs, services, incentivization, information, and partnerships. Such an approach makes full use of a multimodal system that is economically, equitably, and environmentally sustainable.

Table 1. Commuter Assistance Program Regional Development Plan Summary Recommendations

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
1	Statewide	FDOT	**For the FTP 2045**: Adopt a strategy that recognizes the important role of FDOT in managing demand to improve person throughput and reduce congestion on state facilities.	CAP/TMOs can provide input regarding target markets, proposed approaches to address performance on facilities selected by the Districts, suggest use of innovative technologies.	p. 96
2	Statewide	FDOT	**For the FTP 2045**: Establish performance metrics and targets for achieving modal shares as well as an overall target expressed in terms of vehicles per 100 commuters ratio that takes into account all travelers, such as those who ride public transit, telework, bicycle, walk, carpool, and vanpool. Direct all other statewide plans to contain objectives about how the plans will contribute toward achieving these targets. **See Table 21. Recommended Actions and Performance Metrics.**	CAP/TMOs can address performance targets through objectives and tasks in proposed scopes of work, such as employer outreach to promote Best Workplaces for Commuters℠, Qualified Transportation Fringe Benefits for public transit use and vanpooling, parking cash out, Bike/Walk Tampa Bay, Love To Ride bicycle promotions, Emergency Ride Home, Agile Mile Rewards, Bicycle Friendly Businesses and others.	p. 97
3	Statewide	FDOT	**For the FTP 2045**: Recognizing that transportation is a means to an end, name telework as a vital transportation strategy, which moves the work to the worker, rather than transporting the worker to an employment site.	CAP/TMOs can continue to conduct employer outreach, promoting programs such as Best Workplaces for Commuters℠ Telework Certificate.	p. 97
4	Statewide	FDOT	**For the FTP 2045**: Recognizing that the development of the transportation system requires not only physical infrastructure, but also programmatic and institutional infrastructure, the FTP should direct the review of state funding	--	p. 97

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
			sources and federal funding sources allocated by the state (such as Congestion Mitigation and Air Quality (CMAQ)) to enable greater flexibility for the use of those funds to be used to reliably augment and support existing operational expenditures necessary for commuter assistance.		
5	Statewide	FDOT	FDOT should develop a Statewide Strategic Commuter Assistance Program Plan, in support of FDOT Policy 725-030-008 and FDOT Policy 000-725-050, and provide permanent programmatic funding for accomplishing statewide objectives at the District level. This will raise the profile of how commuter assistance supports the FTP.	CAP/TMOs can support their Districts by proposing programs, services, incentives, information and partnership strategies.	p. 100
6	Statewide	FDOT	FDOT should develop a funding mechanism for developing and implementing innovative TDM strategies, similarly to the Public Transit Service Development Program for public transportation.	This could be a competitive grant opportunity for CAPs/TMOs statewide.	p. 190
7	Statewide	FDOT	The statewide CAP Plan and other statewide strategic plans should contain language describing how their objectives are mutually supportive. For example, TDM strategies also can offer potential approaches to improve freight movement. The alteration of travel behavior by route is already used in the	CAP/TMOs can provide input. https://www.commuterservices.com and the Statewide TDM Clearinghouse also are resources.	pp. 101, 105

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
			trucking industry by way of designated truck routes.		
8	I-275 reconstruction	FDOT	Implement a Transportation Management Plan that includes both traffic management and TDM, as part of the I-275 highway reconstruction project. A general rule of thumb is 1-2 percent of cost of reconstruction supports an impactful traffic mitigation program.	There should be CAP/TMO representation on the Community Task Force.	p. 104
9	I-275 reconstruction	FDOT	It is recommended that FDOT dedicate transit lanes established by Regional Rapid Transit Vision Network, to also allow carpools and vanpools to maximize person throughput and address equity concerns.	The CAP/TMOs promote carpooling and vanpooling services.	p. 54
10	Statewide	FDOT	Among the selected transportation industry leaders, stakeholders, representatives of Florida Transportation Commission, academic representatives, key FDOT leadership, and FTC staff who conduct the annual Performance and Production Review Measures review, it is recommended to include experts in the field of TDM.	TBARTA's Commute Tampa Bay Director could serve in this capacity.	p. 149
11	Statewide	FDOT	All newly hired FDOT engineers and planners should complete the Commuter Choice Certificate Program, offered at the USF Center for Urban Transportation Research. Existing FDOT staff are encouraged to participate as well.	Staff of the CAP/TMOs also should complete the Commuter Choice Certificate Program, offered at the USF Center for Urban Transportation Research.	p. 101

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
12	Goal Setting	MPO convene a forum	Broadband access and affordability in the region is a problem for which a public/private dialogue at the state, regional, and local levels should be sought, especially during this time of renewed commitment to equity.	CAP/TMOs can support the MPO in employer and community outreach to promote the public/private dialogue.	p. 112
13	Goal Setting	RPC, MPOs, local governments	Transportation planning should strive for specificity regarding what is meant by economic progress, through a robust public engagement process, and how the transportation system can and should support it.	CAP/TMOs can provide outreach, community engagement, and solicit public input through its membership.	p. 128
14	Goal Setting	MPOs and MPO Chairs Coordinating Committee	The MPOs should consider establishing a regional MPO TDM Committee, composed of commuter assistance service providers, transit representatives, TSM&O representatives, corridor planning representatives from FDOT and the county, and individual citizens who are customers of commuter assistance services.	CAP/TMOs will provide updates and presentations to the MPOs and the MPO Chairs Coordinating Committee.	p. 114
15	Goal Setting	MPOs	Champion the elevation of managing demand as a vital approach on equal footing with TSM&O and capacity building.	CAP/TMO scopes of work will identify and propose ways to support and coordinate with traffic management efforts, corridor studies, PD&Es, and highway reconstruction transportation management plans.	p. 112
16	Long Range Transportation Plan	MPOs	Develop a TDM component to the LRTP, using proposed Goals and Guiding Principles.	CAP/TMOs will provide baseline activities and associated performance evaluation, community engagement input, identification of priority travel	p. 43

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
				markets, proposals for marketing, outreach, service provision.	
17	Long Range Transportation Plan	MPOs	Apply recommended steps for integrating TDM into the regional transportation planning process	CAP/TMOs will provide data and information, community outreach, and input in support of the regional transportation planning process.	p. 113
18	Long Range Transportation Plan	MPOs and MPO CCCs	Introduce the principle of managing demand as high up in the metropolitan long-range transportation planning process as possible, as part of vision and goals.	CAP/TMOs can offer ideas and proposed goal setting language based upon their experience providing employer and community outreach and implementing TDM programs.	p. 114
19	Long Range Transportation Plan	MPO	Select performance metrics that are appropriate to measure the progress toward achieving the overall LRTP vision and goals, and for which the capability exists to measure the selected metrics through data collection and analysis. Establish desired performance targets, informed by benchmarks of other urbanized areas. **See Table 21. Recommended Actions and Performance Metrics.**	CAP/TMOs can offer input for proposed performance metrics and targets, based upon performance of previous TDM programs.	p. 119
20	Long Range Transportation Plan	MPO	The SOV mode share metric should be used in combination with LOTTR/TTTR and VMT reduction and VMT reduction per capita.	FDOT Commuter Assistance Program performance metrics include SOV mode share.	p. 120
21	Long Range Transportation Plan	MPO	Adopt targets to expand the regional vanpool program.	CAP/TMOs can continue to promote the Commute with Enterprise Vanpool Program as part of employer outreach	p. 124

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
22	Long Range Transportation Plan	MPOs, Transit agencies	Expand use of indicators to better identify communities most in need of transit and commuter assistance.	CAP/TMOs can target outreach and commuter assistance to identified communities.	p. 125
23	Long Range Transportation Plan	FDOT, MPO, local governments	Set ambitious performance targets for more commuters and travelers to choose modes other than solo driving, including public transportation, bicycling, walking, carpooling, vanpooling, and telecommuting, and provide funding to achieve those targets, accordingly. Allocate CMAQ funding for commuter assistance activities.	CAP/TMOs can address performance targets through objectives and tasks in proposed scopes of work, such as employer outreach to promote Best Workplaces for Commuters℠, Qualified Transportation Fringe Benefits for public transit use and vanpooling, parking cash out, Bike/Walk Tampa Bay, Love To Ride bicycle promotions, Emergency Ride Home, Agile Mile Rewards, Bicycle Friendly Businesses and others.	p. 130
24	Long Range Transportation Plan	FDOT, MPO, local governments	Calculation of return on investment of transit projects benefiting COCs should consider monetizing reduced facilities and serious injuries, reduced time lost, reduced health care costs, lower unemployment, lower rates of crime due to improved employment, and the infusion of reinvestment back into local communities from increased discretionary spending by populations living in COCs.	CUTR at USF can provided technical support for the application of the Health and Economic Assessment Tool (HEAT).	p. 134
25	Work Program	FDOT	Prioritize areas identified through the *Envision 2030* TDP Density Threshold Assessment (DTA) and the Transit Orientation Index (TOI) in the FDOT District Seven Adopted Work Program for bicycle and pedestrian infrastructure to	CAP/TMOs provide ongoing pedestrian and bicycle safety education and encouragement through Bike/Walk Tampa Bay and campaigns such as Love To Ride.	p. 53

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
			support bicycle-friendly and pedestrian-oriented development patterns in advance of transit infrastructure.		
26	Long Range Transportation Plan	MPOs	Work with stakeholders to develop one or more SMART (specific, measurable, achievable, realistic, timebound)[4] objectives relating to the use of TDM, which contribute toward moving the LRTP performance metrics in the direction of desired outcomes.	CAP/TMOs can coordinate with their MPOs to offer draft SMART objectives for MPO consideration.	p. 155
27	Long Range Transportation Plan	MPOs	To account for underlying growth, evaluate existing conditions projected into some future planning year and/or forecasted future traffic, based upon known or anticipated trends. Measure performance for existing conditions and estimate values for performance metrics for future projected or forecast conditions.	CAP/TMOs can provide data and information about the performance evaluation of existing TDM and commuter assistance programs.	p. 159
28	Long Range Transportation Plan	MPOs	Measure and visually illustrate *unused* highway capacity by day of week, time of day, and seasonally. Visual illustrations in plans usually only depict locations and duration of congestion. A common inference is to build capacity to meet peak demand. Unused highway capacity should be recognized as an opportunity.	TDM strategies and commuter assistance can be targeted to spread some of the travel demand to the shoulders of peak periods. Likewise, visual illustrations of public transit service should include the geographic extension, service gap coverage, and PMT of existing vanpools.	p. 159

[4] U.S. DOT. Federal Highway Administration. "Advanced Metropolitan Planning for Operations: An Objectives-driven, Performance-based Approach—A Guidebook. SAIC. FHWA-HOP-10-026. 2010.

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
29	Long Range Transportation Plan	MPOs	Develop alternative scenarios by selecting a TDM strategy/action or set of TDM strategies/actions that can contribute toward achieving each of the TDM objectives in the LRTP. In the case of a PD&E study for a project or corridor improvement. The TDM strategies and actions would address the stated Purpose and Need. These alternative scenarios would constitute a long range TDM component to the LRTP. It would be the Tampa Bay Commuter Assistance Program Regional Development Plan.	CAP/TMOs can offer input and proposed programs, services, information, incentives, and partnership strategies to build alternative scenarios for evaluation. Various TDM actions are stronger in combination.	p. 160
30	Long Range Transportation Plan	MPOs	An important underlying assumption is that funding for commuter assistance would be reliably programmed year after year to provide continuity of services. Much like the operation of other services, such as firefighters, librarians, and traffic operations engineers, commuter assistance also is "institutional infrastructure." It is recommended that adequate funding, commensurate with objectives set for the CAP and the TMOs be programmed for five years to allow the CAP/TMOs to plan beyond one-year time frames.	CAP/TMOs can devise proposed scopes of work, making use of the longer time frame for planning, implementation and evaluation.	p. 162
31	Long Range Transportation Plan	MPOs	Estimate performance outputs and outcomes for alternative scenarios.	USF Center for Urban Transportation Research, Statewide TDM Clearinghouse can provide technical support for the	p. 183

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
				application of the TRIMMS™ and HEAT models.	
32	Long Range Transportation Plan	MPOs	In coordination with FDOT, transit agencies, and local governments, engage the CAP/TMOs in the development of scopes of work and budgets that implement a preferred scenario. The scopes of work will have a data collection, monitoring, and evaluation task.	CAP/TMOs can prepare scopes of work in coordination with planning partners, reflecting and supporting the preferred scenario.	p. 183
33	Long Range Transportation Plan	MPOs	Incorporate the selected TDM strategy or strategies into the long range cost feasible plan.	CAP/TMOs can implement work programs in collaboration with planning partners.	p. 185
34	Transit service	Transit agencies	Stabilize existing transit service by preventing service cuts. Improve public transit service to existing customers first.	CAP/TMOs can target outreach and commuter assistance to identified communities.	p. 131
35	Capital Improvements Program	Local Governments	Prioritize areas identified through the *Envision 2030* TDP Density Threshold Assessment (DTA) and the Transit Orientation Index (TOI) in the capital improvements programs for bicycle and pedestrian infrastructure to support bicycle-friendly and pedestrian-oriented development patterns in advance of transit infrastructure.	CAP/TMOs provide ongoing pedestrian and bicycle safety education and encouragement through Bike/Walk Tampa Bay and campaigns such as Love To Ride.	p. 53
36	Comprehensive Planning and Regulatory	Local Governments	It is recommended that local government partners adopt land development policies to concentrate population and employment in activity centers or along corridors where public transit can serve them. Furthermore, land development	CAP/TMOs can provide suggestions and recommendations for transit-supportive commuter assistance services and incentives, including SHIFT Tampa Bay neighborhood-based travel planning.	p. 53

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
			regulations supporting transit-oriented development should be promoted.		
37	Regulatory	Local Governments	Consider the locations identified in *Envision 2030* to be medium and high employment intensity as candidate areas for parking management strategies to encourage further development intensities and incentivize employees in those areas to use transit.	CAP/TMOs can work with local governments to identify parking management strategies and incentives at employment sites.	p. 54
38	Regulatory	Local governments	In preparation for I-275 reconstruction, adopt a transit benefits ordinance to provide increased ridership by transit and vanpooling, and the potential for an employer-provided subsidy for transit and vanpooling. Pursue parking management programs in downtowns and in activity centers, to further promote transit use.	TBARTA can lead a coordinative effort among local governments. USF Center for Urban Transportation Research can provide technical support through its Statewide TDM Clearinghouse.	pp. 108, 124
39	Regulatory	Local governments and TBARTA	TBARTA could play a coordinating role to start a dialogue among local governments to discuss how comprehensive planning policies and regulations may find opportunities for greater effectiveness through coordination across jurisdictional boundaries.	TBARTA's Commute Tampa Bay and the TMOs can conduct employer outreach to provide information about the opportunities provided by Qualified Transportation Fringe Benefits.	p. 108
40	Regulatory	Local governments	Actively promote the use of TDM strategies, alternative transportation amenities and commuter assistance as conditions for land development approval.	CUTR offers to craft TDM checklists for individual land development proposals, which would be specific to interested municipalities. Using a Checklist, it is envisioned that commuter assistance	p. 109

Rec. #	Topic	Responsible Entity	Recommendation	CAP/TMO Role	Discussion in Tech. Memo 4
				staff of Commute Tampa Bay and the TMOs provide land development review support and recommendations to staff of their host municipalities.	

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Defining TDM as an Approach to Transportation Service Delivery

How transportation demand management (TDM) is defined often implies the goals to be achieved. It makes a difference in what transportation-related issues and solutions are prioritized. The Florida Department of Transportation (FDOT) defines TDM as "a set of specific strategies that promote increased efficiency of the transportation system and resources by promoting and providing a range of local or regional travel-related choices to influence individual travel behavior by mode, time, frequency, trip length, cost, or route."

TDM and commuter assistance are often used as synonyms, but they are not the same. Commuter assistance programs apply TDM strategies to specifically target commute trips to the work siterather than other trip purposes, such as shopping. This is because TDM is commonly applied to reduce traffic congestion and because traffic congestion is most often associated with the morning and evening weekday peak hours of travel by persons commuting to and from work. TDM is a more general term and commuter assistance is within the realm of TDM. TDM strategies can be used to address other issues besides traffic congestion. TDM can target trip purposes other than the commute to work. In the Tampa Bay area, TDM has historically been used to reduce traffic congestion, as the main priority of government agencies that have funded TDM in the form of commuter assistance programming. For purposes of this project, it is assumed that traffic congestion will remain a top priority, and so the term commuter assistance will be used in this report. This is not intended to exclude consideration of TDM to target other trip purposes and achieve other goals.

The Federal Highway Administration (FHWA) recognizes the following definition of TDM.

> Managing demand is about providing travelers, regardless of whether they drive alone, with travel choices, such as work location, route, time of travel and mode. In the broadest sense, demand management is defined as providing travelers with effective choices to improve travel reliability.[5]

FHWA's inclusion of drive alone commuters in their definition should not be overlooked. Strategies such as shifting the time of trip, regardless of vehicle occupancy or decreasing the frequency of trip making can help ameliorate traffic hot spots under the right conditions. Most commuters drive alone whether due to the lack of viable travel options, real or perceived, ingrained habits, or the lack of a reason to change, such as parking pricing that remains low. Commuters make travel decisions based on a variety of personal considerations that change with the stages of life. For some people, single-occupant vehicle (SOV) travel may be the best choice. The CAPRDP needs to consider how to embrace a mix of strategies that also serve those who continue to drive alone. For example, if peak hour traffic congestion is the main problem, then TDM strategies focused upon SOV commuters to encourage their use of compressed work week, flexible scheduling and staggered start times may help address the problem.

[5] FHWA. "Mitigating Traffic Congestion—The Role of Demand-Side Strategies." Prepared by Association for Commuter Transportation with UrbanTrans, Parsons Brinckerhoff, and ESTC. Report No. FHWA-HOP-05-001. October 2004.

Transportation capital improvements build, expand and repair physical infrastructure. Transportation systems management and operations (TSM&O) strategies optimize traffic flow, while transportation demand management provides programs and services that empower users of the system to make the best decisions about how and when they choose to travel. FHWA considers TDM as a subset of TSM&O. The best TDM programs operate on two levels: providing individual travelers with competitive mobility choices that improve their travel experience, while enabling the transportation system to operate more efficiently.

TDM includes a broad set of strategies that can be tailored to specific objectives and targeted to specific travel markets. However, transportation professionals tend to speak in a shorthand that is often misleading to lay people. For example, phrases to describe TDM are commonly used, such as "trip reduction". Some TDM strategies are not necessarily intended to reduce trips. When trip reduction is the objective, then transportation professionals usually mean "motor vehicle trip reduction." This is an important distinction because one of the metrics that both public and private economic development agencies use to measure community economic growth and prosperity is indications of increased travel and trip making. The result is that the whole toolbox of TDM strategies may be perceived at odds with economic development. On the contrary, properly planned and executed TDM programs support economic development by enabling people to travel more easily, more efficiently, and less expensively, or enabling people to accomplish work and other business without having to travel at all.

To further address traffic congestion, additional TDM programs can make other travel choices more competitive through offering programs, services, incentives and education/encouragement campaigns to remove barriers to using public transit, carpooling, vanpooling, walking, biking, and teleworking. Table 2 lists examples from the Tampa Bay area.

Table 2. Examples of TDM Programs, Services, Incentives and Education/Encouragement

Programs	Services	Incentives/Rewards	Education/Encouragement
TBARTA's Commute Tampa Bay commuter assistance program	OneBusAway app, real time bus locator	PSTA corporate discount transit passes	Love To Ride Campaign
Safe Routes to School program in public schools	Enterprise Carshare	Commute Tampa Bay vanpool subsidy	WalkWise/BikeSmart classes
Best Workplaces for Commuters℠ (BWC)	Tampa's Downtowner	RideFlag preferred carpool parking	League of American Bicyclists Effective Cycling class
Bike/Walk Tampa Bay	Emergency Ride Home	Commute Tampa Bay reward points for coupons and discounts	Car Free Living Campaign
Florida Commuter Choice Certificate Program	Flamingo Fares integration app	Federal Qualified Transportation Fringe Benefits	SHIFT Tampa Bay neighborhood-based travel planning
Local government parking management program	1st mile/last mile microtransit, escooters, bike share	USF Universal Transit Pass (UPASS)	BWC Telework Certificate

Project Purpose

The overall purpose of this project has been to develop a Commuter Assistance Program Regional Development Plan (CAPRDP) for the Tampa Bay area that provides guidance for the application of transportation demand management (TDM) strategies, both regionally and to serve activity centers. The CAPRDP especially emphasizes its potential to support the achievement of the Regional Transit Network Vision of the new TBARTA Regional Transit Development Plan. In weighing the utility of TDM to help accomplish regional transportation goals, it is first helpful to review how the region has considered TDM in the past.

In 2004, the FDOT District Seven regional commuter assistance program, Bay Area Commuter Services, and its subcontractor, USF Center for Urban Transportation Research (CUTR), prepared long range TDM plans for Hillsborough County and for Pinellas County. Those plans measured the performance metrics, vehicle miles of travel (VMT), vehicle trips, mode split and emissions for assessing the impact of TDM, using the Environmental Protection Agency's COMMUTER Model. For Hillsborough County, sets of TDM strategies were grouped into four scenarios.

The preferred scenario, selected by an advisory panel, was a program of comprehensive outreach to the largest employers (employing over 100 employees) to implement voluntary TDM programs. The preferred scenario also included transit and vanpool benefits provided by employers, and an equal subsidy match provided by the commuter assistance program. The preferred scenario also included the application of compressed work weeks and telecommuting as well as premium carpool and vanpool parking provided by participating employers. Lastly, the preferred scenario assumed the implementation of transit improvements in the adopted long-range transit plan. The preferred scenario was applied to baseline conditions in Hillsborough County, in which the drive alone mode share was 80.3 percent. Based upon assumptions regarding the employee participation rate at the largest employment sites, the model results estimated a 4.9 percent decrease in the drive alone commute, with both VMT and vehicle trips decreasing by six percent, relative to the affected employment sites. The alternative mode that gained the most share was telecommuting at 4.7 percent. The results estimated that larger changes in commuting were measured at employment sites rather than area-wide, but the sum of individual employment site trip reduction also would have measurable results regionally. TDM can reduce traffic congestion along a corridor or sub-area. Strongest results come from packaging different TDM strategies, including both incentives and disincentives, that complement and reinforce each other, and that provide the employer with business solutions, such as improving employee recruitment.[6]

It is interesting to reflect upon these estimations from 15 years ago, considering the impact that the current COVID-19 pandemic has had upon traffic. By April 2020, large numbers of employees whose occupations allowed them to accomplish their work remotely stayed home while essential workers whose presence at the job site was required, continued to commute to work. By the fall of 2020, the

[6] Bay Area Commuter Services. 2004. Hillsborough County Long Range TDM Plan. Executive Summary. Prepared by USF Center for Urban Transportation Research. pp. 76-78.

Census Bureau reported that about 30% of Florida workers were teleworking.[7] Prior to the beginning of the staged re-opening of states for business, including Florida, large decreases in traffic were measured. The long-term effects of the eventual resolution of the pandemic have yet to be observed, but transportation planners are considering the potential for a larger share of employees to continue to telework at greater rates than prior to the pandemic. Anecdotal evidence suggests that employers are observing the impact of telework on their businesses and considering options for allowing increased telework to continue. The observed changes could signal an opportunity to plan and operate our transportation system differently.

How Did We Get Here?

Managing travel demand has always been a part of the development and operations of the transportation system, though it may not have been explicitly intended as such. Over the past one hundred years, the government has managed travel demand by influencing people's travel decisions through investment in highways designed for motor vehicle travel. Such influence upon travel behavior was based upon the way the transportation system has been built and financed, by providing more funds for some infrastructure and services, and less for other modes.

This consistent government subsidization of private motor vehicle travel over many decades has created conditions in most cities and communities across the United States, in which car travel is faster, easier, and perceived as safer and more secure, than other modes. This trend was secured when the federal government implemented large infrastructure investments that stimulated a booming economy. Private motor vehicles became broadly affordable by the middle class, and many city dwellers moved to the suburbs in the 1950s through the 1970s, where public transportation could not serve. Our preference for car travel became our dependence upon car travel. The highway system emphasis was underpinned by federal transportation policy, local government land development codes that structured the physical space of our communities around car travel, and robust private sector automobile manufacturing and advertising industries that steered our culture toward requiring car ownership as defining middle class life.

The 1991 signing of the Intermodal Surface Transportation Efficiency Act (ISTEA) by President George H. W. Bush marked an historic pivot toward better managing and maintaining the world class highway system that we had already built. ISTEA introduced new investment programs emphasizing multimodal travel and addressing the transportation impacts of air quality. Since then, subsequent federal transportation reauthorizations have continued to support multimodal travel. However, walking, bicycling, public transit, carpooling, vanpooling, and telework, have faced an uphill battle to slowly win increased traveler demand for such modes. Commuter assistance programs and TDM strategies preceded 1991 but ISTEA gave a much-needed boost to small but sustained investment in alternative modes and the services that support their use. Almost 30 years later, strides have been made to redevelop the physical highway infrastructure to make safe space for nonmotorized travel through the

[7] United States Census Bureau. 2020. Household Pulse Survey – Telework. https://www.census.gov/data-tools/demo/hhp/#/?measures=TWR

gradual creation of a continuous network of sidewalks and bicycle lanes. However, it will take more than that to enable citizens to reap the full benefits of a balanced multimodal transportation system. Sustained investment in regional public transportation systems and the redevelopment of cities and communities are required to reconfigure land uses that optimize how public transit functions so that transit competes equally with or surpasses the private car trip experience. This is a process that will take years after a decades-long transportation system development that gave preference to private motor vehicle travel. In the meantime, TDM strategies support system transformation when funded, packaged, and implemented properly.

Plan Development Method

Previous tasks to develop the CAPRDP included Task 1, an inventory of current TDM efforts and smart technologies, Task 2, containing the results of stakeholder interviews and engagement; and Task 3, a national review of promising, emerging, and evidence-based practices, and challenges and opportunities.

Technical Memorandum 1 summarized the results of existing TDM efforts at the local, regional and state level. Task 1 included a review of existing multimodal plans from Hillsborough MPO, City of Tampa, Hillsborough County, HART, TBARTA, etc. to identify how those plans consider TDM options as complementary and supplementary services to reduce congestion, improve safety, support emergency management, and provide more mobility. Where possible, key performance indicators were identified and trends documented (e.g., vanpool program growth, mode split information, etc.). This task summary also included an integration of the results of the 2017 Florida Commuter Assistance Program evaluation. The FDOT Central Office has funded an updated CAP evaluation that is ongoing. Technical Memorandum 1 also contained a brief history of TDM in the Tampa Bay area. It uses the foundation of the commuter assistance programming provided by the Tampa Bay Area Regional Transit Agency's (TBARTA) Commute Tampa Bay, and by the transportation management organizations (TMO) and initiatives (TMI) that serve the major activity centers in the Tampa Bay area. These TMOs and TMIs include the St. Petersburg Downtown Partnership TMO, the Tampa Downtown Partnership Transportation Committee, the Westshore Alliance, and the New North Transportation Alliance in the USF area. This information provides a base upon which the recommendations for the regional TDM plan have been built.

Technical Memorandum 2 contains a summary report of the stakeholder group meetings. Under this task, CUTR formed a stakeholder group in coordination with FDOT District Seven and shared the results from Task 1. The stakeholder group identified strengths, weaknesses, opportunities, and threats for the current CAP, from the perspective of identified commuter markets to be served by the CAP. In addition, stakeholder outreach was conducted for the purpose of exploring existing collaboration practices among partner agencies. FDOT, TBARTA, Tampa Downtown Partnership, Westshore Alliance, St. Petersburg Downtown Partnership, New North Transportation Alliance, MPOs, and transit agencies were invited to participate.

Technical Memorandum 3 contains the results of nationwide case studies. It includes a discussion of the SWOT analysis (strengths, weaknesses, opportunities, and threats) facing TDM in FDOT District Seven. CUTR developed an interview guide and conducted telephone/web interviews with representatives of identified exemplary programs, based on review of the literature, stakeholder input, and subject matter experts' (e.g., Association for Commuter Transportation) recommendations. Special attention was placed on those that have integrated technologies and/or demonstrated a return on investment. Potential emerging or promising practices/evidence-based practices include integration of technologies relevant to commuters and the role of TDM in emergency management. Promising practices are those based on experience that lead to effective outcomes but have not yet been evaluated. Evidence-based practices are those that have established links to positive outcomes. This information has guided the creation of case studies of promising, emerging and/or evidence-based practices and trends for responding to opportunities and challenges such as introduction of autonomous vehicles, connected vehicles, and shared vehicle services such as transportation network companies, bikesharing, carsharing, and vanpooling. The case studies also feature the role of TDM in:

- major transportation facility reconstruction efforts,
- effective employer and/or community outreach efforts,
- regulatory approaches,
- trip reduction performance programs that incentivize innovation in reducing vehicle trips in specific corridors,
- integration of smart technologies to address commuter needs, and
- planning and operations such as Complete Streets and TSM&O.

This Technical Memorandum 4 constitutes the final report representing the work accomplished in Task 4 and contains the elements of a Commuter Assistance Program Regional Development Plan (CAPRDP), based on the earlier tasks of literature review, interviews, best practice identification, and SWOT analysis. This Plan includes recommendations for institutional arrangements, proposed goals and objectives, and resource requirements.

To estimate the return on investment, this Task 4 has included the development of various groups of TDM strategies evaluated in TRIMMS™, an FDOT-funded model for estimating TDM impacts.[8] These potential strategies include transit subsidies, changes in access time and travel times, changes in parking costs, vehicle miles traveled (VMT) charges, and other incentives or disincentives. The project team input each set of TDM strategies into TRIMMS™ to estimate changes in overall mode share, vehicle trips, and VMT. The estimation of modal share changes due to TDM in TRIMMS™ are based on constant elasticity of substitution (CES) demand functions. The results also account for variability in input values. This uncertainty is especially true in the case of TDM evaluation, where quantitative and

[8] Concas, Sisinnio and Philip Winters. Trip Reduction Impacts of Mobility Management Strategies. http://trimms.com/

qualitative research data have shown positive outcomes but does not yet have enough evidence to support generalizable positive TDM outcomes in all settings.

A degree of uncertainty remains regarding the potential impact of TDM in terms of mode share changes and the resulting societal benefits (e.g., congestion, health and safety, air pollution, energy consumption, etc.). The factors used in this estimation are linked to the underlying Monte Carlo sensitivity analysis tool already embedded in TRIMMS. The final model uses sensitivity analysis to account for acceptable ranges of variation among key factors. Finally, using estimated budgets for the developed alternative scenarios, this Technical Memorandum 4 reports on the cost/benefit ratios for various programs and budgets.

Draft recommendations for the application of TDM strategies were shared and discussed with the Transportation Management Organization Coordinating Group (TMOCG) during a series of work scope pre-implementation meetings held April 14, April 23, May 1, and May 8, 2020.

As a living document, this plan should be used as a point of departure to facilitate efforts for collaborative planning. It is the expectation that monitoring and evaluation will document the efforts of the TMOs and Commute Tampa Bay CAP operated by the Tampa Bay Area Regional Transit Authority (TBARTA), to ensure accountability for the commuter assistance program activities in their service areas, foster continual improvement, and provide justification for future investments.

The Relationship of TDM and TSM&O

A recent publication of FHWA contains recommendations to integrate the use of TDM with transportation systems management and operations (TSM&O). This integration is referred to as Active Transportation and Demand Management (ATDM). ATDM helps achieve operational objectives, including improved throughput, maximized system efficiency, reduced emissions, and improved safety. The ATDM concept is a cyclical process of assessing system performance, implementing dynamic actions, and system monitoring. This concept emphasizes that a collaboration of TDM and TSM&O strategies can have a greater impact upon traffic congestion, both recurrent and non-recurrent congestion due to inclement weather, incidents, special events, and construction work zones. An integrated TSM&O and TDM program can work toward achieving the same objectives and can produce a more pronounced result if used in tandem. This result includes more strategies such as congestion pricing, HOV/HOT lanes, transit signal priority and real-time traveler information.

> ATDM is the real-time management, control, and influence of travel demand, traffic demand, and traffic flow through all transportation facilities, including roadways and mass transit services to achieve operational objectives such as improved throughput, maximized system efficiency, reduced emissions, or improved safety. ATDM is achieved through the deployment of any number of active demand management, active traffic management, or active parking management approaches.[9]

[9] Gopalakrishna, Deepak (ICF), Eva Hsu (ICF), Beverly Kuhn (TTI), Eric Schreffler (ESTC), and Lori Diggins (LDA). "Strengthening Linkages between Transportation Demand Management and Traffic Management." FHWA-HOP-

While TSM&O, also known as Active Demand Management, uses strategies to improve traffic flow, such as variable speed limits, ramp metering, dynamic shoulder use and incident management, TDM uses strategies that affect people's decisions, made before they depart for their trip, about how to travel. Examples of TDM strategies include providing ridematching for carpooling and vanpooling, encouragement and support for bicycling and walking, and a guaranteed emergency ride home program ("commuter travel insurance") for those who use transportation alternatives. Because most urban transportation planning departments emphasize alleviating peak period traffic congestion caused by commuting to work, and because employers and work site managers exercise influence over how their employees commute, TDM programs usually focus upon reaching commuters via their employers. Examples of TDM programming that is provided free to employers by dedicated and trained commuter assistance staff of TBARTA's Commute Tampa Bay program include the following.

- On [work] site support and guidance to establish worksite-based travel options program, specifically tailored to the needs of those worksite employees
- New-hire orientation guidance and materials for commute options
- Onsite education, digital marketing and promotional events about commute options
- Mapping services, including dot-density analysis of employee home zip code location for ridematching
- Emergency Ride Home program for employees who regularly use commute alternatives to single occupant vehicle travel
- Employee surveys to evaluate changes in commute characteristics and needs over time
- Telework program policy guidance and support for business continuity and resilience
- Support for vanpool formation, maintenance, and a subsidy
- Support to employees to use public transit
- Assistance to establish preferred parking for carpools and vanpools
- Assistance with establishing, training, and supporting an onsite Employee Transportation Coordinator
- Assistance to the employer to apply for national recognition as a Best Workplace for Commuters℠
- Awards and recognition to employers and their employees for using the array of commuter choices[10]

Figure 1 illustrates the expansive service reach of the Commute Tampa Bay vanpool program. The map illustrates the locations of major employers, color coded with the locations of the general origins of

18-072. June 2019. p. 6. An Active Demand Management Capability Maturity Framework Tool is available for agencies and regions to assess their level of TDM and TSM&O integration to achieve higher capabilities for managing travel demand and traffic flow. https://ops.fhwa.dot.gov/tsmoframeworktool/tool/adm/index.htm

[10] Commute Tampa Bay, Employer Outreach Services. Tampa Bay Area Regional Transit Authority. Accessed at https://tbarta.com/en/commute-tampa-bay/free-employer-support/

vanpool drivers. One vanpool to James A. Haley Veterans Hospital travels 90 miles from Ocala.[11] The Federal Transit Administration (FTA) recognizes vanpools as a form of public transportation. At over 170 vanpools (April 2020) across the region[12], this has provided cost effective public transportation service to long distance commuters, filling an existing gap in current fixed route service. As anticipated regional bus transit service cuts are contemplated by HART decision makers, vanpools can increasingly serve inter-county commuters. Reporting passenger miles traveled to the National Transit Database yields dollars back from FTA for transit service development.

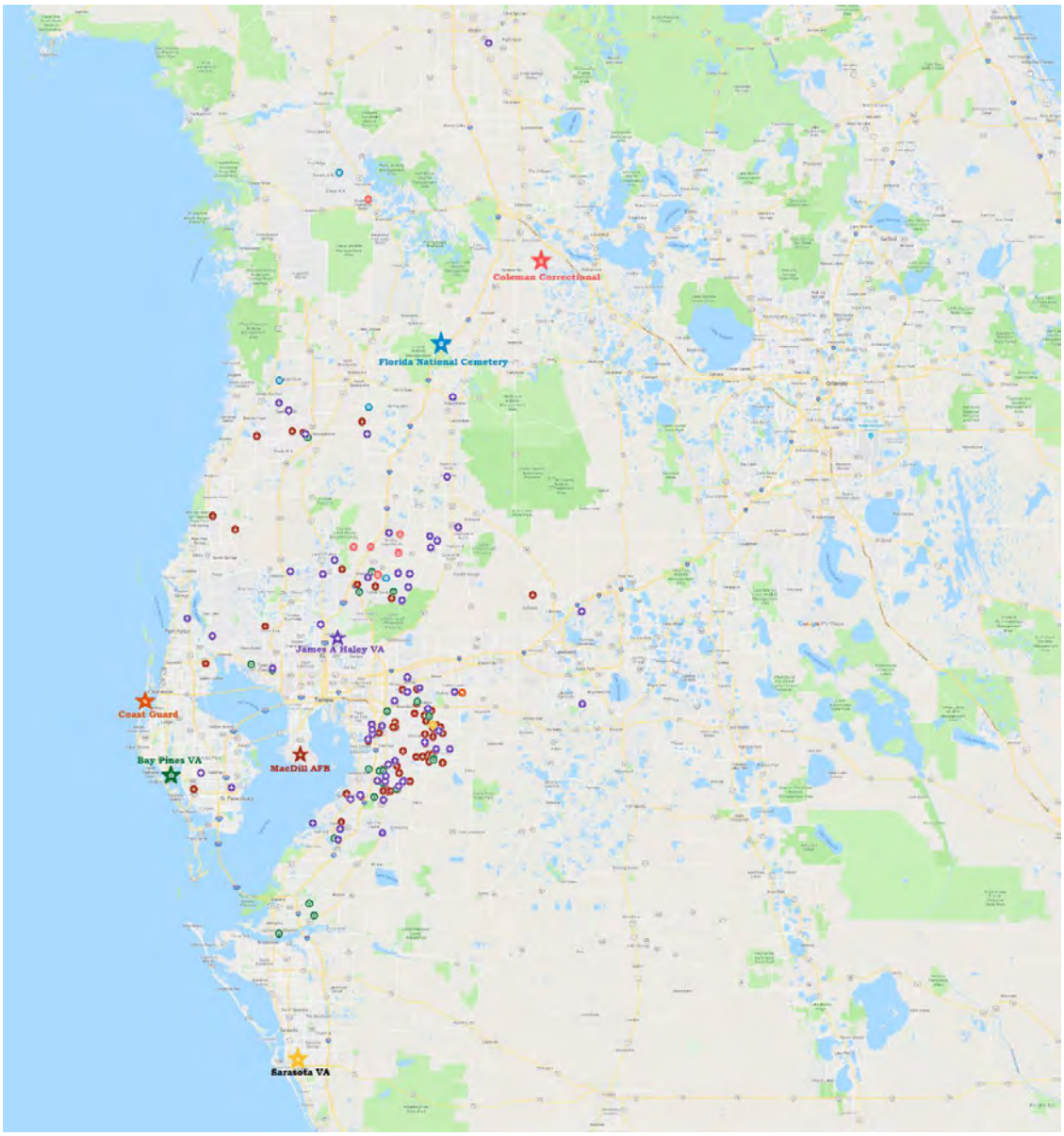

Figure 1. Commute Tampa Bay's Vanpool Program serves long distance commuters.
Source: Map courtesy of Enterprise Holdings, Inc.

[11] Arlinda Karuli, Account Executive. Commute with Enterprise. August 17, 2020.
[12] Arlinda Karuli, Account Executive. Commute with Enterprise. August 19, 2020.

The Relationship of TDM with Highway Design and Capital Improvements

The design of the highway system and the provision of particular capital improvements are critical to the provision of transportation options. For example, a network of connected bicycle and pedestrian facilities is essential for promoting bicycling and walking as safe and convenient forms of travel. Public and private partnerships in the Tampa Bay region have unified around Vision Zero to organize and plan efforts to eliminate fatal crashes and those resulting in serious injuries. This includes recognizing the important role of highway facility design and speed management in improving safety and comfort.

The establishment of the Complete Streets Policy of the Florida Department of Transportation in 2014 has been central to safe walking, bicycling, and use of public transit. Subsequent updates of FDOT manuals, including the FDOT Design Manual to be consistent with the Complete Streets Policy, addresses context sensitive design and speed management to create a safer and more comfortable environment for vulnerable roadway users.[13] FDOT District Seven has worked with regional and local partners to identify specific actions, including the installation of Leading Pedestrian Signals (LPS) in selected locations, based upon local context. It includes shortening arterial intersection signal cycle lengths to prevent high motor vehicle operating speeds and to reduce intersection wait time on side streets where bicyclists are more likely to be traveling.[14] This also has included efforts at the Hillsborough MPO level through the development and implementation of the Vision Zero Action Plan and a review of the Speed Management Action Plan.[15] Nationally, efforts are ongoing to develop better highway design, including intersection design to reduce motor vehicle turning speed and to position motorists to be able to see bicyclists and pedestrians entering the crosswalk.[16] In addition, the development of the statewide Shared Use Nonmotorized (SUN) Trail System through FDOT funding, and its connection to systems of community trails and sidepaths will provide greater opportunities for more people of different abilities to walk and bicycle safely for transportation.

The League of American Bicyclists recognized the State of Florida's achievement to be among the top 10 in the Bicycle Friendly State Ranking.

> Florida is in the top 10 for the first time since 2011. Florida had the best score in the Infrastructure & Funding category reflecting a strong statewide commitment to building bicycle infrastructure and using state and federal funds to do so. While Florida continues to suffer from

[13] FDM 202 Speed Management, 2019 FDOT Design Manual Update. https://www.fdot.gov/roadway/fdm/2019fdm.shtm

[14] Margaret Kubilins. FDOT Transportation Systems Management & Operations. "Supporting Vision Zero in District Seven." Presented in FHWA Office of Safety webinar, "State & Local Alignment Toward Zero Traffic Deaths." July 15, 2019. http://www.planhillsborough.org/hillsborough-mpo-comprehensive-approach-to-speed-management-featured-in-fhwa-webinar/

[15] Gena Torres, Executive Planner, Hillsborough MPO. "Managing Speed on Hillsborough's High Injury Network." Presented in FHWA Office of Safety webinar, "State & Local Alignment Toward Zero Traffic Deaths." July 15, 2019.

[16] National Association of City Transportation Officials (NACTO). "Don't Give Up at the Intersection: Designing All Ages and Abilities Bicycle Crossings." May 2019. https://nacto.org/wp-content/uploads/2019/05/NACTO_Dont-Give-Up-at-the-Intersection.pdf

very high rates of bicycle crashes, deaths, and serious injuries, the state DOT is the only state that has reported a goal of zero deaths to the FHWA and has committed to spend $100 million on street lighting for people biking and walking to improve safety. Leaders in Florida seem to recognize they have a crisis on their hands and are taking action to change their long-term outcomes. Another example of leadership is the state's context classification document to help implement its context-sensitive complete streets design manual.[17]

Hillsborough County is studying lowering speed limits, so that the posted maximum speed limits is the same as the target speed.[18] The potential for lowering speed limits, combined with street improvements to make the travel environment safer and more comfortable for bicyclists and pedestrians, and TDM promotion of safe bicycling and walking can be mutually supporting. As bicycle and pedestrian facilities continue to improve, the role of commuter assistance programming to encourage and promote bicycling and walking as effective and desirable transportation options will grow.

Proposed Goals for the CAPRDP

It is recommended in the development of metropolitan planning organization long range transportation plans, to develop a TDM component using proposed Goals and Guiding Principles.

Below are proposed Goals for the Tampa Bay Area Commuter Assistance Program Regional Development Plan CAPRDP.

1. Support the Regional TDP Vision Network and the TBARTA Regional Rapid Transit System.
2 Provide a comprehensive and consistent long-term approach to commuter assistance, including transportation management organizations (TMOs) to:
   - Provide individuals and employers with travel choices and support for traveling to work, school, and other destinations that meet their needs.
   - Improve the operational performance of the multimodal transportation system serving Tampa Bay by increasing vehicle occupancies and preferential treatment of higher occupancy transportation and non-motorized travel to maintain safe and reliable travel for all.
   - Foster safe and healthy communities by reducing emissions and promoting active transportation.
   - Help create economic opportunities for all by improving access to jobs and other destinations.
   - Broaden the vision for use of TDM to better serve other trip purposes than just the commute.
   - Integrate TDM as part of construction mitigation programs.

Discussion:

- Because this is a Regional Development Plan and much attention has been recently placed on the Regional TDP and TBARTA RRT, this is an opportunity to coordinate with, support, and build

[17] League of American Bicyclists. "Bicycle Friendly State 2019: State Departments of Transportation in the Era of Safe Streets." p. 12.
[18] Larry Josephson. Hillsborough County representative on the Hillsborough MPO Livable Roadways Committee. Minutes of November 20, 2019 Meeting, p. 2.

upon those efforts. To achieve community goals, the focus is on the needs of travelers. Progress may come as the result of changes in policies, introduction of technologies, and better integration of transportation options.

- The future of public transit will be a regional public transportation system. The passage of the 2018 Hillsborough Citizen Referendum to support public transit, walking, bicycling, and improved safety without adding highway capacity demonstrates public support for mobility options.
- The Commuter Assistance Program does not compete with public transit. Commuter assistance supports and complements public transit.
- The Regional TDP provides that while the realization of the Vision Network will take years, commuters need transportation services now. The Commuter Assistance Program is uniquely positioned to address service gaps now.
- MPO funding sources provide flexibility for funding commuter assistance services.

Proposed CAPRDP Guiding Principles

The following are proposed Guiding Principles for the development of a CAPRDP.

1. First, **optimize** how we use our **existing** transportation system.
2. Intensify **"high interaction" outreach** and "high touch" customer service, knowing that "high tech" by itself will not solve all our transportation problems.
3. Provide **more choices** to improve mobility for more people, recognizing that people have varying travel needs. For example, a large share of the population does not drive.
4. Take a "**Customer First**" approach, with a focus on the individual traveler experience, not just systemwide benefits (such as reducing traffic congestion).
5. Prioritize improving service for **existing customers**, because a satisfied customer is more likely to continue using the service. Existing customers define the strongest markets for CAP services and provide the most relevant feedback for continual improvement of services.
6. **Build upon** the existing effective services and programs that are already in place now.
7. **Incentivize**, don't penalize. Service improvements and incentives should be rolled out prior to the introduction of disincentives.
8. **Employers** have more control over travel choices and their consequences than they might think. For example, employers can provide work schedule flexibility to accommodate transit, provide travel options beyond free or subsidized parking, and extend telework options to more of the workforce.

Commuter Assistance Programs Promote Public Transit Service

Perhaps one of the most important actions that can be taken in the Tampa Bay area to provide citizens with travel choices that are competitive with the private passenger car, is the creation of a strong regional public transportation system. The foundation for this is the existing bus service provided by five transit agencies in the region. A comparison of Figures 2 and 3 below shows that when compared to the travel times for the drive alone commute experience, a higher proportion of commuters who use

public transit have a commute journey of one hour or longer. For example, survey data of commuters in the region, from the American Community Survey, illustrate a range of travel times, with drive alone travel time averaging about 27 minutes, but the average does not represent most motorists. The highest number of commuters who use transit travel 60 minutes of more. In combination, 18 percent of all commuters represent 40 percent of total commuting travel time. While TDM cannot improve the bus route travel time, TDM strategies can address things like providing the OneBusAway automated vehicle locator to help transit riders use their time more efficiently.

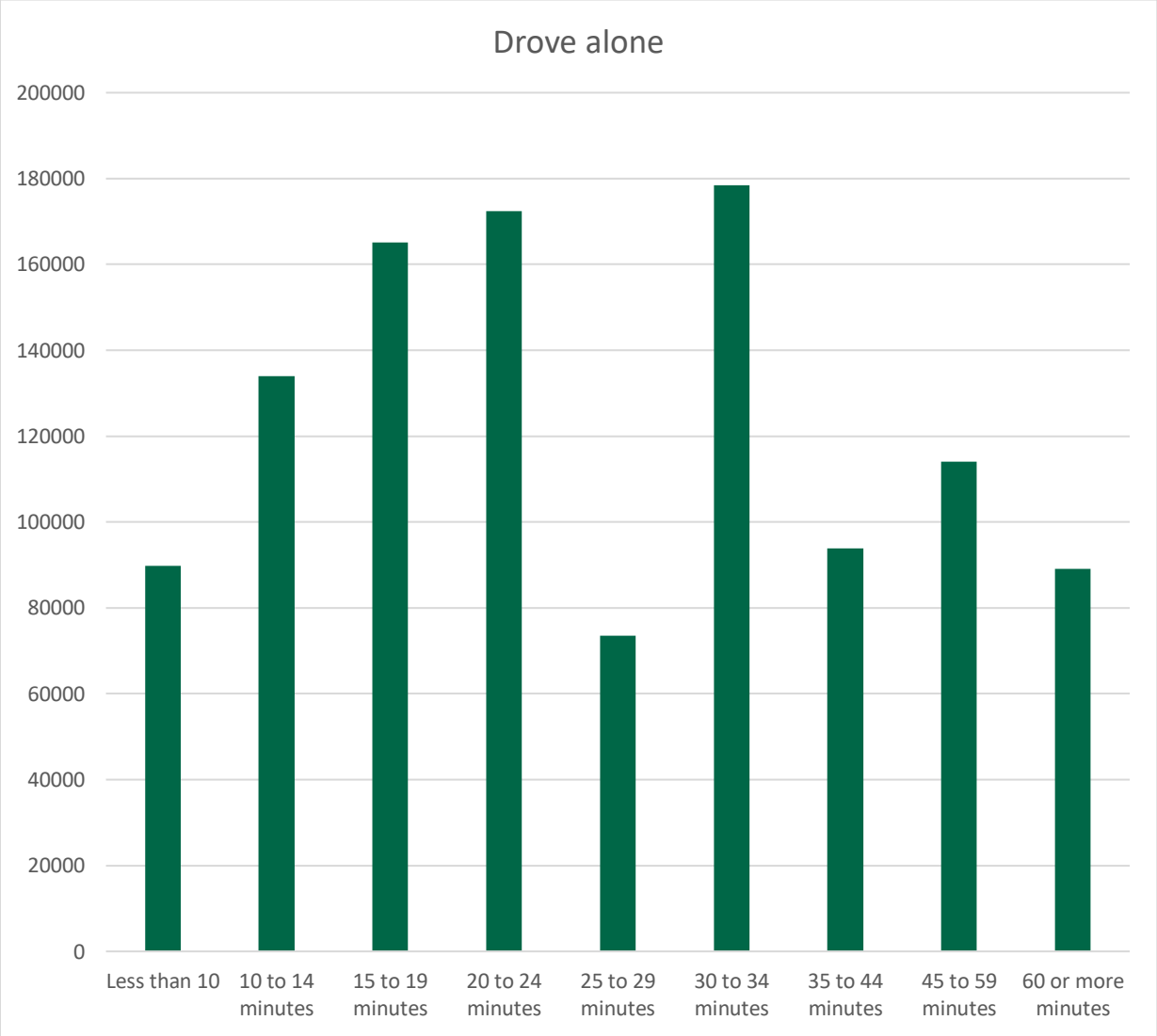

Figure 2. Travel times for the drive alone commute experience.
Source: U.S. Bureau of the Census.

Figure 3. A higher proportion of transit users have a commute journey of one hour or longer.
Source: U.S. Bureau of the Census.

Figure 4 below shows the extent of existing fixed route public transit service. While transit service regional connections are presently weak, it is recommended that short term improvements include more frequent bus service, more weekend bus service, and earlier and later bus service, along identified existing bus routes for the transit agencies in the Tampa Bay region, including HART, MCAT, PCPT, PSTA and TheBus. The emphasis should be on improving transit service for the existing transit dependent patrons. It takes less resources to maintain an existing customer than to win a new customer. Allocating resources to win new customers at the expense of existing customers may cause the transit agency to satisfy neither and to lose both.

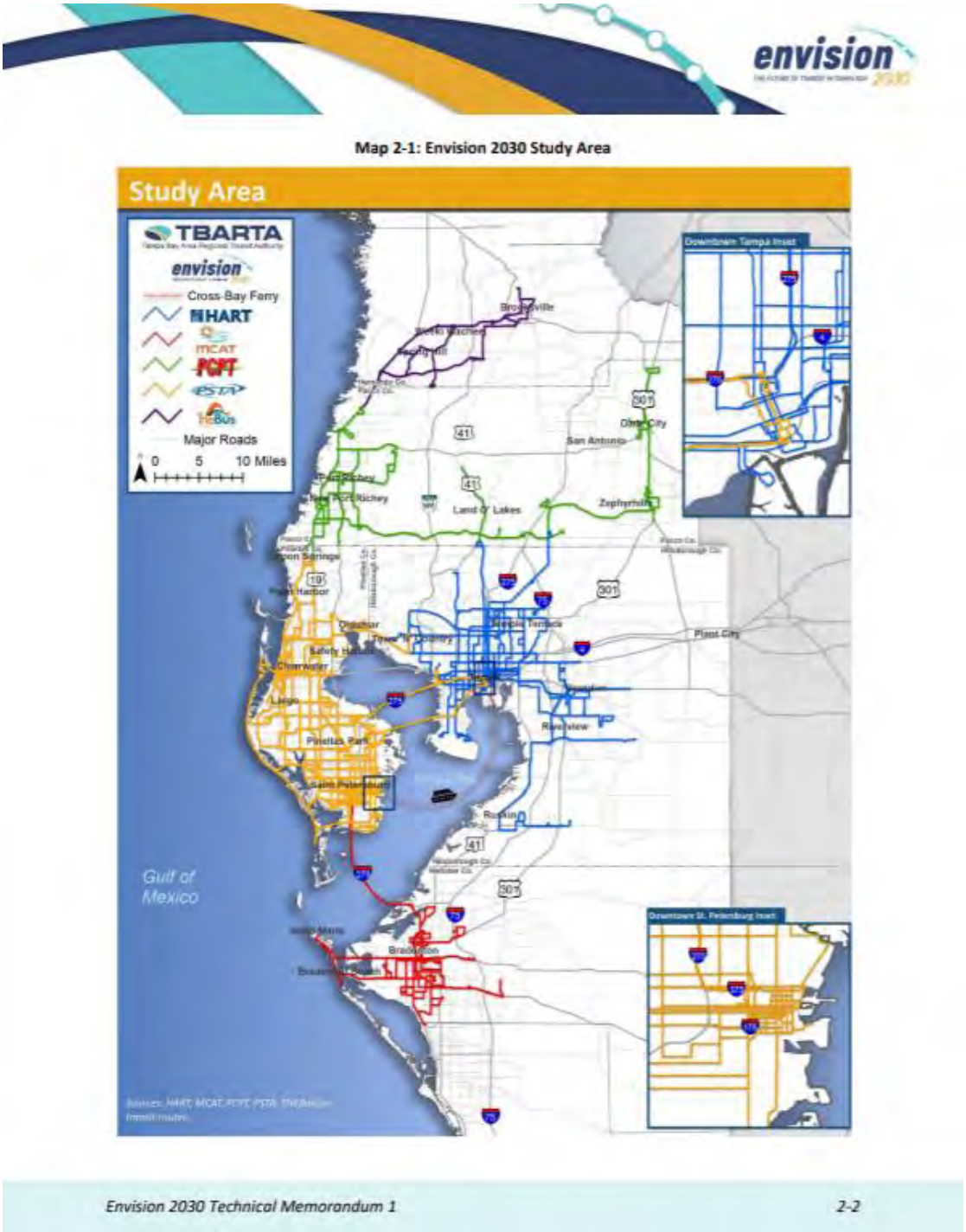

Figure 4. There are service gaps between existing transit service in the five-county area.
Source: *Envision 2030* Regional Transit Development Plan.

PSTA has done an especially good job providing flexible services to help more patrons use public transit. Its Corporate Pass program provides discounts to employers who buy bulk purchases of transit passes for their employees. PSTA also instituted its Essential Workers Program, providing curb-to-curb service using Uber, United Taxi, or Care Ride, to get essential employees to work during the pandemic and while PSTA is operating on a reduced schedule. Even prior to the pandemic, through the use of transportation network companies and taxis, PSTA has instituted several mobility management services to extend the ability of patrons to use transit service. These include Direct Connect, a discounted first mile and last mile transportation service to and from 26 designated locations in Pinellas County, which provides access to PSTA's core and frequently served routes. The TD Late Shift is a complement to the TD discounted bus pass program. It provides on-demand rides to low income riders from 10 p.m. to 6 a.m., increasing access to employment for those who lack access to transportation outside PSTA's regular service hours. Thirdly, PSTA has partnered with City of Tarpon Springs and AdventHealth North Pinellas to provide "Healthy Hop", a transportation service to medical appointments and life sustaining activities for Tarpon Springs residents traveling within the city limits.[19] These are the kinds of services that commuter assistance programs can especially promote to targeted markets.

[19] Pinellas Suncoast Transit Authority. Direct Connect. https://www.psta.net/riding-psta/direct-connect/, TD Late Shift https://www.psta.net/programs/td-transportation-disadvantaged/, Healthy Hop https://www.psta.net/programs/healthy-hop/

The Role of Commuter Assistance to Advance Regional Transit

The Tampa Bay Area Regional Transit Authority (TBARTA), the independent body that operates the Commute Tampa Bay regional commuter assistance program, has undertaken the development of the first regional transit development plan for the Tampa Bay area.[20]

Named *Envision 2030*, its primary focus has been identifying and prioritizing the creation of regional transit service connectivity among the activity centers in the region. These activity centers include downtown St. Petersburg, Clearwater, the Gateway area, Westshore and Tampa International Airport, downtown Tampa, Ybor City, and the area surrounding the University of South Florida, Tampa Campus.

The Commute Tampa Bay commuter assistance program is spatially compatible with the TBARTA regional transit service area and with the FDOT District Seven service area. Four of the activity centers listed above also are the service areas for transportation management organizations (TMO). These include the Tampa Downtown Partnership, the St. Petersburg Downtown Partnership, Westshore Alliance, and New North Transportation Alliance. A fifth TMO is under development in the Gateway area of Pinellas County. TMOs promote commuter assistance services and are discussed later in this report. Many commute trips cross county lines, making them "regional trips". While the regional public transportation system in the Tampa Bay area begins to form, the commuter assistance programming can help backstop fixed route public transit service gaps, both spatially and temporally. Commuter assistance can serve those who may eventually become the market for regional public transit service.

The CAPRDP is in alignment with the individual Transit Development Plans for the public transit systems serving Hillsborough, Pasco, and Pinellas Counties and the forthcoming *Envision 2030* Regional TDP. The CAPRDP defines commuter markets, develops alternative packages of TDM actions with associated budgets and potential funding sources, and proposes a systematic monitoring and evaluation program for the commuter assistance activities.

Provided below is a summary of findings reported in the *Envision 2030* Technical Memoranda 1 through 4, which are particularly relevant to a discussion about commuter assistance. The discussion below aligns commuter assistance support provided by Commute Tampa Bay and the TMOs, with the findings of the *Envision 2030* Regional TDP.

Envision 2030 Baseline Conditions, Technical Memorandum 1

Comparative population data were reviewed for growth trends from the year 2000 to 2018. The data show that for Hillsborough and Manatee Counties, rates of growth were higher in the unincorporated areas. The region overall experienced a 30 percent increase in population. The region's population is expected to increase by 43 percent to more than 4.65 million residents by 2045. Household income

[20] Technical memoranda for the preparation of the regional transit development plan can be accessed at https://www.tbarta.com/en/planning-programs/envision-2030/

statistics indicate that approximately 24 percent of households earn less than $25,000 per year. With regard to commute mode in the Tampa Bay region, a comparison of the years 2000 and 2017 showed that driving alone stayed almost the same at close to 80 percent, carpooling fell from 12.5 percent to 8.5 percent, walking and "other means" rose slightly, from 3.4 percent to 3.6 percent, use of public transit stayed the same at 1.3 percent, and working from home rose from 3.2 percent to 6.6 percent. Twenty percent use alternative commute modes. For the region, 71 percent of transit customers are from households with annual incomes under $25,000, while 33 percent of drive alone commuters are from households with annual incomes under $25,000. Thirty percent of transit commuters are from zero car households.[21]

Commuter assistance organizations take note that unincorporated areas are generally less served by public transit, as shown by the map in Figure 4 where existing transit provides service. This leaves many unserved communities that could benefit from commuter assistance. Twenty percent use alternative commute modes. One-third of low-income households spend their limited resources on a car. During the COVID-19 pandemic, and in its aftermath, the Tampa Bay area and the nation will be reeling economically from the effects of the necessary imposed stay-at-home and social distancing orders. It is unclear how quickly and how well the economy and the financial stability of individual households will recover; however, it is safe to assume that even more people than those represented by the above statistics will be balancing household budgets more carefully.

Shortly after the pandemic arrived, schools shifted to remote instruction and many employees began working remotely. INRIX data had shown a 30 percent drop-off in daily traffic nationwide, according to figures for the week of March 14-20, 2020, as compared to the month prior.[22] Most of those who can continue to work or study remotely are now doing so from home. Also referred to as telecommuting, this essential tool is included in the commuter assistance toolbox, as it eliminates the need to travel to work. While the Bureau of the Census measures "working from home" as having risen to 6.6 percent from 3.2 percent during normal times, this is a conservative figure. "Work from home" is defined as how a worker usually made the journey to work in the week prior to participating in the Census. "Usually" means three or more days per week but available sources indicate that many telecommute one or two day per week. This means that the Census does not capture those teleworkers. For example, a review of over 265,000 commuter records comprising the State of Washington Commute Trip Reduction (CTR) survey data document that pre-COVID 36 percent of commuters actually participate in telecommuting on at least an occasional basis, about 11 percent telecommute at least once per week compared to only three percent that reported teleworking at least three days per week. The flexibility to telework provides benefits to the employer, the telecommuting employee, and motor vehicle trip reduction to the community.

It is not known what the lasting impact from COVID-19 disruption will have on future commuting characteristics. However, principles from the field of behavioral economics provide that people are

[21] Tindale Oliver. "Envision 2030: The Future of Transit in Tampa Bay." Regional Transit Development Plan. Technical Memorandum 1. Baseline Conditions. Final. Prepared for TBARTA. June 2019.
[22] "INRIX United States National Traffic Volume Synopsis #1." Rick Schuman, VP, Public Sector Americas, March 23, 2020.

more likely to try a new behavior at a time when their normal routine has been disrupted, such as when someone moves to a new home, or finds a new job. An opportunity may exist in the Tampa Bay region if the increased number of teleworking days by employees has indicated positive outcomes for both employer and employee. Commute Tampa Bay and the region's TMOs can encourage employers of teleworkers to continue to allow their teleworking employees to retain some greater number of days per week teleworking than they previously used prior to the pandemic. Such encouragement includes making information and training available to help employees and managers alike to optimize productivity and reap the most benefits from teleworking.

Envision 2030 Transit Performance, Technical Memorandum 2

Technical Memorandum 2 described existing transit services in the Tampa Bay region and compared them to peer transit agencies. While the region grew during the last five years, transit passenger trips and passenger miles traveled declined. This is a nationwide trend that might be explained by several factors including the popularity of transportation network companies, a healthy economy with low unemployment (pre-COVID-19), and the increase in telecommuting. However, as the region grows after recovery from the pandemic, the transit agencies will likely be focused upon service expansion, making use of new technologies.[23]

The commuter assistance response is that TDM strategies also leverage emerging technologies to improve transportation services, cost effectively. For example, some commuter assistance programs are using transportation network companies (TNC) as an allowable alternative for emergency ride home programs for transit riders, carpoolers, and vanpoolers who encounter the need to leave work early due to a personal emergency.

In 2019, TBARTA acquired use of the Agile Mile® platform, a cloud-based TDM platform with web, iOS, and Android apps. Figure 5 illustrates the Agile Mile® mobile app. It promotes reducing driving while improving mobility through providing ridematching, trip tracking, trip planning, vanpool matching and management. Agile Mile® integrates the Emergency Ride Home program into its rewards and can issue messages about special events for community engagement, polling, and metrics reporting. The commuter assistance programs in FDOT District 5 (reThink Your Commute) and District 1 (Commute Connector) also use Agile Mile®.[24] This means that for the growing number of commuters who travel long distances to neighboring regions for work opportunities, Agile Mile® delivers a seamless commuter assistance experience.

[23] Tindale Oliver. "Envision 2030: The Future of Transit in Tampa Bay." Regional Transit Development Plan. Technical Memorandum 2. Transit Performance Evaluation. Final. Prepared for TBARTA. September 24, 2019.
[24] Agile Mile platform. https://agilemile.com/

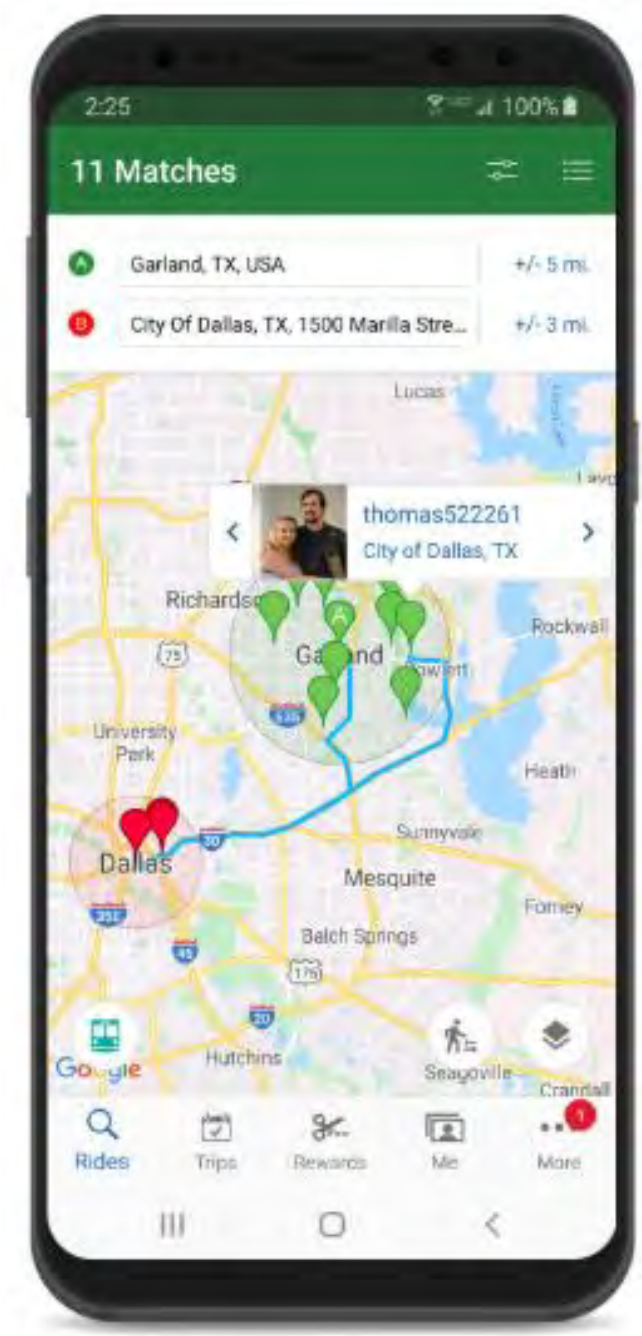

Figure 5. The Agile Mile mobile app enables commuters to find carpool partners.
Source: Agile Mile®. https://agilemile.com/

Envision 2030 Regional Mobility, Technical Memorandum 3

Technical Memorandum 3 identified transit supportive geographic areas within the Tampa Bay region, presented ridership forecasts, identified regional transit needs and developed a prioritized list of mobility improvements. The 2030 Regional Transit Vision includes the three-county area to be served by the Regional Rapid Transit. These are Pasco, Pinellas, and Hillsborough Counties, as well as Hernando and Manatee Counties.

The study applied a Density Threshold Assessment (DTA) to see what areas could support transit service investment. Bulleted lists of locations within each county were identified and mapped as meeting the medium and high employment thresholds to support transit. Such areas could potentially be where discretionary riders, sometimes referred to as "choice" riders, may be located. Most areas that meet the range of residential density and employment intensity thresholds for supporting transit are already accessed by a local transit route, with the exceptions of Plant City, Brandon, and parts of unincorporated Manatee County. A Transit Orientation Index (TOI) also was applied to determine locations where traditional riders, sometimes referred to as "captive riders", are located. Traditional riders are defined as the elderly, youth, low-income persons and those in zero-car households. Areas with high and very high TOI were listed and many but not all areas are accessed by a local transit route.

Regional inter-county commute flows were documented. Nearly 45,000 workers who live in Pinellas County commute to Hillsborough County. Nearly 54,000 Pasco County residents commute to Hillsborough County and another 27,500 Pasco County residents commute to other counties. Approximately 36,000 residents of Hillsborough County commute to Pinellas County. Furthermore, another 41,000 people commute into the TBARTA service area from counties beyond, including Sarasota, Polk, Orange, Lake, Sumter, Citrus, and other counties.

Envision 2030 developed a Regional Transit Vision Network to serve inter-county travel, and to serve travel to and around major activity centers, particularly for commuters. The Vision Network identified that Regional Transportation Disadvantaged Services and Commuter Services also are needed. Recommendations for short term improvements are those that can be done within the next two to five years with lower cost. These included improving existing transit by service frequency, duration, weekend service, and to emphasize service to existing customers, including senior citizens, youth, low-income and zero car households and transportation disadvantaged persons. Longer term improvements also were identified and prioritized. These are higher investment improvements that will take longer to implement beyond the existing transit service areas. These included recommendations for premium BRT, express bus, ferry, rail, local rapid transit, and streetcar. The Vision Network includes recommendations for transit technology improvements, including transit signal priority, variable message signs near park and ride facilities displaying travel times to major activity centers using dedicated transit lanes. Other recommended transit technology improvements include mobile apps, on-demand transit service, and Automated, Connected, Electric, and Shared (ACES) vehicles. The Vision Network includes a seamless transfer experience, simplified fare payments, improved wayfinding, and a unified regional brand. [25]

It is recommended that local governments prioritize areas identified through the Density Threshold Assessment (DTA) and the Transit Orientation Index (TOI) in their capital improvements programs and in the FDOT District Seven Adopted Work Program for bicycle and pedestrian infrastructure to support bicycle-friendly and pedestrian-oriented development patterns in advance of transit infrastructure.

It is recommended that local government partners adopt land development policies to concentrate population and employment in activity centers or along corridors where public transit can serve them.

[25] Tindale Oliver. "Envision 2030: The Future of Transit in Tampa Bay." Regional Transit Development Plan. Technical Memorandum 3. Regional Mobility Needs. Final. Prepared for TBARTA. March, 2020.

Furthermore, land development regulations supporting transit-oriented development (TOD) should be promoted.

A high number of inter-county commutes, many of which are likely longer distance than the average commute distance, may constitute a sizable market for vanpooling, carpooling, and alternative work arrangements (telework, compressed work week, flexible work hours).

It is recommended that FDOT dedicate transit lanes established by Regional Rapid Transit Vision Network, to also allow carpools and vanpools to maximize person throughput and address equity concerns.

Especially as it relates to a large five-county service area, while regional transit services are being planned, funded and implemented, carpooling and vanpooling are effective long-distance commute options that already exist and can be promoted today. Furthermore, TBARTA can already demonstrate the value of its Commute by Enterprise Vanpool Program. Presently, federal formula funding is increased due to the vanpool program to help support continued investment. Employers also can provide tax free subsidies up to $270 per month per employee for riding in a vanpool or on transit.

It is recommended that local governments should consider the locations identified to be medium and high employment intensity as candidate areas for parking management strategies to encourage further development intensities and incentivize employees in those areas to use transit.

Areas with a high Transit Orientation Index also should be candidates for neighborhood-based travel planning services, as currently underway by SHIFT Tampa Bay in three neighborhoods in Hillsborough County. The aim of SHIFT Tampa Bay is to provide personalized travel assistance to encourage households to try alternative ways to commute. SHIFT Tampa Bay partners with Commute Tampa Bay's Agile Mile® program and local businesses to help households get rewards for their travel behavior changes.[26]

While longer term regional transit service will require high investment and take years to implement, commuter assistance programs, services, information, partnerships, and supporting incentivization can step in to serve underserved areas and help fill the gaps now at relatively low cost.

Envision 2030 Situation Appraisal, Technical Memorandum 4

Regarding socioeconomic trends, the *Envision 2030* Situation Appraisal reported that significant growth is projected to occur over the next ten years, particularly in the more rural counties. This will lead to inefficiencies in transit service delivery if innovative changes to transit in the region are not made. Transportation choices and flexibility are desired and needed by Millennials, the aging adult population, tourists, and transportation disadvantaged persons. Regarding travel behavior and commuting trends, 20 percent of the region's population commute to work in another county other than the one in which they live.

[26] SHIFT Tamp Bay. http://www.shifttampabay.org

Community feedback collected as part of *Envision 2030* provided that the number one reason cited by non-riders for not using transit was that it does not go where they need it to go. Regional transit service needs to be integrated with existing local systems to provide a seamless, convenient experience.

Based on an assessment of land use policy, the *Envision 2030* TDP recommends that TBARTA focus on implementing service improvements to the most productive regional routes in terms of ridership, which typically occur in mixed-use and downtown areas with more commercial activity.

Regarding funding, TBARTA revenues are primarily from Federal and State funding sources to support regional transit planning as well as to provide commuter services. With the completion of the *Envision 2030* TDP, TBARTA will be eligible to receive Public Transit Block Grant funds from FDOT. TBARTA's FY 2020 operating budget is $7.5 million and its capital budget is $139,000. TBARTA is at a juncture regarding whether a consensus is reached to expand its services to provide fixed route transit.

Regarding current transit operations, TBARTA presently provides commuter services in the form of the regional vanpool program, Emergency Ride Home, carpool, vanpool and bikepool ride matching, a school pool program, information services relating to the location of park-and-ride facilities and offers telework support. TBARTA coordinates planning with the five transit agencies in its service area.[27]

From the perspective of commuter assistance, we know there are shifting demographics, and some expected growth in the unincorporated areas. This means different travel markets with different needs. TDM strategies for commuter assistance are developed to serve and target specifically defined travel markets with greater flexibility than fixed route public transit service can deliver. TDM strategies also can target existing and potential transit riders to bolster local transit use and provide commuter services in the years before the regional fixed route transit service is implemented.

Regional Rapid Transit Catalyst Project

A report prepared by Jacobs consulting firm for HART identified a "catalyst" transit project among several candidates that were evaluated using FTA criteria. The top project to emerge was a 40+-mile rubber tire service that would operate on dedicated shoulders (bus rapid transit) within the FDOT Interstate modernization plans for I-275, from downtown St. Petersburg to Wesley Chapel. The concept would connect to the Tampa International airport, be constructed within the existing Interstate footprint, and would not remove existing vehicle travel lanes. Going forward, the catalyst project is now referred to as Regional Rapid Transit. This is a critical component of the *Envision 2030* Regional Transit Vision, which is planned to jump start the development of a regional public transportation system by providing all-day inter-county service that is quick, safe, reliable, and frequent. Next steps were identified as a NEPA (National Environmental Policy Act) review and preliminary engineering.[28]

[27] Tindale Oliver. "Envision 2030: The Future of Transit in Tampa Bay." Regional Transit Development Plan. Technical Memorandum 4. Situation Appraisal. Final. Prepared for TBARTA. March 2019.
[28] Jacobs. "Regional Transit Feasibility Plan: A Route Map to Implementation." Final Report. Prepared for Hillsborough Area Regional Transit Authority. November 2018. https://tbarta.com/media/1170/regional-transit-feasibility-plan.pdf

The Regional Rapid Transit project is now underway as a PD&E study, to further define the service. Intermodal hubs will serve as park-and-ride lots. A series of public charrettes took place in Spring 2020 for conceptual station design and amenities.

From the perspective of TDM, parking management can prevent overbuilding parking, incentivize transit use, and support TOD. This observation also holds for HART's Bus Rapid Transit (BRT) study connecting downtown Tampa with the USF area. Parking management is strengthened by Complete Streets access to the transit stations, dynamic parking pricing to move traffic out of the peak period and to better balance the numbers of riders on the buses. Parking management also means preferential parking for carpools and vanpools.

TDM's Role in Use of Emerging Technologies

Special attention has been placed in the CAPRDP on the opportunities for CAPs and transit agencies in using emerging technologies to improve the return on investment in transportation. These emerging technologies and business models will continue to result in the diversification of mode choice in the Tampa Bay area, such as bus rapid transit (BRT), connected vehicles and autonomous vehicles, transportation network companies (TNC), streetcar, escooters, ebikes, carshare, and bikeshare. Some emerging technologies are already being applied in the Tampa Bay area. Vehicle occupancy detection technology can now enable inexpensive enforcement of HOV lanes, to deliver a faster commute by carpool, vanpool, and public transit.

Tampa Bay Smart Cities Alliance

It has been clear to the public and private transportation partners in the Tampa Bay area, that reaping the full benefits of emerging technologies will require collaboration and integration of efforts across multiple disciplines. These disciplines include transportation, energy, health, and others. A Memorandum of Understanding between the University of South Florida and the City of Tampa created the Tampa Bay Smart Cities Alliance (TBSCA) in March 2018. TBSCA is a member of MetroLab Network, comprised of over 35 city-university partnerships. Working with partners including FDOT District Seven, the MPOs, the transit agencies, the local governments of the region, and the private sector, the TBSCA is pursuing the development of a shared transportation data platform and analytical tool. Many data sets from the federal government and private sources are available and provide expanded analysis capabilities, such as federal work zone data exchange (WZDx). TBSCA efforts include encouraging the adoption of shared data formats and file structures, a data dictionary, eliminating data collection duplication, and tackling data privacy protection issues.

New real-time data sources based upon location tracking, such as INRIX and StreetLight, provide insight into trip origins, trip destinations, and travel routes. Such data enable analysis of the relationship between travel speeds and crashes, and the magnitude of travel by time period for more responsive traffic operations planning, such as signal system synchronization. Ultimately, the TBSCA aims to incorporate new data sources into better travel demand modeling for predicting future conditions and

testing different transportation investment scenarios for impacts on various performance metrics, such as the Travel Time Index.

Such outcomes can inform the Congestion Management Process, the prioritization of projects in local government Capital Improvement Programs, and the MPO Transportation Improvement Program. A recent activity has included an identification of the "20 most miserable commutes" based upon calculation of travel times among activity centers, the results of which could be used in the highway project prioritization process. Such information also could be inputs to bus service planning. Should bus rapid transit be considered for serving these commute corridors?

While commuter assistance promotes the use of alternative modes of travel, such promotion also can be more successful as the travel time required for different modes, such as bus travel, becomes competitive with private passenger car. As illustrated by the comparison of Figures 2 and 3 above, commute travel time by bus passengers is generally much longer than by private passenger car. If the 20 most miserable commutes also included commuters who use bus service, taking into consideration the time required to access the bus stop, wait for the bus, make the necessary route transfers, and travel from the destination bus stop to the final destination, then the 20 most miserable commutes might not be only for drivers and riders of private passenger cars. Investment in the public transportation system to narrow the gap in commute times by mode would provide competitive modal choices, attract more commuters to public transit, and make better use of the existing highway capacity.

CAPs Support Traffic Management During Highway Reconstruction

TDM and the CAPs can play a role in emerging technologies. For example, in other regions across the nation, CAPs provide an interface between Traffic Management Centers and the public, communicating to the public the issues relating to transportation planning and construction, such as detours, as well as available transportation services during highway reconstruction projects. FDOT District Seven is planning a multi-year reconstruction of I-275 through west Tampa, including the Howard Frankland Bridge and the interchange of I-275 at SR 60. Known as SafeTRIP, FDOT District Seven plans to apply the TDM strategy of telework to play a role in traffic mitigation during lane closures. Information and communications technologies (ICT) are at the heart of telework. During the lockdown of various sectors of the economy because of the pandemic, telework demonstrated its potential. Commuter assistance program efforts to engage the Westshore business community using Best Workplaces for Commuters Telework Certificate can promote the continued use of telework.

CAPs Communicate and Promote Travel Options

Another example of an emerging technology is Mobility-as-a-Service (MaaS) mobile apps, such as Rideflag, Carma, Moovit, and Waze that display and suggest transportation service alternatives based on the user's enabled location. The City of Tampa is pursuing the implementation of a Mobility-as-a Service (Maas) pilot, which is one of the action themes of the TBSCA. MaaS capabilities are rapidly developing in the technology world. MaaS apps could display information about public transit services across the region, with integrated fare payment, real time automated bus location information (e.g.

OneBusAway), trip planning capabilities, dynamic (real time) ridematching, location of park-and-ride lots, and availability of transportation network companies (TNC). The same MaaS app also could provide information about available carshare, bikeshare and other first mile/last mile microtransit services, and parking guidance systems. MaaS apps could integrate work zone data to reroute travelers away from highway reconstruction traffic delays. MaaS apps also could display the location of bicycle parking and incentivize use of travel options using gamification, among many other potential features. The goal of MaaS is to enable travelers to choose the best option for a seamless travel experience. If the modes and travel options are developed and operated to deliver competitive travel times, cost savings, and convenience, then other modes beside private passenger car are more likely to be selected by more people. For example, a trip of four blocks in length should be well served with a Complete Street: sidewalks, pedestrian signals and crosswalks, bike share, escooter, bike lanes, and bike parking. However, a car driver may be unaware of MaaS apps. The CAP/TMOs raise awareness about the availability of MaaS apps and how to use them.

CAPs Develop Incentives to Use Travel Options

Vehicle occupancy detection technology, also deployed in mobile apps, can deliver rewards, such as preferred parking and discounts to verified carpools/vanpools. It may also enable the effective use of HOV lanes without expensive enforcement. For example, RideFlag Technologies, Inc. vehicle occupancy detection capabilities are being used now on express lanes in San Francisco to ensure that commuters who share the ride in an HOV receive the full benefit of the unimpeded travel lane. The RideFlag app also is being piloted now in the USF area by the New North Transportation Alliance to test the delivery of daily digital parking permits provided in preferential locations to people who travel to the USF Tampa Campus by carpool. This reward system uses the RideFlag vehicle occupancy detection to verify that users of the app are traveling in a carpool and receive preferential parking.

While the development of apps and other technologies show great promise, bringing these capabilities to the customer and encouraging their use is often a missing link. Many commuters lack awareness of new service availability. Commuter assistance staff deliver awareness campaigns through a variety of outlets, and provide “Try-It” incentives, tutorials or training opportunities. One-on-one customized assistance, answering questions, and providing encouragement enables first-time customers to successfully try new services.

CAPs Deliver Safety Messaging

Another action theme of the TBSCA is Reimagining Infrastructure. The FDOT District Seven Mobility Innovation & Transportation Technology Team is investigating safety improvements using video analytics that capture the interaction of motorists, pedestrians, and bicyclists. More is known about crashes that have already happened, but little is known about “near misses” that could lend insight into how to reduce actual crashes. FDOT is developing a scope for a project to observe up to ten intersections to find near misses to help FDOT develop safety countermeasures. These could include innovations in intersection and street design. CAPs also can contribute to these efforts by translating

the findings from "near miss" analyses into public messaging, information campaigns, and safety education products and services for a variety of audiences.

Community Characteristics that Influence Travel Behavior

To consider how best to plan for transportation services in the Tampa Bay area, it is useful to start with estimates of future population growth. Table 3 provides estimates of future population growth. The Bureau of Economic and Business Research (BEBR) estimated that Hillsborough County's population in 2019 was 1,444,870. The medium population projection to 2030 is 1,721,600. That is an increase of 276,730 persons, or a 16 percent increase in Hillsborough County population over the next ten years. Similarly, Pasco County is projected to grow by almost 16 percent over the next 10 years, from 527,122 to 626,800, according to the medium population projection. Pinellas County's population, which is largely built out, is projected to grow by 5.6 percent in the next ten years, from 978,045 to 1,035,600, according to the medium projection.[29] Overall, these projected increases in population across the region will place more pressure upon the transportation system.

Table 3. Estimates of Future Population Growth

County	2019 Population	2030 Population Medium Estimate	Potential increase from 2019	Potential percentage increase from 2019
Hillsborough	1,444,870	1,721,600	276,730	16.1
Pasco	527,122	626,800	99,678	16.0
Pinellas	987,045	1,035,600	48,555	5.6

Source: Bureau of Economic and Business Research, University of Florida, Gainesville.

Regional Commute Mode Share is Shifting

Technical Memorandum 1 discussed travel trends nationwide, Florida statewide, and in the Tampa Bay area. The main points of that discussion are briefly summarized here. Technical Memorandum 1 presented tables of comparisons of mode share from the American Community Survey for the commute to work across the years 2013-2017 for the Tampa-St. Petersburg-Clearwater Metropolitan Statistical Area (MSA) as well as those for the individual counties of Hillsborough, Pasco and Pinellas. That four-year period showed small but significant changes in commuting for residents of the MSA, including a small but significant decrease in driving alone by car, truck or van, from 81.5 percent to 79.1 percent. The next highest mode shares were carpooling by car, truck or van at 8.8 percent and working at home at 7.4 percent. Working at home has been gaining mode share, even prior to the pandemic.

Public Transit Access to Jobs

Use of public transportation (excluding taxicab), walking and other means including bicycling, all indicated less than three percent mode share each, regionally and by county. This can partly be explained by decentralized and lower density land use patterns that separate residential development from other land uses. Tampa ranks #38 nationally for transit access to 52,728 jobs within 60 minutes.

[29] Bureau of Economics and Business Research. January 2020. "Projections of Florida Population by County, 2020-2045, with Estimates for 2019." Volume 53, Bulletin 186. University of Florida.

This accounts for four percent of the total number of jobs in Tampa.[30] There were fewer U.S. households that had zero vehicles in 2013 than in 2017, and this decrease is seen as well in Florida. Car availability in the Florida household is the single biggest factor that affects transit ridership.[31] The availability of TNCs also is suspected of drawing away some transit ridership. Pinellas County showed a small but significant increase in walking from 2013 to 2017.[32]

Nationally there has been an increase in annual VMT per capita from 8,800 in 1992 to 9,900 in 2018; however, there was an eight-year slump in VMT that coincided with the economic recession that began in 2008. In Florida, carpooling declined from approximately 11 percent in 2005 to 9.1 percent in 2017. While carpooling did not significantly decrease in the Tampa Bay region, its share, at 8.8 percent is less than that statewide.

Impact of COVID-19 on Travel Behavior

In a discussion of regional TDM and commuter assistance planning, it is useful to observe the degree to which travel behavior is flexible. Travel trends during the pandemic have been instructive. With the spread of COVID-19 in early 2020, there was a noticeable drop in motor vehicle traffic nationwide.[33] By mid-March, schools and the Florida State University System, as well as other institutions and businesses were rapidly transitioning to online instruction and remote work operations for those occupations that could do so. Florida Governor DeSantis issued a State of Emergency on April 1, 2020, in response to the rapid increase in the number of persons testing positive for COVID-19 in March.

Public Transit Travel Restrictions

Public transit service, such as that offered by Pinellas Suncoast Transit Authority (PSTA) started to operate on a reduced schedule with limited numbers of passengers allowed on the buses. Some services, such as the St. Pete Looper Trolley, closed altogether. Pasco County Public Transit (PCPT) temporarily stopped some routes to enable greater service frequencies on key routes to offset the cap on the number of riders per bus. Fares were temporarily suspended to allow passengers to board the bus using the back door to maintain social distancing. Hillsborough Area Regional Transit (HART) went to a Sunday service schedule and requested that passengers ride the bus for essential travel only. Hernando County Transit Services (TheBus) also reduced its service schedule.

For a brief period, a curfew in Hillsborough County was imposed to enforce sheltering in place and limiting travel to only essential trips.

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[30] American Community Survey data as analyzed by CUTR and presented by Steven Polzin. "Understanding Florida Transit Ridership Declines and How We Can Respond." CUTR Webinar. November 8, 2018.
[31] American Community Survey data as analyzed by CUTR and presented by Steven Polzin. "Understanding Florida Transit Ridership Declines and How We Can Respond." CUTR Webinar. November 8, 2018.
[32] American Community Survey 1-Year Estimates, 2017. Table CP03. Data compiled by Best Workplaces for Commuters at USF Center for Urban Transportation Research.
[33] Stuart A. Thompson, Yaryna Serkez, and Lora Kelley. "How has your state reacted to social distancing?" The New York Times. March 23, 2020. https://www.nytimes.com/interactive/2020/03/23/opinion/coronavirus-economy-recession.html

The pandemic has affected Tampa Bay area vanpools operated by Commute by Enterprise. As of May 12, 2020, thirteen vanpools temporarily stopped operating until at least June. Most of the existing vanpool riders are essential employees who must continue to commute to the work site. The Veterans Administration hospitals have enforced single occupant use for vanpools. Enterprise has offered larger vehicles such as 15 passenger vans at no additional cost to comply with social distancing. Enterprise is paying seat subsidies to cover the cost of vanpools.[34]

Uncertainty Confounds Travel Forecasting

On May 4, 2020 Phase I of the Governor's "Safe. Smart. Step-by-Step. Plan" began the re-opening of the State, except for Miami-Dade, Broward, and Palm Beach Counties. A gradual return of certain activities has been allowed to resume while maintaining social distancing. The re-opening continues and there is a concurrent gradual increase in travel activity. Because conditions are changing rapidly, the effects of COVID-19 on travel behavior in the short term are likely changing from day to day. Due to the uncertainty of the spread of the pandemic, policy makers, businesses, and institutions will be required to change plans as more facts become known and as conditions change. There remain many unknowns relating to the behavior of COVID-19, the seasonal effects on its spread, and the time involved in putting widespread testing in place. Uncertainties also remain about the lead time involved in the development and distribution of a vaccine, and the time involved in the development of "herd immunity" across the population. As a result, some experts are anticipating that the effects of the pandemic on normal life and business activity may last for two years or longer. This will change how and when people travel.

Unemployment Decreases Travel

In addition, the Safer-at-Home order has resulted in secondary effects, including a massive spike in unemployment approaching levels not seen since the Great Depression. This has resulted in subsequent further decreases in travel. The possibility of an economic recession may prolong the recovery time before the daily activities of life and employment fully return to Florida and the Tampa Bay area. Spokespersons for various sectors of society speculate that society will return to a "new normal" that is not yet defined. This new normal is anticipated to also affect travel behavior. Because the magnitude of this pandemic experience has no comparison in modern times, travel demand modelling of this new normal lacks empirical data.

Reduced Government Revenues Affect Transportation

Results of the COVID-19 crisis also are anticipated to force reconsideration of government budgets at the federal, state and local levels, with the possibility of altered funding allocations and altered timelines for programs, services, and capital improvements, including in the transportation sector. Economic ripple effects will likely impact the pace of land development. It also may affect future urban design as social distancing might need to be added to the considerations for both indoor and outdoor public spaces.

[34] Arlinda Karuli. Account Executive. Commute with Enterprise. Email communication. May 12, 2020.

Social Distancing Impact on Public Transit Ridership

Ongoing discussions among public transit professionals include concerns about the long-term effects of the pandemic upon public transit ridership, as current public health precautions warn against being in closed spaces among other people. This also describes the in-vehicle environment of public buses and vanpools.[35] Despite the risks, it also is recognized that public transit has played a critical role during the pandemic, to transport essential workers. The American Public Transportation Association (APTA) has issued guidance to address public transit operations as the economy reopens.[36] The Centers for Disease Control and Prevention (CDC) initially issued guidance recommending that all commuters drive alone to work. Upon recognizing that this recommendation is impractical for many people, the CDC issued updated guidance with recommendations for protecting oneself while using public transportation, ridesharing, and micro-mobility.[37] The international Association for Commuter Transportation (ACT) also issued guidance for the use of public transit and ridesharing, with recommendations for shifting work hours and using telecommuting.[38]

While public health experts study the best methods of surface disinfection against this novel coronavirus, caution has required temporarily suspending use of shared vehicles, such as carshare, until new cleaning protocols are put in place. The Enterprise Carshare program closed nationally due to the pandemic, and at USF it was permanently suspended on March 27, 2020. Commute with Enterprise has been in constant communication with vanpool customers about cleanliness, and vehicle care for the safety of all participants. Enterprise also is delivering Clean Car Kits to vanpool groups.[39]

What Economic Recovery Might Look Like

Getting back to a new normal of travel activity will depend not only on successfully controlling the spread of COVID-19, but also restoring public confidence that venturing out is safe. After the danger is perceived to have passed, the workforce will require time to adjust to the negative impact upon the economy and household income.

Many people may have to share the ride to work due to a new employment location not served by public transit. Others may seek ways to cut commute costs by ridesharing, due to personal financial stresses from layoffs and furloughs. To maintain social distancing, single occupant vehicle travel might increase, once again straining highway capacity, creating bottlenecks, and filling convenient parking facilities to capacity. Some degree of travel for grocery and retail shopping has changed to curbside

[35] Centers for Disease Control and Prevention. "Mass Transit Decision Tool: Public Health Considerations for Reopening Mass Transit During the COVID-19." May 16, 2020. https://www.cdc.gov/coronavirus/2019-ncov/community/mass-transit-decision-tool.html

[36] American Public Transportation Association. "Developing a Pandemic Virus Service Restoration Checklist." White Paper. APTA Standards Development Program. APTA SS-SEM-WP-016-20. Washington, D.C. May 21, 2020. https://www.apta.com/wp-content/uploads/APTA_WP_Developing-Pandemic-Virus-Service-Restoration-Checklist.pdf

[37] Protect Yourself when Using Transportation." Centers for Disease Control and Prevention. May 26, 2020. https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/using-transportation.html#PublicTransit

[38] Association for Commuter Transportation. "Supporting Commuters Returning to Worksites During COVID-19." https://www.actweb.org/i4a/pages/index.cfm?pageid=3527

[39] Arlinda Karuli. Account Executive. Commute with Enterprise. Email communication. May 12, 2020.

pickup, takeout, and delivery services. However, transportation planners and community leaders also search for the "opportunity in a crisis".

Active Transportation at a Safe Social Distance

Opportunities abound for increased walking and bicycling activity. Because public parks and exercise facilities have been closed, more people have begun participating in walking and bicycling for exercise and outdoor enjoyment. To enable the limited reopening of restaurant venues, Restart St. Pete has offered temporary use permits to restaurants to expand outdoor seating areas into existing parking lots and parking spaces immediately in front of restaurants. On May 22, 2020, Bayshore Dr. NE., between 5th Avenue and 2nd Avenue, had been closed to vehicular traffic to allow for increased use by people walking and bicycling, while allowing social distancing. This aligns with Open Streets St. Pete, in collaboration with the City of St. Petersburg, St. Petersburg Downtown Partnership, Car Free St. Pete, AARP, and business sponsors, which have held annual events since 2016 to close streets to car traffic and provide public access for active transportation and fun activities.[40] The Cities of Clearwater, Tampa, and New Port Richey, are examples of other cities that have also allowed temporary use of parking lots and street parking for outdoor seating. These accommodations may stimulate more walking and bicycling activity. Data provided by StreetLight indicated a 50 percent increase in bicycle miles traveled in the Tampa Bay region, when comparing May 2019 with May 2020.[41] Promoted by Tampa Bay area TMOs, Bike/Walk Tampa Bay has responded with campaigns to encourage more people to bicycle, as shown in the Love To Ride campaign in Figure 6.

Figure 6. The Tampa Bay Bike Month Challenge in May 2020 encouraged people to bicycle.
Source: Bike/Walk Tampa Bay web page. Photos were contributed by March Tampa Bay Bike Challenge participants. https://www.bikewalktampabay.org/bicycle/national-bike-month-challenge-2020/

[40] Open Streets St Pete. https://openstreetsstpete.com/
[41] StreetLight Data, San Francisco, CA. July 21, 2020. https://www.streetlightdata.com/corona-bicycle-metrics/

Gains in People Age 55 and Over Working from Home

Working from home in the Tampa-St. Petersburg-Clearwater MSA indicated a small but significant increase from year 2013 to 2017. Hillsborough, Pasco and Pinellas Counties mirrored these trends, indicating small but significant increases in working from home. These rates are higher than the state of Florida overall.[42]

The National Household Travel Survey (NHTS) has been tracking working from home by age group. In 1995, reports of working from home were highest among people age 35-54 and lowest among those over age 55. Over twenty years later, the NHTS 2017 data indicate a shift toward a higher proportion of people over the age of 55 working from home, from 18 percent of survey respondents in 1995, to 34 percent of survey respondents who are age 55 and older. Nationally, the proportion of the population age 55 and over is 29.1 percent.[43] According to BEBR, the proportion of the total population of Florida that is age 55 and older in 2018 was 33 percent. The proportion of the total population that is age 55 and older in Hillsborough, Pasco, and Pinellas Counties are 26 percent, 37 percent, and 41 percent, respectively. Projections to 2045 suggest that those proportions will hold steady for all three counties.[44] These generally higher proportions of persons age 55 and older in Florida and in the Tampa Bay area might suggest a growing trend for employees in the Tampa Bay area to work from home.

Possibility for Increased Adoption of Permanent Telework Arrangements

Increases in emergency telework arrangements by businesses and institutions during the pandemic have also fueled speculation about the potential for some greater amount of teleworking to continue on a more permanent basis, than was seen prior to the pandemic.[45] A recent Gallup poll has found that as many as 59 percent of U.S. workers who are working from home as a result of the coronavirus would prefer to continue to telework after closures are lifted.[46] There are some indications that more businesses and agencies nationwide are considering augmented telework programs. For example, for county departments in Travis County, TX, which have jobs that can be accomplished remotely, County officials are exploring making it mandatory for 20 percent of all employees from those departments to telework.[47] The Houston Galveston Area Council in Houston, TX, is considering establishing a permanent

[42] Bureau of Economic and Business Research, University of Florida, Gainesville.
[43] U. S. Census Bureau. Current Population Survey. Annual Social and Economic Supplement. Table 1. Population by Age and Sex. 2019. Internet Release Date: April 2020.
[44] Bureau of Economic and Business Research. "Population Projections by Age, Sex, Race, and Hispanic Origin for Florida and Its Counties, 2020-2045, with Estimates for 2018." Bulletin 184, June 2019. University of Florida.
[45] States of Play, CNBC/Change Research surveyed 5,787 likely voters in six swing states, April 17-18, 2020, and found that 42 percent of respondents indicated they were working at home. This is up from 9 percent who indicated they worked from home prior to the pandemic. After the economy re-opens, 24 percent of survey respondents indicated they would like to work either entirely from home or more than they had previously. MOE ±1.3 percent. https://www.cnbc.com/2020/04/24/as-working-from-home-becomes-more-widespread-many-say-they-dont-want-to-go-back.html
[46] Megan Brenan. U.S. Workers Discovering Affinity for Remote Work." Gallup. April 3, 2020. https://news.gallup.com/poll/306695/workers-discovering-affinity-remote-work.aspx
[47] Adele Noel. Air Quality Project Manager. Travis County. Austin, TX. April 29, 2020.

telework policy as management is realizing the positive impacts of teleworking.[48] A recent survey of 247 members of the American Society of Civil Engineers compiled information about civil engineering firms for which half or more of their employees are working remotely. The survey asked members what their companies will do after the pandemic is resolved. The consensus of the survey participants is that they do not anticipate that teleworking will completely replace the traditional office, but many firms are now re-evaluating their office space needs. One such firm, WSP in Atlanta, indicated that office space is their second largest expense.[49]

The commuter assistance program and TMOs in the Tampa Bay area immediately responded to the disruption caused by the pandemic. Commute Tampa Bay offered a webinar series on emergency telework. The New North Transportation Alliance, in partnership with Best Workplaces for Commuters also provided emergency telework guidance to employers. In March 2020, Best Workplaces for Commuters, in partnership with e-work.com, also launched a new program, the Telework Certificate, a series of in-depth learning modules for both employers/managers and employees on strategies for working more productively from home.[50] The program offers one free seat to Florida employers and for each Best Workplace, Best Site, or Best University for Commuters in good standing.

Motor Vehicle Trip Reduction from Telework

Some degree of face-to-face collaboration will continue to be needed, but there may be a shift to remote working on a more regular basis and more days per week. The Washington State Department of Transportation's Commute Trip Reduction (CTR) Program documents mode share of employees of worksites that participate under the CTR program. CTR data from 2017-2018 revealed that up to 6.5 percent of employees from affected employment sites indicated that they telework on any given weekday, and close to eight percent of employees telework either one or two days per week.[51]

A body of transportation research over the years has sought to measure the impact of teleworking on travel demand. Predictive models have pointed to largely modest decreases in vehicle trips in the United States. However, in nations such as the Netherlands that have instituted more comprehensive flexible workplace policies, recent research has demonstrated that urbanized areas that have implemented telecommuting over a period of several years have measured an attributable decrease in car kilometers of travel as well as a decrease in peak hour delay.[52] With the prospect of more workplace policies that allow and encourage more employees to telework in the United States, it is possible that future measurement of impacts upon travel may be greater than previous years. To give some idea of

[48] Deborah Mayfield. Principal Program Coordinator, Transportation-Travel Demand Management. Houston Galveston Area Council, Houston, TX. April 29, 2020.
[49] Robert L. Reid. American Society of Civil Engineers. *ASCE News*. "Will Today's COVID-19-Prompted Telework Keep Working Tomorrow?" April 24, 2020.
[50] Best Workplaces for Commuters Telework Certificate. https://www.bestworkplaces.org/training/earn-your-telework-certificate/
[51] Washington State Department of Transportation. Commute Trip Reduction Program Employee Survey. 2017-2018.
[52] Van der Loop, Han, Jasper Willigers, and Rinus Haaijer. 2019. "Empirical Estimation of Effects of Flexible Working on Mobility and Congestion in the Netherlands 2000 to 2016." Transportation Research Record. Vol. 2673(6). 567-565.

the practical possibilities, in 2019, the Netherlands reported that 14.1 percent of its workforce reports usually working away from the office.[53] In the Netherlands, 98 percent of households have access to broadband Internet, and there are strict work place sick leave policies that prevent people from feeling pressure to go to work when they are sick. Dutch workplace management culture is based upon the expectation that an employee will satisfactorily deliver the work product. The Dutch place high value on work/life balance and flexibility. Dutch public libraries are equipped and used by many as an alternative remote work site from home, as are the many cafés.[54]

Transportation statistics about working from home, prior to the pandemic, already point to the possibility that telework will continue to grow. The 30-year mode share trend, as indicated by data reported in the American Community Survey (ACS) 2010 by the Census, found that while working at home constituted only 4.3 percent of the total worker commute mode share nationwide in 2010, working at home also increased by 172 percent during that time period. That is the largest rate of growth for all travel modes.[55]

More recently, the 2018 ACS 1-Year Estimates indicated that nationwide, 5.4 percent of all workers age 16 years and older worked at home. In Florida, out of 9.6 million workers age 16 and over, 6.2 percent worked at home, according to the 1-Year 2018 estimates. That is 595,738 people. For the Tampa Bay area, in 2018, of over 1.4 million workers age 16 and over, 7.3 percent of them indicated that they worked from home. That is about 105,000 workers, or taking the margin of error into account, that is somewhere within a range of 92,000 and 118,000 persons who indicated that they worked from home during the week previous to taking the survey.[56] These pre-pandemic statistics suggest that Florida in general, and the Tampa Bay area, in particular, already demonstrate a greater proclivity to telework, and its greater adoption and more frequent use in the future, is possible.

CAP Role in Disaster Preparedness and Resiliency

It is anticipated that the new normal, post-pandemic, also will include other potential disasters, increasing in type, frequency and severity. For example, the most recent estimates of projected sea level rise in the Tampa Bay area, based upon a thorough assessment of scientific data and the literature, is that by year 2100, sea level rise is projected to increase from two to 8.5 feet.[57] Sea level rise will intensify the impact of hurricanes.

[53] Eurostat. Employed persons working from home as a percentage of the total employment, by sex, age and professional status (%). Last update, June 11, 2020.
[54] Katie Bishop. "What the Dutch can Teach the World about Remote Work." BBC.com. June 23, 2020. https://www.bbc.com/worklife/article/20200623-what-the-dutch-can-teach-the-world-about-remote-work
[55] AASHTO. "Commuting in America 2013: The National Report on Commuting Patterns and Trends." Brief 10 Commuting Mode Choice. October 2013, pp. 8-9.
[56] American Community Survey. 1-Year Estimates Data Profile TableID: S0801, years 2010-2018.
[57] Tampa Bay Climate Science Advisory Council. Updated April 2019. "Recommended Projections of Sea Level Rise in the Tampa Bay Region. " http://www.tbrpc.org/wp-content/uploads/2019/08/CSAP_SLR_Recommendation_2019_Final-1.pdf

Transportation disaster preparedness is not just about hurricane evacuation and hardening infrastructure. It also is about recovery after the event and restoring continuity of operations. The Federal government has turned its attention to emergency recovery readiness and resiliency. A recent research effort, sponsored by the Federal Transit Administration, focused upon the disaster recovery phase and the tools available to restore normalcy to the transportation system, as part of a series of workshops held in several regions across the United States. The Hillsborough MPO and the Sarasota/Manatee MPO participated in one of these workshops. For example, the substitution of information and communications technologies for travel, including the implementation of telework, can be a key component of disaster recovery.[58] Elements of transportation system resiliency include redundancy, options, and adaptability. A cornerstone of TDM and commuter assistance is providing transportation choices that afford the flexibility to adapt to unanticipated and changing circumstances. For example, while public transit and ridesharing options may be limited during a pandemic, someday a different kind of emergency may cause the price of fuel to skyrocket. If this happens before our nationwide private passenger car fleet converts to all electric, then public transit and ridesharing may be better transportation choices for many.

The Lloyd District Employer Transportation Demand Management Guide

The Lloyd District in the City of Portland, Oregon has an All Hazards Recovery Plan aimed at helping employers plan and prepare for emergencies to ensure the safety and security of their staff, and also to preserve their businesses to the maximum extent during the recovery stage of an emergency. There is an Employer Transportation Demand Management Guide that is a component of the Plan.[59] These are actions that local governments in the Tampa Bay area also should consider.

CAP Role in Slowing Climate Change

Resiliency also is about slowing and eliminating the causes of climate change by reducing greenhouse gas emissions to zero. The Intergovernmental Panel on Climate Change (IPCC) has continued to sound the alarm, as it has for decades now, that warming planetary temperatures due to human activity, including transportation, has become an existential threat to society and the biosphere. National news coverage is punctuated with features on disturbing climate events almost daily. Recent examples are the megafires in California, uncontrollable fires on the Australian continent and in the Amazon rain forest, and the massive fires in the fragile Arctic due to melting permafrost and drying land from sustained record-breaking temperatures. These disasters seem far away but they affect air quality worldwide, accelerate global warming from the release of carbon, and are tragedies on many levels. These examples are just one type of disaster. Hurricanes are predicted to worsen in frequency and severity and the Tampa Bay area is among the most vulnerable regions in the United States. There also are the "gradual disasters" that play out slowly, such as sea level rise.

[58] MacArthur, John and Sarah J. Siwek. 2020. "Smart, Shared, and Social: Enhancing All-Hazards Recovery Plans with Demand Management Technologies." Federal Transit Administration Report No. 0151. Office of Research, Demonstration and Innovation. Washington, D.C.

[59] Portland State University. "All Hazards Recovery Plan: Employer Transportation Demand Management Guide." Prepared for Go Llloyd. March 20, 2020. http://www.golloyd.org/blog-1/2020/4/16/employer-tdm-guide

Climate change can be forestalled by slowing the many trends that cause it, such as the loss of forests and greenspace. Florida is losing ten acres of open land per hour to land development that is accommodating Florida's population growth pressures.[60] Growth could be managed with land development controls that support transit-oriented development within urbanized areas. If the state legislature adheres to the intended use of funds raised by the real estate transfer tax for the Sadowski Affordable Housing Trust Fund, then more work force housing can be located where there is existing public transit service. Tied to the development of a strong regional transit system, more people can be encouraged to travel by public transit through targeted TDM programs, services, incentives, and regulation, such as a transit benefits ordinance.

CAP Role in Improving Air Quality

There are many environmental reasons to develop and operate an efficient transportation system. These include not just land preservation for green space, groundwater recharge, wildlife habitat, and agriculture. A more compact urban form requires less acreage for roadways, reducing heat islands and stormwater discharge, and improving air quality. The Clean Air Act Amendments of 1990 established a link between transportation planning and setting limits upon air pollution, including that generated by mobile sources. One of the historical goals of TDM has been to help urbanized areas nationwide to achieve and maintain attainment status for National Ambient Air Quality Standards (NAAQS) for the six criteria air pollutants monitored by the federal Environmental Protection Agency (EPA). These pollutants include nitrogen dioxide, lead, particulate matter, carbon monoxide, sulfur dioxide, and ozone. Of all the criteria air pollutants, ozone is the pollutant that comes closest to violating the standard in the Tampa Bay area. Ozone is generated by the mix of volatile organic compounds with nitrogen oxides (NOx). Using Hillsborough County as an example, there are several sources of NOx in the County. Mobile sources account for the largest proportion at 32 percent. The NAAQS for ozone is 70 parts per billion (ppb) and the measurement is expressed as a design value that is based upon the three-year average of the fourth highest recording per year. There are 30 air monitoring stations in Hillsborough County for national and state air quality standard assessments and 12 special purpose monitors. Two of the air monitoring sites have indicated design values of 66, 67, and 68 for the years 2016 through 2019.[61] This is inching up uncomfortably close to the limit.

NAAQS nonattainment status triggers additional requirements for MPO planning staff to conduct air quality conformity analyses and includes transportation project modeling requirements. It requires collecting data for additional performance metrics, including mode share. It requires the development of a State Implementation Plan (SIP) and maintenance plan. Nonattainment status can impact federal funding.

There are many ways to reduce air pollution from mobile sources to maintain air quality. One way is to promote the use of electric vehicles and cleaner fuels. TDM outreach is another strategy to improve air

[60] Paul Owens, Chair, 1000 Friends of Florida. Webinar Dec 12, 2020.
[61] Jeff Sims. Environmental Protection Commission. "Air Quality Update." PowerPoint presented to the Hillsborough MPO Livable Roadways Committee. April 15, 2020.

quality in the Tampa Bay area, such as promoting public transit, walking, bicycling, ridesharing, and traveling outside the peak periods. This can be done through commuter assistance programs, services, incentives, information campaigns and partnerships.

Another way to reduce mobile source air pollution in the Tampa Bay area has been to reduce traffic congestion through projects that improve traffic flow, reducing car and truck idling. Some projects have focused on transportation systems management and operations (TSM&O) strategies. Other projects have included adding highway capacity.

Strategies from California

The State of California has taken a different approach. California has been leading the charge to use different performance metrics to achieve its goals to reduce GHG emissions, reduce criteria air pollutants, as well as reduce traffic delay, by reducing vehicle miles traveled (VMT). Adding highway capacity has been shown to induce increased VMT. Increasing VMT has been linked to increased traffic delay.

Reducing VMT Per Capita Replaces Roadway LOS Metric

California has statewide smart growth principles. California SB 743 was passed in September 2013, which introduced the VMT metric. The legislation is part of a broader set of state initiatives to reduce automobile dependency while at the same time accommodating population growth, supporting public health, and supporting economic growth. Its main thrusts are to streamline the development of infill and transit-oriented development, support walking, bicycling, and transit modes of travel, and reduce automobile dependency while also addressing the growth of VMT as a primary contributor to traffic delay. SB 743 required local governments to adopt VMT as a main performance metric.

The California Air Resources Board (CARB) developed the 2017 Climate Change Scoping Plan and determined the limits of VMT growth to contain GHG emissions to allow for climate stabilization and achieve GHG emission reduction targets. Because of anticipated future population growth, this must include reducing VMT per capita.

SB 743 required changes to the guidelines that implement the California Environmental Quality Act (CEQA), California's state level version of the National Environmental Policy Act, to assess the environmental impact of proposed projects. The transportation system has been considered an element of the built environment, which can be impacted by proposed projects. Previously, a project's impact upon the transportation system was measured by its impact upon motor vehicle traffic delay, or roadway level of service (LOS). The adopted CEQA guideline changes in 2018 included changes to the transportation analysis that determines the significance of impacts from a proposed project.[62] This includes the replacement of the roadway LOS metric with VMT. The change means that a proposed

[62] California Public Resources Code. Title 14. Natural Resources. Div. 6. California Natural Resources Agency. Chapter 3. Guidelines for the Implementation of the California Environmental Quality Act. Section 15064.3. Determining the Significance of Transportation Impacts. December 28, 2018. p. 11.

project's impact on traffic flow is no longer considered to be a significant environmental impact upon the transportation system. However, according to the new guidelines, significant impacts upon transportation do include impacts to public transit and nonmotorized transportation.

Increasing Highway Capacity Induces Demand

The California Office of Policy Research (OPR) Technical Advisory recommends applying the findings of existing studies that have quantified the percent change in VMT for every percent change in miles to the roadway system. Based upon research, increasing highway capacity does not relieve traffic congestion over the long term. General conclusions are that over the long term, for every one percent increase in miles to the roadway system, there is approximately a one percent increase in VMT. [63] Increasing highway capacity induces more travel demand and growth of VMT. Growth of VMT contributes to increase in traffic delay. Caltrans recognizes and seeks to address the effects of travel demand that has been induced from the development of new capacity. Caltrans has developed a draft Transportation Analysis Framework (TAF) that provides a methodology for calculating induced demand for transportation projects that increase capacity on the California State Highway System. Induced demand, or increased travel, is understood by Caltrans to mean the result of lowering the cost of travel by making travel time shorter due to increased highway capacity.

The National Center for Sustainable Transportation (NCST) at UC Davis has developed a calculator to apply the elasticity of induced demand to determine resulting VMT of a project. Caltrans is working with NCST to update the calculator with new data. Caltrans applies some combination of the NCST induced demand calculator and/or travel demand models capable of assessing induced demand, based upon the proposed facility and the degree of urbanization of the project area.

Local governments can influence growth of VMT through the land development process, investment in public transportation, and TDM strategies.

[63] Handy, S. 2015. "Increasing Highway Capacity Unlikely to Relieve Traffic Congestion." UC Davis: National Center for Sustainable Transportation. https://escholarship.org/uc/item/58x8436d. See also Handy, S., and M. Boarnet. 2014. "Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions." California Air Resources Board Policy Brief. See also Duranton, G. and M. Turner. 2009. "The Fundamental Law of Road Congestion: Evidence from US Cities." National Bureau of Economic Research. Working Paper No. 15376. https://www.nber.org/papers/w15376.pdf See also Transportation for America. "The Congestion Con: How More Lanes and More Money Equals More Traffic." Smart Growth America. Washington, D.C. March 2020. https://t4america.org/wp-content/uploads/2020/03/Congestion-Report-2020-FINAL.pdf See also Walter Kulash, P.E. "Induced Traffic Demand: You Can't Build Your Way Out of Traffic Congestion." Presentation given via webinar hosted by 1000 Friends of Florida. October 23, 2020. Presentation begins on slide 18. https://1000fof.org/wp-content/uploads/2020/10/2010-induced-demand-FINAL.pdf

Commuter Assistance Promotes Health in Transportation

The negative impact of mobile source air pollutants on human respiratory health is well documented.[64] In addition, there are other negative impacts of motor vehicle traffic on human health and safety. Nationwide, there is a strong positive correlation between higher VMT per capita and a higher number of fatalities from motor vehicle crashes per capita. In addition, states with higher VMT tend to have more motor vehicle crash deaths per mile than lower VMT states.[65] Comparatively, use of public transit is associated with less safety risk of being involved in a traffic crash than motor vehicle travel.[66] Physical inactivity contributes to heart disease, diabetes, colon cancer, breast cancer, stroke, depression, Alzheimer's disease, and other conditions of poor health. Obesity and Body Mass Index (BMI) are positively associated with VMT per licensed driver, meaning the greater the VMT, the higher the risk for obesity and higher than normal BMI.[67]

Transit riders walk an average of 24 minutes per day to and from transit stops.[68] A study quantified the impact of achieving goals to increase walking, bicycling, and use of public transit in the Caltrans Strategic Management Plan 2020, based on four scenarios. The study's research question was: "If the changes in active transport could be immediately realized, what would the health impacts have been in 2010? The Integrated Transport and Health Impact Model (ITHIM) was applied to account for outcomes to health, CO_2 reduction, and cost savings as a result. Metrics included annual net change in burden of chronic disease and premature deaths and disability adjusted life years, with an accounting for an increase in crashes involving bicyclists, pedestrians and transit riders. Monetized costs were expressed in 2010 billion $USD, based upon the direct cost of illness, and the loss of productivity, based upon the Value of a Statistical Life of $7.4 million. The Willingness to Pay method was used, which describes the maximum amount of money an individual is willing to pay to cure or decrease the risk of death or injury, and can take into account pain and suffering, lost leisure time, and lost wages. The Value of a Statistical Life was based on Willingness to Pay and was defined by the U. S. Environmental Protection Agency as the economic value placed on eliminating the risk of one premature death. The value of reduced carbon emissions as a result of replacing short-distance motor vehicle trips with bicycling and walking, were expressed in units of Million Metric Tons per year. The annual monetized value of health outcomes through chronic disease reduction ranged from $1.0B to $59.6B based on the method of monetization. Active transport scenarios were associated with carbon reduction of from 3 percent to 14 percent,

[64] U. S. Environmental Protection Agency. Ground Level Ozone Pollution. https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution Particulate Matter Pollution. https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#effects

[65] Fang, K. and J. Volker. 2017. "Cutting Greenhouse Gas Emissions is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled." UC Davis. A White Paper from the National Center for Sustainable Transportation. https://escholarship.org/uc/item/4h5494vr#main

[66] Savage, I. 2013. "Comparing the Fatality Risks in United States Transportation Across Modes and Over Time." *Research in Transportation Economics*. 43: 9-22. http://faculty.wcas.northwestern.edu/~ipsavage/436.pdf

[67] Behzad, B., D. King, and S. Jacobson. 2012. "Quantifying the Association between Obesity, Automobile Travel, and Caloric Intake." *Preventative Medicine*. 56(2), 103-106.

[68] Besser, L., and A. Dannenberg. 2005. "Walking to Public Transit: Steps to Help Meet Physical Activity Recommendations." *American Journal of Preventive Medicine*. 29(4), 273-280.

based upon the level of active transport defined by the different scenarios.[69] Commuter assistance programs promote the use of public transit, walking, and bicycling.

A Vulnerable Workforce

Three years before the pandemic and the unemployment that it brought, a survey conducted by a Harris Poll on behalf of CareerBuilder, a human resources company, surveyed a representative sample of 2,369 employers and 3,462 employees in the private sector nationwide in 2017 and found that 78 percent of U.S. workers live paycheck to paycheck.[70] The sixth annual Survey of Household Economics and Decisionmaking (SHED) reported on the economic wellbeing of households nationwide in 2018. It reported that when a household was faced with a hypothetical emergency expense of $400, four in ten households would have difficulty covering the expense. Similarly to the prior year, 27 percent would have to borrow or sell something to pay for the emergency expense, and 12 percent would not be able to cover the expense at all.[71]

Looking closer at the Tampa Bay area, there are related vulnerabilities. The Tampa Bay Partnership is a coalition of business leaders working together to address the region's toughest economic challenges. Their two key issues of interest are workforce development and transportation to connect Tampa Bay residents to jobs and opportunity. The Tampa Bay Partnership Foundation reported in early 2020 (pre-COVID-19) that the Tampa Bay region will experience 850,000 new people moving here in the next five years, placing pressure on the availability of affordable housing. Compared to 20 peer regions, the Tampa Bay area has had the lowest median household income. At the same time, both housing expenditures and transportation expenditures in the Tampa Bay area, as a percentage of income, have been the fourth highest among the 20 peer regions.[72] As presented in this report under the subheading, Public Transit Access to Jobs, a low percentage of jobs are accessible by public transportation. Zero car households are decreasing despite the expense.

That unfortunate combination will likely be exacerbated by the economic downturn resulting from the pandemic. A Working Paper recently published through the National Bureau of Economic Research predicted that an estimated 42 percent of gross staffing reductions resulting from stay-at-home orders to slow the spread of the pandemic, nationwide, will result in permanent job losses.[73] The May 2020 Employment Situation Summary from the U. S. Bureau of Labor Statistics for May 2020 indicated an

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[69] Maizlish, N. 2016. "Increasing Walking, Cycling, and Transit: Improving Californians' Health, Saving Costs, and Reducing Greenhouse Gases." Final Report. Prepared for Office of Health Equity, California Department of Public Health. https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/Maizlish-2016-Increasing-Walking-Cycling-Transit-Technical-Report-rev8-17-ADA.pdf

[70] CareerBuilder. 2017. http://press.careerbuilder.com/2017-08-24-Living-Paycheck-to-Paycheck-is-a-Way-of-Life-for-Majority-of-U-S-Workers-According-to-New-CareerBuilder-Survey

[71] Board of Governors of the Federal Reserve System. "Report on the Economic Well-Being of U.S. Households in 2018." Washington, D.C. May 2019. p. 21. https://www.federalreserve.gov/publications/files/2018-report-economic-well-being-us-households-201905.pdf

[72] Tampa Bay Partnership Foundation. "2020 Regional Competitiveness Report." pp. 20 and 65. https://www.stateoftheregion.com/

[73] Barrero, Jose Maria, Nicholas Bloom, and Steven J. Davis. "COVID-19 is Also a Reallocation Shock." National Bureau of Economic Research. NBER Working Paper No. 27137, May 2020. https://www.nber.org/papers/w27137

unemployment rate of 13.3 percent.[74] This is slightly better than April 2020 at 14.7 percent, but a precipitous loss as compared to the 4.4 percent unemployment rate prior to the pandemic in February 2020. The Congressional Budget Office supplied Congress with projections that the toll of the pandemic on the economy could require an economic recovery period of ten years.[75] Many of those remaining employed are those working essential jobs that place them at increased exposure to COVID-19. TDM strategies delivered by commuter assistance programs to help promote the availability of transportation options is needed now more than ever to connect the unemployed with potential jobs.

Thousands of households are seeking food relief in the Tampa Bay area. Figure 8 illustrates motorists lined up at a Feeding Tampa Bay Mega Pantry at Hillsborough County Community College, Dale Mabry Campus. A volunteer said that motorists arrive as early as 2:00 a.m. to get in line. The line in this photograph snaked through and filled the entire parking lot. On a typical Saturday, approximately 3,700 motorists line up to receive food. The disturbing irony is that Tampa Bay households are compelled to spend thousands of dollars annually to buy or lease motor vehicles for transportation, but do not have enough money for food.

Figure 7. Motorists line up to receive food assistance from Feeding Tampa Bay, December 5, 2020.

The impacts of COVID-19 on communities of color are disproportionately high. Both the illness and the hardship caused by massive unemployment, as states and regions imposed lock downs to slow the spread of the disease, hit minority communities harder. These include African American, Hispanic, and other minorities that make up a disproportionately higher percentage of essential workers. The death

[74] U. S. Bureau of Labor Statistics. Economic Situation Summary. May 2020. Released June 5, 2020.
[75] New York Times. "U. S. Economy Faces Long-Term Recovery, C.B.O. Says," June 2, 2020. Based on Congressional Budget Office report to Congress. June 1, 2020.

of George Floyd in May 2020 has ignited civil rights protests worldwide, including in the Tampa Bay area. Add to the list unequal access by minority communities to health care, affordable housing, and education due to the digital divide, and it is clear that our society must double down efforts to eliminate racial bias and ensure equal rights and fair access to opportunity. Access to jobs and affordable transportation plays a role.

Fully one third of the U.S. population does not drive a car. These persons include those categorized as Transportation Disadvantaged, such as those with disabilities, very low incomes, the elderly and youth at risk who lack access to employment, education, and other necessary activities of life. Owning a car is expensive. The transportation system in the Tampa Bay area has continued to be car-oriented. With our suburban decentralized land development patterns, accessing jobs, education and the other necessary activities of life without a car is time consuming at best, impossible at worst.

Recently interviewed (prior to the pandemic) on the Florida Matters radio show, the FDOT District Seven Secretary David Gwynn said that there has been insufficient local funding to build, operate, and maintain public transit. While increased transit ridership would raise farebox revenues and justify transit investment, Tampa Bay Times Editorial Page Editor Graham Brink observed that there is a lingering stigma against using public transit.[76] In 2017, the HART bus service was cut 20 percent. While some of that service was restored in the past few years, more service cuts could be on the horizon due to revenue shortfalls, creating new hardship.

Lack of Digital Access

Lower income communities not only lack physical access, but they also lack digital access. This is relevant to a discussion of transportation because transportation is recognized as a means to an end. Increasingly, use of information and communication technologies (ICT) to move information can substitute for physical travel, as was spectacularly demonstrated during the pandemic when traffic volumes suddenly dropped because of the adoption of telework by many organizations, both public and private. In the world of commuter assistance, telework is promoted to reduce traffic congestion. However, there are more important issues at stake. Until recently, broadband access was considered an optional amenity. The Internet has now permeated most areas of life, and its necessity to each household became disturbingly clear during the pandemic, as many children were unable to access their public school curricula due to lack of a home computer and no access to broadband.

Lack of digital access magnifies inequalities on many levels, creating barriers to information-related employment, telehealth, and educational opportunities, to name a few. Research on this topic shows this problem is more nuanced than just lack of broadband availability. The problem is not just in rural

[76] Florida Matters, WUSF Public Media. "Transportation Issues in Tampa Bay's Growing Cities." By Robin Sussingham and Christy Oshana. Interviews with FDOT District Seven Secretary, David Gwynn, Tampa Bay Times business columnist Graham Brink, and USF Center for Urban Transportation Research Director, Dr. Robert Bertini. October 15, 2019. https://wusfnews.wusf.usf.edu/florida-matters/2019-10-15/transportation-issues-in-tampa-bays-growing-cities.

areas, but also in urban areas too, where pockets of lower income communities exist at lower development densities. These areas are less profitable to serve by Internet Service Providers (ISP). In some areas, there is just one ISP. Broadband may be available, but households may not be able to afford a subscription.[77]

Right now, there is a greater need for change and a greater receptivity for change. Regional long-range transportation plans and local government comprehensive plans acknowledge disparities and the importance of prioritizing equity of transportation and access as a goal. TDM strategies and the CAPs that implement them, with their emphases upon the development and promotion of economical, accessible and safe transportation alternatives to driving cars, also can work toward equity in transportation.

Identification of Priority Commuter Groups

As a result of the response to COVID-19, the Tampa Bay area workforce is in a state of restructuring and transition during a new economic recession. Tampa Bay area commuters may be described by any of the following groups, for whom their original commute pattern has been disrupted by mode, frequency, time of day, and route.

- Still employed in an original job, with social distancing requirements (i.e., telework or work from satellite office, or work during different times)
- Still employed in an original job. Must travel to work site. May have new job duties and/or reduced or increased hours
- Unemployed and job-searching
- Newly re-employed and re-establishing their commute
- Returning to college or trade school

Other ways of identifying priority commuter groups:

- By location, such as activity center or corridor, which targets employers and their employees that work in localized areas characterized by greater traffic congestion and parking problems. These employees work in the vicinity of each other, creating opportunities for partnerships with the private sector to develop services that more employees can use, such as shuttles, and matching employees in ridesharing arrangements. Such areas can be organized through a transportation management organization (TMO) and could establish a special services district to fund transportation services.
- TBARTA's current customer database constitutes commuters who have actively sought commuter services. This is described further below.

[77] Tomer, Adie; Elizabeth Kneebone; and Ranjitha Shivaram. "Signs of Digital Distress: Mapping Broadband Availability and Subscription in American Neighborhoods." The Brookings Institution. Metropolitan Policy Program. September 2017. https://www.brookings.edu/research/signs-of-digital-distress-mapping-broadband-availability/.

- By partnering with organizations that work with communities needing re-investment. These may include community redevelopment agencies, community development corporations, and Opportunity Zones. Other organizations that are involved with local and regional workforce development initiatives include Tampa Bay Works of the Tampa Bay Partnership, CareerSource at the county level, and Tampa TechHire. Business development organizations include the Tampa-St. Pete Regional Black Chamber of Commerce, Inc. and the Hispanic Chamber of Commerce of Tampa Bay. These organizations may work with individuals who seek employment and may be most in need of mobility services.
- The largest employers constitute a small percentage of all employers but represent a disproportionate percentage of all employees. Less than 2.5 percent of all companies have more than 100 employees, but these companies represent 27 percent of all employees.

Generally, employees that work in an office environment tend to work at the same location and have routine work hours, making it easier for them to use commuter assistance services, such as ridematching. The most recent available employment data for the Tampa-St. Petersburg-Clearwater MSA from the U. S. Bureau of the Census, County Business Patterns is for the year 2015, summarized in Tables 4 and 5 below. The data are broken down by Office and Non-Office type employment by NAICS Code. Non-office NAICS Codes include industries such as agriculture, mining, and construction. The data provide total numbers of employees within each NAICS Code. However, the data do not provide the exact number of employees for all establishments within specific size ranges.

The data do provide that for office employment sites, there are 1,145 office employment sites with 100-249 employees, 276 office employment sites with 250-499 employees, 99 office employment sites with 500-999 employees, and 65 office employment sites with 1000 or more employees. Table 6 lists the number of office employment sites by size range. If it is assumed that each of the employment sites within each of the size ranges employs the minimum number of employees within that size range, then the 1,585 office establishments that each employ at least 100 employees represent a sum total of at least 298,000 employees or approximately 27 percent of all employees in the Tampa-St. Petersburg-Clearwater MSA. This represents less than 2.5 percent of all work sites. What this means is that if commuter assistance programs targeted that 2.5 percent of all work sites that employ the largest numbers of employees, such a targeted effort would potentially reach 27 percent of all commuting employees.

Concentrating commuter assistance marketing activities just on the office work sites that employ 500 or more employees, these represent 164 work sites, 114,500 employees, or at least 11 percent of all employees in the Tampa-St. Petersburg-Clearwater MSA. Success with this approach in a voluntary environment depends on generating interest on the part of employers to support the commuting needs of their employees.

Table 4. Tampa-St. Petersburg-Clearwater MSA Employment, 2015

Employment	Number of Employees	Percentage
Office Employment	970,463	89.84%
Non-Office Employment	109,698	10.15%
Unclassified	110	0.01%
Total	1,080,271	100.00%

Source: U. S. Bureau of the Census. County Business Patterns by Employment Size Class and Legal Form of Organization. 2015. Table ID CB1500CBP.

Table 5. NAICS Code for all Work Site Sites in the Tampa-St. Petersburg-Clearwater MSA

Type	NAICS Code	Industry	Employees	% Employees
		Total		100%
Office	22	Utilities	4,281	0.4
Office	42	Wholesale Trade	48,766	4.5
Office	44-45	Retail Trade	151,367	14.0
Office	48-49	Transportation and Warehousing	24,418	2.3
Office	51	Information	32,940	3.0
Office	52	Finance and Insurance	77,463	7.2
Office	53	Real Estate, Rental, and Leasing	21,456	2.0
Office	54	Professional, Scientific, and Technical Services	94,025	8.6
Office	55	Management of Companies and Enterprises	25,067	2.2
Office	56	Admin. Support, Waste Mgnt., Remediation Services	101,671	9.3
Office	61	Education Services	21,965	2.0
Office	62	Health Care and Social Assistance	175,699	16.2
Office	71	Arts, Entertainment and Recreation	24,224	2.2
Office	72	Accommodation and Food Services	119,166	11.0
Office	81	Other Services (except Administration)	47,955	4.4
Non-Office	11	Forestry, Fishing, Hunting, and Agriculture	142	<0.1
Non-Office	21	Mining	150	<0.1
Non-Office	23	Construction	54,608	5.1
Non-Office	31-33	Manufacturing	54,798	5.1
Non-Office	99	Unclassified establishments	110	<0.1
		Office	**970,463**	**89.8**
		Non-Office	**109,698**	**10.2**
		Total	**1,080,271**	**100%**

Source: U. S. Bureau of the Census. County Business Patterns by Employment Size Class and Legal Form of Organization. 2015. Table ID CB1500CBP.

Table 6. Establishments and Employees in the Tampa-St. Petersburg-Clearwater MSA, 2015

Establishments	Number of Total Establishments	Percentage of Total Establishments
Total Establishments	74,726	100.00
0-19 Employees	65,279	87.36
20-99	7,667	10.26
100-499	1,600	2.14
>499	180	0.24

Source: U. S. Bureau of the Census. County Business Patterns by Employment Size Class and Legal Form of Organization. 2015. Table ID CB1500CBP.

TBARTA's Current Customer Database

TBARTA's current customer database also can be used to identify priority commuter groups with whom to focus targeted commuter assistance campaigns. The TBARTA customer database constitutes commuters actively seeking commuter services. Social marketing techniques can be applied to better understand the motivations of these customers toward their travel choices.

Social marketing is an effective TDM planning approach to encourage use of commuter assistance services and transportation alternatives to the single occupant vehicle. While traditional marketing is used to sell goods and services, social marketing seeks to influence behaviors. Social marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviors that benefit individuals and communities for the greater social good. [78] Social marketing is characterized by a focus on socially beneficial behavior change, a strong consumer orientation, the use of audience segmentation techniques and the selection of target audiences, the use of marketing's conceptual framework (marketing mix and exchange theory), the recognition of competition, and continual marketing research.[79]

Market segmentation refers to dividing a market into groups of customers to develop different products, services, and communications to meet their specific needs, and to focus resources on those segments that have the greatest potential for change. Segmentation can increase the efficiency and effectiveness of social marketing efforts.[80]

[78] International Social Marketing Association, European Social Marketing Association, and Australian Association of Social Marketing. Consensus Definition of Social Marketing. 2013.
[79] Winters, P.L., Lester, A.B., & Pham, M. "SEGMENT: Applicability of an Existing Segmentation Technique to TDM Social Marketing Campaigns in the United States." NITC-RR-1057. Portland, OR: Transportation Research and Education Center (TREC), 2018. p. 7.
[80] McLeay, F., and D. Oglethorpe. 2013. "Social Marketing, Parental Purchasing Decisions, and Unhealthy Food in Developing Countries: A Nigerian Typology." *Journal of Consumer Behavior* 12.3. pp. 232-242. See also Andreason, A. 2002. "Marketing Social Marketing in the Social Change Marketplace." *Journal of Public Policy & Marketing* 21.1. pp. 3-13. See also Kotler, P., and N. Lee. 2008. *Social Marketing: Influencing Behaviors for Good*. 3rd Edition. Sage Publications. Thousand Oaks, CA.

Applying a Social Marketing Approach to Commuter Assistance

Recent CUTR research has investigated the applicability of a consumer market segmentation technique developed and applied in European Union nations, known as SEGMENT. The SEGMENT project in Europe examined how consumer market segmentation techniques can influence travel behavior choices in favor of more energy sustainable modes of travel. The project analyzed over 10,000 attitudinal surveys to develop eight main attitudinal market segments that can be used to design mobility social marketing campaigns. These attitudinal market segments can characterize survey respondents based upon answers to eighteen "Golden Questions." These questions were identified through the research as the smallest number of key survey questions that accurately reproduce the market segments.[81]

The CUTR research built upon the SEGMENT technique to adapt it to the United States. CUTR researchers applied linear discriminant analysis to a long list of potential questions, to develop and validate a derived series of key "Golden Questions". These Golden Questions accurately predict cluster membership for drivers and non-drivers/light drivers within seven market segments.[82] This adapted SEGMENT technique has been applied to commuter assistance programs in Florida through the CAP Evaluation process. This is for the purpose of maximizing the impact of TDM social marketing campaigns to change travel behavior and reduce the costs of customized consumer market segmentation studies.

The seven U. S. travel market segments are duplicated below, as described in the research.[83]

Three Non-Driver Groups

Groups 1 through 3 are the non-driver groups and are described as follows.

Group 1 – Open-Minded and Practical Travelers

This group somewhat likes driving or traveling by car, truck or van as a passenger. They also believe that people should be allowed to use their cars, trucks, or vans as much as they like. However, they are also open-minded about other modes of transportation. They have positive attitudes towards walking and biking and are aware of the health benefits from walking and biking. They understand that society is facing environmental problems, but do not have a strong drive to act on this situation. They do not like or dislike other modes of transportation such as bus, train, ferryboat, or subway.

Group 2 – Car-Free Choosers

This group does not feel the need to own a car as they believe that public transportation, walking, and cycling are adequate for their daily life. They also think that owning a car, truck, or van is expensive, and

[81] Intelligent Energy Europe. The SEGMENT Tool Kit: Resources for Creating Segmented Marketing Campaigns for Sustainable Transport. Segmented Marketing for Energy Efficient Transportation. 2015.
[82] Winters, P.L., Lester, A.B., & Pham, M. "SEGMENT: Applicability of an Existing Segmentation Technique to TDM Social Marketing Campaigns in the United States." NITC-RR-1057. Portland, OR: Transportation Research and Education Center (TREC), 2018.
[83] Winters, P.L., Lester, A.B., & Pham, M. "SEGMENT: Applicability of an Existing Segmentation Technique to TDM Social Marketing Campaigns in the United States." NITC-RR-1057. Portland, OR: Transportation Research and Education Center (TREC), 2018. pp. 41-43.

therefore do not have any incentive to invest in them. As a result, they are unlikely to increase their driving frequency. However, they still enjoy traveling in a car, truck, or van as a passenger. They also have positive attitudes towards many types of public transportation such as bus, train, ferryboat, or subway. They love walking and biking and strongly believe that walking and biking are very healthy. They also pay a lot of attention to the environmental problems that society is facing and strongly believe that global warming is not an exaggerated threat. If this group dislikes any mode of transportation, it might be motorcycle.

Group 3 – Car Contemplators

This group loves traveling by car, truck, or van, whether they are driving or not. They do not like traveling by public transportation such as bus, train, ferryboat, or subway because they think that they are both slow and stressful. They believe that owning a car, truck, or van is a sign of success and they provide status and prestige to its owner. As a result, they feel that people should be allowed to drive as much as they would like. They do not like biking or walking as a way to get to places but are aware of the health benefits. They are also aware of environmental problems and do not believe that global warming and climate change threats have been exaggerated. However, they do not feel that they need to personally act to solve these problems.

Four Driver Groups

Groups 4 through 7 are the driver groups and can be described as follows.

Group 4 – Malcontented Motorists & Non-Bikers

This group likes driving, but not as much as the Car Lovers/Devoted Drivers do. They agree that it is important to reduce the number of cars, trucks, and vans on the road due to traffic noise and odor. They also feel responsible about environmental problems and do not believe that climate change and global warming have been exaggerated. They somewhat believe that reducing car usage can help stop climate change. Nevertheless, they do not enjoy public transportation because driving is faster. Therefore, they do not have many options besides driving. A distinctive feature of this group is that they dislike bicycles and motorcycles, even though they acknowledge the health benefits of bicycling.

Group 5 – Car Lovers/Devoted Drivers

This group really loves to drive and does not want to cut down their car/truck/van use and believes that there is no realistic alternative to driving. They believe that driving is a way to express themselves. As a result, they strongly believe that people should be allowed to use their car, truck, or van as much as they like. They have very negative attitudes towards biking and walking even though they understand the health benefits of walking and biking. They also have very negative attitudes towards any kind of public transportation and believe that car, truck, and vans are faster and cheaper and safer. However, they do not think that they are too dependent on a car, truck, or van. They also do not enjoy carpooling. They do not agree that car, truck, or vans create noise and odor nuisance or lead to an unhealthy lifestyle. Regarding environmental issues and climate change, this group somewhat believes that the environmental threat has been exaggerated.

Group 6 – Active Aspirer

This group does not enjoy driving as much as people in other groups and would gladly cut down their car, truck, or van use if they could. They believe that driving is quicker than public transportation but not cheaper because owning a car, truck, or van is expensive. They do not like traveling by taxi cab and motorcycle. They have positive attitudes toward public transportation such as bus, subway, railroad, and ferryboat. They also enjoy biking and walking and highly appreciate the health benefits of biking and walking. They are highly aware of environmental responsibilities and climate change and would like to act on them. Therefore, this group believes that it is important to reduce the number of car, truck, and vans due to traffic noise and odor, and to solve environmental issues. If this group has to use a car to get to work, they would like to carpool.

Group 7 – Open-Minded Car Lovers

Just like the Car Lovers/Devoted Drivers group, this group really loves to drive, and does not want to cut down their car, truck, or van use, and believe that there is no realistic alternative to driving. They strongly believe that people should be allowed to use their car/truck/van as much as they like and think that driving is a way to express themselves. Since they believe that driving is cheaper and quicker, they have unfavorable views toward public transportation. Nevertheless, they still like traveling by walking and biking and highly appreciate the health benefits of walking and biking. Despite their love for driving, this group feels responsible about environmental issues and does not believe that climate change and global warming have been exaggerated. Therefore, they think that it is important to reduce the number of car/truck/vans because of traffic noise and odor. This group is open to carpooling.

The SEGMENT report surveyed Florida commuters statewide and found that Florida's top three market segments, as shown in Table 7, are Open-Minded Car Lovers (28%); Malcontented Motorists and Non-Bikers (23%); and Car Lovers/Devoted Drivers (20%). The SEGMENT report also surveyed commuters statewide in Oregon and in Virginia and found that the market segmentation differs from state to state.[84]

The purpose of the CAP Evaluation is to survey the commuters represented in the databases of the six CAPs in Florida to assess changes in travel behavior and in key metrics, calculate the resulting societal benefits, and gauge customer satisfaction. Sponsored by the Florida Department of Transportation, Transit Office, the most recent available data were collected for the CAP Evaluation CY2017. The CAP Evaluation CY2017 also applied the adapted SEGMENT technique with results that can help the CAPs better understand the attitudes of their commuter markets.[85]

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[84] Winters, P.L., Lester, A.B., & Pham, M. "SEGMENT: Applicability of an Existing Segmentation Technique to TDM Social Marketing Campaigns in the United States." NITC-RR-1057. Portland, OR: Transportation Research and Education Center (TREC), 2018. p. 44.

[85] Center for Urban Transportation Research, University of South Florida. "Florida Commuter Assistance Program Evaluation CY2017." Prepared for the Florida Department of Transportation, Transit Office. BDV25 TWO 943-69. November 2018.

The Florida statewide profile of commuters differs from the averages for all Florida commuter assistance program customers statewide, as shown in Table 7 below. The market segments of TBARTA also differ regionally from the other CAPs.

Table 7. Distribution of Market Segments by CAP

			D1	D2	D3	D4/D6	D5	D7
Segment	FL com-muters	All FL CAPs	Com-muter Services	Commuter Services of N. Florida	rideOn	SFCS	reThink Your Commute	TBARTA
NON-DRIVERS								
Open-Minded and Practical Travelers	5%	1.3%	0%	2.9%	0%	0.9%	1.2%	1.6%
Car-Free Choosers	4%	17.7%	0%	14.9%	15.0%	26.9%	13.4%	22.6%
Car Contemplators	3%	3.5%	0%	0%	0%	5.8%	3.4%	3.9%
DRIVERS								
Malcontented Motorists & Non-Bikers	23%	29.3%	34.1%	25.7%	65.0%	22.6%	32.4%	26.5%
Car Lovers/Devoted Drivers	20%	4.6%	15.9%	11.8%	0%	2.7%	3.8%	3.9%
Active Aspirers	16%	34.7%	31.8%	37.6%	20.0%	36.7%	34.4%	34.0%
Open-Minded Car Lovers	28%	8.9%	18.2%	6.9%	0%	4.4%	11.3%	7.5%

Sources: Florida Commuter Assistance Program Evaluation CY2017. Table 10, p. 8; and "SEGMENT: Applicability of an Existing Segmentation Technique to TDM Social Marketing Campaigns in the United States." p. 44.

This identification of priority commuter groups illustrates how TDM strategies implemented through the CAP and partner TMOs specifies targeted commuter markets who more likely could benefit from commuter assistance or have already communicated an interest in finding more transportation options. By selecting one or more targeted markets, CAPs and partner TMOs strategically direct commuter assistance resources in a more cost-effective manner.

Social Ecological Model (SEM)

Whether using an existing transportation option or introducing a new technology, the field of TDM recognizes that the goal is to influence behavior for greater societal benefits. Our behavior is determined by multifaceted and interactive effects of personal and environmental factors. The Social Ecological Model (SEM)[86] is a theory-based framework for understanding the multifaceted and

[86] National Cancer Institute. (2005). *Theory at a Glance: A Guide for Health Promotion and Practice*. U. S. Department of Health and Human Services. Retrieved from

interactive effects of personal and environmental factors that determine behaviors, and for identifying behavioral and organizational leverage points and intermediaries for influence within organizations. Figure 8 illustrates the Social Ecological Model.

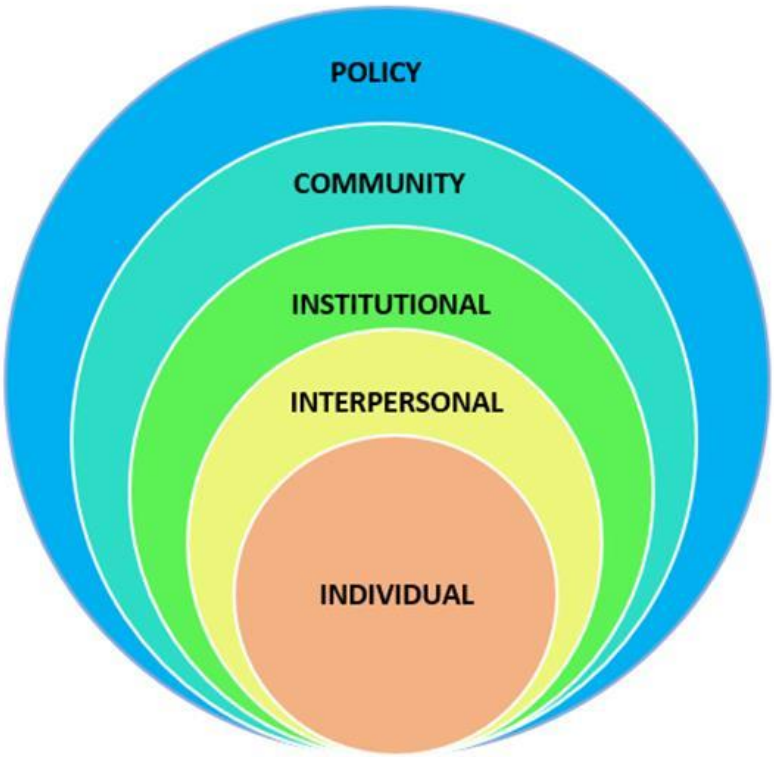


Figure 8. The five nested hierarchical levels of the Social Ecological Model.

There are five nested, hierarchical levels of the SEM. These include the individual, interpersonal, community, organizational, and policy levels. This model asserts that successful behavior change targets individuals and their environments. That is because our families, communities, interactions, and culture all affect how we act. If a person's environment changes, then their behavior often changes. The most effective approach to changing behavior uses a combination of interventions at all levels of the model. Numerous decisions affect short-term and long-term behavior.

For example, the decision where to live greatly affects the traveler's trip length and vehicle miles traveled throughout the time that a traveler lives at a particular location. Home seekers select a place to live based upon what they can afford and how the attributes of a candidate home in its present condition meets their needs. The home's present condition is a culmination of historical investment decisions of its surroundings, the results from previous and existing policies and regulations, the economy, and improvements made by previous tenants. Transportation related conditions include the

https://www.sbccimplementationkits.org/demandrmnch/wp-content/uploads/2014/02/Theory-at-a-Glance-A-Guide-For-Health-Promotion-Practice.pdf

local street network and its access to regional facilities, access to public transportation, and its physical accessibility to work, shopping, educational, civic, recreational and personal business opportunities.

For specific travel markets and in particular areas such as activity centers, investments in multimodal infrastructure and services, with commuter assistance policies, programs, services, incentives, information campaigns, partnerships, and in some cases, regulation, can provide more travel choices that meet the needs of commuters. Table 8 below provides numerous examples of potential TDM strategies that operate on the multiple levels of the Social Ecological Model.

Table 8. Examples of TDM Strategies that Address Personal and Environmental Factors

Social Ecological Model Hierarchical Level	
Policy	Federal, state, region, county, municipal
	Taxation, infrastructure investment, urban services boundaries, land use regulation, mixed use development patterns, neighborhood investment, affordable housing in proximity to public transportation, multimodal infrastructure/services investments, managed lanes, vehical occupancy detection, transit benefits ordinance for employers, trip reduction ordinance for land development, parking management, microtransit policies
Community	Sub-municipal, neighborhood, business district, corridor, university area Community Redevelopment Areas, Opportunity Zones
	Complete streets, parking management, public transit service, carshare, microtransit, circulators, landscaping, Bicycle Friendly Business, transportation management organizations, NECO pass, ERH, vanpool program, carpool matching
Institutional	Employer, school, organizational affiliations, service providers, insurance agency, homeowner or condominium association, property manager
	Work site location, Qualified Transportation Fringe Benefits, ECO pass, transit or vanpool subsidy, parking management, alternative work arrangements, on-site amenities, insurance discounts for reduced VMT, on-site housing
Interpersonal	Spouse/partner, children, other family, neighbors, friends
	Based upon family needs according to life cycle stage (young family, retired, etc.)
Individual	You
	Income, age, health, car ownership, activity level, lifestyle preferences

Commuter assistance programs seek to better understand the barriers faced by target markets, based upon each hierarchical level. By developing an in-depth understanding of the nature of the transportation needs and challenges faced by commuters and other travelers, service providers can begin to tailor programs better addressing those needs. Examples of identifying potential barriers faced by travelers in using various alternative commute modes are illustrated in Tables 9 through 13.[87]

[87] Barriers were identified by students considering a hypothetical travel market as part of the Florida Commuter Choice Certificate Program module, Social Marketing in Transportation. https://www.commuterservices.com/training/

Table 9. Potential Barriers to Carpooling at SEM Hierarchical Levels

Individual	Interpersonal	Organizational	Community	Policy
• Loss of independence • Inconvenient • Cannot find ride(r)	• Germ transfer (COVID) • Cannot run errands/meet family obligations • Negative image/uncool • Stranger danger	• Carpool's scheduling inflexibility • Not clock-punching employer	• Lack of park and ride lots to meet • Overbuilt and underpriced parking incentivizes SOV	• No time saving managed lane discounts • No carpool federal tax benefit • Lip-service in transportation plans • CDC advises against carpooling

Table 10. Potential Barriers to Using Transit at SEM Hierarchical Levels

Individual	Interpersonal	Organizational	Community	Policy
• Uncomfortable access • Weather • No connections • Trip planning difficult (schedules indecipherable)	• Stigma on riding transit (social service) • Stranger danger • Cannot see in bus from outside	• Time-consuming transfers required • Employer subsidizes parking but not transit	• No first/last mile connections • Lack of basic amenities like sidewalks, shelter	• Land use • Lack of accessibility • CDC advises against transit

Table 11. Potential Barriers to Teleworking at SEM Hierarchical Levels

Individual	Interpersonal	Organizational	Community	Policy
• No dedicated workspace in home • Ill-equipped at home • Feeling of isolation/loneliness • Added costs to work at home (supplies, Internet)	• COVID requires childcare/home schooling at same time • Manager distrust of workers • Poor communication habits	• Network security concerns by IT • No formal telework policy at employer • Productivity may suffer • Communications with clients will suffer	• Spotty network coverage • Lack of affordable childcare	• Tax implications if employer and residence are in different states • Telework not considered a mode in budgeting for transportation

Table 12. Potential Barriers to Walking at SEM Hierarchical Levels

Individual	Interpersonal	Organizational	Community	Policy
• Unsafe feeling when walking • Florida weather makes it too hot/humid to walk most of the year • Live too far away to walk to work	• No one to walk with • Unsafe for children to walk to school	• No showers or lockers at work for people who walk • Employer concerned with liability	• Poor lighting of paths • Gaps in sidewalks	• Lumped with bicycle needs • Cars given preference over pedestrians at intersections • LOS F for driving means you are going really slow. LOS F for walking means you take life in your hands.

Table 13. Potential Barriers to Bicycling at SEM Hierarchical Levels

Individual	Interpersonal	Organizational	Community	Policy
• Don't own bike • Bike in disrepair • Lack of affordability for all the gear • Job requires a car	• Cyclists considered selfish • Bike theft • Fear homeless encampments • Not a Lycra person • Aggressive drivers	• No safe/secure place to store bike • Lack of showers and lockers	• People of color fear profiling by police when bicycling • Blame placed on bicyclists in crashes • Enforcement lacking	• Tax benefits suspended until 2026 and level a fraction of parking • No requirement for showers, lockers in new development

Findings from Stakeholder Input and Engagement, Technical Memorandum 2

A stakeholder engagement process had been undertaken to better inform the development of the CAPRDP. This process included meetings with different types of stakeholders, as shown in Table 14, including government staff and service providers. Outreach included presentations with Q&A before various groups such as members of TMOs and neighborhood representatives. It also included presentations and discussion with MPO committees that represented citizens and persons with disabilities. Outreach was extended to student groups, bicycle and pedestrian advocates, and members of the TDM profession statewide. These meetings were frequently followed up with discussions via phone call and emails to collect information about issues and ideas from commuter assistance program planning and implementation partners as well as customer representatives of various commuter markets.

Table 14. Groups Engaged during Stakeholder Outreach

Students	**Lower income residents**	**Business owners**
Elderly residents	**Employers**	**Property owners**
Residents/neighborhood groups	**Service providers**	**Government staff**
Persons with disabilities	**Employees**	**Bicyclists**

There were some emerging themes as certain comments and discussions came up repeatedly. These included topics such as frustration with limiting factors from government procedures and funding constraints, as well as ideas for future collaboration. The stakeholder participants provided numerous ideas for use in the development of the CAPRDP, especially in the areas of marketing and outreach, transportation and land use planning and regulatory tools, and TDM strategies. Parking management was among those strategies most discussed by the stakeholder groups.

Strengths, Weaknesses, Opportunities, Threats Analysis of the Tampa Bay Region's Transportation Circumstances

Stakeholder input from Task 2 also provided perceived strengths, weaknesses, opportunities, and threats (SWOT) for commuter assistance in the future. During the conduct of the Task 3 national review of promising and emerging TDM practices, further analysis of the Tampa Bay area's strengths, weaknesses, opportunities, and threats were identified. Strengths and weaknesses are internal to the commuter assistance program. Opportunities and threats are external to the commuter assistance program. Table 15 summarizes these considerations from Tasks 2 and 3 for TDM planning.

Table 15. CAP Strengths, Weaknesses, Opportunities, and Threats in the Tampa Bay Area

Strengths
Perceptions of strengths collected from Task 2 Stakeholder Outreach • An employer thinks the vanpool program has a lot of merit and wants more information • An office work site for City of Plant City, flexing start time schedules 7:30 am to 9:30 am works well for employees commuting from St. Petersburg and Lakeland • Believes the car sharing service on the USF Tampa Campus is "brilliant" for students; tuition is expensive and car sharing reduces need for car • The new Water Street development in downtown Tampa will be implementing mobility hubs: physical hubs where you can get information and tickets on rail, car share, bus, and MaaS options. • PSTA has first mile/last mile service provided by a transportation network company • Pinellas County implemented a pilot work force program to enable entry level workers to have transportation to a work site. Providing first mile/last mile • Gateway Master Plan bolstered by startup of TMO and support of the Gateway Business Group • Tampa General Hospital will be a model for providing commuter benefits • Pinellas MPO is updating their plans and aims to have mode share targets • Enterprise uses the cost of parking to the employer to get them to try vanpool/carpool; e.g. Wyndham in Clearwater

Strengths derived from Task 3 National Review of other regions compared to the Tampa Bay area

- Fundamental nature of TDM: relatively low cost, quick to implement, capable of "surgical precision" of strategy implementation due to focused target marketing.
- Commuter assistance in Tampa Bay fills in the gaps, such as vanpooling for long distance commutes.
- The largest major activity centers in Tampa Bay have dedicated, on-the-ground transportation management organizations (TMOs) to respond to local needs
- TBARTA's regional nature means cost effectiveness of the delivery of some products and services common to all TMOs such as ridematching, vanpooling and emergency ride home
- TMOs offer FDOT and local governments continual dialogue with local businesses and community groups on transportation issues, not just single projects
- Growing political support to invest in public transportation, bike/walk infrastructure.
- Strong foundation of existing commuter assistance programs and services on which to build.
- Consistent programmed funding at the state level for commuter assistance

Weaknesses

Perceptions of weaknesses collected from Task 2 Stakeholder Outreach

- Organizations that provide commuter assistance are often bound by yearly contracts with no assurance that there will be continued funding. This short time horizon makes it difficult to plan, develop and maintain community collaborative relationships, and evaluate programs that may take longer than a year to show results.
- Insurance/liability issues block better use of private parking
- Many people will not walk more than four blocks in downtown Tampa
- No options for those in Plant City. Cannot take transit from Plant City to Tampa
- Pasco BOCC approves more housing developments that entice people to live far from their jobs.
- Enterprise service provider having a hard time getting the private sector to use their rideshare services
- The banks are an obstacle; bank would not finance a project that did not have a certain number of parking spaces
- Agencies need state support or else, no go on TDM
- How do we keep and attract young, creative talent? "I can teach somebody to code, I can't teach somebody how to be creative." Young creative talent look at the area and say, "Where's the sidewalk? Where's the bike lanes? Where's the transit? I don't think I want to own a car." Keeps coming back to transit.
- Those people who can afford to live in mixed-use housing are not the same people working below in the salon/retail on the first floor.
- Bayshore and Platt – the mixed-use development has been empty for a while.
- A barrier to commuting by bicycle for many people is the need to bring briefcase, lunch, laptop, etc. to and from work.
- Local governments are not coordinating with their transportation management organizations
- MPOs and local governments lack the funding and the staffing resources for TDM planning
- The system closes a lot of people out. We are not having that conversation about how to ensure the aging population stays mobile.
- Lack of political will to make use of the CSX corridor
- On the residential side, there is poor access to public transit

- There are limits to technology that affect equity. Methods are needed to include those who do not have access to technology.
- Presently, all TBARTA vanpools serve federal work sites where there are employer subsidies. There may be price increases, and subsidy decreases that could tip the cost/benefit calculation made by vanpool commuters against vanpooling.

Weaknesses derived from Task 3 National Review of other regions compared to the Tampa Bay area

- An underdeveloped public regional public transit system.
- Limited travel choices outside of the urbanized area of Tampa Bay
- Lack of affordable housing pushing people to suburban fringe beyond transit service area.
- Annual applications for funding for TMOs limit long-range planning
- Telework Tampa Bay (a partnership between TBARTA and RPC) to assist local businesses in starting a telework program was discontinued
- The region has less than a dozen TDM professionals
- Level funding for commuter assistance at the state level
- CMAQ funds (about $2 million per year) are not funding TDM
- TDM not shown in the LRTPs and TIPs in the same manner as other options (e.g., vanpool routes are not mapped but transit systems and trails are)

Opportunities

Perceptions of opportunities collected from Task 2 Stakeholder Outreach

- Growing interest for bike infrastructure from Plant City to Tampa
- Overpass Park – aiming to increase jobs in Pasco so people don't have to commute to other counties
- City of Tampa will soon pilot a Mobility-as-a-Service concept that lays out all modal choices and schedules, etc. allows people to choose based on social factors like "Green ride," "Cheap ride" or "Fast ride" and MaaS also can collect information about travel behavior
- People are willing to walk ¼ mile, but they're willing to also bike ¾ mile
  There is unused space in Dade City, with Pasco MPO considering moving some of their staff to remote offices or work from home
- City of Tampa is conducting "plan through action" pilot programs, for example the Downtowner and eScooters
- City of St. Petersburg has a Complete Streets Plan that established modal priority for streets
- I-275 bridge reconstruction includes creation of a bicycle path.
- City of St. Petersburg won a Bloomberg Grant on climate change
- Training opportunities from National Association of City Transportation Officials (NACTO) for innovative street design
- Pasco MPO is conducting feasibility study for bicycle and pedestrian facilities, with an effort to connect sidewalks

Opportunities derived from Task 3 National Review of other regions compared to Tampa Bay area

- Commuter assistance can harness emerging technologies.
- Social distancing required by pandemic introduces more businesses and employees to the possibilities of telework.
- Other disruption due to pandemic may shift commuter needs. For example, workers who lost their jobs may seek new commute alternatives to solve transportation problems presented by a new job location or job shift time.

- Investments in walking and bicycling infrastructure can be promoted to the community by the CAP and the TMOs.
- Impact of an economic downturn may redefine commuter markets. More households may become more cost sensitive and take another look at commute alternatives.
- Future federal transportation reauthorization.
- The changing conversation about transportation performance, at the national level, emphasizes moving people, not vehicles.

Threats

Perceptions of threats collected from Task 2 Stakeholder Outreach

- Concerns about micromobility safety. Underage users riding Escooters in the streets. Solution: enforcement by police. Other anxieties around the age of riders, 14-year olds riding in the streets. Solution: scooter signage about rules and boundaries, education/training, maybe audio that comes from the scooter that says "area restricted" when going out of bounds instead of simply powering down.
- Two-thirds of [Tampa] downtown parking is private sector. Artificially low parking prices, and absence of a marketplace for optimizing inventory
- Lack of road connections due to rapid growth. Chancey Road in Pasco County is an example.
- Problem is transfer of development rights; sprawl keeps our money tied up
- Insufficient housing choices in Pinellas are forcing households to move to Hillsborough and Pasco

Threats derived from Task 3 National Review of other regions compared to the Tampa Bay area

- A legacy of an historically car-centric transportation system, with close to 80 percent driving alone as their reported commute mode for the journey to work.
- Impact of pandemic on the economy, causing instability of employment, funding, etc.
- The potential for Internal Revenue Code to be revised to eliminate Qualified Transportation Fringe Benefits. One outcome of this might be that the Commute by Enterprise vanpool subsidies provided to federal employees would decrease or be removed altogether.
- Potential for the Florida State Supreme Court to find the Hillsborough Transportation Sales Surtax unconstitutional.
- Even if the Surtax is upheld, an economic downturn could limit Hillsborough Transportation Sales Surtax revenues.
- Employer attitudes that their employees' commute is not their problem.
- Federal EPA actions to loosen fuel economy standards.

Statewide Policies and Plans

The discussion below is a review of planning efforts at the statewide and regional levels. This is relevant to a discussion of the CAPRDP because an important source of CAP funding comes from FDOT. As a result, alignment of CAP goals and objectives with FDOT goals and objectives strengthens outcomes. Conversely, FDOT statewide and regional goals should reflect and advance the use of CAPs and TDM to achieve its goals.

Statewide Commuter Assistance Program

The Florida Department of Transportation established the statewide Commuter Assistance Program, administered through the Districts, to promote the use of TDM strategies by public and private sectors. Since the early 1990s, FDOT has supported the provision of technical assistance for TDM statewide, funding the TDM Clearinghouse at the University of South Florida (USF) in 1991. FDOT also funded technical assistance for promoting bicycle and pedestrian commuting, through the Florida Bicycle/Pedestrian Commuter Assistance Center at the Florida Institute for Marketing Alternative Transportation (FIMAT) at Florida State University (FSU). In 1992, FDOT provided funding support to training for TDM professionals that led to the establish the Florida Commuter Choice Certificate Program at USF, which provides TDM training to transportation professionals.

In 1999, FDOT funded a Transit Corridor Program (Policy 725-030-003) that provided funds for transit demonstration projects. In 2001, FDOT established the Park-and-Ride Lot Program (policy 725-030-002), providing funding for the construction, promotion, and maintenance of park-and-ride lots.

FDOT provides policy guidance and funding support to the Districts that fund regional commuter assistance programs and transportation management organizations. In 2002, FDOT adopted Policy 725-030-008, establishing procedures and guidelines for the Commuter Assistance Program for identifying effective employer-based transportation demand management strategies, fostering development of public/private partnerships and funding eligible recipients to carry out commuter assistance program projects. The Policy provides definitions of terms, descriptions of roles and responsibilities, eligible project costs, and performance indicators.

In 2007, Policy 000-725-050 was adopted by FDOT to ensure that FDOT considers TDM strategies in all studies, plans, programs, and functional areas. The Commuter Assistance Program will be implemented in conjunction with other strategies and activities including those in MPO plans and studies, local government comprehensive plans, locally prepared feasibility studies, and Transit Development Plans.

The CAP Procedure and the TDM policy are still in place.

Florida Transportation Plan 2045

The FTP 2045 update process is underway and will be adopted in late 2020.[88] The drafting of the FTP began in July 2020. There are four elements to the FTP 2045.

- Vision
- Policy
- Implementation
- Performance

The Vision Element has been completed and includes the following main vision emphases.[89]

- Global Leadership in the Future of Mobility

[88] The Florida Transportation Plan process. http://floridatransportationplan.com/
[89] 2045 Florida Transportation Plan, Vision Element. Florida Department of Transportation. May 2020. http://floridatransportationplan.com/pdf/REPORT_FDOT_Vision2020_final_Apr20_spreads.pdf

- Forward-looking planning for how transportation contributes to a more competitive, resilient, and sustainable state
- Sustainable transportation partnerships and investments

The Vision Element also articulates seven goals that are consistent with and build upon the previous FTP 2040. These include the following.

1. Safety and security for residents, visitors, and businesses
2. Agile, resilient, and quality transportation infrastructure
3. Connected, efficient, and reliable mobility for people and freight
4. Transportation choices that improve accessibility and equity
5. Transportation solutions that strengthen Florida's economy
6. Transportation systems that enhance Florida's communities
7. Transportation solutions that enhance Florida's environment

In Technical Memorandum 1, a summary of the existing FTP 2040 goals and objectives was provided, with recommendations offering a host of specific commuter assistance program actions that could be implemented to advance the goals and objectives of the FTP 2040. Those earlier recommendations are listed in Table 16 below.

Table 16. Florida Transportation Plan--Goals and Objectives; How CAPS can Help Meet Them

Goals	Objectives	CAPs (example activities)
Safety and security for residents, visitors, and businesses.	• Prevent transportation-related fatalities and injuries. • Reduce the number of crashes on the transportation system. • Prevent and mitigate transportation-related security risks. • Provide transportation infrastructure and services to help prepare for, respond to, and recover from emergencies.	• Educate all customers, including visitors, about safety issues and improvement strategies for all modes. • Participate in the planning processes such as Complete Streets, including communicating with Florida businesses • Reduce VMT via ridesharing and transit • Offer CAP services to facilitate business continuity such as facilitating the adoption of telework
Agile, resilient, and quality transportation infrastructure.	• Meet or exceed industry, state, national, or international standards for infrastructure quality, condition, and performance for all modes of transportation. • Optimize the functionality and efficiency of existing infrastructure and right of way.	• Assist the FDOT with the promotion of managed lanes • Assist FDOT with mitigating traffic during congestion by encouraging commuters to shift to higher occupancy modes and/or change time of their trip • Incorporate and support emerging technologies such as

Goals	Objectives	CAPs (example activities)
	• Adapt transportation infrastructure and technologies to meet changing customer needs. • Increase the resiliency of infrastructure to risks including extreme weather and climate trends.	autonomous vehicles and smart mobility options where appropriate to improve system efficiency • Facilitate on-going and multi-project involvement with employers re: transportation needs and plans via transportation management associations
Efficient and reliable mobility for people and freight.	• Reduce delays related to bottlenecks, gaps, and crashes and other incidents for all modes of Florida's transportation system. • Increase the reliability of all modes of Florida's transportation system. • Increase customer satisfaction with Florida's transportation system and regulatory processes for Florida's residents, visitors, and businesses. • Increase the efficiency of the supply chain for freight moving to, from, and through Florida. • Increase the efficiency and flexibility of transportation-related regulatory processes.	• Reduce delays through demand management options such as encouraging employers to stagger work hours • Promote the provision of qualified transportation fringe benefits by employers to increase transit and vanpooling • Increase employer involvement in addressing mobility and congestion needs by fostering the development of commuter-friendly workplace policies through programs such as Best Workplaces for Commuters • Support commuter education and encourage adoption of automated and connected vehicles • Integrate smart mobility options as part of emergency ride home and ridesharing efforts • Promote ridehailing as a first/last mile transit service for commuters • Provide support for high occupancy vehicles in managed lanes, as appropriate
More transportation choices for people and freight.	• Increase the use of new mobility options and technologies such as shared, automated, and connected vehicles, to meet the needs of Florida's residents, visitors, and businesses. • Increase the share of person trips using public transportation and	• Facilitate the formation of carpools, vanpools and the adoption of alternative work hour strategies like compressed work week • Incentivize trial use of transit, carpools, etc.

Goals	Objectives	CAPs (example activities)
	other alternatives to single occupancy motor vehicles. • Increase the number of quality options for visitor travel to, from, and within Florida. • Increase the number of quality options for moving freight to, from, and within Florida. • Increase the efficiency and convenience of connecting between multiple modes of transportation for complete trips	• Select priority groups to effectively change travel behavior based on their needs and circumstances • Support TDM strategies in support of FDOT's Complete Streets Policy • Facilitate the use of Engineering, Education, Encouragement, Enforcement and Evaluation & Planning toward safe use of travel by bicycle and pedestrian • Support public/private partnerships to provide carsharing, bikesharing, and shuttle services to facilitate the use of travel options • Provide recognition through programs like Best Workplaces for Commuters to employers for commute friendly programs to help manage demand
Transportation solutions that support Florida's global economic competitiveness.	• Provide transportation infrastructure and services to support job growth in transportation dependent industries and clusters. • Increase transportation connectivity between Florida's economic centers and regions. • Increase transportation connectivity between Florida and global and national trading partners and visitor origin markets. • Increase the number of skilled workers in Florida's transportation-related industries	• Manage vanpool and carpool programs to reach long distance commuters linking rural residents with jobs • Provide training and technical assistance to improve the skills and capabilities of CAP professionals in Florida and promote understanding of TDM among transportation community
Transportation solutions that support quality places to live, learn, work, and play.	• Plan and develop transportation systems that reflect regional and community values, visions, and needs. • Increase customer satisfaction with Florida's transportation system.	• Promote Complete Streets • Provide assistance to encourage development and design that provides more walkable and bikeable communities • Partner with community health organizations to encourage travel by non-motorized modes

Goals	Objectives	CAPs (example activities)
	• Provide convenient, efficient accessibility to the transportation system for Florida's residents and visitors. • Provide transportation solutions that contribute to improved public health	
Transportation solutions enhance Florida's environment and conserve energy.	• Plan and develop transportation systems and facilities in a manner that protects, and where feasible, restores the function and character of the natural environment and avoids or minimizes adverse environmental impacts. • Decrease transportation-related air quality pollutants and greenhouse gas emissions. • Increase the energy efficiency of transportation. • Increase the use of transportation fuels and energy sources that are alternatives to traditional fossil fuels.	• Reduce VMT and the result emissions and energy use by increasing use of non-single occupant vehicle trips and/or substituting the need to travel (e.g., telework)

Source: USF Center for Urban Transportation Research.

It is observed that none of the 56 strategies listed under the former "Existing State & Interregional Strategies, identified in the existing Florida Transportation Plan Policy Element" recognized the FDOT Commuter Assistance Program. The best place for a commuter assistance strategy, its role and how it will advance the Policy Element would fit easily into the category of Customers.[90]

Commuter assistance programs (CAPs), implemented at the District level, support the fastest growing "travel alternative" - telework - during times like COVID-19. CAPs provide help to commuters who carpool/vanpool, bicyclists and pedestrians, especially for customers who have limited or no public transit service. CAPs utilize transportation demand management strategies that yield numerous societal benefits such as enhanced mobility and reduced transportation costs, reduced emissions, reduced traffic congestion, and improved safety. It is recommended that the new Policy Element for the FTP 2045 recognize transportation demand management strategies and the Commuter Assistance Program that implements them.

[90] Florida Department of Transportation, Office of Policy Planning. "Existing State & Interregional Strategies, Identified in the Existing Florida Transportation Plan Policy Element. http://floridatransportationplan.com/pdf/Existing%20State%20and%20Interregional%20Strategies_v8.pdf

An FTP 2045 update Steering Committee has been assisted by three sub-committees. These three subcommittees reflect the priorities of the FTP 2045.

- Automated, Connected, Electric, and Shared (ACES) Subcommittee
- Resilience Subcommittee
- Safety Subcommittee

The proposed draft strategies developed by the subcommittees for the FTP 2045 emphasize the physical infrastructure of the transportation system, including the highway and the ACES vehicles that will travel along it.

CAPs Support the Institutional Infrastructure

Additional alternatives to consider are cost-effective and quickly implementable strategies to improve the operational efficiency of the existing transportation system. One of the key programs that support operational efficiency is the commuter assistance program (CAP) that implements transportation demand management strategies. Instead of motor vehicle throughput, the CAP emphasizes person throughput using focused programs, services, incentives, information, and partnerships that enable travelers to make the best use of the transportation system, including managed lanes. Without this "institutional infrastructure", travelers are left to their own devices regarding how to travel. One example of this deficit is the hundreds of thousands of motorists statewide who habitually merge onto the same congested travel lanes at the exact same time every weekday, believing there are no other choices. An example of a cost-effective commuter assistance strategy to address this is travel options communicated through a mobile app or other means, to convey real time variable parking pricing by location and time of day/day of week within activity centers. Commuter assistance programs also leverage efforts to manage demand by working with employers to increase work-at-home participation by their workforce, link remote workers with jobs, provide tax free transit benefits to employees, and adjust work schedules to avoid peak periods and/or mitigate traffic during construction. Commuter assistance programs also partner with transportation management organizations (TMOs) that conduct employer outreach in designated activity centers where traffic congestion is the greatest. There are several TMOs in operation in Florida. TMOs are organized groups that apply carefully selected approaches to facilitating the movement of people and goods within an area. TMOs are often but not always legally constituted and are frequently led by the private sector in partnership with the public sector to solve transportation problems.[91]

Recommendation for the FTP 2045: FDOT should adopt a strategy that recognizes the important role of FDOT in managing demand to improve person throughput on state facilities.

[91] National Center for Transit Research. *TMA Handbook: A Guide to Successful Transportation Management Associations*. Prepared for the Association for Commuter Transportation at the Center for Urban Transportation Research, University of South Florida, Tampa, FL. 2001.

TBARTA's Commute Tampa Bay and the region's transportation management organizations (CAP/TMOs) can provide input regarding target markets, propose approaches to address performance on facilities selected by the Districts, and suggest use of innovative technologies.

While the physical transportation infrastructure provides travel lanes, and TSM&O technologies improve traffic flow, the FDOT Commuter Assistance Program focuses upon the ***people*** who use the system. Commuter assistance provides services and incentives to enhance and offer safe, affordable travel options to driving alone. Commuter assistance serves travelers even before the trip begins. Improved traveler decision making and traveler behavior is an essential component of achieving the vision and goals of the FTP 2045, not only enhancing personal mobility but also improving system efficiency. Strategies that manage demand can be implemented within months, rather than years, and for far less cost than reconstruction of physical infrastructure. Improving efficiency of the existing system buys FDOT time.

Recommendation for the FTP 2045: FDOT should establish performance metrics and targets for achieving modal shares as well as an overall target expressed in terms of the ratio, vehicles per 100 commuters, which takes into account all travelers, such as those who ride public transit, telework, bicycle, walk, carpool, and vanpool. Direct all other statewide plans to contain objectives about how the plans will contribute toward achieving these targets. See Table 21. Recommended Actions and Performance Metrics.

The CAP/TMOs can address performance targets through objectives and tasks in proposed scopes of work, such as employer outreach to promote Best Workplaces for Commuters℠, Qualified Transportation Fringe Benefits for public transit use and vanpooling, parking cash out, Bike/Walk Tampa Bay, Love To Ride bicycle promotions, Emergency Ride Home, Agile Mile Rewards, Bicycle Friendly Businesses and others.

Recommendation for the FTP 2045: Recognizing that transportation is a means to an end, FDOT should name telework as a vital transportation strategy, which moves the work to the worker, rather than transporting the worker to an employment site.

The CAP/TMOs can continue to conduct employer outreach, using programs such as Best Workplaces for Commuters℠ Telework Certificate.

Recommendation for the FTP 2045: Recognizing that the development of the transportation system requires not only physical infrastructure, but also programmatic and institutional infrastructure, the FTP should direct the review of state funding sources and federal funding sources allocated by the state (such as Congestion Mitigation andAir Quality (CMAQ)) to enable greater flexibility for the use of those funds to be used to reliably augment and support existing operational expenditures necessary for commuter assistance.

FTP Strategic Intermodal System (SIS) ACES Subcommittee

The FTP Strategic Intermodal System (SIS) ACES Subcommittee developed revised draft strategies following input from the March 2020 Steering Committee Meeting. These strategies relate to funding, partnerships, technology and data, planning, infrastructure and design, economic and workforce development, and customers. The strategies focus upon the development of physical infrastructure.

Under strategies for customers, the following are listed.

> Address unique needs of all customer groups to
>
> a. Enhance mobility and access to opportunity for all
> b. Ensure equitable access to new technologies for groups such as seniors, youth, rural residents, low-income residents, residents with limited English proficiency, disabled residents, and visitors
> c. Avoid unintended consequences, such as creating additional equity gaps related to accessing technology
>
> - Ensure emerging technologies will support customer needs during special events and emergencies
> - Continue public awareness and education about the use and impacts of emerging technologies, particularly during the transition to comprehensive adoption of new technologies
> - Commit to ongoing research on customer acceptance, values, preferences, and behaviors related to technology[92]

Notably, these strategies relate to helping people use the new technologies for travel. What about using new technologies such as Mobility-as-a-Service or Mobility-On-Demand apps to make smarter travel decisions regarding when and how to travel? There is no strategy that articulates this. To what extent will ACES be integrated with mechanisms that incorporate transportation demand management (TDM) as well as TSM&O so that the application of ACES does not result in new high-tech bottlenecks? For example, if everyone chooses to travel, using their ACES vehicles at the same time in the morning, these commuters will be stuck in ACES traffic. After FDOT optimizes ACES traffic flow, and before FDOT builds more capacity, it is recommended to incentivize more commuters to choose to travel before or after the peak period.

Strategy #10 under Infrastructure and Design calls for "Work[ing] with metropolitan planning organizations and local governments to advance innovative transportation and community design concepts that enhance safety, mobility, and accessibility. These concepts should address locations with

[92] Florida Department of Transportation, Office of Policy Planning. "Revised Strategies following March Steering Committee Meeting Input." FTP-SIS ACES Subcommittee. May 13, 2020. http://floridatransportationplan.com/pdf/ACES%20Strategies%20051320_2.pdf

high or unique safety risks, bottlenecks, or interaction among multiple transportation modes and services, such as mobility hubs, curbs, and intersections/crossings."[93]

FDOT should harness the potential of its own statewide Commuter Assistance Program that resides in the Transit Office, to promote traveler adoption of new technologies to help travelers make smarter travel decisions regarding when and how to travel. Transportation design should not have to bear the full burden of solving traffic congestion when there are other tools that can contribute toward the solution of less congestion and more access.

FTP SIS Resilience Subcommittee

The FTP-SIS Resilience Subcommittee developed "Draft Strategies Following Survey Responses". There are thirteen strategies, the majority of which primarily relate to hardening physical infrastructure to withstand the impacts of climate change, such as sea level rise.

Commuter assistance programs, services and incentives that implement TDM strategies target travel decision making before the trip is made. Commuter assistance is among the few potential travel strategies that prevent, avoid, and address the very source of the problem contributing to climate change. Listed below are the "Draft Strategies" that potentially complement commuter assistance in this approach.

A. Integrate comprehensive land use, transportation and water resource planning to strengthen community planning, sustainability and resilience
B. Improve coordination and collaboration across all agencies, jurisdictions, plans, and programs
H. Establish a long-term approach to incentivize, where appropriate, the transition of infrastructure away from vulnerable areas
J. Improve the agility of the transportation system through multimodal options and redundancy
L. Promote transportation solutions that reduce greenhouse gas emissions[94]

FTP Safety Subcommittee

Safety is an overarching goal of the FTP 2045 and FDOT has adopted the goal of zero traffic fatalities as part of Vision Zero. The Vision Element recognizes that bicycle and pedestrian safety requires a comprehensive approach. FDOT and the FTP Steering Committee created a Safety Subcommittee to provide input to the FTP as well as the update of the Strategic Highway Safety Plan (SHSP).

[93] Florida Department of Transportation, Office of Policy Planning. "Revised Strategies following March Steering Committee Meeting Input." FTP-SIS ACES Subcommittee. May 13, 2020. p. 1-2.
http://floridatransportationplan.com/pdf/ACES%20Strategies%20051320_2.pdf
[94] Florida Department of Transportation, Office of Policy Planning. "FTP-SIS Resilience Subcommittee. "Draft Strategies Following Survey Responses."
http://floridatransportationplan.com/pdf/Resilience%20Strategies%20following%20Survey_v2.pdf

The FTP Safety Subcommittee met in June 2020 to prioritize the five most important strategies to advance Vision Zero. One of the strategies that did not make the cut was the following.[95]

> Expand outreach and communications campaigns to increase public awareness of at-risk road users and improve user behaviors.

What is missing for the ranking was a discussion of cost effectiveness. There is a need for more emphasis upon changing travel behavior. While designing safe infrastructure is important, no amount of infrastructure designed to maximize safety will protect users from unsafe travel behaviors. Commuter assistance programs focus upon influencing travel behavior, not only to change according to mode, route, time of day, etc. but also to adopt safe behaviors. For example, commuter assistance programs can deliver safety education classes, information, and campaigns targeted to motorists, bicyclists, pedestrians and transit users. This is like the above strategy to expand outreach and communications campaigns to increase public awareness of at-risk road users and improve user behaviors.

Proposed Statewide Strategic Commuter Assistance Program Plan

It is recommended that FDOT develop a Statewide Strategic Commuter Assistance Program Plan and provide permanent programmatic funding for accomplishing objectives at the District level. This will raise the profile of how commuter assistance supports the FTP. This Plan would address the following.

1. Describe how it directly relates to and supports the other statewide plans, such as the Strategic Highway Safety Plan (SHSP) and others.
2. Describe its uniquely essential contribution to supporting the FTP that none of the other plans address (e.g., fostering the use of the new technologies by commuters and employers).
3. Establish a corresponding longer-term planning horizon, with objectives describing how it will support the achievement of modal performance targets contained in the FTP 2045.
4. Provide direction for the update and execution of the FDOT Policy 725-030-008, establishing procedures and guidelines for the Commuter Assistance Program.
5. Provide direction for the execution of and adherence to FDOT Policy 000-725-050, adopted in 2007 to ensure that FDOT considers TDM strategies in all FDOT studies, plans, programs, and functional areas.
6. Provide general guidelines how the Commuter Assistance Program in each District will be implemented in conjunction with other strategies and activities, including those in MPO plans and studies, local government comprehensive plans, locally prepared feasibility studies, and Transit Development Plans.
7. Supplement existing CAP funding by allocating additional long-term federal funding sources, such as use of Congestion Mitigation and Air Quality (CMAQ) for commuter assistance programs at the District level and for partner transportation management organizations to supplement state and local funding.

[95] Florida Transportation Plan. FTP Safety Subcommittee. Meeting #4. June 11, 2020. http://floridatransportationplan.com/pdf/Safety%20Subcommittee%20Meeting4_Summary.pdf

8. Identify and recommend other local and statewide funding sources that can reliably fund the ongoing Commuter Assistance Program.
9. It is recommended that FDOT develop a funding mechanism for developing and implementing innovative TDM strategies, similarly to the Public Transit Service Development Program for public transportation.
10. Integrate FDOT's commuter assistance toolbox of transportation demand strategies with physical system development and with traffic operations, including adding vanpool routes to system maps
11. Reduce fatalities and serious injuries by adopting safety objectives to expand outreach and communications campaigns to increase public awareness of at-risk road users and improve user behaviors.
12. Work with the commuter assistance programs of each District, and their partner transportation management organizations that promote emerging technologies, such as Mobility-as-A-Service (MaaS) apps that deliver trip planning, integrated fare payment, vehicle occupancy detection for managed lanes, congestion pricing and rewards. Incentivization enhances safety, mobility, accessibility, and reduces bottlenecks. MaaS technologies help travelers use the greater array of modal options.
13. Engage the commuter assistance programs of each District, and their partner transportation management organizations to support community resilience through their programs, services, incentives, information and partnerships. Resilience strategies include enhancing travel choices that generate less greenhouse gas emissions or none at all. Commuter assistance strategies support individual traveler resilience by encouraging them to know about and choose from among all their options. Commuter assistance programs and services can help reduce or avoid bottlenecks, by managing demand during emergencies, such as hurricanes.

CAP/TMOs can support their Districts in the identification of successful programs, services, incentives, information and partnerships.

A Statewide Strategic Commuter Assistance Program should contain language and objectives describing how it relates to and supports the other statewide strategic plans.

Recommendation: Other statewide strategic plans should contain language describing how their objectives and commuter assistance objectives are mutually consistent and supportive.

CAP/TMOs will provide input. Resources also include statewide Commuter Services, found at https://www.commuterservices.com and the Statewide TDM Clearinghouse.

Recommendation: All newly hired FDOT engineers and planners should complete the Commuter Choice Certificate Program, offered at the USF Center for Urban Transportation Research. Existing FDOT staff are encouraged to participate as well.

Staff of the CAP/TMOs also should complete the Commuter Choice Certificate Program, offered at the USF Center for Urban Transportation Research.

Planning Activities in the Tampa Bay Region

Within the Tampa Bay region, concurrent transportation planning activities at the state, regional and local levels are ongoing to address future needs. In the meantime, regional commuter assistance activities address current mobility issues.

In early 2020, TBARTA's Commute Tampa Bay program has implemented a new platform for helping commuters find carpool and vanpool matches. Known as AgileMile (formerly NuRide), it features both a desktop site and Apple and Android apps, and rewards users for logging their alternative transportation trips, including transit, biking, carpool, vanpool, and telecommuting. AgileMile also is used by other commuter assistance programs nationwide, including the Metropolitan Washington Council of Governments' Commuter Connections program.

Commute Tampa Bay also has increased the number of free rides offered through its Emergency Ride Home (ERH) program from four free rides to six. The ERH program also was changed to a reimbursement model so that riders can choose their own ride home. TBARTA also has created new materials for commuter assistance partners in the Tampa Bay region to share with customers and mailing lists.[96] Commute Tampa Bay also provides subsidies for over 170 vanpools that currently operate in the Tampa Bay area. Operated by Commute with Enterprise, vanpools serve longer distance regional commuter trips that fixed route public transit cannot serve. Vanpools also contribute passenger miles traveled data to the National Transit Database, bolstering areawide performance for a greater return of funding from FTA. The Commute Tampa Bay regional commuter assistance program is the service foundation of the Tampa Bay Area CAPRDP. Figure 9 details performance of the Commute Tampa Bay commuter assistance program based upon metrics specified in the FDOT commuter assistance program procedure. These performance outcomes were reported in February 2020, prior to the pandemic. These results do not include VMT reduced and other performance outcomes resulting from the vanpools.

[96] Email communication. Cyndi Raskin, Director of Commuter Services. Tampa Bay Area Regional Transit Authority. December 16, 2019.

TBARTA
Tampa Bay Area Regional Transit Authority

Commuter Services
February 2020

Database Registrations	Added February 2020	Added Since October 2019 (FY 2020)	Total in Database
*Carpool Interest**		5	
*Vanpool Inrerest**		57	
Carpool or Vanpool Interest	50	150	
*Emergency Ride Home***		127	
Bike Partner	14	16	
Other Registrations (transit, walk, telework)	55	55	
Total Registrations	**119**	**410**	**3,362**

	Total for February 2020	Total Fiscal Year (FY 2020) Oct 2019-Jan 2020	Total Fiscal Year (FY 2020) Feb-Sep 2020
Vanpools in Service	172		
Mode Switch to Commute Alternative	33	67	33
Number of Commuters Requesting Assistance	394	2,170	394
Total Commute Alternative Trips	30,776	621,658	30,776
Vehicle Travel Miles Saved	896,015	6,572,201	896,015
Parking Spots Saved/Reduced (average/week day)***	58	226,418	
Gallons of Fuel Saved***	2,097	262,887	2,097
Greenhouse Gas Reductions***			
VOC (lbs)	60.13	6.0148	60.13
*PM10****		0.2455	
CO (lbs)	318.00	36.2937	318.00
PM 2.5 (lbs)	0.87	0.5830	0.87
CO2 (lbs)	41,111	2,550.0148	41,111
NOX (lbs)	60.95	17.0221	60.95
Commuter Costs Saved	$552,420	$2,760,325	$552,420

Carpool and vanpool interest not tracked separately in Agile Mile
****Emergency Ride Home is a reward in Agile Mile, so this data is now included in the Commuters Requesting Assistance data.***
*****Enterprise does not provide this data for vanpools***
******Data not collected in Agile Mile***

Figure 9. Performance Metrics Reported by Commute Tampa Bay February 2020.
Source: Tampa Bay Area Regional Transit Authority

FDOT's Initiatives in the Tampa Bay Region

FDOT District Seven is working on several projects in the Tampa Bay area. Main areas of emphasis include the application of smart technologies, such as autonomous vehicles, connected vehicles, and techniques such as ramp metering, adaptive signal and lane control and hard shoulder running to reduce traffic congestion and improve system reliability. In the last two years, FDOT District Seven also has funded the Marion Transitway autonomous shuttle pilot and the app-based Downtowner shuttle service in downtown Tampa, to provide first mile and last mile transportation solutions. FDOT District Seven also has planned for the reconstruction of the Howard Frankland Bridge along I-275 and interchange reconstruction at SR 60 and at I-4, to improve traffic flow.

Based upon the experience with highway reconstruction of other regions, it is recommended to set aside funds for implementation of a Transportation Management Plan that includes both traffic management and TDM, as part of the I-275 highway reconstruction project. A general rule of thumb is that one to two percent of the total cost of the reconstruction project can provide for impactful traffic mitigation.

Traffic mitigation activities could be started in preparation of reconstruction, then continued thereafter. These include use of vehicle occupancy detection technologies to enable effective managed lanes, allowing HOV2+ to use HOV lanes free, and collaboration with local governments to implement parking management strategies at the destination end of the trip. Parking management includes coordinated parking pricing by location, time of day and day of week. It also includes provisions for unbundling parking from leases in coordination with employers offering parking cash out to employees, and preferential parking for carpools and vanpools. TDM strategies also include commuter assistance campaigns promoting route detours to avoid the reconstruction corridor completely, and employer outreach promoting vanpooling, telecommuting, and flexible work hours. Recommended regulatory approaches that could coincide with the I-275 reconstruction include implementing a transit benefits ordinance, with local governments coordinating this implementation regionally, with the assistance of TBARTA.

FDOT also has funded the Regional Transit Feasibility Study, managed by HART, and the Regional Rapid Transit PD&E Study, managed by TBARTA. This study is evaluating alternative transit corridors and technologies. FDOT has also shown commitment to providing safe walking and bicycling facilities on state roadways and bridges through implementation of their Complete Streets policy. FDOT also has funded the statewide Shared Use Nonmotorized (SUN) Trail network of off-road paved paths that will connect to the community trail network. FDOT also has funded the Statewide Non-motorized Traffic Monitoring Program that collects pedestrian and bicycle usage data for planning purposes. It is possible that monitoring stations could be installed in locations in the Tampa Bay area.

Tampa Bay Regional Strategic Freight Plan

Even in freight planning, transportation demand management strategies are used. FDOT has many initiatives to ensure the reliable movement of freight regionally, including the Tampa Bay Regional Goods Movement Study. FDOT recognizes that freight transportation is a key driver of the economy and that truck delay translates to economic losses. The Tampa Bay Regional Strategic Freight Plan[97] provides a framework for policy and investment decisions for goods movement, considering land use patterns, new technologies and the demand for just-in-time delivery. The discussion below provides a brief overview of the Strategic Freight Plan, then describes how the CAPRDP can support it.

FDOT has recognized that "…Freight mobility and community livability are both viable needs that require creative solutions to balance freight accessibility and personal mobility."[98] The Freight Plan provides

[97] Florida Department of Transportation. Tampa Bay Regional Strategic Freight Plan, Update November 2018.
[98] Florida Department of Transportation. Tampa Bay NEXT: The Future of Transportation. Freight Mobility. http://www.tampabaynext.com/freight/

"…a framework for integrating freight mobility considerations into the regional and local planning processes. It includes the processes, information, and tools that decision makers and planners need for effectively addressing freight mobility issues."[99]

The Freight Plan identifies needed improvements to the Freight Transportation Network, based upon the type of highway facility (limited access, regional corridor, freight distribution route, and freight activity center streets) and their freight facility function. There are four identified functions. These are Mobility, Connectivity, Circulation and Access. For example, a freight activity center street is a facility type that would primarily serve an Access function and its Mobility function would be very limited. A limited access highway would primarily serve a Mobility function, and its Access function would be very limited. Most of the four highway facility types that serve some freight function also are facilities shared with passenger vehicles. Highway facility improvement needs for ten locations were identified as 2018 priorities, including capacity improvements, grade separation, operational improvements, and the Interstate modernization program.[100] Other identified potential improvement needs included maintenance and safety/security improvements.

Acknowledging land use compatibility with community activity, the Freight Plan provides street and intersection design considerations to accommodate trucks in areas categorized as Freight-Oriented Areas (high freight activity/low livability), Diverse Activity Areas (high freight activity/high livability), and Community-Oriented Areas (high livability/low freight activity).

Freight Strategic Plan objectives include improving mobility conditions for the freight transportation system and improving accessibility and connectivity to freight activity centers. Other objectives are related to freight compatibility with the land use and community context within which the freight network operates. Plan objectives include improving safety, accessibility, and mobility conditions where freight and passenger transportation system intersect and protecting and mitigating the effects of freight activities on communities and neighborhoods. Compatibility objectives also include improving community and regional economic competitiveness and coordinating plans and policies that encourage an integrated approach to freight and livability issues.

Recommendation: Just as the proposed Statewide Strategic Commuter Assistance Program Plan would describe how it supports other statewide strategic plans, these other statewide strategic plans should contain language describing coordination with commuter assistance.

For example, this CAPRDP advocates that transportation demand management strategies also can offer potential approaches to improve mobility, access and safety of freight activity, as well as improve compatibility with passenger transportation and the livability of communities. The alteration of travel behavior by route is already used in the trucking industry by way of designated truck routes. The CAP/TMOs can provide input to other statewide strategic plans. Other resources include Commuter Services at https://www.commuterservices.com and the Statewide TDM Clearinghouse.

[99] Florida Department of Transportation. Tampa Bay Regional Strategic Freight Plan, Update November 2018. p. 3.
[100] Florida Department of Transportation. Tampa Bay Regional Strategic Freight Plan, Update Nov. 2018. p 21.

The 2018 freight priorities in the Strategic Freight Plan already include managed lanes as part of the Interstate modernization program for segments of I-4, I-275, and I-75 within the Tampa Bay region. Managing lanes, particularly as it applies to allocating lanes for specific vehicle types, whether they be trucks or high occupancy vehicles, and managing by time of day and price, has the impact of altering travel decisions made by truck drivers and motorists. These include altering when to travel, what route to use (choosing to use the managed lanes or another facility), time of travel, and some motorists may switch to public transit, vanpool or carpool, if the managed lane allows their use.

An example of a British counterpart to the Goods Movement Advisory Committee for the Tampa Bay Strategic Freight Plan is the Freight and Servicing Action Plan developed by Transport for London, in collaboration with city, regional and business groups. This Plan grappled with the compatibility of freight movement through a congested city, with community safety and quality of life, while preserving freight movement efficiency and minimizing congestion impacts upon freight movement. This Plan combines the use of physical capacity improvements, application of information and communications technologies for traffic management, and travel demand management strategies.

At the scale of locations like Tampa Bay Diverse Activity Areas and Community-Oriented Areas, higher density European cities use micro-hubs for package delivery that reduces last mile truck traffic within communities. Other strategies include night delivery, loading and unloading control strategies for commercial vehicles, timing of deliveries to minimize noise impacts, and freight consolidation centers to use delivery capacity more efficiently. Business improvement districts also develop freight and servicing area management plans that address compatibility issues involving safety, efficiency, emissions reduction, and protecting industrial land for future growth needs.[101] As more warehousing facilities are located in the Tampa Bay area, demand management strategies should be applied not only for their large work forces, but also for goods movement.

Local Government Comprehensive Planning and Regulation

Florida is a growth management state, requiring a local government comprehensive planning (LGCP) process that provides for the orderly growth of their communities. The LGCPs contain a series of elements, including one for land use and one for transportation. The requirements for comprehensive planning have evolved over the past 45 years. In the meantime, Florida's population has more than tripled in the past 50 years, with an estimated 21.3 million now with projections that it will double again by 2060. That is approximately 1,100 new residents each day coming into the state, placing tremendous development pressure on communities.

The hallmark of local government transportation planning in Florida has been concurrency, instituted in 1985 by the Growth Management Act. LGCPs had to be externally and internally consistent, financially feasible, and had to meet concurrency requirements. This means that adequate transportation and

[101] Transport for London. Freight and Servicing Action Plan. 2019. http://content.tfl.gov.uk/freight-servicing-action-plan.pdf

other public facilities had to be in place at the same time as new land development was occupied, and the new facilities had to provide sufficient service to meet the demand created by the new development. Transportation level of service (LOS) standards were established, but it was narrowly defined as being based upon the ratio of motor vehicular volumes to the available lane capacity of the roadway. It did not consider other modes of travel. Land development was charged impact fees based upon a calculation of traffic generation. Over the next 35 years, local government concurrency management systems grew more intricate as these systems attempted to avoid land development moratoria resulting from LOS violations, calculate equitable fees on land development, and not push development out to the suburban fringe. Because roadway widening was costly, local and state governments looked for other means to maintain LOS standards. TDM was introduced as a strategy to reduce traffic congestion and thus maintain LOS standards.

The Community Planning Act of 2011 made concurrency optional for local governments. If a local government chose to maintain its concurrency management system, then it had to provide planning principles for concurrency, set LOS standards and devise implementation strategies. In fact, many local governments chose to keep their existing concurrency management systems.

The Act established priorities of the LGCP land use element as providing a balance of uses that foster vibrant communities and economic development opportunities and that discourage sprawl. The purpose of the transportation element of the LGCP was the development of a multimodal system with emphasis on public transportation. Local governments that kept concurrency had to allow developers to pay and proceed with their development, according to a fee formula that does not consider existing transportation facility deficiencies.

In 2013, further changes to transportation concurrency were enacted by the Florida State legislature. Local governments were encouraged to adopt long term strategies to support multimodal solutions, adopt an areawide LOS not dependent upon any single road segment, and discount impacts of locally desired development, such as development in urban infill areas. Other strategies that were encouraged included assigning secondary priority to vehicle mobility and primary priority to a safe, comfortable, and attractive pedestrian environment, with convenient access to public transit. The amendments also encouraged establishing multimodal level of service standards that rely primarily on non-vehicular modes of transportation where existing or planned community design will provide an adequate level of mobility, and to reduce impact fees to promote development within urban areas.

While transportation concurrency is optional, it remains up to the local governments how to deal with the effects of growth, including providing for needs to maintain mobility and access, as well as how to pay for transportation improvements and services. Local governments must figure out how to raise the funds needed, and if a transportation concurrency management system remains in place, the imposition of fees upon proposed development must be commensurate with the transportation impacts generated by that development and the transportation facilities built with those fees must be shown to reasonably serve that development. Local governments generally want to encourage new development to promote the economy and generate more tax revenue.

As local governments update their comprehensive plans, this is an opportunity to further consider including policies that prioritize the development of public transit service. Policies identifying TDM and commuter assistance can be used to support urban infill, access and revitalization. Such policies support maximizing the use of existing highway capacity and allocating space for multiple modes. Policies also include parking and curb management in downtowns and in activity centers.

Local government regulations implement their LGCPs. As identified in Technical Memorandum 3, other urban areas have adopted other types of zoning that better support mixed use development, parking management ordinances, trip reduction ordinances and transit benefits ordinances. It is recognized that regulations come with the burden of implementation and enforcement.

It is recommended that local governments invest in parking management systems that limit supply and vary the price by location, day of week, and time of day. Implemented successfully, such systems can generate revenue to support not just parking management but other transportation improvements. Concurrently with parking management, it is recommended that local governments implement a transit benefits ordinance.

This would be an advantageous addition to a transportation management plan for the I-275 reconstruction. A transit benefits ordinance can be as simple as requiring employers to provide a pre-tax set aside of gross income for use by employees to pay for their commute transportation. While some transit benefits ordinances in other cities go farther, requiring subsidies, this does not have to be a part of an initial roll-out of a transit benefits ordinance. The income set aside lowers the employee's taxable gross income and also lowers the employer's payroll taxes. Some employers use their payroll tax savings to fund transit subsidies for their employees. These mechanisms are more effective when implemented across jurisdictions.

Recommendation to local governments and TBARTA: TBARTA could play a coordinating role to start a dialogue among local governments to discuss how comprehensive planning policies and regulations, such as a transit benefits ordinance, may find opportunities for greater effectiveness through coordination across jurisdictional boundaries.

With a recognition of the value of mixed-use land development, form-based zoning is gaining wider traction. Also known as contextual zoning, or flexible zoning, form-based zoning allows market demand to determine the mix of uses within the constraints of building type set by the community. The building owner determines the uses. The look and layout of a street is carefully controlled to reflect neighborhood scale, parking standards, and pedestrian accessibility. Form-based zoning creates zoning districts based upon a rural-to-urban transect. The Center for Applied Transect Studies provides models for form-based codes.[102] The transect concept, originally borrowed from the biological sciences, is also the basis for the Context Classification System used by FDOT to guide more context sensitive roadway

[102] Center for Applied Transect Studies. SmartCode Version 9.2. https://transect.org/codes.html

design. Because form-based code is design oriented, it works well for the creation of Complete Streets, placemaking, and the use of charrettes to engage community participation.

Beyond the updates of the LGCP and its implementing regulations, another major activity at the local government level is proposed land development review for consistency with land development regulations. Many local governments use the land development review process to shape infrastructure at a development's interface with the street, and to put in place amenities and transportation services as part of property management to make it easier for tenants to use public transit and other forms of transportation. Technical Memorandum 3 provides an example from Arlington, VA. Many local governments employ TDM professionals that provide technical support to the land development review process.

Ten years ago, the USF Center for Urban Transportation Research prepared a TDM Checklist for Individual Land Development Proposals, on behalf of the Tampa Downtown Partnership. The checklist broke down the land development review into steps for each stage of the process, with time frames, and identifying coordinating agencies. This checklist constituted a proposal that the TMO staff of the Tampa Downtown Partnership provide review support to staff of the City of Tampa. The checklist was accompanied by a summary of information distribution to land developers in advance of the development review process.

Recommendation to Local Governments: Actively promote the use of TDM strategies, alternative transportation amenities and commuter assistance into conditions for land development approval. Through the State TDM Clearinghouse, CUTR offers to craft an updated TDM Checklist for Individual Land Development Proposals, which is specific to interested municipalities. Using the Checklist, it is envisioned that commuter assistance staff of Commute Tampa Bay and the TMOs could provide land development review support and recommendations to staff of their host municipalities.

Metropolitan Planning Process

By federal regulation, states and MPOs are required to develop, evaluate, and select not just capital improvements but also operational strategies for the long-range and short-range time frames for moving people and goods. States and MPOs document these investment decisions in their plans. There are ten federal planning factors that must be addressed, including economic vitality, safety, security, accessibility and mobility, environmental protection, integration and connectivity, efficient system management, preservation of existing systems, resiliency and reliability, and travel and tourism.[103]

It is well established in the transportation profession that TDM strategies should be integrated into the transportation planning process at multiple levels.[104] At least four states, Washington, Colorado,

[103] 23 CFR 450.206 Scope of the Statewide Transportation Planning Process and 23 CFR 450.306 Scope of the Metropolitan Transportation Planning Process.
[104] Gopalakrishna, Deepak (Battelle), Eric Schreffler (ESTC), Don Vary (Wilbur Smith Associates), David Friedenfeld (Wilbur Smith Associates), Beverly Kuhn (Texas Transportation Institute), Casey Dusza (Texas Transportation Institute), Rachel Klein (Battelle), Alexandra Rosas (Battelle). "Integrating Demand Management into the

California, and Georgia, and many regions across the nation have made efforts to do this. These integrations include at the statewide, region, corridor, and local planning levels. TDM strategies can be applied to address multiple issues, including improving accessibility and mobility of both passengers and freight, reducing congestion, improving travel time reliability, improving safety, and supporting economic development. TDM strategies have historically been applied to help address air quality, and can address environmental and sustainability issues to improve health, equity, community livability and quality of life.

Importance of TDM at the Regional Level

One reason why it is important to incorporate TDM strategies at the regional level is because commute trips, and trips for other purposes, are not confined within jurisdictional boundaries, hence the major effort undertaken by TBARTA to develop the first Regional Transit Development Plan. Because people have different travel needs, commuter assistance using TDM strategies seeks to support the use of a greater array of travel choices, including public transportation. While close to 80 percent of the Tampa Bay region's commuters drive alone, close to 9 percent carpool, representing the next largest travel mode. While carpooling has been on the decrease in recent years, there are highly variable conditions, such as the pandemic and the economic fall out that may cause more commuters to reconsider their options and seek more economical modes. Planning is underway to develop a regional public transit system, but local transit revenue reductions will likely cause service cuts near term. As the demand for public transit begins to rebound when the pandemic crisis passes, commuters will still need regional travel options sooner than regional transit will be available.

Presently, the pandemic has depressed public transit ridership worldwide. However, as pharmaceutical companies race internationally for the development of a COVID-19 vaccine, representatives for the Centers for Disease Control and Prevention have expressed confidence that a safe and effective vaccine will eventually be available for everyone and eliminate the threat of disease. The pandemic experience has further armed us with better sanitation and disinfection protocols for public spaces. As a result, it is anticipated that public transit, carpooling and vanpooling will again emerge as good travel choices for many, especially as the region recovers from an economic recession resulting in the aftermath of the pandemic. For example, PSTA experienced a general trend of rising ridership over the past twenty years, particularly during the last recession that began in FY 2007/2008.[105]

The CAP and TMOs Provide Employer Telework Support

For certain types of jobs and other business (online learning, shopping), information and communications technologies (ICT) may take the place of more trips, including regional trips, than before the pandemic. However, barriers to the use of telework and online learning go beyond management resistance. While broadband availability is generally good in the Tampa Bay area, there

Transportation Planning Process: A Desk Reference." Prepared for Federal Highway Administration, Office of Operations. FHWA-HOP-12-035. Washington, D.C. August 12, 2012.
https://ops.fhwa.dot.gov/publications/fhwahop12035/index.htm

[105] Forward Pinellas. Advantage Pinellas 2045 Long Range Transportation Plan. p. 8/17.

may be pockets of less dense areas in suburban and more rural areas that still do not have broadband. Additionally, broadband affordability may be out of reach for many households, regardless of availability.[106] Figure 10 illustrates regional broadband subscription rates.

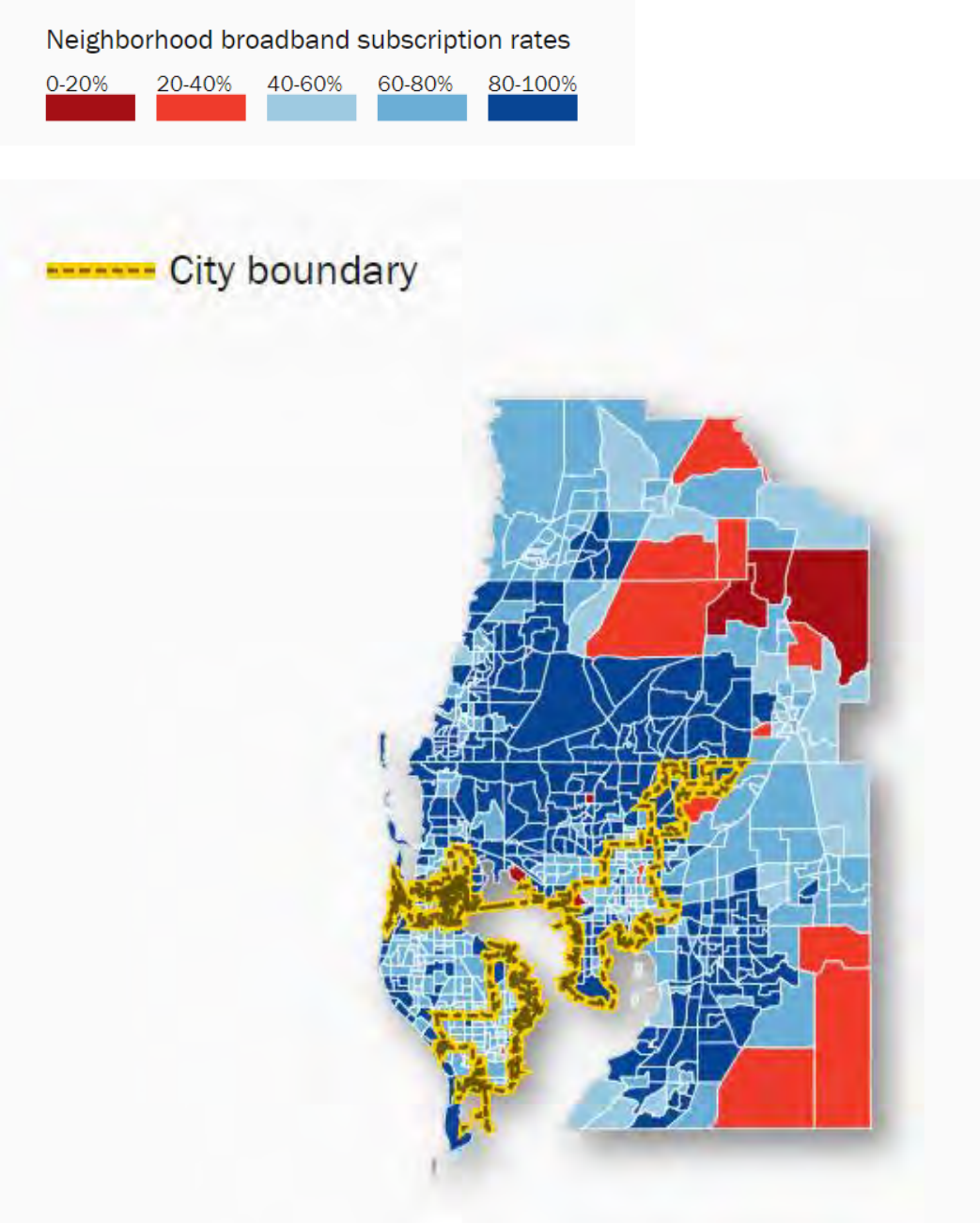


Figure 10. Neighborhood broadband subscription rates for Tampa-Petersburg-Clearwater Area.
Source: The Brookings Institution. Data visualization produced by Alec Friedhoff.
https://www.brookings.edu/research/signs-of-digital-distress-mapping-broadband-availability/

[106] Tomer, Adie; Elizabeth Kneebone; and Ranjitha Shivaram. "Signs of Digital Distress: Mapping Broadband Availability and Subscription in American Neighborhoods." The Brookings Institution. Metropolitan Policy Program. September 2017. https://www.brookings.edu/research/signs-of-digital-distress-mapping-broadband-availability/.

This is evidenced by public school children in the region who could not access online curricula when the pandemic began. These are unmet needs for household access to telework and ICT solutions that TDM strategies otherwise support.

Recommendation: Broadband access and affordability in the region is a problem for which a public/private dialogue at the state, regional, and local levels should be sought, especially during this time of renewed commitment to equity. It is recommended that the MPOs convene a forum to address this.

The CAP/TMOs can support the MPOs in employer and community outreach to promote the public/private dialogue.

A second reason why TDM planning should be considered at the regional level is for the more efficient coordination of commuter assistance marketing and service provision and to promote collaboration. The TMO Coordination Group (TMOCG) is an existing informal organization that has aided in regional collaboration since the 1990s. MPOs can play a role in civic and coalition building. The collaborative process among multiple entities and the public participation processes of the MPOs could be brought to bear upon TDM planning and its integration with the larger effort, such as the development of the long range transportation plan and its updates, development of the transportation improvement program and its yearly update, the congestion management process, transportation safety planning and programming, and corridor studies. Funding sources for TDM are available, such as CMAQ and STP, for which the regional planning prioritization process should consider.

Recommendation: The MPO should champion the elevation of managing demand as a vital approach on equal footing with TSM&O and capacity building.

CAP/TMO scopes of work will identify and propose ways to support and coordinate with traffic management efforts, corridor studies, PD&Es, and highway reconstruction transportation management plans

Recommended Steps for Integrating TDM into the Regional Transportation Planning Process

For integrating TDM into the transportation planning process, the following recommendations are adapted from FHWA's *Desk Reference*.[107] The FHWA *Desk Reference* also cites the use of the Institutional Capability Maturity Model proposed by FHWA in its *Guide for Improving Capability for*

[107] Gopalakrishna, Deepak (Battelle), Eric Schreffler (ESTC), Don Vary (Wilbur Smith Associates), David Friedenfeld (Wilbur Smith Associates), Beverly Kuhn (Texas Transportation Institute), Casey Dusza (Texas Transportation Institute), Rachel Klein (Battelle), Alexandra Rosas (Battelle). *Integrating Demand Management into the Transportation Planning Process: A Desk Reference*. Prepared for Federal Highway Administration, Office of Operations. FHWA-HOP-12-035. Washington, D.C. August 12, 2012. https://ops.fhwa.dot.gov/publications/fhwahop12035/index.htm

Systems Operation and Management.[108] Based upon the level of integration of TDM into the current planning processes of an agency, the Institutional Capability Maturity Model recommends a series of actions that guide integration from an ad hoc approach to a better defined level. For those agencies with greater TDM planning experience, higher-level actions are recommended for managing demand to optimize the outcomes for systems operation and management.

It is recommended that the MPO apply the planning steps listed below, for incorporating TDM into the long-range transportation planning process. Each step is discussed in further detail.

CAP/TMOs can provide data and information, community outreach, and input in support of the regional transportation planning process.

1. Introduce the principle of managing demand as high up in the metropolitan long-range transportation planning process as possible, as part of vision and goals.
2. Select performance metrics that are appropriate to measure the progress toward achieving the overall LRTP vision and goals, and for which the capability exists to measure the selected metrics through data collection and analysis. Establish desired performance targets.
3. Work with stakeholders to develop one or more SMART (specific, measurable, achievable, realistic, timebound)[109] objectives relating to the use of TDM, which contribute toward moving the LRTP performance metrics in the direction of desired outcomes.
4. To account for underlying growth, evaluate existing conditions projected into some future planning year and/or forecasted future traffic, based upon known or anticipated trends. Measure performance metrics for existing conditions and estimate values for performance metrics for future projected or forecast conditions.
5. Develop alternative scenarios by selecting a TDM strategy/action or set of TDM strategies/actions that can contribute toward achieving each of the TDM objectives in the LRTP. In the case of a PD&E study for a project or corridor improvement, the TDM strategies and actions would address the stated Purpose and Need. These alternative scenarios would constitute a long range TDM component to the LRTP. It would be the Tampa Bay Commuter Assistance Program Regional Development Plan.
6. Apply evaluation tools to the alternative scenarios to estimate performance outcomes. Compare against performance targets and re-evaluate performance targets to make sure they are realistic.
7. Determine which entity or combined collaboration of entities will implement each TDM strategy.
8. Incorporate the selected TDM strategy or strategies into the long-range cost feasible plan.

[108] Parsons Brinckerhoff. *Guide for Improving Capability for Systems Operation and Management*. Strategic Highway Research Program (SHRP) II. Report S2-L06-RR-2. 2011.
[109] U.S. DOT. Federal Highway Administration. "Advanced Metropolitan Planning for Operations: An Objectives-driven, Performance-based Approach—A Guidebook. SAIC. FHWA-HOP-10-026. 2010.

1. Articulate Managing Demand in Major Goals

It is recommended that the MPO introduce the principle of managing demand as high up in the metropolitan long-range transportation planning goal setting process as possible as part of vision and goals.

This includes a statement about managing demand as integral to the solution toward achieving the vision, goals or policies. TDM should "…constitute an overriding philosophy for mobility and accessibility rather than a means simply to mitigate certain negative aspects of the transportation system."[110] MPO staff are in a position to introduce TDM concepts to the MPO Board and illustrate how managing demand aligns with broader regional goals.

Managing demand is not just for decreasing traffic congestion. It is a set of tools that, when properly funded and executed in conjunction with the right capital and TSM&O investments, can make progress toward a wide number of goals relating to economic growth, mobility, equity, environmental sustainability, financial stewardship, and others.

CAP/TMOs can offer ideas and proposed goal setting language based upon their experience providing employer and community outreach and implementing TDM programs.

In public outreach, CAP/TMO staff should be included in the development of messaging (website, social media messages, posters and brochures) and public input instruments, such as surveys. For example, words and phrases can be misinterpreted, muddying survey results. For example, is "rideshare" a carpool/vanpool or is "rideshare" a ride provided by a TNC?

Recommendation: The MPOs should consider establishing a regional MPO TDM Committee, composed of commuter assistance service providers, transit representatives, TSM&O representatives, corridor planning representatives from FDOT and the county, and individual citizens who are customers of commuter assistance services.

Such a committee would be charged with the drafting of goals or policies and objectives that integrate commuter assistance and TDM into the regional planning process. CAP/TMOs can provide updates and presentations to the MPOs and the MPO Chairs Coordinating Committee (CCC).

[110] Gopalakrishna, Deepak (Battelle), Eric Schreffler (ESTC), Don Vary (Wilbur Smith Associates), David Friedenfeld (Wilbur Smith Associates), Beverly Kuhn (Texas Transportation Institute), Casey Dusza (Texas Transportation Institute), Rachel Klein (Battelle), Alexandra Rosas (Battelle). "Integrating Demand Management into the Transportation Planning Process: A Desk Reference." Prepared for Federal Highway Administration, Office of Operations. FHWA-HOP-12-035. Washington, D.C. August 12, 2012. p. 64. https://ops.fhwa.dot.gov/publications/fhwahop12035/index.htm

There are examples of LRTPs from other regions that have goals and objectives relating to TDM, contained in Technical Memorandum 3. For example, the Houston-Galveston Area Council serves as the region's MPO and its LRTP places an emphasis upon managing the existing system. TDM is identified as one of five system management tools. The 2013 Atlanta Regional Commission TDM Plan set its sights upon achieving "TDM+", which takes traditional TDM and expands its application to serve all trip purposes. It uses TDM in collaboration with efforts relating to climate change, healthy communities, and active aging. The Denver Regional Council of Governments serves as the MPO for a region that is an air quality nonattainment area. Its performance measures include increasing the non-single occupant vehicle mode share to work from a 25.1 percent baseline in 2014 to 35.0 percent in 2040, and a 10 percent decrease in VMT from a 2010 baseline to 2040.

Examples of vision statements, goals, objectives and strategies from other regions illustrate variation by topic and specificity. Some address specific outcomes while others describe the process by which the region plans and implements strategies. It is observed that the urbanized areas that have actual long range or strategic TDM plans are typically regions served by a single MPO. These regions also tend to be in air quality nonattainment status.

Goals of the Tampa Bay Region's MPO LRTPs 2045

In 2018, a joint regional effort of Hillsborough, Pasco and Pinellas Counties undertook a citizen survey, It's Time Tampa Bay, to identify public priorities for transportation. The results of this survey were incorporated into the LRTP update process for each MPO. Each MPO identified several goals that address the ten federal planning factors and are consistent with the 2040 FTP and their municipalities' LGCPs. Commuter assistance program activities and TDM strategies can support the accomplishment of these goals.

Hillsborough MPO. It's Time Hillsborough 2045 Long Range Transportation Plan

The Hillsborough MPO Long Range Transportation Plan (LRTP) identified needs, goals, and performance metrics. Table 17 replicates the table found in the Hillsborough MPO 2045 LRTP, which summarizes, according to each of five priority topics, the problems, status, and needs.

Table 17. Hillsborough MPO Assessent of Major Goals Compared with Needs

Good Repair and Resilience	Vision Zero	Smart Cities	Real Choices When Not Driving	Major Investments for Economic Growth
Problem	**Problem**	**Problem**	**Problem**	**Problem**
Heavy usage and limited funding have compromised the condition of our roadways, bridges, and transit vehicles. Deterioriation of these assets can limit our ability to travel within the county and surrounding areas. Roads are vulnerable to storms and sea level rise.	Crashes are a serious problem in Hillsborough County. We have frequently ranked among the most dangerous counties in the nation for pedestrians, cyclists, and drivers. High tech, low tech, and infrastructure improvements could help change that in the future.	Punctuality is critical for commuters and shippers. It is important to make travel times reliable. Tech and operational solutions can reduce traffic, air pollution, and crashes, and also assist travelers through bad weather, special events, and construction.	People need access to work, school, health services, and healthy food when they cannot drive, or do not own a car. This is especially important for our disadvantaged communities, that often lack convenient access to these important destinations.	Hillsborough County is expected to increase in population by 55 percent by 2045. Investments in major projects are critical to supporting a growing economy. Safe, reliable, and efficient transportation infrastructure is needed to efficiently move people and goods.
Current Status				
5,318 centerline miles of road **757** bridges **201** transit vehicles (HART)	**No. 2** Fatality rate in FL, for traffic deaths per vehicle mile **2016** worst year for fatal crashes **226** Fatalities was the worst year ever. **169** fatalities in 2018	**71%** of Interstate highways considered reliable **11%** residents within **150** meters of high-volume road **9.2%** adult asthma rate highest in state	**14%** residents with good bus service **20%** live near a good low-stress place to walk **21%** groceries accessible via bus service	**3%** of expressways are heavily congested today and the forecast for 2045 is **37%** if no improvements are made Overcapacity on other major roads will increase from **2%** to **14%**
Needs				
• Meet roadway pavement standards • Meet bridge safety standards • Maintain an appropriate number of vehicles for service • Maintain average age of transit fleet • Improvd resiliency to flooding	• Complete streets safety enhancements • Filling sidewalk gaps and providing lighting on major roads in the urban service area • Reduce crash rates • Reduce fatal crash rates	• Operational improvements such as turn lanes at bottleneck intersections • Advanced traffic management systems and other technology enhancements for congestion relief • Travel time reliability by minimizing variation	• Local, express, circulator, and MetroRapid bus routes • Trails and greenways network • Demand-response services for the Transportation Disadvantaged	• Road widenings • Interchange improvements • Fixed-guideway rapid transit systems

Source: Hillsborough MPO 2045 Long Range Transportation Plan. "What Hillsborough Will Need." Recreated from p. 17.

The Hillsborough MPO LRTP identified two data-driven priorities for major investments.

- Rapid Transit in Dedicated Right of Way
- Targeted Expansion of Major Roads

The goal of the Real Choices When Not Driving investment program is to expand mobility options in the form of bus services, paratransit services for the Transportation Disadvantaged (TD), and the development of a network of side paths that are walk/bike facilities that are separated from motorized vehicle traffic. Approximately 7.1 percent of households in Hillsborough County have zero motor vehicles. According to the "State of the System" report of the Hillsborough MPO (approved April 2, 2019, p.18), this is equivalent to approximately 100,000 people.

Pasco MPO. Mobility 2045 Long Range Transportation Plan.

The Pasco MPO LRTP articulated six goals thus:

- Provide multimodal facilities and services that support economic development.
- Improve the safety and security of the multimodal transportation network for motorized and nonmotorized users.
- Maximize opportunity for local and regional connectivity and modal choice for all Pasco County residents, employees, visitors, and commerce.
- Create quality places by coordinating transportation and land use planning with the County and cities, which facilitate healthy, active living and protect the County's natural resources through proactive environmental stewardship.
- Manage and provide a reliable and efficient multimodal transportation system.
- Encourage full public participation early and throughout plan adoption and ensure that the Transportation Plan and MPO planning activities reflect the needs of the community, particularly those that are traditionally underserved.[111]

In 2014, the Pasco MPO Board adopted a policy that future road improvements on non-freeway/expressway roads shall be limited to a maximum of six general purpose through lanes. There are no objectives in the LRTP. Instead, there are identified projects categorized in the Mode/Program areas of Highway Expansion; Transit (Operations & Capital); Trail, Sidewalks, and Bicycle Facilities; ITS/CMP; and Highway Maintenance. All areas except transit gained increased percentages of the funding in the Mobility 2045 Plan, as compared to the Mobility 2040 Plan. While transit funding constituted 25 percent of the Mobility 2040 Plan, the total funding in the Mobility 2045 Plan for transit was 9.4 percent.

Forward Pinellas. Advantage Pinellas 2045 LRTP

The Plan provides that long term transportation investments will be planned based upon six pillars that represent the priorities of the community.

[111] Pasco County MPO. Mobility 2045 Long Range Transportation Plan. Adopted December 11, 2019. p. 2-1.

Pillars

- Attractive and Unique Destinations
- A Resilient Community
- Safe and Healthy Communities
- Strong Economic Opportunity
- Mobility and Accessibility for Everyone
- A Collaborative Vision for the Future

The Plan emphasizes the integration of land use decisions with transportation policy and working with local governments to accomplish this. The Plan includes transit-friendly mixed-use redevelopment with a corridor-based nonmotorized strategy and Complete Streets. The Plan calls for regulatory reform to support affordable housing, seek balance between vehicle capacity and the safety of all road users, and manage vehicle speeds in appropriate locations.

The Advantage Pinellas 2045 LRTP goals describe transportation as a means to an end to develop key community advantages, including attractive and unique destinations, resilience, and safe and healthy communities. Strategic, collaborative and sustainable investments in the transportation network are directed to achieve the vision articulated in other Pinellas plans relating to economic development, climate/environment, and land use.

- Goal 1 to create and sustain attractive and unique destinations is supported by an Active Transportation Plan. This plan seeks to redesign neighborhoods that support walking and bicycling with safe, convenient, and connecting infrastructure. Commuter assistance programming can support desired outcomes by promoting safe bicycling and walking for all trip purposes.
- Goal 2 is to develop and sustain a resilient community. There are objectives and policies that use TDM.
- Goal 3 is to invest in transportation projects that promote safe and healthy communities, promoting equity in countywide transportation investments is a key theme. This is to ensure that both the benefits and the impacts of transportation investments are equitably distributed. Commuter assistance programs provide encouragement and education activities to help people walk and bicycle safely.
- Goal 4 supports transportation projects that provide for strong economic opportunity.
- Goal 5 calls for the achievement of an "…efficient, effective, equitable, safe and complementary multimodal transportation network in Pinellas County and through the Tampa Bay region that provides viable travel options for all transportation users." Commuter assistance programs can provide support to all these activities.
- Goal 6 is to achieve the land use and economic development vision of the Pinellas Countywide Plan and the vision of other regional plans related to economic development,

climate/environment and land use through strategic, collaborative, and sustainable investments in the transportation network. [112]

2. Select Performance Metrics

It is recommended that the MPO select performance metrics that are appropriate to measure the progress toward achieving the overall LRTP vision and goals, and for which the capability exists to measure the selected metrics through data collection and analysis. It is recommended to establish desired performance targets, informed by benchmarks derived from other urbanized areas.

CAP/TMOs can offer input for proposed performance metrics and targets, based upon performance of previous TDM programs.

Federal regulations require that in order for states and MPOs to be eligible for federal transportation funding, investments will be made toward national goals, including safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays.[113] Such investments will be made to achieve targets for specified performance metrics. [114]

Therefore, performance metrics, to a large degree are already selected for us. However, there are some other options to consider, as discussed below. But first, the federal, state and metropolitan planning performance metrics of primary relevance to TDM are listed below and include the following.

Highway Safety Improvement Program (HSIP)

- Number of motor vehicle crash-related serious injuries and fatalities
- Number of serious injuries and fatalities of non-motorized users
- Serious injuries and fatalities per vehicle miles traveled

National Highway Performance Program (NHPP)

- Level of Travel Time Reliability (LOTTR)[115]
- Percentage of person-miles on the Interstate system that are reliable
- Percentage of person-miles on the non-Interstate NHS that are reliable

[112] Forward Pinellas. Advantage Pinellas 2045 LRTP. p. 2.5.
[113] 23 CFR Part 490.
[114] 23 CFR §490.105 – Establishment of performance targets.
[115] LOTTR is the ratio of the longer travel times (80th percentile) to a "normal" travel time (50th percentile), using data from FHWA's National Performance Management Research Data Set (NPMRDS). Data are collected in 15-minute time segments between 6 a.m. and 8 p.m. Person-miles include occupancy in auto, bus, and trucks.

National Highway Freight Program (NHFP)

- Truck Travel Time Reliability (TTTR)[116]

National Performance Management Measures for Congestion Mitigation and Air Quality (CMAQ) Program—Traffic Congestion

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

The threshold of excessive delay is measured based upon the travel time at 20 miles per hour or 60 percent of the posted speed limit travel time, whichever is greater, measured in 15-minute intervals. Peak travel hours are defined as 6-10 a.m. on weekday mornings, the weekday afternoon period is 3-7 p.m. or 4-8 p.m. The total excessive delay metric is weighted by vehicle volumes and occupancy.

Recent federal guidance has recommended the use of passenger trips rather than vehicle trips as a metric for mobility, recognizing that careful metric selection can avoid unintended consequences.

Mode Share

Presently, the federal government requires measuring mode share only in air quality nonattainment areas. None of the CMAQ performance metrics are required in urbanized areas in Florida because all areas are in attainment for National Ambient Air Quality Standards (NAAQS). Why set mode share targets if it is not required? Measuring mode share is an indicator of achieving the overall goal of developing a multimodal system.

Even in air quality attainment areas, the mode share metric should be considered because of its capability of measuring progress toward achieving other objectives. Reducing SOV mode share will have the effect of improving travel time reliability for people (LOTTR) and freight (TTTR), decreasing traffic congestion, decreasing highway wear and tear, improving safety, improving equity, reducing criteria air pollutants and reducing greenhouse gas emissions. The American Community Survey of the U.S. Bureau of the Census is one source for mode share data, depending on the geographic service area to which an objective is applied and depending on the time period needed for measurement.

It is recommended that the MPO use the SOV mode share metric in combination with LOTTR/TTTR and VMT reduction and VMT reduction per capita.

[116] The TTTR ratio is the 95th percentile travel time divided by the normal time (50th percentile) for each Interstate segment. The TTTR Index is generated by multiplying each segment's largest ratio of the five time-of-day periods by its length, then dividing the sum of all length-weighted segments by the total length of the Interstate. The NPMRDS includes truck travel times.

The FDOT Commuter Assistance Program performance metrics include SOV mode share. However, measuring SOV mode share reduction alone does not fully capture the congestion reduction benefit to the system, resulting from travel behavior changes that commuter assistance programs and TDM strategies can promote. For example, a TDM campaign encouraging employers and their solo driving employees to embrace staggered start times, compressed work week, and other alternative work hour arrangements could reduce congestion without a mode shift. Other travel behavior changes not captured by measuring SOV mode share are incremental but important to vehicle trip reduction and VMT reduction, such as a carpool adding an additional rider, or carpools joining into a vanpool, or vanpoolers switching to regional public transit, or trip elimination through telework.

The "Work from Home" Mode Demonstrates Congestion Reduction Potential

Working from home has been included as a mode in the Journey to Work data compiled through the American Community Survey (ACS). As demonstrated especially during the early months of the pandemic, those who could work remotely did so full time. There is evidence to suggest that prior to the pandemic, the rate of telework has been underreported. While ACS data measure how commuters usually traveled to work during a prior week (that is, three or more days per week), a detailed commute database from travel surveys from the WSDOT Commute Trip Reduction program provides evidence to suggest that more people typically telework one or two days per week; therefore, these teleworkers would not have been counted in the ACS. Commuter assistance campaigns can encourage more employers to maintain some of the gains in telework shown during the pandemic, which better squares with the optimal balance of in-office collaborative time and at-home focus time. For some employees of many organizations, this optimal balance might include two, three or more telework days per week.

National Public Transit Performance Metrics

MAP-21 also established performance metrics for public transportation.[117] These address federal safety and asset management goals. Transit agencies nationwide report a variety of performance data to the National Transit Database (NTD). This contributes toward the U.S. DOT Conditions and Performance Report to Congress that reports the status of highways, bridges, and public transit.[118] For safety, public transit agencies report the number of incidents by transit mode per 100 million passenger miles traveled, and number of fatalities and serious injuries per 100 million passenger miles traveled.

Transit mobility and access metrics include average operating (passenger-carrying) speeds, system capacity, vehicle occupancy, vehicle use, unlinked passenger trips and passenger miles, average trip length, vehicle reliability, access to transit, and access to employment. Transit service effectiveness and efficiency metrics reported to the NTD reflect the condition of the overall system.

- ✓ Operating expenses per vehicle revenue mile
- ✓ Operating expenses per vehicle revenue hour

[117] 49 U.S.C. Chaper 53.

[118] U.S. DOT. Federal Highway Administration and Federal Transit Administration. "Status of the Nation's Highways, Bridges, and Transit, Conditions and Performance. Report to Congress." 23rd Edition. November 2019. https://www.fhwa.dot.gov/policy/23cpr/

- ✓ Operating expenses per passenger mile
- ✓ Operating expenses per unlinked passenger trip
- ✓ Unlinked trips per vehicle revenue mile
- ✓ Unlinked trips per vehicle revenue hour

Florida transit agencies report the following metrics in their transit development plans and compare them to performance of peer transit agencies.

- Vehicle revenue hours
- Vehicle revenue miles
- Unlinked passenger trips, annual
- Unlinked passenger trips per revenue hour
- Unlinked passenger trips per revenue mile
- Operating expense, annual
- Cost per revenue hour
- Cost per revenue mile
- Cost per unlinked passenger trip
- Vehicles operated in maximum service
- Revenue hours per vehicle operated in maximum service
- Revenue miles per vehicle operated in maximum service
- Farebox revenue, annual
- Farebox recovery—ratio of fares collected to total operating costs
- Farebox revenue per unlinked passenger trip
- Subsidy per unlinked passenger trip

To maintain a customer focus, the Transit Capacity and Quality of Service Manual (TCQSM) further specifies transportation service indicators from the perspective of the transit passenger.[119] The quality of service framework for fixed-route transit includes frequency, service span, access, passenger load, reliability, and travel time. Access can be measured by transit service area coverage and also is dependent upon the presence of infrastructure that enables safe and direct access by walking or bicycling to the transit stop.

The federal government includes vanpooling in its definition of public transportation for purposes of reporting passenger miles traveled to the National Transit Database. That reporting contributes to increased federal transit formula funding that makes its way back to the area. Vanpools serve trips not served by fixed route public transit and they tend to be longer distance commute trips, so vanpooling fills in the service gaps not served by fixed route transit. Operating expenses per vehicle revenue mile for vanpooling is lower than for bus and vanpool farebox revenue recovery is higher for vanpool than for

[119] Transit Capacity and Quality of Service Manual. 3rd Edition. Transit Cooperative Research Program. Report No. 165. The National Academies Press. Washington, D.C. 2013.

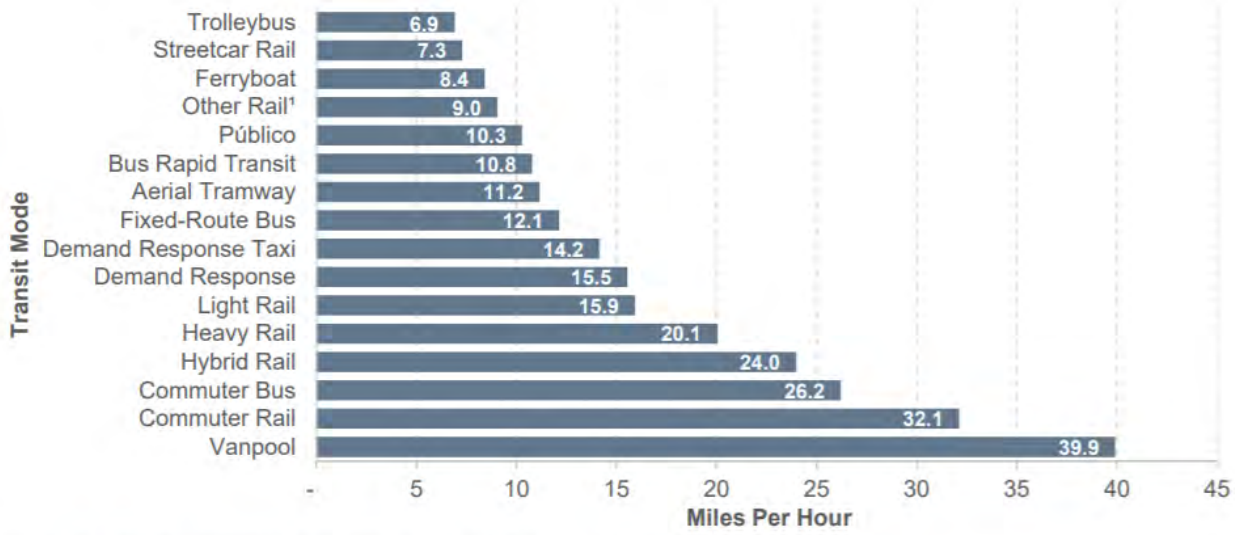
bus transit. Table 18 provides comparison data of TBARTA's vanpool program with data for the King County Metro vanpool program, the largest vanpool program in the United States.

Table 18. Vanpool Farebox Revenue Recovery is Higher than for Bus Transit

	SERVICE EFFICIENCY	SERVICE EFFECTIVENESS	FAREBOX RECOVERY
	Operating Expenses per Vehicle Revenue Mile	Operating Expenses per Unlinked Passenger Trip	Fare Revenues as Percent of Operating Expenses
King County (Seattle) – Vanpool only	$0.69	$3.01	69.3%
King County – Bus only	$16.07	$5.38	25.2%
TBARTA – Vanpool only	$0.68	$5.19	77.6%
HART – Bus only	$9.28	$6.52	16.1%

Source: Federal Transit Administration. National Transit Database, 2018
https://www.transit.dot.gov/ntd/transit-agency-profiles

Figure 11 shows average travel speeds by transit modes, which are generally lower than the solo driving experience. Vanpooling is listed as having the highest travel speed of the transit modes. Vanpooling also was shown to have the highest rate of growth of vehicle revenue miles, 11.8 percent, between the reporting years 2004-2014, when compared to all other public transit modes.



¹ Includes monorail/automated guideway, cable car, and inclined plane.

Figure 11. Average speeds for passenger-carrying transit modes, 2014.
Source: National Transit Database as reported by U.S. DOT, Federal Highway Administration and Federal Transit Administration. "Status of the Nation's Highways, Bridges, and Transit, Conditions and Performance. Report to Congress. 23rd Edition. November 2019, Exhibit 4-18, p. 4-23.
https://www.fhwa.dot.gov/policy/23cpr/

Prior to the pandemic, there were over 170 vanpools in operation in the Tampa Bay area, which were a part of the Commute with Enterprise service, subsidized by Commute Tampa Bay (TBARTA). Since the pandemic, some of those vanpools were discontinued, but at last count, 165 were still in operation. This is due in part to the cleaning protocols put in place, and due in part to the fact that so many essential workers rely on their vanpools. Both carpools and vanpools fill the service gap where fixed route transit cannot provide access. There is likely a bigger market for vanpooling participation if there were more subsidies available through employers. Presently, federal employers are the primary providers of vanpool and transit subsidies through Qualified Transportation Fringe Benefits (QTFB).

Recommendation for MPOs: Adopt targets to expand the regional vanpool program.

CAP/TMOs can continue to promote the Commute with Enterprise Vanpool Program as part of employer outreach.

Recommendation for local governments: Adopt a transit benefits ordinance to encourage increased ridership by transit and vanpooling, and the potential for an employer-provided subsidy for transit and vanpooling. Pursue parking management programs in downtowns and in activity centers, to further promote transit use.

These strategies should be implemented prior to the I-275 reconstruction. The USF Center for Urban Transportation Research can provide technical support through its Statewide TDM Clearinghouse. The CAP/TMOs can promote understanding of the opportunities provided by QTFBs.

Access to fixed route transit is generally measured based upon proximity of transit service to neighborhoods. Access to employment has been measured as the percentage of metro area jobs that can be accessed by residents within a commute trip of some defined time duration, such as 60 minutes. The Brookings Institution found that nationally, low-income suburban areas had adequate transit access, measured as a transit trip up to 90 minutes duration, to only 22 percent of low- and middle-skilled jobs.[120] This is a broad indicator of a nationwide service gap for a market that commuter assistance programs can help address. As the renewed national conversation on racial equity continues, public transit is in the spotlight as a critical service that often fails to adequately serve minority communities.[121] LINK Houston, a non-profit organization that advocates for equitable transportation, developed the Transportation Equity Demand Index (TEDI), using 15 indicators to shed light on areas in Houston that most need improved transit service.[122] Commuter assistance and TDM strategies can help improve transit access through programs, services, and subsidies.

[120] The Brookings Institution. "Missed Opportunity: Transit and Jobs in Metropolitan America." May 2011.
[121] "The Importance of Transit in Communities of Color." Transit Tuesday Webinar hosted by a consortium of state associations of public transit agencies. Guest panelists Darnell Grisby, American Public Transportation Association; Dorval Carter, CEO, Chicago Transit Authority; Christof Spieler, Huitt-Zollars; Oni Blair, LINK Houston. Oct. 6, 2020. https://us02web.zoom.us/rec/share/38bB4oz2UJrwxc_ll_5u4xVakjLmLjW**96iU**dkTFLJsq5IaGq2v8pLcXmBgO8bxZV.QF6nhWRzblUJlZVk
[122] LINK Houston. "Equity in Transit: 2018 Report." https://linkhouston.org/wp-content/uploads/2018/11/LINKHouston_EquityinTransit2018_Report.pdf

It is recommended that transit agencies and the MPOs expand use of indicators to better identify communities most in need of transit and commuter assistance.

The CAP/TMOs can target outreach and commuter assistance to identified communities most in need.

Reduce Motor Vehicle Miles Traveled to Reduce Traffic Delay and Automobile Dependency

At the regional level, highway capacity improvements are justified primarily as necessary for economic growth. There is no doubt that this is true as the population is expected to continue to grow and highways and the Interstate require sufficient capacity for passenger throughput. Freight delivery depends on reliable travel times to meet schedules and customer demand. Commuters depend on the transportation system to deliver them to work on time.

However, the task of maintaining highway capacity and mobility becomes complex as decisions to widen existing highways and build new highways must be evaluated against unintended consequences of disruption to adjacent neighborhoods, displacement of residents and businesses, and the increased negative environmental impacts resulting from induced demand. While highway expansion is justified to reduce the air quality impacts from stopped motor vehicles idling in traffic gridlock, a growing body of research work is taking a renewed look at induced demand, as discussed earlier in this report.

It is helpful to look at what municipalities in California are doing to reduce travel delay, reduce the generation of criteria air pollutants, and reduce greenhouse gas emissions, not by physical expansion of the highway, but by reducing motor vehicle miles traveled (VMT).

California state law provides that municipalities adopt VMT with targets for VMT reduction. The Cities of San Jose and Los Angeles were among the first to adopt the usage of VMT. This approach to transportation planning establishes a new balance of multimodal transportation level of service that usually features lowered motor vehicle design speed and a reallocation of roadway space among multimodal travelers. California has recognized that continued preferential investment in highway capacity instead of public transit means fewer competitive modal travel options and a perpetuation of our dependence on car driving. A renewed focus on the development of public transportation with walking and bicycling access, supported by TDM strategies, commuter assistance and employer outreach contribute toward making the most efficient use of existing capacity, while at the same time increasing passenger throughput, and delaying the need to physically expand the highway system.

Reducing automobile dependency by the traveling public has become a more urgent need, especially at a time of job loss and economic recession due to the COVID-19 pandemic of 2020. This can be done by halting bus service cuts, heightened investment in public transit and Complete Streets, and application of TSM&O and TDM. Reducing automobile dependency is a powerful economic growth and development tool as it supports access to jobs while conserving household budgets for other necessities.

Consider Other Metrics to Measure Transportation's Contribution to Economic Progress

Highway capacity expansion is usually justified in LRTPs as the basis of supporting economic growth. There is a growing lively discussion, internationally, regarding how best to measure economic progress. For example, is it more useful to measure growth or wealth?[123] What is important regarding using the transportation system to support the economy? Is it to reduce commute travel delay? Reduce the distance between jobs and housing? Reduce barriers to access between jobs and housing? Reduce the cost of commute transportation shouldered by households? The Tampa Bay Partnership's 2019 Regional Competitiveness report provides information about economic indicators, which could guide a regional discussion. This work can be used to help our community more specifically define what we mean by economic progress. The Tampa Bay area was compared with nineteen other comparable medium-sized cities across the United States, as well as with the U.S average, to benchmark the region's status using a variety of indicators in the categories of economic vitality, innovation, infrastructure, talent and civic quality. The figures discussed below reflect conditions prior to the pandemic.

The Tampa Bay area has a lower percentage of commuters with 1+ hours commute time than the U.S. average. The following overview is provided. "Commuters live in one location and work in another, and the duration of a commute is primarily affected by distance and road congestion. When jobs are located in greater proximity to where workers live, the distance and duration of commutes generally decreases. In Tampa Bay, the opposite trend is occurring. Jobs are growing in one set of counties, and housing units and the population of employed persons are growing in a separate set of counties."[124]

Further insight provided by the analysis shows, except for Citrus County, that commuters with 1+ hour commutes generally earn more annual income than those who do not. For example, workers from Hernando County earned an average of $37,851 annually but workers from Hernando County who commuted 1+ hours to work earned an average of $46,828 annually.[125] That is almost a $9,000 difference; however, this income gain may be significantly offset by the annual cost of transportation, reported as $7,063 for the Tampa Bay region overall and does not include the cost of one's time.[126]

The report cited Census data showing the proportion of commuters with 1+ hour commutes has been growing in the Tampa Bay area, as it also has nationally.[127] The report concluded that this pattern may indicate that longer, inter-county commutes will continue to increase and that it also could mean that affordable housing is being located farther from employment centers. This does not bode well for workers who currently depend on the public transportation system that presently has minimal regional connectivity. A larger proportion of those who ride public transportation experience commutes one hour or longer.

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[123] For one such examination, see David Pilling. "The Growth Delusion: Wealth, Poverty, and the Well-Being of Nations." New York: Tim Duggan Books. 2018.
[124] Tampa Bay Partnership. "2019 Regional Competitiveness Report." p. 38.
[125] Tampa Bay Partnership. "2019 Regional Competitiveness Report." p. 38.
[126] Tampa Bay Partnership. "2019 Regional Competitiveness Report." p. 58.
[127] U.S. Bureau of the Census. American Community Survey. 2017 1-Year Estimates, Table S0801.

One of the outcomes reported by the 2019 Regional Competitiveness Report is the financial instability rate as described by Asset Limited, Income Constrained, and Employed (ALICE), for which there are established thresholds. ALICE represents those who are employed and above the poverty line but live paycheck to paycheck and cannot withstand unexpected costs arising from emergencies. The Tampa Bay area ranks 16th out of the 20 peer regions, having the fifth highest share of its working population, at 29.4 percent, that are above the poverty line but below the ALICE threshold.[128] Considering that close to 80 percent of the region's commuters drive alone to work, this includes some portion of ALICE workers whose household budgets are burdened by car ownership or leasing.

The Tampa Bay region also ranked in the worst quintile for the following indicators.

- Transit ridership per capita
- Transit vehicle revenue miles per capita
- Pedestrian and bicyclist fatalities per 100,000 residents
- Both median and mean household income
- Average wage
- Transportation affordability: transportation expenditures as a percentage of income

At the same time, the Tampa Bay region ranked in the best quintile for the number of hours of driving time spent in congestion, meaning that the Tampa Bay region ranks among the best compared to peer regions with regard to the experience driving to work. That is 22 hours drivers spend in congestion annually for the Tampa Bay region, based on INRIX Traffic Scorecard data.[129] This is an average across the highway system. One's perspective matters, as this does not reflect the experience of commuters who drive every morning southbound on I-275 into downtown Tampa. However, the delay issue is localized spatially and temporally—making it highly amenable to TSM&O and TDM strategies.

For more perspective, if it is assumed that the average worker works 250 days each year, then those 22 hours are roughly equivalent to waiting roughly five minutes each morning in line at a coffee shop. Ask anyone who has migrated to the Tampa Bay area from urbanized regions in California, Texas, or the City of Atlanta. Most will say that the Tampa Bay area does not have a congestion problem.

Do we calculate the amount of time public transit riders spend waiting for the bus or as a result of having to transfer one or more times or because the bus broke down or because of difficulties with first mile/last mile bus system access? Do we weight minutes lost by public transit riders higher, since the negative consequences to public transit riders can be much more severe compared to the minutes lost by most motorists as they sit in traffic in the air-conditioned comfort of their private cars?

[128] Tampa Bay Partnership. "2019 Regional Competitiveness Report." p. 64.
[129] Tampa Bay Partnership. 2019 Regional Competitiveness Report. pp. 16, 22, 34-36, 59.

Recommendation to the RPC, MPOs and local governments: Transportation planning should strive for specificity regarding what is meant by economic progress, through a robust public engagement process, and how the transportation system can and should support it.

CAP/TMOs can provide outreach, community engagement, and solicit public input through its membership.

The Challenge to Elevate Public Transit Quality of Service

Federal transit funds primarily pay for transit capital facilities rather than operating expenses, such as buses, bus garage and maintenance facilities, and transit stations. Yet federal transportation investment focuses primarily on national and interstate travel, particularly as it relates to freight.

Historically, more investment has been directed to the highway system than the public transportation system. Less than one quarter of the total federal transportation apportionments go toward public transportation, both nationally and in Florida. The federal Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) authorized $305 billion on transportation investments for fiscal years 2016 through 2020. Apportionment for highway projects totaled over $207 billion over five years, as shown in Table 19. However, apportionment from FY 2016 through FY 2020 to FTA for public transit projects nationwide was $62.9 billion. Florida received approximately $2 billion for each of the five years for highway improvements and on average, approximately $416 million for each of the five years for public transit.[130] Less federal funds for public transit might be justified on the grounds that public transit serves local trips. However, as more commuters travel across county lines, commutes are becoming regional in nature. Public transit should serve regional trips.

Table 19. Federal FAST Act Funding Apportioned to FHWA and FTA for Projects Nationwide

Federal Fiscal Year	Total Apportionment in Billions	Highway $B* Apportionment	Public Transit $B** Apportionment	Percentage of total apportioned funds for public transit
2016	51.2	39.7	11.5	22%
2017	52.8	40.5	12.3	23%
2018	54.6	41.4	13.2	24%
2019	55.6	42.4	13.2	24%
2020	56.1	43.4	12.7	23%
Total	**270.3**	**207.4**	**62.9**	**23%**

*USDOT, FHWA Summary of Estimated Total FY 2016 - FY 2020 Apportionments Under the Fixing America's Surface Transportation (FAST) Act. https://www.fhwa.dot.gov/fastact/estfy20162020apports.pdf
**USDOT, FTA Apportionments. https://www.transit.dot.gov/funding/apportionments

[130] Federal Transit Administration. FTA Apportionments Formula and Discretionary Programs State FY 1998-2020. https://www.transit.dot.gov/funding/grants/fta-allocations-formula-and-discretionary-programs-state-fy-1998-2020-excel

Federal transit dollars come from a finite funding "pie" and are divided up among the transit agencies nationwide. More funding allocated to one transit system means less remaining to be allocated among other transit systems.

State transportation funds focus primarily upon serving regional trips, including trucks carrying freight, which must pass through an urban area while traveling on an Interstate, hence the focus on travel delay and travel time reliability on the Interstate going through urban areas. From a congestion standpoint, this raises the question whether local trips should use the Interstate System or if there is a better way to manage the use of the existing Interstate highway capacity to prioritize freight-carrying trucks and regional passenger trips, and reward high occupancy vehicles such as buses. The function of state roads is primarily to connect communities; however, Complete Streets and Context Classification recognizes that the highway must be designed to fit the community it passes through. State transit funding largely pays for transit planning and technical support. It is the responsibility of local government to fund local roads. Local government also is the primary funding source for operations of the transit system that serves a community or urban area. It is incumbent upon state and local entities to flex funding sources, where possible, for transit, bicycling, walking, and commuter assistance programs. CMAQ is an example of a funding source that should be allocated for commuter assistance.

Federal funding programs since 1991 have directed some resources to the development of a multimodal and intermodal system, nationwide. State, regional, and local plans typically call for the allocation of funding for the development of multiple modes other than solo driving, to make these alternatives "viable." However, viability falls far short of competitiveness. For a true multimodal/intermodal system, all the modes are developed and operated such that equivalent levels of service are experienced comparatively well across modes. The result is that travelers are more apt to select the most efficient and appropriate mode for that trip, such as walking or bicycling for short trips where sidewalks and bike lanes connect trip origins with destinations. Cost conscious commuters will select public transit. While public transit will not be as fast as solo driving, an equivalent transit level of service will deliver reasonable travel times for much less cost to the traveler.

Performance Targets to Achieve Modal Competitiveness

TDM strategies and commuter assistance can tilt the balance toward attracting greater ridership for HOV modes when existing HOV service levels are good enough that it attracts a market that is willing to trade a reasonable time cost in exchange for saving money otherwise spent on car ownership or leasing. TDM strategies that tip the balance include employer-provided Qualified Transportation Fringe Benefits to employees, which lower the cost of public transit and vanpooling, and parking management that raises the cost to drive. But no amount of incentives can tilt the balance where public transit is inaccessible. Efficiencies from careful stewardship of scarce transit funds go only so far to provide service. Better performing public transit from the customer's perspective (frequency and reliability, service span, access) requires more funding.

Public policy makers have the power to either make the transportation "pie" larger or reallocate funds within the existing transportation pie to achieve transit competitiveness with solo driving. Multimodal competitiveness has ostensibly been the intent of federal transportation reauthorizations since 1991, as well as the explicit intent of long range goals at the local, regional and state levels.

Selecting relevant metrics goad change toward goal achievement. Setting ambitious performance targets sends a clear signal that resources must be allocated to explicitly effect a shift in transportation system development priorities. Resource allocation enables measurable progress that closes the performance gap between solo driving and public transit service and other modes.

Recommendation for FDOT and the MPO: Set ambitious performance targets for more commuters and travelers to choose modes other than solo driving, including public transportation, bicycling, walking, carpooling, vanpooling, and telecommuting, and provide funding to achieve those targets, accordingly. Allocate CMAQ funding for commuter assistance activities.

CAP/TMOs can address performance targets through objectives and tasks in proposed scopes of work, such as employer outreach to promote Best Workplaces for Commuters℠, Qualified Transportation Fringe Benefits for public transit use and vanpooling, parking cash out, Bike/Walk Tampa Bay, Love To Ride bicycle promotions, Emergency Ride Home, Agile Mile Rewards, Bicycle Friendly Businesses and others.

It is unlikely that riding the bus will ever be as fast as solo driving one's private car. This accounts for the walk to the bus stop and the time it takes for the bus to stop along the route to pick up other passengers. However, most adults who have visited other cities with strong public transit systems know the experience of a reasonable wait time for the bus, easy route connections, a comfortable ride, and a disembarking point within just a few blocks' walking distance to a final destination. All this for a much lower cost per household than car ownership or leasing. That cost is many thousands of dollars per year lower per household. Such a household cost savings represents a critically important opportunity at a time when one in every five children in the Tampa Bay area struggle with hunger.[131]

Such cities that have made strong and consistent transit investment over the decades have higher ridership and the passengers are a more even mix of lower, middle, and upper income residents and visitors, riding the same buses together. Examples of public transit systems that have recently ranked high in accessibility and convenience, from a consumer perspective, include WMATA (Washington, D.C.), MBATA (Boston), Tri-Met (Portland), and Metro (Seattle).[132]

Instead, most car-centric urban areas in the United States have underfunded their public transit systems for many decades, to a degree that even the lowest-income residents seek to escape having to use

[131] Feeding Tampa Bay. Accessed October 7, 2020. https://www.feedingamerica.org/find-your-local-foodbank/feeding-tampa-bay

[132] Adam McCann. Financial Writer. WalletHub survey, "Cities with the Best & Worst Public Transportation." September 10, 2019. https://wallethub.com/edu/cities-with-the-best-worst-public-transportation/65028/

transit at the first opportunity. Consistently poor investment in public transit tends to result in a car-centric transportation system and a car-centric community culture that is unaware of the benefits of other strong travel mode options. Riding poorly functioning public transit not only steals a passenger's precious time away from employment and other important pursuits, but also the experience of riding public transit feels like a daily punishment for earning a lower income. Riding public transit to work is a difficult journey for many. For some, it is impossible. The lack of geographic coverage, service span and frequency, force lower income households to spend a disproportionate amount of annual income on a car, sacrificing other essentials, such as food, adequate housing, medical care, education, and a household emergency fund.

Recommendation for transit agencies and local governments: Stabilize existing transit service by preventing service cuts. Improve public transit service to existing customers first.

CAP/TMOs can target outreach and commuter assistance to identified communities.

Commuter assistance programs know that it is easier to retain existing customers with satisfactory service than it is to reach for new ("choice") customers at the expense of existing customers. Out of necessity, "captive" ridership will escape bad transit service by obtaining a car if possible. Instead of spreading transit resources too thin to attract high income solo drivers (usually unsuccessfully), concentrate service improvements for existing riders first, for the largest ridership gains coming from existing riders, then increasing gains from new riders of moderate income.

Proposed service cuts target lower performing bus routes or segments of those routes, to reduce coverage and trip frequency. The service cuts are intended to improve efficiencies and reduce costs. However, some people still ride those route segments slated to be reduced or cut completely. They are going to work, school, the doctor, etc., and their daily routines are dictated by the bus service schedule. Every time service is cut, like HART's Mission Max in 2017, it causes serious disruption to the lives of those who depend on that service, especially those with children in school or daycare, and those who are caregivers to other dependents at home. Suddenly, bus riders no longer can pick up their child from daycare before it closes. Suddenly, they cannot arrive to work on time. Or they can catch an earlier bus and arrive an hour or more earlier to work, requiring them to withdraw their child from the daycare center that does not open early enough. Suddenly, they must walk over a mile to the bus stop, along streets with no sidewalks, or after disembarking, to get to a job site. Cutting public transit service runs counter to the commitment for Health in All Policies.

In this time of urgent reliance on essential workers, economic crisis, and social justice reckoning, preventing public transit service from being cut is the very least our communities should be willing to do. But the region can go farther. For example, the Mid-Ohio Regional Planning Commission (MORPC) 2020-2050 Metropolitan Transportation Plan contains six regional goals that give direction to investments in the regional transportation system. One such goal is to use public investments to benefit the health, safety, and welfare of people. Measurable objectives for this goal include the following.

"Minimize the difference in trip travel time for disadvantaged populations relative to the regional trip travel time."[133]

It is unrealistic to set performance targets for the public transit experience to equal the travel times and convenience of driving one's private car. However, targets should strive toward delivering the public transit travel experience that makes it a reasonable alternative. The somewhat longer public transit travel times are offset by a big decrease in out-of-pocket transportation costs. Performance targets for public transit access, span of service and frequency/reliability should at least reverse the ridership declines experienced by public transit since 2013 and set public transit on a course to reduce SOV mode share, comparable to those of urbanized areas listed in Table 26. For example, the Hillsborough MPO LRTP 2045 performance outcome for Real Choices When Not Driving is to "Expand bus service on 800 miles of roads with somewhat frequent or better service."[134] That would be double the number of centerline miles served by HART bus service now. However, accomplishing this means that approximately 16 percent of total paved roadway miles in Hillsborough County (state, county, city combined) would have service by 2045. Is this good enough?

The funds must come from somewhere to preserve and improve public transit. Government leaders can choose to re-allocate transportation dollars to public transit investment. Such a permanent year-after-year reprioritization of public transit over other investments, to make public transit truly competitive with solo driving, would accomplish the following.

- Support a Health in All Policies commitment.
- Help existing transit riders keep their jobs. These bus riders represent the most vulnerable households, many of whom may be one paycheck away from eviction. They depend on **existing** transit service to get to work.
- Pump more income into the local economy, as more people ride transit, drive less and even get rid of a car, saving potentially thousands of dollars per household in transportation costs each year, and spending saved money on other goods and services. Prior to the pandemic, HART served roughly 37,000 trips daily. A quick calculation below estimates the potential dollars saved by carless households to be spent on essential goods and services.
    - For simplicity of calculation, let's assume the 37,000 transit trips represent approximately 18,500 individuals making one round trip daily.
    - There are 2.48 persons per household. 18,500 individuals represent at least 7,460 households.
    - In the Tampa Bay area, seven percent of all households have no car and 43 percent have access to one vehicle.[135]

[133] Mid-Ohio Regional Planning Commission (MORPC). "2020-2050 Columbus Area Metropolitan Transportation Plan. p. 1-11. https://www.morpc.org/mtp2050/
[134] Hillborough MPO Long Range Transportation Plan 2045. p. 66.
[135] Bureau of Transportation Statistics.

  - Looking just at zero car households, that is seven percent of 7,460 households or 522 households.
  - According to ESRI Business Analyst, annual household cost of transportation for the Tampa Bay region is $7,063. This average includes auto ownership costs, auto usage costs, and transit usage costs.[136] Transportation costs may vary across the region.[137]
  - A monthly HART Express bus pass costs $95.00 or $1,140 annually.
  - A potential savings of $5,923 annually ($7,063 - $1,140) would be available to each zero car household.
  - This could represent an additional $3,091,806 ($5,923 x 522 households) annually available to spend on goods and services in the community. This amount would grow as ridership increases and more households save money on transportation expenses.

- Make a meaningful, major, and lasting contribution toward improving social equity, during a time when lack of social equity is a national problem that touches every community.
- Retain existing riders first, then attract additional (and returning) riders over time, as transit service continues to improve. Many of these riders will come from households hit particularly hard by the pandemic and are looking for practical ways to economize.
- Improve access to a higher percentage of jobs in the service area. This will increase the labor shed for businesses.
- Improve the wellbeing of public transit riders and their households by having more disposable income for essential goods and services.
- Improve public health outcomes as more people walk or bicycle to the transit stop.
- Justify further investment in street improvements for bicyclists and pedestrians, which reduce traffic fatalities and serious injuries.
- Reduce air pollution and greenhouse gas emissions.
- Increase transit operational efficiencies, as buses in service transport increased numbers of passengers per vehicle revenue hour and per vehicle revenue mile.
- Reduce traffic congestion.

Equity Performance Metrics

The exclusion of different groups of people from economic opportunity deflates the capacity of the region to grow and prosper economically. These excluded groups may be those of a different race or

[136] Tampa Bay Partnership. 2019 Regional Competitiveness Report. pp. 58-59.

[137] The Center for Neighborhood Technology offers more granular estimates for annual average household housing and transportation costs. Using the calculated Transportation Index for Hillsborough County from the Center for Neighborhood Technology, the average amount per household per year spent on transportation is $11,835, an average of $80 of which is spent on public transportation. Subtracting this out, then average transportation costs just on auto expenses would be $11,755. Transportation costs were defined as the sum of auto ownership costs, auto use costs, and public transit costs, as modeled for a typical household, and ranged from $8,092 to $16,031. The potential savings per household to go car free would be $10,615 (that is $11,755-$1,140), providing a potential for $5,541,030 (that is $10,615 x 522 households) spent in the community.

ethnic background or those known as Transportation Disadvantaged (TD) due to income, disability or age. Transportation for the TD population is often discussed as a social services issue, separate from the conversation about transportation for economic development. People labelled as a member of the TD population tend to rely on public transportation. Regions where public transportation is poor lose out on the full economic contribution potential of those who must use public transportation.[138]

TDM strategies and commuter assistance are applied not just to reduce traffic congestion as experienced by motorists but also to improve mobility and access to the traveling public. Vehicle miles traveled (VMT) is the metric typically applied to TDM strategies, with the objective to reduce (motor vehicle) VMT to reduce congestion, improve air quality and improve safety. Indeed, reducing fatalities and serious injuries reduces economic costs to society, to say the least[139], but those economic cost savings are not figured into considerations for choosing transportation investments for purposes of economic growth. Regional planning includes equity and environmental justice considerations, primarily as it applies to Communities of Concern (COC). Equity considerations to evaluate transportation projects include health, safety, and access to opportunity. When these equity dimensions are improved for populations within the COCs, the benefits accrue not just to the COCs but also to the entire community. Investment in capital and operations for public transit, pedestrian and bicycle facilities, with impacts of reducing motor vehicle miles traveled and reducing traffic congestion, also improve health and safety, and improve access to opportunity.

It is recommended that calculation of return on investment of transit projects benefiting COCs should include consideration of monetizing reduced facilities and serious injuries, reduced time lost, reduced health care costs, lower unemployment, lower rates of crime due to improved employment, and the infusion of reinvestment back into local communities from increased discretionary spending by populations living in COCs.

The Tampa Bay Partnership has examined transportation equity from an economic growth and regional competitiveness standpoint. The Partnership recently released the "2020 Regional Equity Report: State of the Region" that examined many indicators and outcomes of equity.[140] These included indicators relating not just to physical transportation but also to digital access. Digital access is discussed here, relating to commuter assistance, because of the outsided role telework, online education/training, telehealth, and other digital access has on the ability of people to participate in society without the need for physical trip making. Avoiding trip making bestows powerful savings to households in the form of

[138] For public transit and commuter assistance supporting workforce competitiveness advantages offered by persons with disabilities, presentation from Kyle Johnson, President and CEO – Lighthouse Central Florida/Lighthouse WORKS!, as part of "Guiding the Old Workforce through the New Normal", a Multimodal Transportation Workshop webinar, hosted by the Florida Department of Transportation (FDOT). November 5, 2020, as part of Mobility Week.

[139] Value of a Statistical Life as defined by the U.S. Environmental Protection Agency is $7.4 million (2016). There were 169 fatalities reported in Hillsborough County in 2018.

[140] Tampa Bay Partnership. "2020 Regional Equity Report: State of the Region." Produced in collaboration with The Community Foundation of Tampa Bay and United Way Suncoast and is affiliated with the State of the Region Initiative. https://issuu.com/tampabaypartnership/docs/2020_regional_equity_report

saved cash and saved time. The "2020 Regional Equity Report" reported that digital access in the Tampa Bay region is among the lowest in its peer group, based upon an analysis of 2018 data from the Bureau of the Census, American Community Survey. The Tampa Bay region ranks in the worst quintile for all racial and ethnic categories, including white, non-Hispanic, for households having a computer and an Internet subscription.[141]

The "2020 Regional Equity Report" also reported on the difference in mode of transportation to work between white and black people, based upon the 2018 ACS. Black workers in the Tampa Bay area are almost three times as likely to rely on public transit/walking to work as white, non-Hispanic workers. This finding, taken together with the Tampa Bay area's second to lowest ranking out of the 20 peer regions for percentage of the entire population that relies on public transit/walking to work, illustrates a bleak picture for employees who must rely on public transit. That so few employees commute using public transit in the region, 2.4 percent in the Tampa Bay area, compared with other regions is an indicator of poor transit service quality.[142]

Another recent study of equity considerations in regional planning was conducted for the Center for Transportation Equity, Decisions, and Dollars. Some conclusions drawn are that including equity as part of the vision, goals, and policies of a region can be a way to infuse equity considerations into all aspects of the LRTP and the TIP development stages, including project processes. The study examined several case studies nationwide, including MetroPlan Orlando. The report contained recommendations that all project evaluation criteria should be assessed through an equity lens. Transportation projects that benefit COCs, regardless of type or mode, can be systematically prioritized. Project proximity to a COC does not necessarily mean that it benefits the population that lives in the COC. The calculation of return on investment should incorporate equity considerations. Public outreach should target COCs.[143]

MetroPlan Orlando applies a variety of performance metrics to Traditionally Underserved Areas (Environmental Justice Areas) and compares the values for these same metrics to those for the MetroPlan Region and MetroPlan Urbanized. The scorecard shows the number of performance metrics where Environmental Justice Areas fall below the regional measure. Performance metrics include those listed in Table 20.[144]

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[141] Tampa Bay Partnership. "2020 Regional Equity Report: State of the Region." pp. 54-57.
[142] Tampa Bay Partnership. "2020 Regional Equity Report: State of the Region." pp. 58-61.
[143] Williams, Kristine, Jeff Kramer, Yaye Keita, Lucy Deba Enomah, and Tia Boyd. "Integrating Equity into MPO Project Prioritization." Final Report CUTR-2019-12. CTEDD Project No. 018-03. University of South Florida Center for Urban Transportation Research. Prepared for the Center for Transportation, Equity, Decisions, and Dollars (CTEDD), The University of Texas at Arlington. pp. 153-155. https://www.cutr.usf.edu/2020/01/integrating-equity-into-mpo-project-prioritization/
[144] MetroPlan Orlando. 2040 Addendum. Performance Based Planning. 2040 Long Range Transportation Plan. Adopted 2018. Updated April 2019. https://metroplanorlando.org/wp-content/uploads/LRTP2040_Addendum_Update-April2019.pdf

Table 20. MetroPlan Orlando Applied Several Transportation Equity Performance Metrics

Equity Consideration	Transportation Performance Metrics
Safety	• Number of fatalities (motorized, transit, bicycle, pedestrian) • Number of serious injuries (motorized, transit, bicycle, pedestrian) • Rate of fatalities per 100 million vehicle miles traveled for each mode • Rate of serious injuries per 100 million vehicle miles traveled for each modes
Access	• Percent of population within 30-minute auto/transit travel time to activity center • Percent of population within ¼ mile of a transit stop • Percent of employment within ¼ mile of a transit stop • Percent of population within ¼ mile of an activity center (walkable/bicycle community) • Jobs-housing balance
Affordability	• Transit ridership percent for workers • Percent of arterial and collector network with street trees/landscaping • Percent of income spent on housing and transportation • Annual transportation cost per household • Annual auto ownership cost per household • Number of autos per household • Annual VMT cost per household • Annual transit cost per household

Source: MetroPlan Orlando. 2040 Addendum. Performance Based Planning. 2040 Long Range Transportation Plan. 2019.

Table 21 offers some recommendations for immediate actions and associated transportation performance metrics to support communities in the Tampa Bay region.

Table 21. Recommended Actions and Performance Metrics

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
FDOT/MPO			
Reallocate funds to improve bus service	↑Bus service access/coverage ↑Bus service frequency ↑Bus service time span/duration	↑Transit/Vanpool ridership ↑Transit/Vanpool passenger miles traveled ↑Federal transit formula funding ↑Travel time reliability ↑Customer satisfaction ↑Economic Return on Investment ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Access to jobs Equity Economic growth Quality Placemaking Healthy communities Connectivity Mode Choice Environment
Reallocate CMAQ funds to amplify commuter assistance	↑Employer outreach ↑Commuter outreach ↑Neighborhood/Civic association outreach	↑Transit/Vanpool ridership ↑Transit/Vanpool passenger miles traveled ↑Work from home ↑Bike/walk/carpool ↑Travel time reliability ↑Customer satisfaction ↑Economic Return on Investment ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Access to jobs Equity Economic growth Healthy communities Connectivity Mode Choice Environment
Improve digital access	↑Work from home ↑Education from home ↑Job training from home	↑Travel time reliability ↑Customer satisfaction ↑Community engagement	Access to jobs Equity Economic growth Healthy communities

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
	↑Shop/health care/personal business from home	↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Connectivity Mode Choice Environment
Complete Streets emphasis	↑Transit ridership ↑Transit PMT ↑Bicycle trips and miles traveled ↑Pedestrian trips and miles traveled	For all modes separately: ↓Number of fatalities ↓Number of fatalities per capita ↓Number of serious injuries ↓Number of serious injuries per capita ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Vision Zero Access to jobs Equity Economic Growth Quality Placemaking Healthy communities Connectivity Mode Choice Environment
Speed management, reduce speeds	↑Bicycle trips and miles traveled ↑Pedestrian trips and miles traveled	For all modes separately: ↓Number of fatalities ↓Number of fatalities per capita ↓Number of serious injuries ↓Number of serious injuries per capita ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Vision Zero Equity Quality Placemaking Healthy communities Connectivity Mode Choice Environment
Prioritize strategies that maximize use of existing highway capacity	↑Free HOV2+ lanes ↑Vehicle occupancy detection ↑Tolling ↑Congestion pricing	↑Transit/Vanpool/Carpool ridership ↑Transit/Vanpool passenger miles traveled ↑Federal transit formula funding ↑Travel time reliability ↑Customer satisfaction ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita	Innovation and technology Access to jobs Equity Economic Growth Environment Quality Placemaking Mode Choice

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
		↓Vehicle delay ↓Peak period vehicle trips ↓NAAQS Air pollution (Ozone, NOx, PM, CO)	
Support TBARTA regional transit and vanpool development	↑Regional transit service access/coverage ↑Regional transit service frequency ↑Regional transit service time span/duration ↑Vanpool formation	↑Transit/Vanpool ridership ↑Transit/Vanpool passenger miles traveled ↑Federal transit formula funding ↑Travel time reliability ↑Customer satisfaction ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Access to jobs Equity Economic growth Quality Placemaking Healthy communities Connectivity Mode Choice Environment
Support intercity bus travel and regional passenger rail development	↑Regional transit service access/coverage ↑Regional transit service frequency ↑Regional transit service time	↑Transit/Vanpool ridership ↑Transit/Vanpool passenger miles traveled ↑Federal transit formula funding ↑Travel time reliability ↑Customer satisfaction ↓Single occupant vehicle (SOV) trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Access to jobs Equity Economic growth Quality Placemaking Healthy communities Connectivity Mode Choice Environment
Statewide VMT charge	↓VMT	↑Desire to live closer to employment	Finance and administration
Local Governments			
Partner with Commute Tampa Bay and transportation management organizations to support commuter assistance	↑Constituent awareness of commuter assistance ↑Employer and Community engagement ↑Joint implementation and planning ↑Funding for commuter assistance	↑Transit/Vanpool ridership ↑Transit/Vanpool passenger miles traveled ↑Carpool ridership ↑Bicycle trips and bicycle miles traveled ↑Walking trips and pedestrian miles traveled ↑Telework	Access to jobs Equity Economic growth Mode choice Healthy communities

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
	• Best Workplaces for Commuters • Bike/Walk Tampa Bay • Commute with Enterprise Vanpool • Emergency Ride Home • Love to Ride Tampa Bay • Ridematching rewards • SHIFT Tampa Bay • Telework Certificate	↑Employer access to labor ↑Employee recruitment and retention ↑Employer savings on costs of providing parking	
Transit benefits ordinance to increase employer support for transit and vanpooling	↑Employer participation ↑Employer provision of pre-tax income for transportation expenses ↑Employer provision of monthly transit pass ↑Employer provision of vanpool subsidy up to $270/month per employee ↓Employer payroll tax ↓Employee taxable gross income	↑Transit/Vanpool ridership ↑Transit/Vanpool passenger miles traveled ↑Federal transit formula funding ↑Travel time reliability ↑Customer satisfaction ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓Vehicle delay ↓NAAQS Air pollution (Ozone, NOx, PM, CO)	Access to jobs Equity Economic growth Mode Choice Environment
Advocate for flexible work schedules	↑Employer participation ↑Number employees with staggered start times ↑Number of employees working compressed work week	↑Travel time reliability ↑Employee satisfaction ↓Vehicle delay ↓Peak period vehicle trips ↓NAAQS Air pollution (Ozone, NOx, PM, CO)	Access to jobs Equity Economic growth Environment
Provide digital access to support remote work and job training	↑Work from home ↑Education from home ↑Job training from home ↑Shop/health care/personal business from home	↑Travel time reliability ↑Customer satisfaction ↑Community engagement ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO)	Access to jobs Equity Economic growth Healthy communities Connectivity Mode Choice Environment

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
		↓Vehicle delay	
Encourage safe bicycling through Bike/Walk Tampa Bay and Love To Ride	↑Bicycle trips ↑Bicycle miles traveled	For all modes separately: ↓Number of fatalities ↓Number of fatalities per capita ↓Number of serious injuries ↓Number of serious injuries per capita ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Vision Zero Quality placemaking Access to jobs Equity Economic growth Healthy communities Connectivity Mode Choice Environment
Support increased bus transit service operations	↑Bus service access/coverage ↑Bus service frequency ↑Bus service time span/duration	↑Transit/Vanpool ridership ↑Transit/Vanpool passenger miles traveled ↑Federal transit formula funding ↑Travel time reliability ↑Customer satisfaction ↑Economic Return on Investment ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Access to jobs Equity Economic growth Quality Placemaking Healthy communities Connectivity Mode Choice Environment
Prioritize affordable housing near transit service and employment centers	↑% of population within 30-minute transit travel time to activity center ↑% of population within ¼ mile of a bus stop	↑Transit ridership ↑Transit passenger miles traveled ↑Bicycle trips and bicycle miles traveled ↑Walking trips and pedestrian miles traveled ↓Percent of income spent on housing and transportation	Access to jobs Equity Economic growth Quality Placemaking Healthy communities Connectivity Mode Choice Environment
Complete Streets	↑Transit ridership ↑Transit PMT	For all modes separately: ↓Number of fatalities ↓Number of fatalities per capita	Vision Zero Access to jobs Equity

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
	↑Bicycle trips and miles traveled ↑Pedestrian trips and miles traveled	↓Number of serious injuries ↓Number of serious injuries per capita ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Economic Growth Quality Placemaking Healthy communities Connectivity Mode Choice Environment
Speed management, speed reduction	↑Bicycle trips and miles traveled ↑Pedestrian trips and miles traveled	For all modes separately: ↓Number of fatalities ↓Number of fatalities per capita ↓Number of serious injuries ↓Number of serious injuries per capita ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay	Vision Zero Equity Quality Placemaking Healthy communities Connectivity Mode Choice Environment
Trip reduction ordinance for employers	Examples of activity-based compliance metrics: ↑% of employers offering commute benefits • Parking cash-out • Qualified Transportation Fringe Benefits • On-site bike parking • On-site bus stop • Telework, flexible work hours ↑Number of employees participating ↑% of employees participating ↑% of employers who are members of a transportation management organization (TMO)	Examples of performance-based metrics ↑Transit/Vanpool ridership ↑Transit/Vanpool passenger miles traveled ↑Work from home ↑Bike/walk/carpool ↑Travel time reliability ↑Employer satisfaction ↑Employee satisfaction ↓Peak period vehicle trips per 100 employees ↓Vehicle trips per 100 employees ↓Worksite parking needs ↓Commuter costs ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓SOV mode share	Access to jobs Equity Economic growth Quality placemaking Healthy communities Connectivity Mode choice Environment

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
	↑% worksites that have designated an Employee Transportation Coordinator (ETC) ↑% ETCs participated in TDM training ↑% ETCs that have distributed information about commute options ↑% worksites that conduct baseline and biennial commuter survey ↑% worksites that have submitted an annual report	↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicle delay along designated corridor or service area ↓Person-hours delay along designated corridor or service area	
Trip reduction ordinance for land developers, property owners/managers	Examples of compliance metrics: • Mobility fee schedule that disincentivizes location of new development on suburban fringe • Unbundle parking from residential and commercial leases • Prepare TDM plan for the development • Submit annual report • Provide preferentially located free or discounted HOV parking • Provide bike parking, lockers, showers • On-site sidewalks, curbside drop-offs, bus stop	Examples of performance-based metrics ↑Transit/Vanpool ridership ↑Transit/Vanpool passenger miles traveled ↑Work from home ↑Bike/walk/carpool ↓Peak period vehicle trips per 100 employees ↓Vehicle trips per 100 employees ↓Worksite parking needs ↓Commuter costs ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita ↓SOV mode share ↓NAAQS Air pollution (Ozone, NOx, PM, CO) ↓Vehicular delay along designated corridor or service area ↓Person-hours delay along designated corridor or service area	Improve success of transit-oriented development Access to jobs Equity Economic growth Quality placemaking Healthy communities Connectivity Mode choice Environment
Parking ordinance--private sector	Defined parking supply maximums for land development types "Right-sized parking" based on local data	↓SOV mode share	Improve success of transit-oriented development Quality placemaking
Parking management plan: real time variable pricing—	↓Peak period vehicle trips	Maintain optimum parking occupancy rates	Economic vitality Mode choice

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
public sector, by time of day and location			Quality placemaking
MaaS fare integration	↑Number of app downloads and profiles created	↑Customer satisfaction ↑Transit PMT ↑Transit trips ↓Peak period vehicle trips Maintain optimum parking occupancy rates	Economic growth Mode choice
Institute bikeshare and escooter	↑Number of shared bikes available ↑Number of bikeshare trips ↑Number of shared escooters available ↑Number of escooter trips	↑Customer satisfaction ↑Transit ridership ↑Transit passenger miles traveled ↓Single occupant vehicle (SOV) vehicle trips (VT) ↓SOV vehicle miles traveled (VMT) ↓SOV VMT per capita	Economic vitality Mode choice Quality placemaking
Curbside management to include HOV drop-off/pick-up	↑Number of carpool/vanpool pick-ups and drop-offs	↑Customer satisfaction ↑Transit/vanpool/carpool ridership ↑Transit/vanpool passenger miles traveled	Access to jobs Equity Mode choice
Landscaping, weather protection, benches	↑Number of street segments meeting landscaping and design standards	↑Bicycle trips and bicycle miles traveled ↑Walking trips and pedestrian miles traveled ↑Transit ridership and passenger miles traveled ↑Customer satisfaction	Mode choice Equity Quality placemaking Economic vitality
Commute Tampa Bay	As documented by Commute Tampa Bay and evaluated by Commuter Assistance Program Evaluation using TRIMMS℠		
Regionwide Employer outreach Agile Mile Ridematching Agile Mile Rewards Emergency Ride Home Enterprise Vanpool formation Vanpool subsidy	↑Number of employers contacted ↑Number of employers participating ↑Number of commuters who are aware of commuter assistance ↑Number of commuters requesting assistance (database registrants) ↑Agile Mile Rewards redeemed (includes Emergency Rides Home) ↑TDM program elements used by each employer	↑Number of commuters switching modes from SOV ↑% of database registrants switching modes from SOV ↑Number of vans in service ↑Number of carpool/vanpool passenger trips ↑Customer satisfaction ↓Number of motor vehicle miles traveled (VMT) ↓Number of parking spaces used	Access to jobs Equity Economic growth Innovation and technology Quality placemaking Healthy communities Connectivity Mode choice Environment

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
		↓Commuter costs ↓Gallons fuel consumed ↓Greenhouse gas emissions generated	Resilience--Continuity of Operations
Transportation management organizations			
Employer outreach campaigns to promote commuter choices and services: • Public transit • Park and Ride information • Transit promotional discounts • Agile Mile ridematching and rewards • Emergency Ride Home • Assist vanpool formation • Carshare • Bikeshare/microtransit • Qualified Transportation Fringe Benefits • Transit/vanpool subsidy • Parking cash-out • Preferential HOV parking • Tampa Bay Smart Cities Alliance	↑Number of employers contacted ↑Number of employers participating ↑Number of commuters who are aware of commuter assistance ↑Number of commuters requesting assistance (database registrants) ↑Agile Mile Rewards redeemed (includes Emergency Rides Home) ↑Number of TDM program elements offered by each employer ↑Number of participants using transit promotional discounts ↑Number of carshare program registrants ↑Number of bikeshare/microtransit program registrants ↑Number of MaaS app downloads ↑Number of managers completing BWC Telework Certificate ↑Number of employees completing BWC Telework Certificate ↑Number of Best Workplaces for Commuters ↑Participation in Bike/Walk Tampa Bay events ↑Number of registrants for Love To Ride ↑Number of LAB Bicycle Friendly Businesses	↑Number of commuters switching modes from SOV ↑% of database registrants switching modes from SOV ↑Number of vans in service ↑Number of carpool/vanpool passenger trips ↑Customer satisfaction ↓Number of motor vehicle miles traveled (VMT) ↓Number of parking spaces used ↓Commuter costs ↓Gallons fuel consumed ↓Greenhouse gas emissions generated	Improve success of transit-oriented development Access to jobs Equity Vision Zero Economic growth Innovation and technology Quality placemaking Healthy communities Connectivity Mode choice Environment Resilience--Continuity of operations

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
Mobility-as a Service (MaaS) Mobile apps that support commute options • BWC Telework Certificate • Flexible work start time • Compressed work week • Best Workplaces for Commuters, Best Universities for Commuters, Best Sites • Bike/Walk Tampa Bay • Love To Ride Tampa Bay • League of American Bicyclists Bicycle Friendly Business, Bicycle Friendly University • Pilot new technologies • Scale up successful pilots	↑Number of LAB Bicycle Friendly Universities ↑BFU designation elevation ↑Pilot program participation		
Civic/Neighborhood outreach to promote transportation options • SHIFT Tampa Bay—Neighborhood-based travel planning	↑Number of households contacted ↑Number of households who are aware of commuter assistance ↑Number of households requesting assistance ↑Number of households participating ↑Agile Mile Rewards redeemed (includes Emergency Rides Home)	↑Number of commuters switching modes from SOV ↑% of SHIFT household participants switching modes from SOV ↑Number of vans in service ↑Number of carpool/vanpool passenger trips ↑Number of bicycle trips ↑Number of bicycle miles traveled	Access to jobs Vision Zero Equity Economic growth Innovation and technology Quality placemaking Healthy communities Connectivity

Recommended Entity Actions	**Potential Output Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Potential Outcome Performance Metrics and Desired Direction** **Increase ↑** **Decrease ↓**	**Goals Addressed**
		↑Number of pedestrian trips ↑Number of pedestrian miles traveled ↑Customer satisfaction ↓Number of motor vehicle miles traveled (VMT) ↓Number of parking spaces used ↓Commuter costs ↓Gallons fuel consumed ↓Greenhouse gas emissions generated	Mode choice Environment Neighborhood Resilience Improve success of transit-oriented development
Public/private forum	↑Number of contact hours with public and private sector representatives	↑Participant satisfaction ↑Public/Private collaborative initiatives	Enhanced community engagement and private sector input

There are several other sources of transportation-related performance metrics used in Florida, which should be kept in mind when selecting regional transportation performance metrics, to maintain consistency.

Performance Metrics Recommended by the Florida Transportation Commission

The Florida Transportation Commission plays an oversight role of the Florida Department of Transportation. Florida law requires that the Florida Transportation Commission (FTC) review and recommend metrics, referred to as the Performance and Production Review Measures (PPRM), for the evaluation of performance and productivity of the Florida Department of Transportation (FDOT).[145] Consistent with the Florida Statutes, there are six key performance areas that the metrics measure. These include production (consultant and construction contracts), finance and administration, preservation of the current state system (bridge and pavement), safety of the current state system, capacity/mobility, and disadvantaged business enterprise and minority business programs. The review by the FTC Work Group resulted in the report, "The Performance and Production Review of the Florida Department of Transportation." The most recent 2020 review scope set out to reduce the total number of metrics (from over 30) in favor of simple, understandable, and meaningful metrics that focus on key performance areas. The purpose also was to align FDOT's Vital Few metrics (improve safety, inspire innovation, foster talent and enhance mobility) with the Governor's transportation priorities (improve safety, embrace innovation and technology, and reduce congestion). The review resulted in the selection of 15 metrics and some additional informational items. The metrics of relevance to commuter assistance included one for safety: reduction of the rate of fatalities per 100 million vehicle miles traveled on all public roads in Florida year over year, with the objective to demonstrate progress toward zero fatalities (Vision Zero). Presently, new internal safety metrics are under development by FDOT task teams for intersection crashes, lane departure crashes, and for bicycle and pedestrian. The second metric of relevance to commuter assistance relates to capacity/mobility. The FTC Work Group's recommended metric is the time it takes to clear incidents with the objective to clear incidents in less than 60 minutes.[146]

In addition, the FTC Work Group recommended informational items that may be presented to the FTC, relating to the six statutorily defined key performance areas. Table 22 below provides an excerpt of recommended informational items of relevance to commuter assistance. The FDOT Transit Office maintains a statewide commuter assistance program through funding and policy guidance. Rideshare services are identified by the FTC Work Group.

[145] Section 334.045, F.S.
[146] Florida Transportation Commission. "Performance and Production Review, Performance Measures." August 14, 2020.

Table 22. Informational Items Recommended by the Florida Transportation Commission

Topic	Informational Item	Notes
Safety	Emergency Management Preparedness and Response	
Capacity/ Mobility	Public Transit: Monitor traditional public transit ridership over time—year to year ridership trends	Traditional transit=buses, commuter trains, ferries, paratransit services, monorails, and tramways, etc.
	Public Transit: Monitor non-traditional public transit ridership over time—year to year ridership trends	Non-traditional transit=rideshare services, e-scooter operations, bike sharing, etc.
	Travel Time Reliability—Planning time index	
	Travel Time Reliability—Vehicle delay	
	Tolling/Roadway Technology Deployment—Monitor implementation of All-Electronic Tolling	
	Tolling/Roadway Technology Deployment—Monitor deployment of technology along the State Highway System for use by automated, connected, electric, and shared vehicles.	
Customer Service	Customer service—permitting responsiveness	
	Customer service—such as visitor and resident surveys, construction and maintenance surveys	
	Customer service—Road Ranger services	FTC staff to coordinate with the appropriate FDOT office/program to attain specific information about road ranger services.

Source: Excerpted from Florida Transportation Commission. Performance and Production Review, Informational Items matrix. August 14, 2020.

The FTC Work Group recommended that the metrics be annually assessed for relevance and effectiveness.[147]

Recommendation for FDOT: Among the selected transportation industry leaders, stakeholders, FTC Commissioners, academic representatives, key FDOT leadership, and FTC staff who conduct the annual PPRM review, it is recommended to include experts in the field of transportation demand management.

TBARTA's Commute Tampa Bay Director could serve in this capacity.

In addition, *The FDOT Source Book* is a comprehensive report on all major modes of travel in Florida. Multimodal mobility is described using 37 selected mobility metrics and these are used for planning analyses and for making funding decisions. *The FDOT Source Book* is updated annually, with the most

[147] Florida Transportation Commission. "Review of Performance and Production Measures." August 14, 2020.

recent edition reflecting the emphasis on the Vital Few—safety, mobility and innovation. Data are presented for years 2010-2019 statewide and aggregated by MPOs, other urbanized areas, and non-urban areas. The *FDOT Source Book* reports that between 2010 and 2019, Florida's population grew 12.8 percent, the number of licensed drivers grew by 11.8 percent, but VMT gre by 15.3 percent. [148] A companion document, *Methodologies for the FDOT Source Book: A Technical Report*, describes the calculations for the mobility measures.

Commuter Assistance Program Metrics

According to the procedure established by the FDOT Commuter Assistance Program, all commuter assistance programs receiving FDOT funding report the following performance metrics.

1. Number of commuters requesting assistance
2. Number of commuters switching from single occupant vehicles
3. Number of agency vans in service, and other coordinating agency vans that are participating in the rideshare-matching program (where applicable)
4. Number of vehicle trips eliminated for all commuters participating in the commuter assistance program
5. Number of vehicle miles eliminated for all commuters participating in the commuter assistance program
6. Number of employer contacts and employers participating
7. Description of major accomplishments
8. Number of parking spots saved/parking needs reduced
9. Amount of commuter costs saved[149]

Metrics as Measured by Trip Reduction Impacts of Mobility Management Strategies (TRIMMS℠ 4.0)

TRIMMS℠ is a tool that was developed at the USF Center for Urban Transportation Research, which models the impacts from the application of TDM strategies. The calculated outputs from TRIMMS include 15 metrics, including the following.

- Commuter awareness of brand identity
- Number of commuters requesting assistance
- Percent of commuters switching modes
- Number of vans in service
- Actions to build TDM into local planning
- TDM program elements used by each employer

[148] Florida Department of Transportation. Forecasting and Trends Office. *The FDOT Source Book*. 2020. p. 13.
[149] Florida Department of Transportation. Commuter Assistance Program. Procedure No. 725-030-008. Effective September 24, 2002.

TRIMMS also calculates the following outcomes.

- Vehicle trips per 100 commuters
- Average VMT per person
- Emissions reduced
- Total and per-person cost savings
- Benefit/cost ratio

Hillsborough MPO Performance Metrics and Targets

Table 23 illustrates federally required performance metrics, adopted targets, and actual performance of the system, as indicated by meeting the target (green "X's") or falling short of the target (red "X's"). The MPO Board adopted the Safety performance targets February 5, 2019. The MPO Board adopted the remaining performance targets October 30, 2018. TIP projects are required to make progress toward these targets.

The MPO Livable Roadways Committee requested an additional optional performance metric: non-SOV trips with the objective to increase non-SOV trips. Current non-SOV trips are at 19.8 percent. A proposed target was to increase non-SOV trips to 22 percent.

Table 23. Hillsborough MPO Performance Dashboard

	MAP-21 Performance Targets for Federally Required Measures	
	Pavement	
X	≥60% Interstate pavement in good condition	
	≤5% Interstate pavement in poor condition	X
	≥40% non-Interstate NHS pavement in good condition	X
	≤5% non-Interstate NHS pavement in poor condition	X
	Bridges	
	≥50% NHS bridges in good condition by deck area	X
	≤10% NHS bridges in poor condition by deck area	X
	Transit Assets	
	≤22% rolling stock (buses and vans) meeting or exceeding useful life benchmark	X
	≤81% equipment (support vehicles) meeting or exceeding useful life benchmark	X
	0% rail fixed guideway track with performance restrictions	X
	≤10% passenger & parking facilities rated below 3 on term scale	X
	Safety	
X	≤188 fatalities on a 5-year rolling average (2015-2019)	
X	≤1,354 serious injuries on a 5-year rolling average (2015-2019)	
X	≤229 fatalities & serious injuries on a 5-year rolling average (2015-2019)	
X	≤1.33 fatalities per 100M VMT on a 5-year rolling average (2015-2019)	
X	≤9.55 serious injuries per 100M VMT on a 5-year rolling average (2015-2019)	
	Travel Time Reliability	
X	≥75% Interstate NHS network with a level of travel time reliability < 1.50	
	≥50% non-Interstate NHS network with a level of travel time reliability < 1.50	X
X	≤2.00 truck travel time reliability index score	
	NHS = National Highway System VMT = vehicle miles traveled	

Source: Table recreated from Hillsborough MPO "State of the System" Report, approved, April 2, 2019, p. i.

The Hillsborough MPO LRTP 2045 has set out to achieve the following outcomes, listed in Table 24, with $32.2 Billion in targeted investments.

Table 24. Hillsborough MPO Long Range Performance Outcomes

Good repair and resilience	Vision Zero	Smart cities (ITS, signals, interchanges)	Real choices when not driving (trails)
• All roads resurfaced on schedule for their functional class • No bridges are in poor condition • Transit vehicles are replaced on time • Reduce average age of bus fleet by 22% and 50% less bus breakdowns • Invest $22 million per year to make highly vulnerable and critical roads resilient to flooding and storms • Prevent up to $100 million in daily economic losses (gross regional product) from impassable roads after major weather events	• 35% reduction in total crashes on major roads • 30% reduction in bicycle and pedestrian crashes • 35% reduction in fatal and injury crashes	• Improve 220 miles in road network coverage • Reduce delay by 80% • Improve travel time reliability by 30% • Reduce vehicle incidents by 3% • Reduce duration of incidents by 40%	• Expand bus service on 800 miles of roads with somewhat frequent or better service • Build 150 miles of trails • Provide regular bus service to 34% of isolated door-to-door passengers
Major investments for economic growth			
• Expand mobility options by funding high-performing rapid transit projects • Reduce congestion on backed up interstates, expressways, highways, and local roads by funding cost feasible roadway projects and interchange improvements • Improve accessibility to key economic spaces			

Source: Recreated from Hillsborough MPO 2045 Long Range Transportation Plan, p. 66.

Forward Pinellas MPO Performance Targets

The Forward Pinellas LRTP 2045 provided that the MPO will work with local governments to define transportation performance metrics that consider other travel modes and safety. The Forward Pinellas Board adopted performance targets for the performance metrics specified by federal rule. These include performance targets for safety, transit asset management, pavement and bridge condition, truck travel time reliability (TTTR), and level of travel time reliability (LOTTR) experienced by motorists on both the Interstate and the non-Interstate system. Like the Hillsborough MPO Board, the Forward Pinellas

Board decided to also adopt the statewide performance targets for TTTR and LOTTR established by FDOT in 2018. These are listed below.[150]

Percentage of person miles traveled on the Interstate that are reliable.

- 2-year target: 75%
- 4-year target: 70%

Percentage of person miles traveled on the non-Interstate NHS that are reliable.

- 2-year target: n/a
- 4-year target: 50%

Truck travel time reliability ratio on the Interstate

- 2-year target: 1.75
- 4-year target: 2

[150] Forward Pinellas. Advantage Pinellas 2045 Long Range Transportation Plan. Appendix A Performance Report. https://forwardpinellas.org/wp-content/uploads/2019/11/AdvantagePinellas-Appendix-A-for-Performance-Measures.pdf

3. Develop SMART Objectives to Accomplish the Goals

Recommendation for MPOs: In collaboration with local governments, work with stakeholders to develop one or more SMART (specific, measurable, achievable, realistic, timebound)[151] objectives relating to the use of TDM, which contribute toward moving the LRTP performance metrics in the direction of desired outcomes.

The CAP/TMOs can coordinate with their MPOs to offer draft SMART objectives for MPO consideration.

For example, Vision Zero is a key safety goal and program. Commuter assistance can contribute to outreach and messaging to inform motorists, bicyclists and pedestrians to understand who has the right of way at intersections under various circumstances. A SMART objective might include identifying a targeted market of motorists for whom selected actions would contribute toward an increase in knowledge about specific relevant rules of the road. An increase in knowledge of the specific rules, as exhibited by ten percent of the targeted market, over a measured baseline, could be established to be accomplished within an outreach project timeframe, such as one year. As recognized in FHWA's *Desk Reference*, the development of objectives is iterative, with monitoring and evaluation used to refine and adjust objectives over time, to guide and inspire progress toward achieving the goals.[152]

Example from Commuter Connections Program

Another example in which TDM objectives were refined based upon previous years' performance comes from the Commuter Connections commuter assistance program of the National Capital Region Transportation Planning Board of the Metropolitan Washington Council of Governments (MWCOG) in the Washington, D.C. area. Commuter Connections has many of the same program elements as those provided by Commute Tampa Bay and the TMOs, including ridematching for carpools and vanpools, promotions to bicycle to work, Guaranteed Ride Home and various incentive programs for using commute alternatives to driving alone. Four main elements that Commuter Connections evaluate are telework programs provided by Maryland and Virginia partners, employer outreach, comprehensive media campaigns, and the Guaranteed Ride Home program. These programs support the accomplishment of goals established by the MWCOG's National Capital Region Transportation Planning Board for improving the commuter travel experience, meeting air quality goals, and mitigating growth in VMT. The time period for evaluation of performance is in three-year periods, the most recent of which was July 2017 through June 2020 (FY2018 to FY 2020).

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[151] U.S. DOT. Federal Highway Administration. "Advanced Metropolitan Planning for Operations: An Objectives-driven, Performance-based Approach—A Guidebook. SAIC. FHWA-HOP-10-026. 2010.

[152] Gopalakrishna, Deepak (Battelle), Eric Schreffler (ESTC), Don Vary (Wilbur Smith Associates), David Friedenfeld (Wilbur Smith Associates), Beverly Kuhn (Texas Transportation Institute), Casey Dusza (Texas Transportation Institute), Rachel Klein (Battelle), Alexandra Rosas (Battelle). *Integrating Demand Management into the Transportation Planning Process: A Desk Reference*. Prepared for Federal Highway Administration, Office of Operations. FHWA-HOP-12-035. Washington, D.C. August 12, 2012. p. 98. https://ops.fhwa.dot.gov/publications/fhwahop12035/index.htm

The following objectives were provided in the evaluation framework for Commuter Connections.[153]

Maryland Telework program objectives for 2020, established by Commuter Connections:

- Maintain 31,854 teleworkers
- Reduce 11,830 daily vehicle trips
- Reduce 241,209 daily miles of travel
- Reduce 0.122 daily tons of NOx
- Reduce 0.072 daily tons of VOC

Telework!VA objectives for 2020, established by Virginia Department of Transportation and the Virginia Department of Rail and Public Transportation:

- Increase telework by 1,500 teleworkers at *Telework!VA* work sites
- Reduce 500 daily vehicle trips
- Reduce 9,000 daily miles of travel
- Reduce 0.0027 daily tons of NOx
- Reduce 0.0021 daily tons of VOC

Commuter Connections established the following objectives for the GRH program for 2020:

- Maintain 18,496 GRH registrants
- Reduce 6,296 daily vehicle trips
- Reduce 177, 568 daily vehicle miles of travel
- Reduce 0.089 daily tons of NOx
- Reduce 0.048 daily tons of VOC

Commuter Connections established the following objectives for employer outreach for 2020:

- Overall, 2,031 total participating employers
- Employers with bike services, 590 participating employers
- Employers without bike services, 1,441 participating employers
- Reduce 90,776 daily vehicle trips
- Reduce 1,533,161 daily vehicle miles of travel
- Reduce 0.617 daily tons of NOx
- Reduce 0.385 daily tons of VOC

Commuter Connections also established objectives for mass marketing for 2020:

- Encourage 23,168 commuters to switch modes
- Reduce 10,809 daily vehicle trips

[153] LDA Consulting, in association with Eric N. Schreffler, Transportation Consultant, Center for Urban Transportation Research, University of South Florida, and CIC Research, Inc. "National Capital Region Transportation Planning Board, Commuter Connections Program. Transportation Demand Management (TDM) Program Elements Revised Evaluation Framework FY 2018 – FY 2020." Prepared for the Metropolitan Washington Council of Governments. March 19, 2019. pp. 17-25.

- Reduce 181,932 daily vehicle miles of travel
- Reduce 0.085 daily tons of NOx
- Reduce 0.025 daily tons of VOC

Forward Pinellas Objectives

The Pinellas County metropolitan planning process outcomes provide an outstanding example nationwide of the incorporation of objectives and policies using TDM to achieve regional transportation goals.[154] These objectives could be made "SMART" with the selection of some measurable change over a baseline within a defined time period. Pinellas County is completely urbanized. Transportation improvements of the future will serve activity centers and corridors that are in the process of redeveloping, using transit-oriented development design. The LRTP contains an abundance of direct references to the use of TDM as well as objectives and policies that lend themselves well to be accomplished through use of TDM strategies.

Promoting Active Transportation

The active transportation Goal 1 is described by three objectives and 22 policies relating to infrastructure. Commuter assistance programming can support desired outcomes by promoting the use of that infrastructure for safe bicycling and walking for all trip purposes. Commuter assistance provides the human interface to engage, inform, encourage, and empower people to explore and try active transportation options.

Using the Existing System More Efficiently

There are objectives and policies that use TDM to achieve Goal 2 to develop and sustain a resilient community. For example, Objective 2.1 is to improve the performance of the transportation system through more efficient use of existing facilities and investments in technology. A policy under Objective 2.1 is to identify and prioritize lower cost operational and small-scale physical improvements and transit and TDM strategies, through the Congestion Management Process (CMP) to mitigate traffic congestion on the major road network. Forward Pinellas calls for a dedicated revenue source of $1-5 million to be made available annually to fund the CMP.

Incorporating Health in All Policies

Objectives and policies for Goal 3 call for incorporating a Health in All Policies Framework for evaluating projects and to develop a Vision Zero Action Plan. The Plan also supports safe school transportation, namely walking school buses, bike rodeos, school pools, and promotion of safe walking and bicycling access to schools. Commuter assistance programs provide encouragement and education activities to help people walk and bicycle safely.

Leveraging Private Sector Investment

To support Goal 4 for strong economic opportunity, Objectives 4.2 and 4.3 call for directing transportation and redevelopment investment to activity centers and multimodal corridors for diversity of jobs, and transportation and housing options. Commuter assistance programming often geographically targets transportation corridors and activity centers. Commuter assistance can target hot

[154] Forward Pinellas. Advantage Pinellas 2045 LRTP. Appendix B. Goals, Objectives, and Policies.

spots identified in the LRTPs, including roadway segments with worst congestion, worst travel time reliability, worst traffic crash records, and greatest need for mobility options, and develop a commuter assistance strategy for that specific targeted corridor.

Under Objective 4.4 to leverage private sector investment in the development and operation of transportation services, Forward Pinellas calls for the encouragement of employers, developers and businesses to participate in meeting the mobility needs of residents, visitors and employees. Transportation management organizations (TMO) are recognized in the Pinellas LRTP as an employer-based solution to improved mobility and accessibility. Furthermore, a policy calls for business-led telecommunications strategies to reduce travel demand and improve the efficiency of the transportation system. Another policy calls for working with transportation related agencies and local governments to help employers take advantage of deductions allowed under Internal Revenue Code Section 123(f) for providing transportation benefits to employees. These are known as Qualified Transportation Fringe Benefits (QTFB). These activities are squarely within the realm of commuter assistance.

The Plan also contains objectives and policies that support emergency evacuation and the maintenance of Continuity of Operations Plans (COOP). As evidenced by the "Stay-At-Home" directives across the Tampa Bay region and nationwide, telework and other applications of information and communication technologies enable the accomplishment of work and other business while supporting social distancing. Commuter assistance programs have actively supported telework strategies, including the recent Telework Certificate offered to employees and to managers of a distributed workforce through Best Workplaces for Commuters.[155]

Providing Economic Development through Sustainable Transportation Investment

Supporting policies for Goal 5 for economic development through sustainable investments in the transportation network, explicitly include prioritizing transportation projects that reduce single-occupant vehicle (SOV) trips, implementing improved transit service, and assisting and encouraging the use of TDM strategies that promote alternatives to SOV travel. The Plan lists carpooling, vanpooling, transit use, walking, bicycling, telecommuting and variable work schedules. Policies also include working with local governments to reform parking regulations to eliminate minimum parking standards when transit and other travel alternatives are available. Listed strategies include parking pricing, adaptive reuse of parking facilities, shared parking, and strategies to support walkable communities. Forward Pinellas also will support technology innovations and micro-mobility strategies. These are to strengthen first-mile and last-mile connections between transit stops or station areas and travelers' origins and destinations.

Providing Travel Options for All Users

Goal 6 seeks to achieve an efficient, effective, equitable, safe and complementary multimodal transportation network that provides travel options for all users. Objective 6.2 is to increase transit mode share and overall ridership by providing frequent, fast and reliable service. The PSTA Transit Development Plan provides further detail, including transit marketing and outreach commuter

[155] http://www.Bestworkplaces.org

assistance.[156] Transit planning is a coordinated effort with land use redevelopment initiatives to concentrate future workforce housing and jobs closer to transit service. The Advantage Pinellas 2045 LRTP illustrates several identified investment corridors that are recognized as important for supporting transit and connecting people to jobs, training opportunities, and housing options of different levels of affordability.

4. Measure Baseline Conditions

Recommendation for MPOs: To account for underlying growth, evaluate existing conditions projected into some future planning year and/or forecasted future traffic, based upon known or anticipated trends. Measure performance for existing conditions and estimate values for performance metrics for future projected or forecast conditions.

The CAP/TMOs can provide data and information about the performance evaluation of existing TDM and commuter assistance programs.

For example, the measurement of baseline conditions depends on the selected performance metrics for the TDM program. Some regions measure baseline conditions that represent their existing past TDM performance regarding reduction of vehicle trips, reduction of motor vehicle miles traveled, and reductions of emissions as a result of the TDM program of the previous program period. TDM Program performance is measured against its own past performance.

Other regions measure the baseline performance of the transportation system, as the starting point against which TDM program performance will be compared, as part of proposed transportation improvements altogether. Underlying population and employment growth that generates motor vehicle trips and motor vehicle miles traveled also are projected to a selected future planning horizon, based upon known or anticipated trends. The baseline conditions represent existing and future conditions without the TDM program.

The forecast of future population and employment and where people will live and have jobs impacts the use of the transportation system as it exists and as it will function in the future with already committed improvements. These conditions define the baseline. This analysis identifies corridors anticipated to experience traffic congestion and unreliability, safety, and accessibility issues. Based upon these anticipated problems, alternative transportation solution scenarios are developed.

It is recommended that MPOs measure and visually illustrate *unused* highway capacity by day of week, time of day, and seasonally. This is because visual illustrations in plans usually depict locations and duration of congestion, placing emphasis upon it. Unused highway capacity also should be recognized as an opportunity.

[156] Pinellas Suncoast Transit Authority. "Advantage Pinellas: Transit. FY 2021-2030 Transit Development Plan. Final. Adopted April 22, 2020. https://www.psta.net/media/4784/fy2021-2030-tdp.pdf

5. Develop Alternative Scenarios to Achieve Objectives

Recommendation for MPOs: Develop alternative scenarios by selecting a TDM strategy/action or set of TDM strategies/actions that can contribute toward achieving each of the TDM objectives in the LRTP. In the case of a PD&E study for a project or corridor improvement, it would address the stated Purpose and Need. These alternative scenarios would constitute a long range TDM component to the LRTP. It would be the Tampa Bay Commuter Assistance Program Regional Development Plan.

CAP/TMOs can offer input and proposed programs, services, information, incentives, and partnership strategies to build alternative scenarios for evaluation. Various TDM actions are stronger in combination.

Scenario Planning

The development of alternative scenarios applies to both system-level planning and corridor planning as well as to planning for a discrete transportation project. Scenarios are compared to the baseline. The baseline is sometimes referred to as the "Do Nothing" alternative. It is labelled below in Table 25 as Alternative 1.

Choosing to do nothing is a valid alternative. Faced with increasing traffic congestion, some commuters do respond by changing their travel time or route or teleworking on their own without any intervention beyond the existing commuter assistance services that are already in place. In the case of Alternative 1, it is assumed that some level of commuter assistance programs and services have already been in place as part of the existing conditions, and that those baseline commuter assistance programs will remain in place for all successive scenarios.

The COVID-19 pandemic provides an example of a situation where existing conditions may resolve a mobility issue like traffic congestion, without having to "do anything". The urbanized Tampa Bay area has experienced firsthand how traffic volumes drastically decreased as information workers moved from the office to working from home. Sometimes existing conditions take care of the issue. Another example might be out-migration. However, if the results of no new investment are unacceptable, then the development of new alternative scenarios composed of various strategies would be devised.

Baseline conditions (do nothing) are not the "No Build" scenario. Transportation corridor studies and PD&E studies frequently identify them as the same. Doing so overlooks the opportunity to look at other less expensive improvement alternatives before committing to often high investment "Build" options.

Table 25. Alternative Transportation Improvement Scenarios

Existing Conditions plus underlying growth to future planning year	Alternative 1 (Baseline "Do Nothing")	Alternative 2	Alternative 3	Alternative 4, 5, 6…
	Assumes existing commuter assistance services	Optimize Use of Existing Capacity		Build New Capacity
		Improve Transportation Choices	Improve Traffic Flow	
	No new investment beyond already committed improvements	Modest investment	Moderate investment	Higher investment
		Some combination of TDM strategies Alt. 2A, Alt. 2B, etc.	Some combination of TSM&O strategies Alt. 3A, Alt. 3B, etc.	Some combination of capacity improvements Alt. 4A, Alt. 4B, etc.
			+	+
			Some combination of TDM strategies Alt. 2A, Alt. 2B, etc.	Some combination of TSM&O strategies Alt. 3A, Alt. 3B, etc.
				+
				Some combination of TDM strategies Alt. 2A, Alt. 2B, etc.

Table 25 illustrates a concept for the development of alternative transportation improvement scenarios that suggests a chronological order in which they should be implemented, trying lower investment strategies first before proceeding to strategies that require higher levels of investment. This concept also suggests that the alternative scenarios should be cumulative to some degree. In other words, TDM strategies should be built into the alternative scenarios using TSM&O and capacity building. This concept applies to highly localized areas, corridor planning, and system level planning.

Table 25 illustrates an approach that aims first, to fully explore how improving mobility options for travelers can alter conditions enough to improve system efficiency. As one moves toward the right side of the table, the alternatives include more efforts with higher levels of investment. Table 25 shows that the use of the TDM strategies are incorporated into each successive alternative transportation improvement scenario for evaluation. The evaluation process would consider TDM alone and in combination with different sets of TSM&O strategies and capacity development alternatives.

The Alternative 2 scenario in Table 25 could be called the "Improve Transportation Choices" scenario. Such a new name eliminates an implicit bias that Build/No Build suggests some sort of binary condition where those are the only two choices. This Alternative 2 scenario represents the underlying existing commuter assistance programs and services that already have been in place, plus a set of additional augmented TDM strategies.

In the Tampa Bay area, TDM strategies post-COVID-19 could include some combination of promoting the continued use of telework by some workers, in addition to instituting alternative work hours, and flexible work start times. TDM strategies also should include incentives such as public transit subsidies, promoting the Guaranteed Ride Home service, and parking cashout by employers to motivate cost-conscious commuters to shift to transit or carpooling. TDM strategies also could include both non-regulatory and regulatory approaches, such as transit benefits ordinances. These are examples.

Recommendation for MPOs: An important underlying assumption is that funding for commuter assistance would be reliably programmed year after year to provide continuity of services. Much like the operation of other services, such as firefighters, librarians, and traffic operations engineers, commuter assistance also is "institutional infrastructure." It is recommended that adequate funding for the CAP and the TMOs be programmed for five years to allow the CAP/TMOs to plan beyond one-year time frames.

The CAP/TMOs will devise proposed scopes of work, making use of the longer time frame for planning, implementation and evaluation.

There are many different TDM strategies or actions that can impact travel behavior. In turn, travel behavior impacts desired outcomes. The effect of any one TDM strategy by itself may be small, but the effect of combining several may be pronounced, as can be quantified using TRIMMS™ v4.1.

TSM&O Builds Upon TDM and Commuter Assistance

TDM strategies are generally modest investments to remove barriers from using transportation alternatives and encourage changes in travel decision making using incentives and disincentives. TSM&O strategies are introduced in Alternative 3 to improve traffic flow. TSM&O strategies usually include physical infrastructure investments, such as that for intersection improvements, ramp metering, real-time messaging signs, signal synchronization, and traffic control centers. It also includes incident management services such as Road Rangers. The purpose of these investments is to make traffic flow more efficiently in the existing lane capacity.

Before considering lane capacity improvements, it is recommended to first optimize the use and results derived from TDM strategies and TSM&O. For example, single-occupant vehicle (SOV) mode share in the Tampa-St. Petersburg-Clearwater is 79.5 percent. Table 26 provides the comparative mode shares of other urbanized areas of roughly similar worker populations in the United States. Table 26 illustrates that the Tampa Bay area has the potential to reduce its SOV mode share. As shown in a study of TDM

use in the I-5 corridor of Seattle, WA[157], reducing SOV mode share, even by a few percentage points, can provide significant traffic flow benefits during the peak periods, for less investment, buying more time until the need for new capacity.

Seattle is located in the Central Puget Sound region that falls under the statewide 2006 Commute Trip Reduction (CTR) Efficiency Act. This Act set minimum targets for reducing SOV commutes and reducing VMT. In the first three years of the program, 154 million VMT were reduced from 1,000 worksites that participated in the CTR law. This represents over 500,000 commuters. This was estimated to have reduced highway delay in the Central Puget Sound region by 8 percent.[158]

Table 26. Comparative SOV Mode Shares for Other MSAs

Metropolitan Statistical Area	Percentage SOV Mode Share	2014-2018 Estimate Workers 16 years and over
Phoenix-Mesa-Scottsdale, AZ	76.4	2,123,697
Portland-Vancouver-Hillsboro, OR-WA	70.4	1,205,566
Salt Lake City, UT	74.9	597,855
Seattle-Tacoma-Bellevue, WA	68.0	1,954,105
Tampa-St. Petersburg-Clearwater, FL	79.5	1,371,436

Source: American Community Survey, 2018. Table CP03. Compiled by Best Workplaces for Commuters at University of South Florida.

Alternative 4 from Table 25 introduces alternative scenarios for new lane capacity. Widening existing roads and building new roads is expensive, often results in negative community impacts, and requires a long lead time for planning and developing a mitigation program. Alternative 4 illustrates that highway widening and new roadway construction/reconstruction scenarios also should take advantage of the full complement of TDM strategies and TSM&O in combination with building new lane capacity. TDM/TSM&O should be used not only for construction mitigation but also thereafter when the roadway capacity improvements are complete.

The proposed Regional TDM Scenarios in Table 27 below have been reviewed by the TMO Coordination Group (TMOCG), with regard to options for advancing commuter assistance programming in the Tampa Bay area in the future. Updates to the Metropolitan Planning Organization (MPO) Long Range Transportation Plans (LRTP) for the MPOs in the Tampa Bay area have been accomplished, laying out analyses of population and employment trends, and where the growth may occur within the region.

[157] Winters, Phil, Nevine Labib Georggi, Sachin Rai, and Liren Zhou. May 2007. "Impact of Employer-based Programs on Transit System Ridership and Transportation System Performance." FDOT BD 549 WO 25. National Center for Transit Research at the Center for Urban Transportation Research, University of South Florida. Tampa.
[158] Gopalakrishna, Deepak (Battelle), Eric Schreffler (ESTC), Don Vary (Wilbur Smith Associates), David Friedenfeld (Wilbur Smith Associates), Beverly Kuhn (Texas Transportation Institute), Casey Dusza (Texas Transportation Institute), Rachel Klein (Battelle), Alexandra Rosas (Battelle). "Integrating Demand Management into the Transportation Planning Process: A Desk Reference." Prepared for Federal Highway Administration, Office of Operations. FHWA-HOP-12-035. Washington, D.C. August 12, 2012. p. 74. https://ops.fhwa.dot.gov/publications/fhwahop12035/index.htm

The LRTPs have established long range goals and objectives, and identified cost affordable transportation projects, as well as unfunded needs to serve the anticipated growth through to the planning horizon year. These projects address ways to advance the goals and objectives. Prioritization of cost affordable projects has resulted in the update of the Transportation Improvement Program for the next five years.

Commuter assistance programs also can play a role in accomplishing MPO goals and objectives, including support of economic growth through better access to jobs, reducing wear and tear on the existing highway system through reducing motor vehicle trips, reducing traffic congestion, increasing safety, and making positive gains in environmental stewardship and community livability. The TMOCG, comprised of TBARTA, FDOT, Tampa Downtown Partnership, Westshore Alliance, St. Pete downtown Partnership, and New North Transportation Alliance, can lay out a longer term commuter assistance strategy that addresses the proposed goals and guiding principles recommended earlier.

Many recommendations for TDM strategies are based upon examples described in Technical Memorandum 3 and could coincide with the I-275 reconstruction project, then be continued thereafter. These include use of vehicle occupancy detection technologies to enable effective managed lanes, allowing HOV2+ to use HOV lanes free, and collaboration with local governments to implement parking management strategies at the destination end of the trip. Parking management includes coordinated parking pricing by location, time of day and day of week. It also includes provisions for unbundling parking from leases in coordination with employers offering parking cash out to employees, and preferential parking for carpools and vanpools.

Recommendations also include commuter assistance campaigns promoting route detours to avoid the reconstruction corridor completely, and employer outreach promoting vanpooling, telecommuting, and flexible work hours. Recommended regulatory approaches include implementing a transit benefits ordinance, with local governments coordinating this implementation regionally. As local governments update their comprehensive plans and regulations, it is recommended that local governments consider the merits of form-based zoning to promote mixed use development and greater proximity of housing to jobs. Like other regions nationwide, it also is recommended to apply TDM strategies not just to peak hour commute trips to reduce traffic congestion, but also to other trip purposes to further enhance mobility.

Table 27. Proposed Regional TDM Scenarios

Proposed Regional TDM Scenarios	**1. Existing Voluntary**	**2. Proposed Augmented Voluntary Strategies (1+2)**	**3. Proposed Regulation-based (1+3)**	**4. Proposed Comprehensive Plan (1+2+3)**

TDM Strategy Alternatives	• Vanpool program
	• Vanpool subsidy
	• Ridematching
	• Incentives
	• Schoolpool
	• Bikepool
	• Park-and-Ride information
	• Telecommuting guidance
	• Guaranteed Ride Home
	• Employer outreach
	  ○ Telecommuting
	  ○ Staggered Start Times
	  ○ Compressed Work Week
	  ○ Flextime
	• Special events
	• Transit promotional discounts
	• Preferred carpool parking
	• Tolled lanes
	• Microtransit
		• Significantly more commuter assistance staff dedicated to employer outreach.
		• Outreach campaign to encourage employers to provide QTFB, pre-tax funds for transportation, transit/vanpool subsidy.
		• Encourage parking cash-out
		• Encourage unbundling of parking from lease
		• Start early conversation about more new P-n-R locations.
		• Encourage alternative work arrangements
		• Continue to improve Guaranteed Ride Home
		• Promote TBSCA MaaS app fpr seamless travel experience
		• Scale up successful pilots, such as neighborhood-based travel planning (i.e., SHIFT Tampa Bay)
		• Incentives to try a new commute mode
			• Development-based trip reduction ordinance with mobility fee
			Or
			• Employer-based trip reduction ordinance
			Or
			• Transit benefits ordinance
			And
			• Allow HOV2+ in managed lanes
			• Congestion pricing
			And
			• Parking management plans in activity centers, with variable parking pricing	

Impact	D7 CAP results, B/C TRIMMS™ v4.1, HEAT			
Investment Cost	Existing CAP budget (FDOT) Approx. $260,000 FY19/20 Approx. $604,000 FY20/21	Augmented low cost	Medium cost	Higher cost

Proposed Regional TDM Scenarios	**1. Existing Voluntary**	**2. Proposed Augmented Voluntary Strategies (1+2)**	**3. Proposed Regulation-based (1+3)**	**4. Proposed Comprehensive Plan (1+2+3)**
Potential funding sources	Forward Pinellas Congestion Management Process funds	Existing plus CMAQ, public and private sources	Existing plus CMAQ, public and private sources	
Examples	• Commute Tampa Bay • Downtown Tampa's Downtowner • Best Workplaces for Commuters • Bike Walk Tampa Bay • RideFlag pilot	• Transform66 Traffic Mitigation Program P-n-R lots (VA) • WorkSmart, King County Metro (WA) • City of Seattle "Move the Needle Challenge" • Commute Seattle's Flexwork Program • Ride2Transit on demand van hailing service, dynamic routing technology, Bellevue, WA • Workplace Connector, last mile vanshare, reThink, Orlando • Atlanta Regional Commission Gimme Five, $5 per use of new mode up to $150 • MARTA monthly discounted transit passes for employment sites • Denver/Boulder EcoPass • Boulder NecoPass • Seattle SR 520 TDM Program for bridge reconstruction over Lake Washington • Minneapolis eWorkPlace telework program • I-10/I-110 ExpressLane vanpool campaign, Los Angeles • State of Utah telework program to improve air quality	• NYC Transit Benefit Ordiance • Seattle Commuter Benefits Ordinance • Commute Trip Reduction Law, WA State • RideFlag application to managed lanes, San Francisco • SFPark dynamic parking pricing, San Francisco • Seattle Unified Downtown Parking Partnership app • LA Express Park • King County Right Size Parking Calculator • California switching from using travel delay performance metric to VMT performance metric • City of San Jose switching to VMT as main mobility metric • Oregon VMT user fee	

Proposed Regional TDM Scenarios	**1. Existing Voluntary**	**2. Proposed Augmented Voluntary Strategies (1+2)**	**3. Proposed Regulation-based (1+3)**	**4. Proposed Comprehensive Plan (1+2+3)**
		• Community in Motion neighborhood based outreach, King County Metro • incenTrip, Commuter Connections, Washington, DC • US35 Express Lanes Social Marketing, Denver, CO • BetterPoints gamification and trip tracking		
Supporting conditions	• PSTA Corporate Transit Discount • Complete Streets • HART OneBusAway and PSTA Real Time Bus information app • 511/Advanced Traveler Information System	• HART Corporate Transit Discount (proposed) • Neighborhood transit discount (proposed) • MaaS could provide travel conditions in work zones • Housing closer to jobs • Affordable housing • Tampa Downtown's Parking Management Plan	• Vehicle occupancy detection technologies • Local government support for establishing regulatory solutions, including transit benefit ordinance and parking management • Tampa-Hillsborough Expressway Authority and FDOT Turnpike Enterprise support for HOV2+ in managed lanes	

6. Estimate Performance Outcomes

There are several tools and models that can be used to estimate the impacts of TDM strategies. The discussion below briefly describes the existing CAP Evaluation program, as well as a methodology that estimated the congestion reduction along the Interstate-5 corridor in Seattle, WA, due to the Commute Trip Reduction (CTR) program implemented by employers. Since then, the Trip Reduction Impacts of Mobility Management Strategies (TRIMMS™ v.4.1) has been developed and refined. Another tool that shows promise is the Health Economic Assessment Tool (HEAT). Both are described below.

Florida Commuter Assistance Program (CAP) Evaluation

A yearly statewide Commuter Assistance Program (CAP) Evaluation presently provides analysis of data collected by six commuter assistance programs in Florida, including Commute Tampa Bay. The most recent Evaluation uses 2017 data, and results are available for each CAP. Data were collected via online survey of CAP customers to estimate travel mode behavior changes.[159] Estimated mode share changes and the associated VMT reductions also can be used to estimate the change in societal costs, based on the TRIMMS™ 4.0 model.[160] Presently, the TRIMMS™ model is being updated with global and regional parameters to reflect updated travel distances by mode and other factors. Societal costs include air pollution, greenhouse gas emissions, congestion, excess fuel consumption, health and safety impacts, and noise pollution, and are computed based upon mode splits and emission rates for 99 MSAs. Annualized benefits are compared to annualized costs using the 2017 budgets from the FDOT Work Program for commuter ridematching and marketing. Overall, Florida's CAP programs statewide yielded nearly $31 million in benefits compared to almost $6 million in investment from FDOT. This computes to a benefit to cost ratio of 5.3.[161] A new CAP Evaluation is presently underway.

This example illustrates an evaluation specifically to compare benefits versus costs to satisfy a traffic congestion reduction objective, thereby conserving lane capacity for economic growth. TDM can be applied to achieve many other objectives, including those relating to improving mobility, accessibility, and equity, improving safety and health outcomes, and reducing air pollutants and greenhouse gas emissions.

The following tables list the proposed outputs, outcomes, and data needs. Table 28 categorizes the outputs into five components of customer life cycle: reach, acquisition, conversion, retention, and loyalty. This continuum begins with making moving a commuter from pre-contemplation to contemplation stagecommuter aware of your "brand", informing them what the CAP has to offer,

[159] Center for Urban Tranportation Research. "Florida Commuter Assistance Program Evaluation CY2017." Prepared for the Florida Department of Transportation. BDV25 TWO 943-69. University of South Florida, Tampa. November 2018.
[160] Center for Urban Transportation Research. TRIMMS™ 4.0 model. Trip Reduction Impacts of Mobility Management Strategies.
[161] Center for Urban Tranportation Research. "Florida Commuter Assistance Program Evaluation CY2017." Prepared for the Florida Department of Transportation. BDV25 TWO 943-69. University of South Florida, Tampa. November 2018. p. 2.

changing them into a commuter who reduces vehicle trips, and then keeping them as a loyal customer whose satisfaction with the products or services urges other commuters to partake of the products and services. This structure is based on the assumption that working through employers is simply a means of reaching the customer –the individual commuter; affecting employer policies will affect commuter behavior.

Table 28. Proposed Performance Metrics Grouped by the Five Steps in the Customer Life Cycle

	Performance	**What it will be Used to Measure**	**Collected by**
Reach			
Output	Share of commuters aware of brand identity (brand to be determined by CAP (CAP name/phone number/web)	Commuter services awareness	General public survey
Output	Profiles of TDM elements for each employer-client (See Table 30 for data needs)	Employer outreach effectiveness (quantity.market penetration) Data will be used by CUTR to estimate benefit/cost of employer outreach program	CAP
Output	Number of employers with telework programs, and total number of employee trips reduced by teleworking	Employer outreach effectiveneness (quality)	CAP
Output	Number of employers with compressed work week, and total number of employee days not traveling to work due to CWW for each of thee types of CWW programs: 4/40, 9/80 and other	Employer outreach effectiveness (quality)	CAP
Acquisition			
Output	Number of individuals requesting assistance	Interest in commuter services	CAP logs
Output	Number of total requests for assistance (i.e., capture repeat customers)	Level of effort in maintaining commuter services	CAP
Conversion			
Output	Percent of drive alone commuters shifting to a commute alternative	Effectiveness of commuter services in changing travel behavior	Database survey and general public survey
Output	Percent of commuters who shift from one alternative mode to another mode (e.g., from carpool to transit)	Effectiveness of commuter services in increasing number of customers shifting to higher occupancy vehicles	Database survey and general public survey
Output	Percent of commuters who currently use a commute alternative increasing their weekly frequency of commute alternative use (e.g.,	Effectiveness of commuter services in	Database survey and

	Performance	**What it will be Used to Measure**	**Collected by**
	from carpool one time per week to carpool three times per week)	increasing frequency of use	general public survey
Output	Number of vanpool passenger trips (directly operated and purchased transportation)	Vanpool program effectiveness	NTD report
Output	Number of vans operated in maximum service	Vanpool program effectiveness	NTD report
Output	Actions to incorporate TDM into the land development process (see *Incorporating TDM into the Land Development Process* report for list of actions https://scholarcommons.usf.edu/cutr_nctr/182/)	Establish supportive environment for converting commuters	Specific actinos determined by District and CAP
Retention			
Output	Avoidable customer turnover (i.e., excludes those who move out of the area, retire, etc.)	Measure of program growth	CAP
Output	Percent of non-SOV customers who revert to SOV	Effectiveness of commuter services in retaining customers	Database survey and general public survey
Loyalty			
Output	Overall customer satisfaction (with emphasis on quality, willingness to use services again and willingness to refer a friend)	Customer satisfaction	Database survey

Table 29. Outcome Metrics

	Performance	**What it will be Used to Measure**	**Collected by**
Outcome	Vehicle trip rate per 100 commuters (peak periods and total)	Effectiveness of reducing congestion by reducing vehicles on the road	Database survey
Outcome	Vehicle miles of travel (peak periods and total) per person		Database survey
Outcome	Total and per person unlinked passenger trips (e.g., bike to bus then bus = 2 UPT)	Accessibility	Database survey NTD
Outcome	Total and per persn passenger miles of travel	Accessibility	Database survey NTD
Outcome	Customer satisfaction	Overall satisfaction with the CAP programs and products	Database survey
Outcome	Emissions reduced	Environmental impacts	Database survey
Outcome	Energy reduced	Energy impacts	Database survey
Outcome	Total and per person commuter savings	Commuter impacts	Database survey
Outcome	Duration of non-SOV mode use	Effectiveness of retention efforts and impact of life cycle costs	Database survey
Outcome	Benefit/Cost Ratio	Total costs and benefits from the employer outreach	TRIMMS model

To estimate the societal costs and benefits at the employer level, the following data are needed, listed in Table 30.

Table 30. TRIMMS Data Requirements for Societal Benefit-Cost Analysis

Type	Mode	Data	Units
Employer data		Employer	
		Location	
		Industry Sector	
		Number of Employees	
Survey		Response Rate to Employer Mode Split survey	
Mode Split		Drive alone	
		Carpool	
		Vanpool	
		Transit	
		Bicycle Walk	
		Other	
Accessibility		Bus Stop	Within ¼ mile
		Bike lane	Within ¼ mile
		Sidewalk	Within ¼ mile
Amenities		Shopping	Onsite of within ¼ mile
		Bank	Onsite of within ¼ mile
		Restaurant	Onsite of within ¼ mile
		Childcare	Onsite of within ¼ mile
Parking		Carpool parking	Yes/No
		Vanpool parking	Yes/No
		# free parking spaces on site	
Marketing		# hours per week promoting	Hours/week
		Internal mail/Email	Yes/No
		Promotional events	Yes/No
		Ridematching	Yes/No
Emergency Ride Home		ERH	Yes/No
		Company vehicles for ERH	Yes/No
Flexible Work Hours		Flexible work hours	Yes/No
Financial Incentives	Drive Alone	Current parking cost	($/vehicle)
	Drive Alone	New parking cost	($/vehicle)
	Drive Alone	Current trip cost	($/trip)
	Drive Alone	New trip cost	($/trip)
	Drive Alone	Current other cost	($/trip)
	Drive Alone	New other cost	($/trip)
	Carpool	Current parking cost	($/vehicle)
	Carpool	New parking cost	($/vehicle)
	Carpool	Current trip cost	($/trip)
	Carpool	New trip cost	($/trip)
	Carpool	Current other cost	($/trip)
	Carpool	New other cost	($/trip)

Type	Mode	Data	Units
	Vanpool	Current trip cost	($/trip)
	Vanpool	New trip cost	($/trip)
	Transit	Current trip cost	($/trip)
	Transit	New trip cost	($/trip)
	Bicycling	Current trip cost	($/trip)
	Bicycling	New trip cost	($/trip)
	Walking	Current trip cost	($/trip)
	Walking	New trip cost	($/trip)
	Other	Current trip cost	($/trip)
	Other	New trip cost	($/trip)

Measuring Corridor Impact of Employer Commute Trip Reduction Programs

Estimates of reduction in delay can be calculated using VMT reduction, traffic volumes, and speeds. CUTR developed a method that applied FHWA's CORSIM highway microscopic simulation model to actual traffic conditions that included the impacts from the CTR programs of 189 employers along an 8.6-mile segment of I-5, with a scenario that represented traffic conditions if the CTR programs did not exist. The data were supplied by the Washington State Department of Transportation's (WSDOT) Commute Trip Reduction program. It demonstrated that the cumulative effect of the employer trip reduction programs in Seattle reduced delay along I-5.[162] This example was discussed in detail in Technical Memorandum 3.

Estimating Impacts of the Proposed CAPRDP using TRIMMS v.4.1 and HEAT

To estimate the impacts of various proposals, the research team applied the latest Trip Reduction Impacts of Mobility Management Strategies (TRIMMS) model and Health Economic Assessment Tool to estimate the impacts of bicycling and walking. TRIMMS was developed by CUTR with funding support from the National Center for Transit Research, the Florida Department of Transportation and the US Department of Transportation. The Health Economic Assessment Tool (HEAT) was developed by the World Health Organization to conduct economic assessments of the health impacts of walking or bicycling.

TRIMMS 4.1

TRIMMS allows the analyst to estimate the impacts of a broad range of transportation demand management programs, policies and services at the worksite and area-wide levels. For the purposes of this plan, the analysis was restricted to the areawide level. The analyst can evaluate strategies directly affecting the cost of travel, such as transit and vanpool discounts or subsidies, parking pricing, pay-as-you-go pricing, parking cash-out strategies and other financial incentives. For example, the federal government allows employers to provide up to $270 per month tax-free to employees for parking, transit or vanpool subsidies. Employers can also offer pre-tax option for employees to pay for those

[162] Winters, Phil, Nevine Labib Georggi, Sachin Rai, and Liren Zhou. May 2007. "Impact of Employer-based Programs on Transit System Ridership and Transportation System Performance." FDOT BD 549 WO 25. National Center for Transit Research at the Center for Urban Transportation Research, University of South Florida. Tampa.

same qualified transportation fringe benefits. As discussed earlier, some cities have introduced transit benefit ordinances to require large employers to provide a pre-tax option for transit.

In addition to financial impacts, the analyst can evaluate the impact of strategies affecting access (e.g., walking times due to closer proximity of transit to destination) and travel times (e.g., changes in in-vehicle travel times for users of managed lanes). Other common program support strategies are accounted for in the analysis such as the presence of ridematching, emergency ride home, telework and flexible work hours, and worksite amenities. The extent of the employee transportation coordinator's effort is expressed as the number of hours worked on the program per week. Worksite amenities included the presence of sidewalks connecting transit stops within or near the worksite.

TRIMMS allows estimating the impact of land-use controls on transit ridership. These strategies include land-use policy changes affecting gross population and retail establishment density levels, transit station accessibility improvements, and transit-oriented development initiatives. The approach to estimate changes in transit demand levels is based on constant-elasticity demand functions.

According to the U.S. Census Bureau Household Pulse Survey, about 31% of Florida households have an adult in the household who substituted some or all their typical in-person work for telework because of the coronavirus pandemic. To accommodate this spike in teleworking, outcomes were adjusted from the basic TRIMMS analysis by modifying the change in VMT of increasing the frequency of telework to an average of 3 times per week. Change in VMT resulting from an increase in telework frequency was estimated by comparing the VMT for the 26,000+ individuals from the Commute Trip Reduction data in the State of Washington who reported their telework frequency and mode. The process used by WSDOT was used to calculate VMT per employee and is listed in Table 31.

Table 31. VMT for Teleworkers

Number of Days Teleworked	Share of All Teleworkers by days per week	Average Commute Miles (One-Way)	Daily One-Way VMT
1	50.7%	17.5	8.8
2	21.9%	20.1	7.7
3	8.6%	21.9	5.5
4	6.6%	23.3	2.7
5	12.2%	23.2	0.0

TRIMMS predicts mode share and VMT changes brought about by the above TDM initiatives using constant elasticity of substitution (CES) trip demand functions. These functions estimate changes from baseline trip demands taking into account users' responsiveness to changes in pricing and travel times; The evaluation of program support strategies is based on regression equation coefficients that weight in the relative strength of program support strategies and pricing strategies.

HEAT 4.3.1

HEAT allows CUTR to calculate the benefits of physical activity from bicycling or walking to work, as it affects mortality. It also allows for estimating the health effects of air pollution and crashes. Current estimates for the region indicate that walking and bicycling to work account for approximately 2.1 percent of all mode shares combined. A comparison was made with the current commute mode shares of both modes and "comparison cases" if this region increased mode share for walking by one percent for the journey to work and increased bicycling by one percent for the journey to work. Use of those modes for non-work purposes was not included in the analysis so the total societal health benefits are underestimated. HEAT follows the key steps shown in Figure 12. Basic function of the HEAT model for walking and bicycling.

Assessing road crashes in HEAT

HEAT assesses the effects of road crashes by using a generic estimate of road crash risk multiplied by the local data on bicycling provided by the analyst. The generic estimate of road crash risk for bicycling is derived based on national statistics, dividing the total number of fatal bicycling crashes by the total distance cycled.

Buehler and Pucher (2020) found that the U.S. had 11.2 pedestrian deaths per 110M km from 2016 to 2018. The study also found that the fatality rate for bicyclists is 6 deaths per 100M km.[163]

Safety improvements over time

In assessments that compare two cases (such as before and after or scenario A versus B), the user of the HEAT model has the option to specify a change in road crash risk (such as a 10% decrease). The tool then applies a linear interpolation of the crash risk over time.[164]

[163] Ralph Buehler & John Pucher (2020) The growing gap in pedestrian and cyclist fatality rates between the United States and the United Kingdom, Germany, Denmark, and the Netherlands, 1990–2018, Transport Reviews, DOI: 10.1080/01441647.2020.1823521. See also https://www.enotrans.org/article/pedestrian-and-bicyclist-fatalities-reach-twenty-year-highs-in-2018/

[164] More information about the HEAT model can be found at https://heatwalkingcycling.org/HEAT_UHI/#HIA_CRA_intro

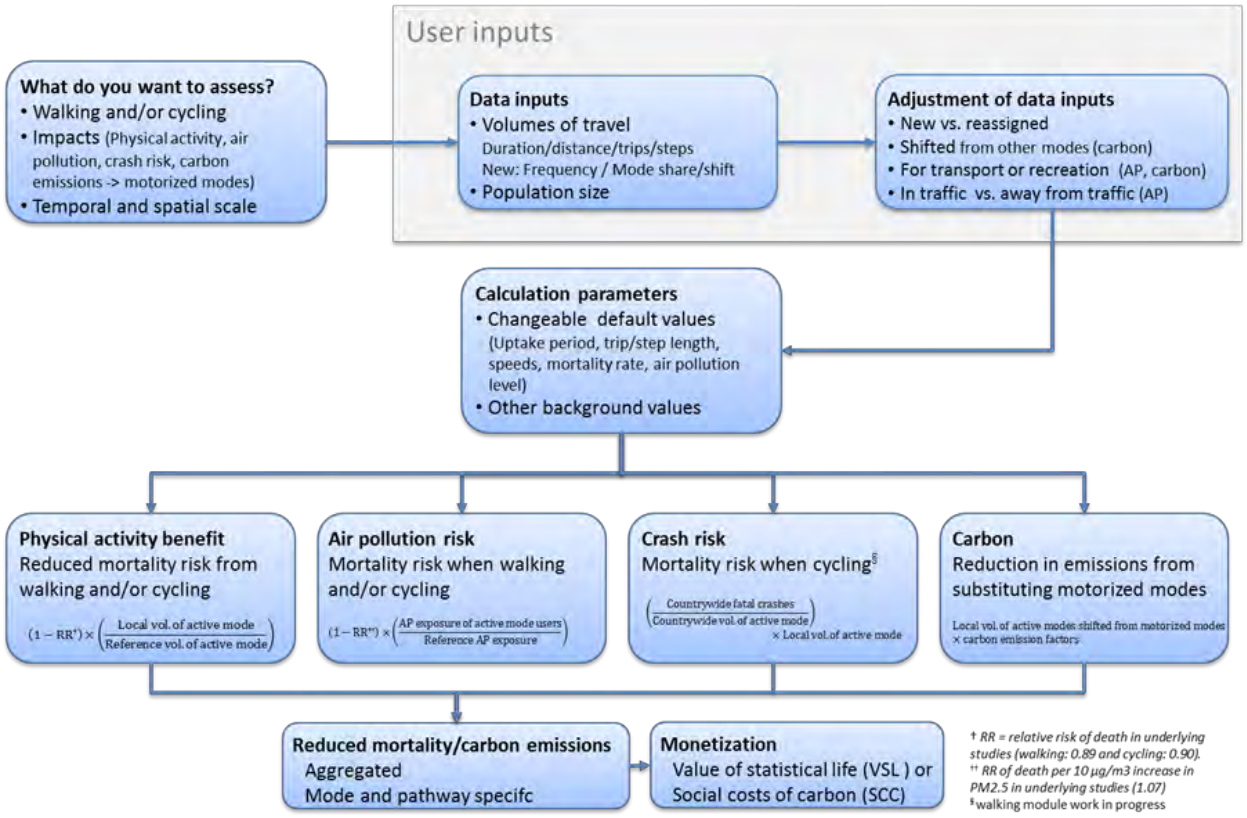

Figure 12. Basic function of the HEAT model for walking and bicycling.

Table 32 contains the key localized inputs used for HEAT model.

Table 32. Local Input Values for HEAT Model

Input	Value	Source
Estimate Total Workers 16 years and over	1,488,779	American Community Survey 2019. Table S0801 for Tampa-St. Petersburg-Clearwater, FL Metro Area
Estimate Total Workers 16 years and over MEANS OF TRANSPORTATION TO WORK Car, truck, or van	86.2%	
Estimate Total Workers 16 years and over MEANS OF TRANSPORTATION TO WORK Walked	1.6%	
Estimate Total Workers 16 years and over MEANS OF TRANSPORTATION TO WORK Bicycle	0.5%	
Estimate Total Workers 16 years and over MEANS OF TRANSPORTATION TO WORK Public transportation (excluding taxicab)	1.1%	
Person Trip Length (Mean) – Home-based trip (work) – Walk	1.43 miles	2017 National Household Travel Survey (https://nhts.ornl.gov/) – National average
Person Trip Length (Mean) – Home-based trip (work) – Bicycle	2.77 miles	
Value of a Statistical Life (updated for 2020)	$10.9 million	USDOT Guidance on Treatment of the Economic Value of a Statistical Life in U.S.

		Department of Transportation Analyses – 2016 Adjustment

Disclaimer
HEAT Global (i.e., this tool) is a prototype of HEAT which has not gone through scientific consensus approval yet and as such is not being officially endorsed by WHO yet. Features and assumptions may be subject to change. You may use HEAT Global at your own discretion.

Please note:
HEAT does not calculate risk reductions for individual persons but an average across the population under study.
The "value of statistical life" does not assign a value to the life of one particular person but refers to an average value of a “statistical life”.
Many of the variables used within HEAT are estimates and therefore liable to some degree of uncertainty.
HEAT provides an approximation of the order of magnitude of impacts. To get a better sense for the robustness of the results, reruns with low and high estimates for variables where you have provided a “best guess”.

Tables 33 through 46 show both the impacts of bicycling and walking and the economic value of those impacts.

Table 33. Results for Walking to Work and Physical Activity

Impacts on mortality	Economic value of mortality impacts
2 premature deaths are prevented per year	$19,900,000 per year
18 premature deaths prevented for the full assessment period of 10 years	$199,000,000
Adjusted to 2020 value (i.e. discounted/inflated)	$139,000,000

Mortality is monetized using value of statistical life (VSL) of 10 900 000 USD/death.

Table 34. Results for Bicycling to Work and Physical Activity

Impacts on mortality	Economic value of mortality impacts
0.060 premature deaths are prevented per year	$673,000 per year
0.60 premature deaths prevented for the full assessment period of 10 years	$6,730,000
Adjusted to 2020 value (i.e. discounted/inflated),	$4,690,000

Table 35. Results for Walking to Work and Air Pollution

Impacts on mortality	Economic value of mortality impacts
0.020 premature deaths are prevented per year	$195,000 per year
0.20 premature deaths prevented for the full assessment period of 10 years	$1,950,000
Adjusted to 2020 value (i.e. discounted/inflated)	$1,360,000

Table 36. Results for Bicycling to Work and Air Pollution

Impacts on mortality	Economic value of mortality impacts
0.002 premature deaths are prevented per year	$23,400 per year
0.020 premature deaths prevented for the full assessment period of 10 years	$234,000
Adjusted to 2020 value (i.e. discounted/inflated)	$163,000

Table 37. Results for Walking to Work and Crash Risk

Impacts on mortality	Economic value of mortality impacts
0.050 premature deaths are prevented per year	$550,000 per year
0.50 premature deaths prevented for the full assessment period of 10 years	$5,500,000
Adjusted to 2020 value (i.e. discounted/inflated)	$3,940,000

Table 38. Results for Bicycling to Work and Crash Risk

Impacts on mortality	Economic value of mortality impacts
0.002 premature deaths are prevented per year	$23,400 per year
0.020 premature deaths prevented for the full assessment period of 10 years	$234,000
Adjusted to 2020 value (i.e. discounted/inflated)	$163,000

Table 39. Results for Walkiing to Work and Carbon Emissions

Impacts on carbon emissions	Economic value of carbon emissions
325,622 tons of CO2 equivalent per year	$17,600,000 per year
3,256,220 tons of CO2 equivalent for the full assessment period of 10 years	$176,000,000
Adjusted to 2020 value (i.e. discounted/inflated)	$126,000,000

Carbon emissions have been monetized using an average carbon value of $52.80/tCO2e

Table 40. Results for Bicycling to Work and Carbon Emissions

Impacts on carbon emissions	Economic value of carbon emissions
310,189 tons of CO2 equivalent per year	$16,800,000 per year
3,256,220 tons of CO2 equivalent for the full assessment period of 10 years	$168,000,000
Adjusted to 2020 value (i.e. discounted/inflated)	$120,000,000

Carbon emissions have been monetized using an average carbon value of $52.80/tCO2e

Table 41. Results for Walking to Work (All Pathways)

Impacts on mortality and carbon emissions	Economic value of mortality and carbon emissions
0.800 premature deaths are prevented per year	$26,200,000 per year
8.00 premature deaths are prevented for the full assessment period of 10 years	$262,000,000
Adjusted to 2020 value (i.e. discounted/inflated)	$184,000,000
325,622 tons of CO2 equivalent per year reduced	
3,256,220 tons of CO2 equivalent reduced	

Table 42. Results for Bicycling to Work (All Pathways)

Impacts on mortality and carbon emissions	Economic value of mortality and carbon emissions
0.009 premature deaths are prevented per year	$16,900,000 per year
0.09 premature deaths are prevented for the full assessment period of 10 years	$169,000,000
Adjusted to 2020 value (i.e. discounted/inflated)	$121,000,000
310,189 tons of CO2 equivalent per year reduced	
3,101,889 tons of CO2 equivalent reduced	

Table 43. Results for Physical Activity (All Modes)

Impacts physical activity on mortality	Economic value of physical activity on mortality
2.000 premature deaths are prevented per year	$29,600,000 per year
19.000 premature deaths are prevented for the full assessment period of 10 years	$206,000,000
Adjusted to 2020 value (i.e. discounted/inflated)	$143,000,000

Table 44. Results for Air Pollution (All Modes)

Impacts of air pollution on mortality	Economic value of air pollution on mortality
0.020 premature deaths are prevented per year	$218,000 per year
0.200 premature deaths are prevented for the full assessment period of 10 years	$2,180,000
Adjusted to 2020 value (i.e. discounted/inflated)	$1,520,000

Table 45. Results for Crash Risks (All Modes)

Impacts of crash risk (all modes) on mortality	Economic value of crash risk
1.000 premature deaths are prevented per year	$11,700,000 per year
11.000 premature deaths are prevented for the full assessment period of 10 years	$117,000,000
Adjusted to 2020 value (i.e. discounted/inflated)	$83,500,000

Table 46. Results for Carbon Emissions (All Modes)

Impacts of carbon emission (all modes) on mortality	Economic value of crash risk
635,811 tons of CO2 equivalent per year prevented	$34,400,000 per year
Carbon emissions prevented for the full assessment period of 10 years	$344,000,000 per year
Adjusted to 2020 value (i.e. discounted/inflated)	$246,000,000

Carbon emissions have been monetized using an average carbon value of $52.80/tCO2e

Results for Carbon Emissions (all modes)

Summary of input data

The volume data you have entered corresponds to an increase of 0.3 min. per person and day.
The assessed population is 1,703,797.

Summary of impacts for carbon emissions

As a result, carbon emissions are reduced by 635,811 tons of CO2e per year.
Over the full assessment period of 10 years, carbon emissions are reduced by 6,358,109 tons of CO2e.

Economic value of impacts for carbon emissions

Carbon emissions have been monetized using an average carbon value of 52.8 USD/tCO2e. This corresponds to an economic value of USD 34,400,000 per year.
Over the full assessment period of 10 years, the total economic impact is USD 344,000,000.
Adjusted to 2020 value (i.e., discounted/inflated), the total economic impact is USD 246,000,000.

Disclaimer

HEAT Global (i.e., this tool) is a prototype of HEAT which has not gone through scientific consensus approval yet and as such is not being officially endorsed by the World Health Organization (WHO) yet. Features and assumptions may be subject to change. You may use HEAT Global at your own discretion.

Please note:

- HEAT does not calculate risk reductions for individual persons but an average across the population under study.
- The "value of statistical life" does not assign a value to the life of one particular person but refers to an average value of a “statistical life”.
- Many of the variables used within HEAT are estimates and therefore liable to some degree of uncertainty.
- HEAT provides an approximation of the order of magnitude of impacts. To get a better sense for the robustness of the results, reruns with low and high estimates for variables where you have provided a “best guess”.

Results of the Assessment

Summary of input data

The volume data entered corresponds to an increase of 0.3 min. per person and day.
The assessed population is 1,703,797.

Summary of impacts for mortality and carbon emissions

As a result, 0.80 premature deaths are prevented per year.
Over the full assessment period of 10 years, 8.00 premature deaths are prevented.

Economic Value of Impacts

Mortality is monetized using value of statistical life (VSL) of USD 10,900,000 per premature death.
Carbon emissions have been monetized using an average carbon value of USD 52.8 per ton of CO2e. This corresponds to an economic value of USD 43,000,000 per year.

Over the full assessment period of 10 years, the total economic impact is USD 430,000,000.
Adjusted to 2020 value (i.e. discounted/inflated), the total economic impact is USD 304,000,000.

Recommendation for MPOs: Estimate performance outputs and outcomes for alternative scenarios. This will require a review of needed data not yet available for key performance indicators, a determination of which agencies will collect the data, and budgetary provisions to cover the cost of data collection and analysis.

The USF Center for Urban Transportation Research, Statewide TDM Clearinghouse can provide technical support for the application of the TRIMMS™ model.

7. Determine Roles of Commuter Assistance and TDM Partners

Recommendation for MPOs: In coordination with FDOT, transit agencies, and local governments, engage the CAP/TMOs in the development of scopes of work and budgets that implement a preferred scenario. The scopes of work will have a data collection, monitoring, and evaluation task.

CAP/TMOs will prepare scopes of work in coordination with planning partners, reflecting and supporting the preferred scenario.

In the Tampa Bay area, there are presently several organizations that implement TDM strategies. Commute Tampa Bay and the five TMOs are natural choices to implement TDM strategies because of the experience, expertise, and local knowledge their staffs can apply to address transportation issues. These include TBARTA's Commute Tampa Bay program that provides a regional vanpool program, regional Guaranteed Ride Home program, ridematching powered by Agile Mile, and promotions for public transportation and other available modes, such as intercity bus. Commute Tampa Bay partners with the transportation management organizations or initiatives (TMO/TMI) in the Tampa Bay area.

The international Association for Commuter Transportation has adopted the following definition for TMOs. Some organizations use "transportation management association (TMA)"; however, since the acronym has been used by the federal government to refer to a transportation management area, use of the term TMA can cause confusion. The definition below applies to TMOs, TMAs and TMIs.

> A Transportation Management Association [or Organization] is an organized group applying carefully selected approaches to facilitating the movement of people and goods within an area. TMAs are often legally constituted and frequently led by the private sector in partnership with the public sector to solve transportation problems.[165]

There are over one hundred TMOs in the United States, Canada, the U.K., the Netherlands, and other nations. TMOs usually are located to serve the unique transportation and parking needs of activity centers that generate a large magnitude of motor vehicle traffic. In the Tampa Bay area, established TMOs include the St. Petersburg Downtown Partnership TMO, the Westshore Alliance, the New North Transportation Alliance in the USF area, and the Tampa Downtown Partnerhip TMO. A fifth TMO is under development as part of the Gateway Master Plan in Pinellas County.

The Tampa Bay area TDM organizations also are embedded in the communities that they serve through a network of partnerships with affiliated organizations. For example, the New North Transportation Alliance and the Tampa Downtown Partnership founded Bike/Walk Tampa Bay, a regional coalition that promotes safe walking and bicycling for all trip purposes. The TMOs are public private partnerships that include large employers in their service areas. The five TMOs have numerous resources at their disposal, including the national Best Workplaces for Commuters℠ (BWC) brand that promotes the National Standard of Excellence for employers, universities, and commercial campuses in providing outstanding commuter benefits to their employees. The promotional materials, technical support, webinars, and peer exchange resources of BWC are used by Commute Tampa Bay and the TMOs to provide information, assistance and promotions to employers. In turn, employers that provide commute benefits reap rewards of an expanded talent pool, better recruitment and retention, reduced absenteeism and tardiness, better work/life balance, and higher productivity of their employees as a result of addressing commute issues. During the COVID-19 pandemic, BWC launched an online Telework Certificate program for managers and employees to enhance the necessary skills to be fully productive while working remotely.

Professionals who staff Commute Tampa Bay and the TMOs also have access to professional development through the Florida Commuter Choice Certificate Program and several listservs that put TDM professionals in touch with an international network to exchange ideas about reducing traffic congestion and enhancing mobility. Tampa Bay area TDM professionals also have free access to the Florida Statewide TDM Clearinghouse that provides free technical support, offered through the Center for Urban Transportation Research at the University of South Florida.

Roles for the implementation of TDM strategies extend beyond the professional commuter assistance partners to their private and public collaborative entities. Distributed responsibilities for particular strategies and activities can include the Florida Department of Transportation District Seven, the

[165] National Center for Transit Research. *TMA Handbook: A Guide to Successful Transportation Management Associations*. Prepared for the Association for Commuter Transportation at the Center for Urban Transportation Research, University of South Florida, Tampa, FL. 2001. https://scholarcommons.usf.edu/cutr_nctr/index.3.html

regional metropolitan planning organizations, the school districts, the local governments, and private consultants.

MPOs can serve various roles with respect to TDM. For example, Commuter Connections, a program of the National Capital Region Transportation Planning Board that is the region's designated MPO at the Metropolitan Washington Council of Governments in Washington, D.C., provides commuter services to residents and as part of employer outreach. Services include Guaranteed Ride Home, telework assistance and ridematching. MPOs may provide technical support and studies to assist CAPs and TMOs and provide input on TDM service development. MPOs also can help CAPs and TMOs leverage public and private funds to implement traffic congestion reduction programs. This may include applying CMAQ dollars to TDM strategies. MPOs and local governments in other regions often hire transportation professionals with expertise in TDM planning and implementation with primary job duties to identify and integrate TDM strategies into planning, programming, performance monitoring and evaluation. Government TDM staff coordinate with CAPs and TMOs.

8. Incorporate Selected TDM Scenario into LRTP

Recommendation for MPOs: Incorporate the selected TDM strategy or strategies into the long range cost feasible plan.

The CAP/TMOs will implement work programs in collaboration with planning partners.

Thereafter, the strategies and commuter assistance activities of the selected TDM scenario would be folded into the plan of the appropriate partners. These include the FDOT Work Program, the local government capital improvements program (CIP) and the MPO Transportation Improvement Program (TIP). Implementation of the TDM strategies would include a scope of work, timeline, budget, monitoring, evaluation, and reporting components. Next steps would be identified by prioritizing recommendations, recommended performance metrics, monitoring and evaluation, cost estimates, identification of lead agency, and a timeline (short term, 3-5 years, long term 5+ years).

Funding of TDM

Federal funds are a major source of funding for commuter assistance and TDM programs, particularly Congestion Mitigation and Air Quality (CMAQ) funds for reducing criteria pollutants. Federal Aid Highways explicitly lists carpool and vanpool projects, and TDM programs and strategies.[166] In addition, the CMAQ Improvement Program also provides funding for "…a project or program that shifts traffic demand to nonpeak hours or other transportation modes, increases vehicle occupancy rates, or otherwise reduces demand for roads through such means as telecommuting, ridesharing, carsharing, alternative work hours, and pricing…"[167] The Surface Transportation Block Grant (STBG), also known as Surface Transportaion Program (STP), may provide funding under provisions of 23 U.S.C. 133(c). Like CMAQ, STBG also is a flexible fund in which a state DOT may direct funds to non-highway modes. Federal/State Planning Research (SPR) funds may be used to plan for TDM, monitor and analyze the effectiveness of TDM programs, and integrate TDM into other transportation programs.

Regional funding is minor as the MPOs do not generate funds but play a coordinative role in the allocation of federal funds. MPOs can remove federally funded projects, but not direct how most funding is spent. For example, in the LRTP 2040, the Hillsborough MPO Board set priorities for approximately $15 million for the period, FY 2019 through 2023. These funds were from federal Transportation Alternatives (TA) and the Surface Transportation Program (STP). Funds were allocated to HART bus and CAD/AVL equipment replacement, integrated corridor management (signals/ITS), bicycle and pedestrian safety improvements, planning and corridor studies and design. The Hillsborough MPO has been willing to consider commuter assistance projects for a portion of its funding.[168]

State Funding Sources

State funding for commuter assistance has in the past come from different categories, including District Dedicated Revenue (DDR), State Primary Highways & PTO (DS), and the State Public Transit Office (PTO). FDOT must prepare a Long-Range Statewide Transportation Plan (LRSTP), with a Statewide Transportation Improvement Program (STIP) and a State Planning and Research Program. The State legislature and Governor approve the Tentative Work Program during Spring Session,to take effect July 1. FDOT begins to develop the following year's Tentative Work Program beginning July 1.

Recent History of CAP Funding

The Adopted Work Program of FDOT District 7 FY 2018/19 – FY 2022/23, listed capital and operating funds for TBARTA's commuter assistance program from the FHWA Surface Transportation Program. This was described as travel demand management, outreach and education, and commuter services. Table 47 below reproduces excerpts from the Adopted Work Program of FDOT District 7 FY 2018/19 – FY 2022/23.

[166] 23 U.S.C. §133(b)(5) and (b)(12). See also 23 U.S.C. §146.
[167] 23 U.S.C. §149(b)(7).
[168] Phone conference with TMOCG members and Hillsborough MPO staff to discuss potential funding allocation in the TIP update, March 10, 2020.

Table 47. Funding Alocations for TDM Programming in Tampa Bay Region

Item Number: **408205 2** Description: TBARTA - FHWA SURFACE TRANSPORTATION PROGRAM LRTP: Choices when not driving, p. 166
Extra Description: TRAVEL DEMAND MGT/OUTREACH AND EDUCATION; COMMUTER SERVICES
Type of Work: COMMUTER TRANS. ASSISTANCE
Project Length: 0 *NON-SIS*

Fund	<2019	2019	2020	2021	2022	2023	>2023	All Years
CAPITAL - MANAGED BY BAY AREA COMMUTER SERVICES								
SU	$650,000	$0	$0	$0	$0	$0	$0	$650,000
Totals:	**$650,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$650,000**
OPERATIONS - MANAGED BY BAY AREA COMMUTER SERVICES								
SU	$0	$350,000	$0	$0	$0	$0	$0	$350,000
SU	$245,000	$0	$0	$0	$0	$0	$0	$245,000
SU	$230,000	$0	$0	$0	$0	$0	$0	$230,000
Totals:	**$475,000**	**$350,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$825,000**
Item 408205 2 Totals:	**$1,125,000**	**$350,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,475,000**

FDOT Adopted FY 2018/19 - FY 2022/23 TIP

Item Number: **412533 1** Description: TRANSPORTATION MANAGEMENT ORGANIZATION COORDINATING GROUP LRTP: Choices when not driving, p. 166
Extra Description: OPERATING ASSISTANCE
Type of Work: COMMUTER TRANS. ASSISTANCE
Project Length: 0 *NON-SIS*

Fund	<2019	2019	2020	2021	2022	2023	>2023	All Years
OPERATIONS - MANAGED BY BAY AREA COMMUTER SERVICES								
DDR	$1,450,662	$0	$0	$600,545	$603,161	$603,161	$0	$3,257,529
DPTO	$733,937	$469,000	$509,170	$0	$0	$21,947	$0	$1,734,054
DS	$200,000	$0	$0	$0	$0	$0	$0	$200,000
Totals:	**$2,384,599**	**$469,000**	**$509,170**	**$600,545**	**$603,161**	**$625,108**	**$0**	**$5,191,583**
Item 412533 1 Totals:	**$2,384,599**	**$469,000**	**$509,170**	**$600,545**	**$603,161**	**$625,108**	**$0**	**$5,191,583**

Source: FDOT Adopted Work Program for FY 2018-2019 through 2022-2023.

Capital for years previous to 2019 was $650,000 with no further allocated budget for the five-year planning period, for total capital of $650,000. Operations budget was listed as $475,000 for years prior to 2019 and $350,000 for 2019, with no further allocated budget for the five-year planning period, for total operations at $825,000. Capital and operations combined totalled $1,475,000.

Also as part of the Adopted Work Program of FDOT District 7 FY 2018/19 – FY 2022/23, a separate item was listed for maintenance and expansion of the vanpool program, funded from FHWA Surface Transportation Program and TRWR funds. Funds for years prior to 2019 were listed at $1,617,200, and funds for 2019 were listed at $800,000, with no further allocated budget for the five-year planning period, for a total of $2,417,200 for the vanpool program, if the funds prior to 2019 are included.

As part of the Adopted Work Program of FDOT District 7 FY 2019/20 – FY 2023/24, there was no item listed for TBARTA vanpool or commuter assistance. There was a three-year allocation for the Tampa Downtown Partnership for the Downtown Circulator for a total of $5,960,000.

A separate budget item lists operating assistance for the TMOCG. For the period prior to 2020, a total of $2,852,863 was allocated. These funds came from a combination of State Primary Highways & PTO (DS), District Dedicated Revenue (DDR), and State PTO (DPTO). Thereafter, funds have been allocated separately for each year from 2020 through 2024, for a total of $5,851,164, if funds from years prior to 2020 are included. For year 2020, a total of $509,170 is listed. There are four TMOs, providing an average of $127,292 for each of their operations.

The FDOT Tentative Work Program of FDOT District Seven FY 2020/21 – FY 2024/25 shows maintenance of funds for the TMOCG at these levels, for a five-year total of $3,129,132.

The Nature of CAP Activities Relative to Funding

It is understood that funding can be a limiting factor, both in the amount available as well as restrictions placed on the use of the funds. A categorization that is conventional to the transportation field is the distinction between capital and operations. FDOT Central Office supports a long-range multimodal vision and is organized according to function as well as by modes. The FDOT Commuter Assistance Program resides as part of the Transit Planning Division within the Transit Office. While promoting use of public transit is a key role of commuter assistance, it goes beyond public transit and vanpools, to commuter use of the highway system by carpools, as well as by bicyclists and pedestrians. In the Tampa Bay area, this might extend to ferries as well. Telecommuting continues to grow in importance. Commuter assistance is predicated upon having the multimodal capital facilities in place from which customers can choose. It also depends on both transit operations and highway operations, in the sense of transit service coverage, frequency, and duration, HOV lanes, and traffic signals that include a pedestrian walk phase. In short, commuter assistance is not exclusive to a particular mode, nor can it neatly be categorized as capital or operations. This sometimes creates challenges relating to determining funding for which commuter assistance may be eligible. If it is eligible, commuter assistance programs and services may be compared against other candidate projects that are entirely different, such as a new transit route. Commuter assistance may not fit well into existing applications and prioritization criteria.

The FDOT Commuter Assistance Program funding adheres to guidelines established by policy in 2002. At the discretion of FDOT Central Office and the FDOT Districts, certain types of activities may be preferred or prescribed contractually. For example, the commute trip purpose may take priority over other trip purposes for the use of some funding sources. The CAP and TMOs have assisted important programs such as Safe Routes to School and Pik My Kid that focus on mobility solutions for K12 schools. These and other programs could potentially be funded by other FDOT sources.[169] Sponsors might prefer to fund discrete commuter assistance projects defined by a beginning and end, within the time constraints of a contract period. There are many commuter assistance activities that lend themselves well to discrete projects, such as specific campaigns that run for a certain time period, or special events.

However, there are other important kinds of CAP activities that require sustained effort over periods of time longer than one year. For example, the heart of commuter assistance, particularly as it relates to commute trips, is employer outreach. To do it effectively requires ongoing sustained effort because it involves customer service relationship building for continuity of commuter assistance visibility. Management staff at work sites move on or are replaced over time by new management staff. Likewise, employee turnover at a work site requires persistent contacting and outreach to sustain progress in introducing commuter services, promoting their use, and providing ongoing support to both the employees who use commute alternatives as well as to management that needs information.

Furthermore, the Tampa Bay region has been served by chronically underfunded public transit that strains to cover dispersed communities and ends at county boundaries. The result is a car-centric commuting culture that requires more intense, targeted, and tailored outreach to address issues that are particular to each work site. While today's employers tend to better recognize that employee wellness affects a company's bottom line, the relationship between wellness and the commute to work is not always obvious to them. Commuter assistance implementation requires outreach extended over time to cultivate that understanding by managers and commuters alike and empower them with transportation options that they might not have otherwise seriously considered. This type of work is a process that depends on sustained commuter assistance staff labor hours.

Whether the improvement is tied to a transportation facility, or a land development, there is a greater comfort level on the part of government to use grants and revenue sources for capital improvements, rather than toward a service. Many funding sources specify for capital facilities only. Physical facilities provide tangible evidence of the fulfillment of a contractual requirement. The new facility provides visible proof, with photos in news stories, that public money was used for a public benefit. Once built and while still new, there is a temporary pause in the need for maintenance of that capital facility. Physical facilities give an impression of permanence.

Similarly, to address congestion reduction, there is a greater confidence level to invest in capital facilities for the creation of infrastructure to implement transportation systems management and operations strategies (TSM&O). Likewise, for highway construction and reconstruction projects, more confidence

[169] Transportation Alternatives can be used for Safe Routes to School programmimg and is provided through 23 U.S.C. §213(b)(3).

and investment are placed in Active Transportation and Demand Management strategies that rely on ITS infrastructure. In both these examples, the investment is in capital facilities to moderate motor vehicle traffic flow, rather than investment in programs and services that support changes in decisions to travel.

Unlike the construction of a new transportation facility, a perceived drawback of TDM programs is that they require ongoing funding. However, the investment in a capital facility also is never finally complete. Instead, it marks the beginning of costs incurred annually to operate and maintain that capital facility. The large number of deteriorated bridge structures across the United States is one example of expensive maintenance and preservation. With the expansion of highway network lane miles comes the expansion of lane miles that need maintenance and preservation.

Nonetheless, some new highway capacity will be needed to accommodate a growing population, with TSM&O to optimize vehicular traffic flow. However, unlike construction and traffic operations to accommodate traffic, TDM targets traffic at its source by addressing the needs of travelers and altering the trip itself. For every motor vehicle trip that a TDM service removes from a highway bottleneck, it also improves traffic flow on all other segments of every vehicle trip removed.

FDOT has a number of different transit funding programs, as described in the Resource Guide for Transit and Transit-Related Programs.[170] Commuter assistance is categorized as a transit-related program. Like public transit, commuter assistance must respond to changing market needs with flexible and innovative services.

It is recommended that FDOT develop a funding mechanism for developing and implementing innovative TDM strategies, similarly to the Public Transit Service Development Program for public transportation. This could be a competitive grant opportunity for CAPs/TMOs statewide.

Local funding Sources

Other funding sources for TDM strategies are tied to the beneficiary or users of a service, such as a special taxing district that pays for a circulator serving properties with that district. The list below are some potential funding sources.

Taxation

- Fuel tax
- Taxes on commercial parking transactions or upon parking facilities
- Local sales tax
- Special district tax on property owners
- Tax increment financing, as in Community Redevelopment Areas and transit oriented development

[170] Florida Department of Transportation. Resource Guide for Transit and Transit-Related Programs. Prepared by the USF Center for Urban Transportation Research. October 2011. https://www.fdot.gov/docs/default-source/transit/Documents/TransitResourceGuide.pdf

Fees

- Parking revenues
- Roadway tolls
- Motor vehicle registration fees
- Mileage based fees
- Mobility fees and services provided as a condition to a land development order

A review of potential funding sources indicates that there are far more funding sources for capital facilities than for programs and services. In many cases, funding for capital facilities provides positive synergies with TDM strategies. For example, commuter assistance services promoting walking, bicycling, and use of public transit will be much more effective if there are complete networks of sidewalks and bicycle facilities. Federal Transportation Alternatives funds can be allocated toward pedestrian and bicycle capital facilities.

Likewise, more local governments are charging mobility fees as part of an agreement with a land developer of a site. Unlike conventional impact fees imposed for capital facilities to satisfy transportation concurrency, a mobility fee is charged to all land developments regardless of the existence of excess motor vehicle capacity on adjacent highways. Furthermore, the magnitude of the fee is tied to the development site's distance from the urban core, with less fees charged to sites closer to the urban core. Such a fee anticipates that the development that is closer to the urban core will generate less vehicle miles traveled and will be located within the public transit service area. The fees go toward multimodal capital improvements. Again, such fees support sidewalk, bicycle, and public transit infrastructure.

However, in Florida, with the exception of TDM programs and service requirements in existing Developments of Regional Impact and Sector Plans, the use of land development conditions requiring the implementation of corresponding TDM programming to encourage use of that new sidewalk, bicycle, and public transit infrastructure has been rare.

Perhaps the best funding sources are those that not only are designed to discourage or reward particular decisions about trip making, but also raise revenues that can then be redirected back to support commuter assistance. An example is variable parking pricing that encourages parking outside the peak periods and helps balance parking demand with parking supply across locations. A portion of parking revenues can be allocated toward commuter assistance services, such as Guaranteed Emergency Ride Home for commuters who have decided to carpool and who have reduced their demand for parking. In this case, no new expensive capital facilities have to be built. TDM optimizes the use of existing infrastructure.

Private Sector Participation

The private sector, particularly employers, can be particularly effective when using TDM funding strategies at their disposal. Often, these are implemented at the work site and are cost neutral to the

employer. For example, an employer that rents office space may have a lease agreement that unbundles parking from the lease. This employer can then offer parking cash out to its employees. Some of these employees will pay for parking. Other employees may use the cash toward purchasing a transit pass. Employers also may offer their employees Qualified Transportation Fringe Benefits by setting aside federal pre-tax income up to $270 per month per employee to use for transportation expenses. Employees save money from reduced income taxes. Employers save money on payroll taxes. Employers can choose to use these savings to subsidize transit passes for their employees, providing an extra benefit to employees at no extra cost to the employer. Implemented on the scale of a corridor, a district, a municipality, or regionwide, TDM strategies that shift trip decision making also optimize the use of existing infrastructure and delay the need to build more capacity.

MPO Process for Allocating Funds

The Metropolitan Transportation Planning process is to be a performance-driven, outcome-based approach. Part of the role of the MPO is to identify and evaluate alternative transportation improvement options and update data and planning methods. The Long Range Transportation Plan, also known as the Metropolitan Transportation Plan (MTP), is required to foster mobility and access for people and goods in a manner that promotes efficiency and preservation of the system, and promote good quality of life. The Transportation Improvement Program (TIP) is a program of prioritized projects that contribute to the region's transportation performance goals, metrics, and targets. The Unified Planning Work Program (UPWP) lays out the planning priorities of the metropolitan region, includes funding for planning activities such as data collection, planning studies, and public engagement activities for the next one or two years.

When an urbanized area exceeds 200,000 population, it becomes a Transportation Management Area (TMA). This results in changes to the MPO project selection process and requires development and use of a Congestion Management Process (CMP).

Figure 13 illustrates the general time frames of the yearly MPO Transportation Improvement Program update process.

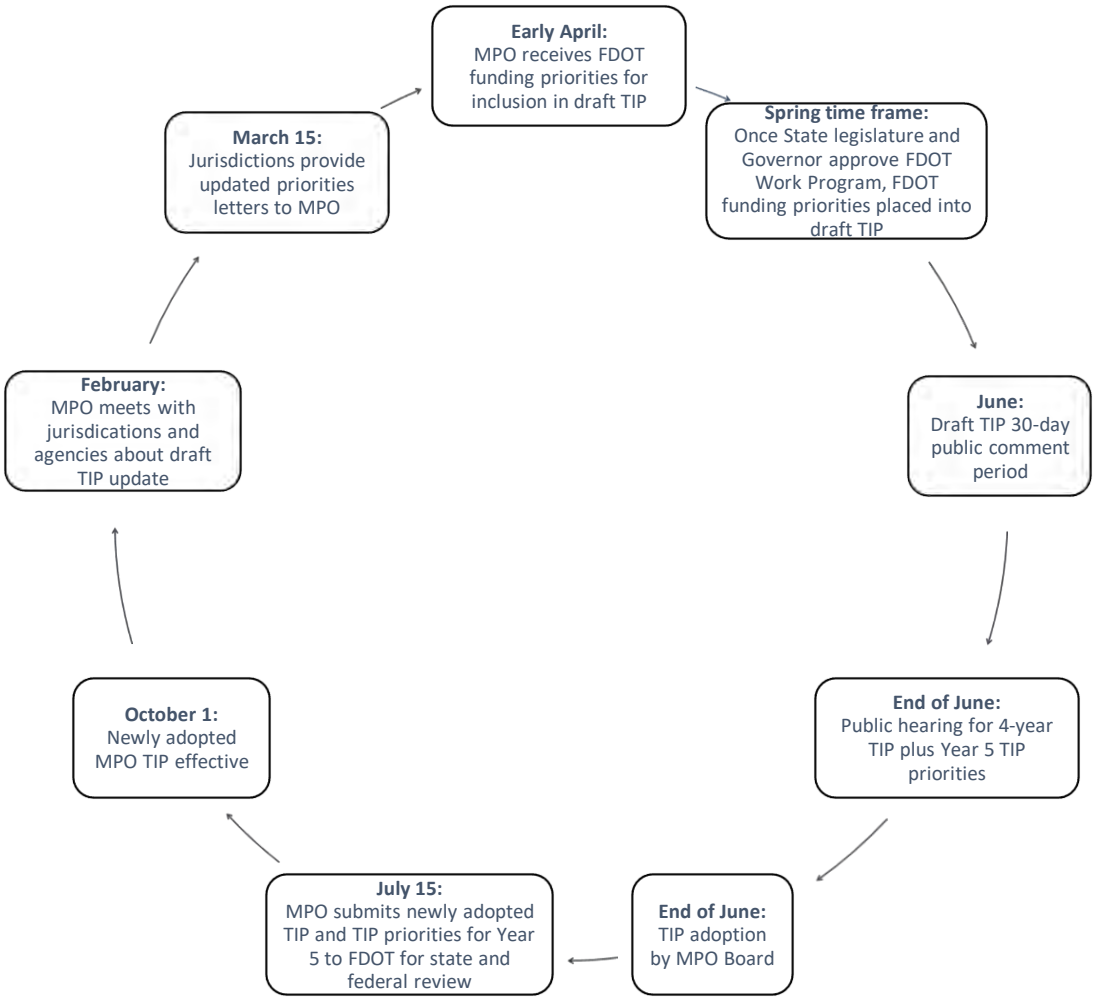

Figure 13. MPO yearly cycle for allocating funds.

This update process illustrates that federal funding requests for commuter assistance and TDM strategies must first appear as priorities of FDOT and of the local governments, by placement in the FDOT Work Program and in the local government capital improvements program.

Recent Examples of Hillsborough MPO Funding Requests

The MPO updates its project priorities for the next TIP, based upon its established goals and performance metrics and targets. Recent examples of new priority requests have included transit project requests from HART, such as electric bus and electric bus infrastructure, automated transit vehicle facilities and infrastructure, and a study relating to HART and CSX. From FDOT, Hillsborough County and City of Tampa sponsors, there have been project requests to the MPO for intersection safety improvements, traffic signals, raised medians, bike lane connections, sidewalk connections, ADA improvements, innovative intersection treatments, and a request for a PD&E study for a multi-use trail underpass from the City of Temple Terrace. Requests also have included a vanpool and TDM related

services request from TBARTA. This was for $800,000 in FY 2026 for vanpool support. The MPO is recommending $200,000 yearly.[171]

In budgets of MPO Transportation Improvement Programs and local government Capital Improvement Programs, pie charts and table headings tend to label TDM as part of the transit budget, or as part of the TSM&O budget. However, closer inspection of the budget line items often indicates little expenditure for actual TDM programs and services.

Federal Funding

The USDOT first distributes federal funds through apportionment to the MPOs and the states. Then discretionary funds are awarded to applicants. Authorization refers to the multiyear act by Congress. Appropriation is yearly.

- Authorization is a ceiling.
- Appropriation is the actual amount awarded to federal agencies based on an appropriation process.
- Apportionment is a formula provided in law, which is used to distribute funds to states and metropolitan areas. Apportionment is made on October 1 that is the first day of the federal fiscal year. States are then able to obligate, or spend, the funds in accordance with the Statewide Transportation Improvement Program (STIP).
- Discretionary: Project sponsors compete for the funds and awards are given based on merit.

USDOT first allocates the funds into the various programs, such as the Surface Transportation Block Grant (STBG) Program, and the Congestion Mitigation and Air Quality (CMAQ) Program. Then FHWA and FTA distribute funds to FDOT. The funds are then distributed by FDOT to the MPOs. The MPOs then distribute the funds to tribal governments, local governments, and transit operators.

Surface Transportation Program (STP)

It is possible to use STP funding for TDM programs, as these funds are flexible and can be used for a variety of programs, including asset management, regional priorities, debt service and other state programs. For example, the Colorado State Department of Transportation allocates STP—Metro funds to address metropolitan area transportation issues. It is a flexible funding source to fund transportation improvements in Transportation Management Areas (TMA) that are defined as urban areas with populations greater than 200,000. Per Federal law, funds are sub-allocated to MPOs that are TMAs on the basis of the population of the TMA Urbanized Areas (UZA) per data from the U.S. Census. In the Denver region, there is a Regional TDM Pool, for which funds are competitively allocated to commuter assistance providers, using STP-Metro funds that have been allocated in the Denver Regional Council of

[171] Hillsborough MPO. Transportation Improvement Program. This Year's Document: FY 2020/21-2024/25 and Priorities for Next Year's Document." PowerPoint presentation. http://www.planhillsborough.org/wp-content/uploads/2020/06/TIP-Document-for-Adoption-1.pdf

Governments (DRCOG) TIP. While most of the funding for TDM programs in the Denver region comes from federal CMAQ funds, approximately 7 percent has come from STP-Metro funds.[172]

Congestion Mitigation and Air Quality

One of the few sources of funding that has been annually available since the early 1990s for potential allocation to TDM strategies is the federal Congestion Mitigation and Air Quality (CMAQ) Program. CMAQ funds can be used for both capital and for operations, including TDM programs and services. The following discussion describes what CMAQ funds can be used for and how CMAQ funds have been used. Unlike many other potential TDM funding sources, such as those described above, use of CMAQ funds for TDM programming would be relatively quick to implement.

The Federal-Aid Highway Program is a federally funded, State-administered program, under which State DOTs are responsible for determining which projects are Federally funded, including those that benefit local public agencies (LPA). The FAST Act of 2015 reauthorized the funding of surface transportation programs, including Federal-Aid Highways, at over $305 billion for fiscal years (FY) 2016 through 2020.

The Congestion Mitigation and Air Quality (CMAQ) Program began in 1991 as part of the Intermodal Surface Transportation Efficiency (ISTEA) Act and has continued as part of each transportation reauthorization since then, including the FAST Act. The main goal of CMAQ is to fund transportation projects that reduce regulated emissions associated with carbon monoxide, ozone, and particulate matter pollution in nonattainment and maintenance areas. Many of these projects aim to reduce traffic congestion. CMAQ can be used for both capital and operations. FHWA and FTA administer the CMAQ program by determining project eligibility and making annual apportionments to the States based upon the severity of the pollution within each state's borders and the population affected. Federal law enables the use of CMAQ for TDM programs as follows.

> 23 U.S. Code §149(b) Eligible Projects. provides that "…a State may obligate funds apportioned to it under section 104(b)(4) for the congestion mitigation and air quality program only for a transportation project or program if the project or program is for an area in the State that is or was designated as a nonattainment area for ozone, carbon monoxide, or particulate matter under section 107(d) of the Clean Air Act (42 U.S.C. 7407(d)) and
>
> 23 U.S. Code §149(b)(7) if the project or program shifts traffic demand to nonpeak hours or other transportation modes, increases vehicle occupancy rates, or otherwise reduces demand for roads through such means as telecommuting, ridesharing, carsharing, alternative work hours, and pricing:
>
> 23 U.S. Code §149(d) States Flexibility. (1) States without a nonattainment area.—If a State does not have, and never has had, a nonattainment area designated under the Clean Air Act (42

[172] Denver Regional Council of Governments. DRCOG Regional Short Range TDM Plan (2012-2016). June 2012. p. 14.

> U.S.C. 7401 et seq.), the State may use funds apportioned to the State under section 104(b)(4) for any project in the State that—(A) would otherwise be eligible under subsection (b) as if the project were carried out in a nonattainment or maintenance area; or (B) is eligible under the surface transportation block grant program under section 133.

CMAQ funds may be used for transportation projects likely to contribute to the attainment or maintenance of NAAQS, with a high level of effectiveness in reducing air pollution and be included in the MPO's current LRTP and TIP.

The FAST Act directs FHWA to apportion funding as a lump sum for each State then divide that total among apportioned programs, including CMAQ. A state may transfer up to 50% of CMAQ funds made available each fiscal year to other programs, including the National Highway Performance Program, National Highway Freight Program, Surface Transportation Block Grant Program, Transportation Alternatives, and Highway Safety Improvement Program. No funds may be used to add capacity except for HOV facilities that are available to SOV only at off-peak times.

Past Use of CMAQ in Florida and in the Tampa Bay Area

All urbanized areas in Florida are in attainment for National Ambient Air Quality Standards (NAAQS). Those states like Florida, which contain no nonattainment or maintenance areas, still receive a minimum allocation of CMAQ funds. A review of the use of CMAQ funds in Florida for the years 2015 through 2019, based upon the FHWA CMAQ Public Access System, indicates that CMAQ funds were often flexed to be used for STP-eligible projects. The CMAQ funds also were often supplemented with other non-CMAQ funds for projects. Many projects receiving CMAQ funds were for roadway resurfacing, traffic flow improvements, construction, and addition of lanes.

The available Project Reporting Categories for the use of CMAQ funding include the following.

- Advanced Diesel Truck / Engine Technologies
- Alternative Fuels and Vehicles
- Bicycle and Pedestrian Facilities and Programs
- Congestion Reduction and Traffic Flow Improvements
- Freight / Intermodal
- Inspection Maintenance (I/M) Programs
- Ride Sharing
- STP / CMAQ
- Transit Improvements
- Travel Demand Management
- Other

Many CMAQ-funded projects were labeled in the category of Congestion Reduction and Traffic Flow Improvements for such project types as signal improvements, ITS incident management enhancement, ATMS arterial management, and Road Ranger service.

Some CMAQ funds also were used for bicycle, rail trail and sidewalk capital projects, labeled under the Project Category as Bicycle and Pedestrian Facilities and Programs. One CMAQ-funded project supported the Clean Cities Coalition.

CMAQ funds were allocated to commuter assistance programming for South Florida Commuter Services serving the Miami urbanized area. No CMAQ funds were allocated in the greater Tampa Bay area for commuter assistance in the past five years.

CMAQ funds also were awarded to Miami Dade County for transit improvements, operating assistance and fuel. First- and last-mile on-demand transit service for Dadeland/Civic Center Areas also was awarded to the Miami Urbanized Area MPO.

Two I-10 interchange PD&E projects in north Florida were categorized as Travel Demand Management.

Table 49 contains the total number of projects that were awarded CMAQ funds in Florida for the years 2015 through 2019, as well as those CMAQ projects awarded within the greater Tampa Bay area.

Table 48. CMAQ -Funded Projects Awarded in Florida from 2015 through 2019

Year	Total CMAQ-funded Projects in Florida	Total CMAQ-Funded Projects in the greater Tampa Bay Area*
2019	55	5
2018	43	3
2017	40	0
2016	44	3
2015	43	5
Total	225	16

*Includes the counties containing the Tampa-St. Petersburg-Clearwater MSA (Hillsborough, Pasco, and Pinellas), plus Hernando and Citrus Counties within FDOT District Seven, plus Manatee County that is included within the TBARTA service area.
Source: FHWA Air Quality. CMAQ Public Access System. https://fhwaapps.fhwa.dot.gov/cmaq_pub/Search

The Table 49 includes a listing of all projects for the MPOs within the FDOT District Seven service area, plus any CMAQ projects that took place in Manatee County. Data provided for the Project Details contained within the FHWA CMAQ Public Access System were often missing for CMAQ-funded projects. There was almost no data listed in the Project Details regarding estimated emissions reductions. The data are shown below as were reported.

Table 49. CMAQ-Funded Projects in the Greater Tampa Bay Area, 2015-2019

Year	MPO	Title	Project Category	CMAQ Project ID	Outreach Activity?	Congestion Reduction Project?	Other Project Description	CMAQ Capital Amount	Non-CMAQ Funding	Total
2019	Hillsborough County	CR580/Sam Allen Rd from W of SR39 to E of Park Rd; Add lanes	Congestion Reduction and Traffic Flow Improvements	FL20180017	N	Y		$131,558.00	$32,889.50	$164,447.50
2019	Hernando County	82nd Ave from 69th St to CR 510	Congestion Reduction and Traffic Flow Improvements	FL20190005	N	Y		$55,100.00	$13,775.00	$68,875.00
2019	Hernando County	CR 578 (Co Line Rd) from Suncoast Parkway to US 41	Congestion Reduction and Traffic Flow Improvements	FL20190015	N	Y		$1,768,595.00	$442,148.75	$2,210,743.75
2019	Hillsborough County	City of Tampa Kennedy/Hyde Park/Dale Mabry ATMS 122 Signals	Congestion Reduction and Traffic Flow Improvements	FL20190016	N	Y		$237,566.00	$59,466.50	$297,032.50
2019	Hernando County	US 19 SR 55 from W Jump Court to W Fort Island Trail	Congestion Reduction and Traffic Flow Improvements	FL20190017	N	Y	Add Lanes and Reconstruct	$148,175.00	$37,043.75	$185,218.75
2018	non-MPO awardee	SR 582 Fowler Ave from W of Nebraska Ave to W of Bruce B Downs Blvd	STP/CMAQ	FL20150003	N	N		$886,291.00	$221,572.75	$1,107,863.75
2018	Hillsborough County	SR 674 Sun City Center E of Commercial Ctr Dr to E of US 301 resurfacing/cst	Congestion Reduction and Traffic Flow Improvements	FL20180005	N	Y		$303,567.00	$75,891.75	$379,458.75
2018	Hillsborough County	CR 580/Sam Allen Rd from W of 539 to E of Park Rd; Add lanes	Congestion Reduction and Traffic Flow Improvements	FL20180017	N	Y		$748,824.00	$187,206.00	$936,030.00
2017--none										
2016	Hillsborough County	SR 574 MLK Blvd from E of Parsons Ave to E of Kings Way Rd	STP/CMAQ	FL20160003	N	N		$90,782.00	$0.00	$90,782.00
2016	Hillsborough County	Gateway Expressway FM SR690 @ US19 and SR 686 Extension @ CR 611 to W of I-275	STP/CMAQ	FL20160011	N	N		$1,913,647.00	$0.00	$1,913,647.00
2016	Hernando County	SR 52 (Schrader Hwy) from W of Suncoast Parkway to E of US 41 (SR 45)	STP/CMAQ	FL20160013	N	N		$1,358,022.00	$0.00	$1,358,022.00
2015	Pinellas County	SR 686 (Roosevelt) from 49th St. Bridge to N Ulmerton Rd	STP/CMAQ	FL20130005	N			$1,209,402.00	$2,376,030.00	$3,585,432.00
2015	Hillsborough County	I-75 Exit Ramp to SR 60	STP/CMAQ	FL 20120008	N	N		$17,786.00	$0.00	$17,786.00
2015	Hillsborough County	SR 582 Fowler Ave from W of Nebraska Ave to W of Bruce B Downs Blvd	STP/CMAQ	FL20150003	N	N		$173,321.00	$4,485,888.00	$4,659,209.00
2015	Pasco County	US 301 (SR 41/Gall) from SR 39 to S of CR 54	STP/CMAQ	FL20150006	N	N		$408,245.00	$7,428,464.00	$7,836,709.00
2015	Pasco County	US 19/SR 55 from Marine Parkway to SR 52	STP/CMAQ	FL20150017	N	N		$211,283.00	$1,241,405.00	$1,452,688.00
								$9,662,164.00	$16,601,781.00	$26,263,945.00

Source: FHWA Air Quality. CMAQ Public Access System. https://fhwaapps.fhwa.dot.gov/cmaq_pub/Search

Table 50 below provides information about CMAQ funds awarded to commuter assistance programs, public transit projects, or projects identified under the Project Reporting Category as "Travel Demand Management". None of these projects were listed in the Public Access System Project Details as outreach projects.

The information in this table is noteworthy for two reasons. First, based upon the data listed in the FHWA CMAQ Public Access System, the South Florida Commuter Services program in the Miami Urbanized Area MPO appears to be the only commuter assistance program in Florida that has received CMAQ funding in the past five years. Second, while CMAQ funds can be flexed to be used for a variety of project types, some of these types of projects that were placed in the Project Category of Travel Demand Management are not ordinarily considered to be Travel Demand Management.

Considering just those projects listed below, which would be regarded as generally consistent with the commonly understood definition of Travel Demand Management (projects # 1, 2, 7, and 8), those projects received approximately one third of the total funding allocated to all projects categorized as Travel Demand Management.

Table 50. CMAQ-Funds Awarded by Project Reporting Category

	Year	Awardee	Project	Project Reporting Category	Further Description	CMAQ Capital Funds	Total Awarded
1	2019	Miami Urbanized Area MPO	South Florida Commuter Services in Miami Dade County Operations Commuter trans	Travel Demand Management	Program – Information/Matching – Matching, Marketing	$8,897.00	$11,121.75
2	2019	Miami Urbanized Area MPO	First Mile, Last Mile On-Demand Transit Service Dadeland/Civic Ctr areas	Travel Demand Management	Shuttle Services, Transit Services Demonstration; Operations	$800,000.00	$1,000,000.00
3	2019	Miami Urbanized Area MPO	**South Florida Commuter Services** in Miami-Dade County	Transit Improvements	Operating Assistance and Fuel	$45,585.00	$56,981.25
4	2019	No MPO identifed. State sponsored project	ITS Incident Management Enhancement	Travel Demand Management	Other ITS Operations	$1,005,996.00	$1,319,995.00
5	2019	Okaloosa-Walton TPO	SR 8 (I10) @ CR 4 Antioch Road interchange PD&E	Travel Demand Management	--	$243,226.00	$304,032.50
6	2018	Capital Region Transportation Planning Agency	SR 8 (I10) @ CR 4 Antioch Road interchange PD&E	Travel Demand Management	--	$558,014	$697,517.50

	Year	Awardee	Project	Project Reporting Category	Further Description	CMAQ Capital Funds	Total Awarded
7	2016	--	South Florida Commuter Services in Miami Dade County Operations Commuter Trans	Travel Demand Management	Shared Ride Project – Information/Matching, Matching, Marketing	$35,729.00	$35,729.00
8	2015	Miami Urbanized Area MPO	South Florida Commuter Services in Miami Dade County Operations Commuter Trans	Travel Demand Management	Shared Ride Project – Public Program – Information/Matching, Matching, Marketing	$62,306.00	$65,475.00
9	2015	Miami Urbanized Area MPO	Transit on NW 27th Enhanced Service	STP/CMAQ	--	$2,395,943.00	$11,955,330.00

Source: FHWA Air Quality. CMAQ Public Access System. https://fhwaapps.fhwa.dot.gov/cmaq_pub/Search

Proposed Federal Transportation Reauthorization: The INVEST Act

The federal FAST Act was extended one year to September 30, 2021. Since 2019, Congressional activity has focused on the process for a transportation reauthorization. Early efforts, including the proposed "America's Transportation Infrastructure Act of 2019", S. 1992, by the Senate Environment and Public Works Committee, proposed a 27 percent increase from the FAST Act in five-year transportation expenditures. The Senate EPW bill proposed preserving the core formula programs, including CMAQ, with a focus on performance, and adding a Congestion Relief Program and a formula Carbon Reduction Incentive Program. The Congestion Relief Program was proposed to fund a variety of activities including TDM strategies, such as a requirement that toll facilities allow free or reduced price HOV-3. The Carbon Emission Reduction Program was proposed for programs, including shifting traffic outside the peak, telework, ridesharing and pricing projects. The Reauthorization bill would require pricing projects to incentivize higher vehicle occupancy, and by time of day and route choice. The bill proposed integrating TDM into the transportation planning process, and congestion mitigation during construction, and greenhouse gas reduction into the formula programs.

The House Transportation & Infrastructure Committee proposed their own bill, the "Investing in a New Vision for the Environment and Surface Transportation in America (INVEST in America) Act", for $319 Billion over five years. In comparison, the FAST Act provided $225 Billion for the Federal-Aid Highway Program. Under the INVEST Act, the CMAQ program would grow at the same pace as the other programs and would allow operating expenses beyond the three-year limit. The INVEST Act proposed to provide substantial increases in bicycle and pedestrian network building, and congestion reduction grants that emphasize operational, technology and mode shift strategies. The INVEST Act would fund pilots for the development of a highway funding system based upon VMT. The INVEST Act would create

a new program to support greenhouse gas emissions reduction with performance metrics. The INVEST Act also proposes $105 billion for transit, as compared to $61.1 billion from the FAST Act.[173]

Presently, there are many unknowns, including whether the Senate and House will work together to create a transportation reauthorization bill that has bi-partisan support. What can be observed is an apparent shift in emphasis, as is evident in both bills, toward preservation, resiliency, reducing greenhouse gases, and an emphasis on operational, technology, and mode shift strategies.

[173] Jason Pavluchuck. Coalition for Smarter Transportation.

List of Acronyms

ACES	autonomous, connected, electric, shared
ACS	American Community Survey
ACT	Association for Commuter Transportation
ADA	Americans with Disabilities Act
ADM	active demand management
ALICE	Asset Limited, Income Constrained, and Employed
APTA	American Public Transportation Association
ATDM	active transportation and demand management
BEBR	Bureau of Economic and Business Research
BRT	bus rapid transit
BWC	Best Workplaces for Commuters℠
CAD/AVL	Computer-Aided Dispatch/Automated Vehicle Locator
CAP	commuter assistance program
CAPRDP	Commuter Assistance Program Regional Development Plan
CDC	Centers for Disease Control and Prevention
CES	constant elasticity of substitution
CIP	capital improvements program
CCC	Chairs Coordinating Committee
CEQA	California Environmental Quality Act
CMAQ	Congestion Mitigation and Air Quality
CMP	Congestion Management Process
COC	Communities of Concern
COOP	continuity of operations
CTR	commute trip reduction
CUTR	Center for Urban Transportation Research (University of South Florida)
DTA	Density Threshold Assessment
EPA	Environmental Protection Agency
ERH	emergency ride home
FAST	Fixing America's Surface Transportation (federal Act)
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FTC	Florida Transportation Commission
FTP	Florida Transportation Plan
FDOT	Florida Department of Transportation
GHG	greenhouse gas
GRH	guaranteed ride home
HART	Hillsborough Area Regional Transit Authority
HEAT	Health Economic Assessment Tool
HOV	high occupancy vehicle
HSIP	Highway Safety Improvement Program
ICT	information and communication technologies
IPCC	Intergovernmental Panel on Climate Change
ISTEA	Intermodal Surface Transportation Efficiency Act
ISP	Internet service provider
ITHIM	Integrated Transportation and Health Impact Model
ITS	Intelligent Transportation Systems

LGCP	local government comprehensive plan
LOS	level of service
LRTP	long range transportation plan
LOTTR	Level of Travel Time Reliability
LPA	local public agency
LPS	leading pedestrian signal
LRTP	long range transportation plan
MaaS	Mobility as a Service
MCAT	Manatee County Area Transit
MOE	margin of error
MPO	metropolitan planning organization
MOVES	Motor Vehicle Emission Simulator
MSA	metropolitan statistical area
MTP	metropolitan transportation plan
NAAQS	National Ambient Air Quality Standards
NACTO	National Association of City Transportation Officials
NAICS	North American Industry Classification System
NCST	National Center for Sustainable Transportation
NEPA	National Environmental Policy Act
NHFP	National Highway Freight Program
NHPP	National Highway Performance Program
NHTS	National Household Transportation Survey
NPMRDS	National Performance Management Research Data Set
NTD	National Transit Database
PCPT	Pasco County Public Transit
PD&E	Project Development & Environment (study)
PHED	Peak Hour Execessive Delay
PMT	passenger miles traveled
PPRM	Performance and Production Review Measures
PSTA	Pinellas Suncoast Transit Authority
QTFB	Qualified Transportation Fringe Benefits
RRT	Regional Rapid Transit
SafeTRIP	Safe **T**raffic Management, **R**egional Demand, **I**nnovation, **P**ublic Engagement
SHSP	Strategic Highway Safety Plan
SIP	state implementation plan
SIS	Strategic Intermodal System
SMART	specific, measurable, achievable, realistic, timebound
SOV	single occupant vehicle
STP	Surface Transportation Program (interchangeable with STBG)
STBG	Surface Transportation Block Grant (interchangeable with STP)
SUN Trail	Shared Use Nonmotorized Trail
SWOT	strengths, weaknesses, opportunities, threats
TBARTA	Tampa Bay Area Regional Transit Authority
TBSCA	Tampa Bay Smart Cities Alliance
TCQSM	Transit Capacity and Quality of Service Manual
TD	transportation disadvantaged
TDM	transportation demand management
TDP	transit development plan

TEDI	Transit Equity Demand Index
TEEM	TDM Effectiveness Evaluation Model
TheBus	Hernando County Transit Services
TIP	transportation improvement program
TMA	transportation management area
TMI	transportation management initiative
TMO/TMA	transportation management organization/association
TMOCG	Tranportation Management Organization Coordination Group
TNC	transportation network company
TOD	transit-oriented development
TOI	Transit Orientation Index
TRIMMS™	Trip Reduction Impacts of Mobility Management Strategies (model)
TSM&O	transportation systems management and operations
TTTR	Truck Travel Time Reliability
UPWP	Unified Planning Work Program
USD	U.S. Dollars
VMT	vehicle miles traveled
VSL	value of a statistical life
VT	vehicle trips
VTR	vehicle trip rate
WHO	World Health Organization
WSDOT	Washington State Department of Transportation
WTRM	Worksite Trip Reduction Model
WZDx	Work Zone Data Exchange