



Chapter 5
Technology/Autonomy



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Supporting Documents

- Automation Summary Report (ITS / TSM&O Workshops)





5.0 Technology/Autonomy

The MPO develops ways to better manage congestion.

The MPO supports Advanced Traffic Management System (ATMS) technology to reduce traffic jams, coordinate traffic signals, keep buses on schedule, improve reliability, and manage parking more efficiently.

Rapid advances in transportation technology are expected to radically transform how Floridians move around the state within the next few decades. Even today, people are turning to mobility on-demand like shared rides, shared e-scooters, and shared bicycles. In the same way, significant growth in e-commerce is already changing the way freight moves on our highways and local streets. This trend is expected to continue, with NASDAQ predicting in 2017 that by 2040 as much as 95% of shopping will be facilitated by e-commerce.

To stay ahead of this shift, the MPO is taking these trends into consideration during the LRTP process and is already acting today. The transportation system of tomorrow will require many advanced roadside technologies to function properly and Sarasota and Manatee Counties already have a host of it in place: 520 traffic signals, 287 closed-circuit television (CCTV) cameras, four arterial dynamic message signs (ADMS), 68 microwave vehicle detection systems (MVDS), and 127 Bluetooth readers¹. The LRTP prioritizes projects that can help expand this system, better preparing larger portions of the roadway network.

This technology serves as the base towards achieving the transportation system of the future, including the 2045 Connected and Automated Vehicle Priority corridors of I-75, US-41, and the newly added SR-80/Fruitville Road corridor.

The primary guiding document is the LRTP Technology Memorandum (2020), which summarizes a wide variety of topics related to transportation technology as it applies to the region's transportation system.

¹ Manatee County RTMC Reports, Q4 2019.

Technology / Autonomy

Objectives

Projects shall...



Improve operating efficiency using intelligent transportation systems.



Identify infrastructure needed for Autonomous / Connected / Electric / Shared-Use technology.

Prioritization Factors

Does the project...

Expand the advanced traffic management system?



5.1 L RTP Technology Memorandum (2020)

The L RTP Technology Report was drafted to better understand how emerging transportation technologies will impact cities within the L RTP's planning horizon. The report reviewed the following specific items

- Technology and the L RTP's Vision;
- National and State Guidance;
- Sarasota/Manatee MPO Response; and
- L RTP Recommendations

The following sections serve to summarize the key plans, trends, and guidance on transportation technology identified through the research conducted for the L RTP Technology Memo.

5.1.1 L RTP Vision

The 2045 L RTP update is a guide for developing the multi modal transportation system of tomorrow and is built upon the requirements of Federal and State law and emerging transportation issues. Mobility on Demand (MOD), autonomous vehicles (AVs), and connected vehicles (CVs) and their respective impacts on the transportation network are among the emerging issues identified by the FHWA. To help steer this process, the MPO developed a series of scenario planning exercises designed around robust stakeholder involvement. At the conclusion of this process on April 20, 2020, the MPO Board adopted a series of Vision Statements:



Promote Economic Diversity:

Attract high-tech businesses and employees, focus on port centers as economic engines, brand and plan for the higher education/cultural corridor on US-41, prepare transportation infrastructure for new technology.



Preserve Environmental Health:

Safeguard treasured environmental assets, plan for resiliency from storms and flooding, balance protection and land use, increase density, and decrease auto dependency.



Create Vibrant Places:

Increase housing and transportation choices, provide more multi modal options including safe walking and bicycling, preserve corridors for future premium transit to connect urban centers.

In the spirit of achieving these visions, each of which includes or is impacted by a transportation technology component, the L RTP Technology Memo details national, state, and regional guidance for addressing transportation technology and resulting L RTP recommendations.



5.1.2 Key Takeaways from National and State Guidance

Significant attention has been paid to the impending autonomous future and research efforts have been undertaken to understand and prepare for the adoption of emerging transportation technologies. The LRTP Technology Memo reviews leading industry research and publications from professional and research organizations to highlight the opportunities and challenges related to emerging transportation technologies. The Technology Memo identified that emerging transportation technologies present significant opportunities for good by reducing some crash types, increasing mobility access and choice, and increasing efficiencies in the transportation system.

The Technology Memo also identified areas where agencies and policy makers need to take an active role in addressing the changes that will be brought by emerging transportation technologies. One such example is the necessary evolution of transportation funding sources. Agencies will need to develop and advocate for new ways of funding transportation budgets, as autonomous vehicles (AVs), Alternative Fuel Vehicles (AFV), and electric vehicles (EVs) threaten to significantly shrink fuel tax revenue. The impact of these changes to state fuel tax revenue is shown as **Figure 5-1** as described by the Center for Urban Transportation Research (CUTR).

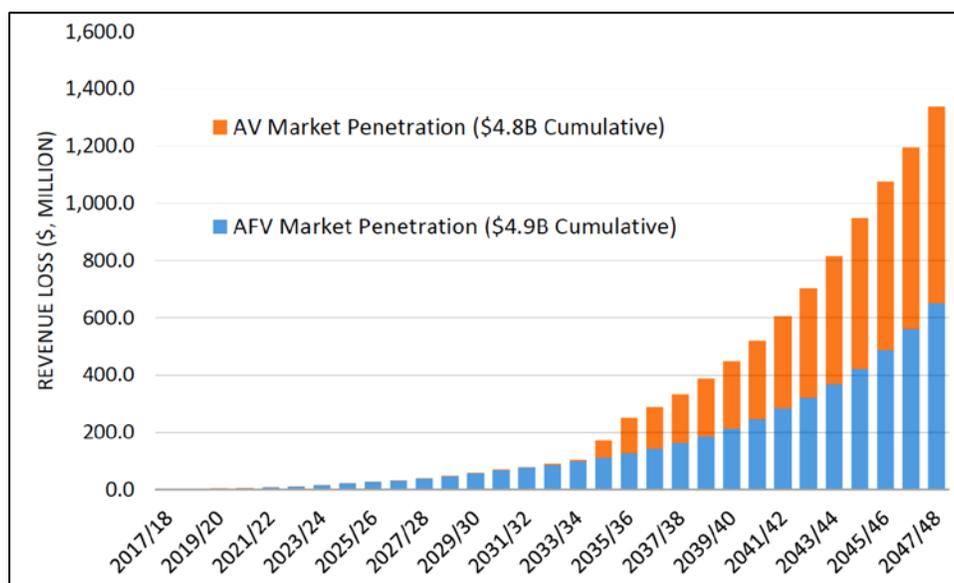


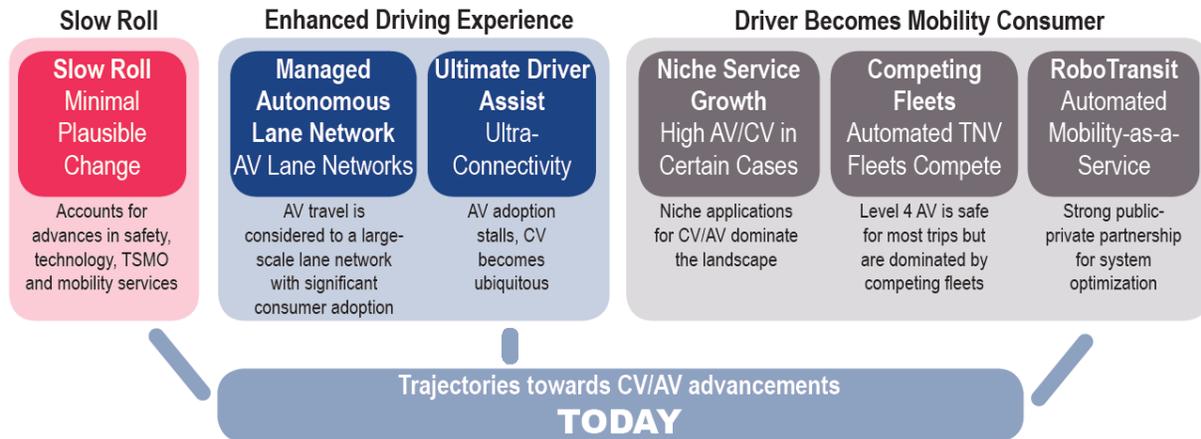
Figure 5-1: Combined State Fuel Tax Revenue Losses from AFV and AV Market Penetration

A common thread throughout the national and state research efforts was that decisions made today will have major impacts on how new technologies will shape cities of the future so consideration of emerging technology and data sources are paramount as the MPO plans for the future transportation system. Many advanced technologies are best used on a regional level, MPOs can serve as an important resource to local agencies looking to implement such technologies.



MPOs should continue to coordinate with State and Federal authorities while staying abreast of emerging trends.

Figure 5-2 shows three CV/AV trajectories based on information from the FDOT Automated, Connected, Electric and Shared-Use Vehicles (ACES) Guidebook. These trajectories can be used by the MPO as a starting point for their own long-range planning to assess how CV/AV trends may apply to the social, economic, and transportation vision for their region.



Source: FDOT, "Guidance for Assessing Planning Impacts and Opportunities of ACES Vehicles," 2018.

Figure 5-2: Trajectories Towards CV/AV Advancements

5.1.3 Sarasota/Manatee MPO Response

The MPO has already begun to explore the implications of future transportation technology for the Sarasota/Manatee region. In 2019 and 2020, the Sarasota/Manatee MPO held a series of Intelligent Transportation Systems (ITS) workshops to educate the community about the national and statewide trends for integrating advanced transportation technology in the transportation network. These sessions addressed how MPOs can guide the development of these technologies in Sarasota and Manatee counties through inclusion in the LRTP. Additionally, these sessions served to coordinate with the MPO's local implementing partners on a funding and investment strategy moving forward to best use the available Federal and State transportation revenues for technology-based solutions.

The MPO has also pursued "big data" through a contract with software-as-a-service company, StreetLight, to obtain real-time data on traffic patterns and behavior along the region's transportation networks for the update to the LRTP. Data sources such as this are a major opportunity for MPOs to affordably inform data-driven policy decisions. To date, the MPO has used this powerful new data source to analyze congestion and prioritize active transportation



infrastructure based on existing bicycle and walking origin-destination trends. The MPO is encouraged to look for opportunities to integrate this new real-time data into existing or future performance metrics.

The LRTP Technology Report outlined a collection of emerging transportation technology trends and encouraged MPO staff to stay apprised of these trends as each evolves or emerges, especially as they pertain to the unique areas under the MPO's jurisdiction or individual transportation networks. The emerging trends include:

- **Land Use Policies**- Integration of land use and transportation planning should be considered to promote more positive outcomes for ACES, AVs, and integration of transit-oriented development (TOD).
- **Electric Charging Stations**- Publicly available charging stations will be needed as EVs approach wide adoption.
- **Smart Cities** | An umbrella term that covers a multitude of technologies such as sensors to determine parking availability, pedestrian counts, and congestion.
- **Mobility-as-a-Service (MaaS)**- An umbrella term covering many forms of shared mobility, including carsharing (e.g., Zipcar), microtransit options such as bike sharing and scooter sharing (e.g., B-Cycle, Bird), on-demand ride services (e.g., Lyft), and microtransit options (e.g., Via), and is often integrated into trip planning tools.
- **Microtransit**- A form of MaaS that most often includes on-demand and pre-scheduled transit completed by smaller vehicles such as vans or six-seat EVs.
- **Shared Mobility**- A form of MaaS that involves the rental of small vehicles such as e-scooters, pedal bikes, and e-bikes is expected to become more widespread in urban areas.
- **Mobility Data Standards and Data Privacy** These data can be generated by shared micromobility vehicles, smartphones, on-board vehicle computers, or app-based navigation systems. Data privacy policy will be needed to protect end users while helping to inform the planning process.

5.1.4 LRTP Recommendations

As the primary guide of transportation over the next decade and beyond, the 2045 LRTP update provides a major opportunity to influence the way technology is incorporated into the transportation network. As development of the LRTP moves forward, impacts of emerging technology should especially be considered in the following categories:

- **Congestion Management** – CV, ITS, and “smart city” technologies will, and already do, offer significant opportunities to enhance congestion management techniques. These technologies should be incorporated into the decision-making process whenever possible



when considering congestion management techniques, including the proposed TSM&O Committee noted later in the recommendations.

- *Funding Strategies* – A shift in Florida’s vehicle fleet towards a larger proportion of shared-use and electric vehicles will have a profound impact on revenue collected by Federal, State, and local government. Consideration should be paid to alternative funding mechanisms such as annual or usage fees. Flexibility should be encouraged as trends not yet envisioned for this sector continue to evolve.
- *Performance Measures* – Consideration of emerging technologies is invaluable in tracking performance moving forward and must be included in the LRTP. Leveraging emerging data sources such as mobility data to measure project performance should be considered where appropriate.
- *Transit* – Today’s transit ecosystem is already being “disrupted” as a result of the emergence of new MaaS technologies. This trend is expected to continue, especially as AV technology begins market penetration at meaningful levels. Transit decisions should consider these existing and future changes with a goal of producing a relevant and resilient transit network throughout the LRTP planning horizon.
- *Project Ranking* – Consideration of future technologies, in the form of expanding the Advanced Traffic Management System, should be a component of the project ranking process in the 2045 LRTP. For example, a project that considers the impact of future technologies, builds in “future-proofing,” or incorporates an advanced technology should receive additional weight when compared to a similar project that does not. This technique will ensure that projects funded by the LRTP remain relevant well into the future. Future expansions of the project ranking criteria should be considered as the deployment of transportation-based technologies are advanced.
- *Transform 2045 TSM&O Committee* – A Committee should be formed to ensure that application of advanced transportation technologies meets the intent of the LRTP and other regional transportation plans. The Committee’s members should include, at a minimum, subject matter experts in the fields of planning and engineering representing Federal, State, regional, or local authorities. These authorities should include counties, municipalities, transportation agencies or authorities, and other transportation-related fields as appropriate.