Safety, ITS, Technology & Security

2045 Long Range Transportation Plan Technical Report #5

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Prepared for

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Section 1: Introduction

In addition to safety and security, which have historically been integral aspects of any major multimodal planning activity in Pasco County, technology has become an increasingly important planning consideration given the growth in potential technological applications for multimodal systems. When creating plans associated with the county’s multimodal transportation network, safety, security, and technology impacts on users of all types of modes, including road users, bicyclists, and pedestrians, must be considered and addressed.

Safety and security considerations in multimodal transportation systems are key federal requirements. Under current federal law, the metropolitan planning process for a metropolitan planning area must provide for consideration of projects and strategies that will increase the safety and security of the transportation system for motorized and non-motorized users. In addition, review and analysis of the safety target areas or “emphasis areas” identified at the state level by the Florida Strategic Highway Safety Plan also are required to ensure consistency in the planning process.

MOBILITY 2045 reviews existing conditions related to these considerations, identifies initiatives already in place to address them, and recommends enhanced strategies and effective countermeasures to address the issues and related impacts.

Furthermore, MPOs in Florida have been encouraged to address emerging topics, including technology advances, in the LRTP. Beginning to address these issues early on may potentially minimize the level of effort needed to achieve future compliance.
Section 2: Transportation Safety

Providing and improving safety of the transportation system is crucial to the health and well-being of residents, visitors and business travelers in Pasco County. As a federally required component of the metropolitan transportation planning process, safety is analyzed within this section through the combination of GIS and the FDOT’s Crash Analysis Reporting System (CARS).

Under the Federal Highway Safety Improvement Program (HSIP), five performance measures have been established for evaluating safe traveling conditions on the highway system. These measures became effective on April 14, 2016 and were developed to consider the safety of motorists, bicyclists, and pedestrians. The goal of the HSIP is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, supported by the following five performance measures established under MAP-21 and reinforced through the FAST Act.

- **PM 1**: Number of fatalities
- **PM 2**: Rate of fatalities (measured against roadway traffic volumes)
- **PM 3**: Number of serious injuries
- **PM 4**: Rate of serious injuries (measured against roadway traffic volumes)
- **PM 5**: Number of non-motorized (bicycle and pedestrian) fatalities and serious injuries

Three measures (PM1, PM3, and PM 5) evaluate the total number of fatalities and serious injury crashes. The two remaining measures (PM 2 and PM4) evaluate the fatalities and serious injuries based on traffic volumes as a means of normalizing crash severity results against roadway conditions. Expressed as crashes per 100 million vehicle miles traveled (VMT), the fatality and serious injury rates provide a basis for comparing crash severity conditions across varying geographic areas.

In addition to reporting on the established performance measures, the Florida Department of Transportation (FDOT) and the MPO are now responsible for establishing annually reported targets for each of these five measures. Since crash data from any given year may have extreme peaks or valleys, a rolling five-year average of the data is used as the basis for evaluating crash patterns and trends.

The visualizations and data analysis for MOBILITY 2045 utilized crash data from 2012 to 2016. After being aggregated and joined within GIS to traffic volume data, the spatial analysis of total crashes and the crash rates was used for analysis and reporting consistent with the federal safety performance measures.

The top 25 road segments with the highest number fatal and severe injury crashes are located primarily along major highways in the County (Figure 2-1). Interstate 75, US 19, SR 52 and SR 54 all had segments...
that were within the top 25 of total crashes. These roadway segments rank towards the top in terms of total crashes as a function of higher volumes of traffic that travel along major corridors.

Figure 2-2 illustrates the same analysis conducted for the rate of fatal and serious injury crashes normalized by traffic volumes as described above. The top 25 road segments measures by the rate of fatalities and serious injuries are much different than the top 25 segments based solely on crash frequency. This normalization of the data shows the highest rate of fatalities and serious injuries occurring primarily on county and local roadways with lower traffic volumes than the state highways and interstates.

Crashes involving bicyclists and pedestrians are concentrated in western Pasco County, primarily along the US 19 corridor (Figure 2-3). The higher population density of the US 19 corridor is a key factor in the number of crashes, as higher population densities are more likely to see more bicycle and pedestrian activity. One roadway segment of note is Moog Road, which has previously been identified in studies as a focus corridor. The roadway section and surrounding land use patterns lead to an unsafe environment for bicycles and pedestrians and is seen on Figure 2-3 as a top crash corridor.
Figure 2-1: Top 25 Roadway Segments by Total Serious Injury and Fatality Crashes
Figure 2-2: Top 25 Roadway Segments by Normalized Total Serious Injury and Fatality Crashes
Figure 2-3: Top 25 Roadway Segments by Total Bicycle and Pedestrian Crashes
As the total population of Pasco County continues to rise, so does the amount of crashes resulting in an injury or fatality. The increase in population is not the primary culprit for the increase in crashes however, as the annual percentage growth of population is far below the total amount of crashes as seen in Figure 2-4.

**Figure 2-4: Percent Growth, 2013–2016**

Source: BEBR and CARS

Figure 2-5 summarizes the countywide distribution of crash characteristics from 2012-2016 for each of the FDOT SHSP Emphasis Areas. Nearly three in every 10 crashes occur at an intersection and more than 1 in four involves an at-risk driver. While less than 10 percent of the total crashes from 2012-2016 involved a vulnerable road user, Figure 2-6 shows that in the same time period vulnerable road users accounted for more than 20 percent of the serious injuries and fatalities resulting from traffic crashes.

Additional observations from the crashes over this 5-year period include:

- Lane departures are the only other crash factor that represents more than 10 percent of the crashes.
- In addition to vulnerable road users, impaired driving is the only other SHSP Emphasis area that has a noticeable increase in the share of fatalities and serious injuries compared with the total crash statistics.

To address the serious nature of vulnerable road user fatalities and serious injuries, FDOT conducted a Countywide Pedestrian and Bicycle Safety Action Plan (PBSAP). This study targeted focus corridors and intersections, which produced a variety of strategic action items to improve bicycle and pedestrian safety. In total, eight corridors and four intersections were identified as crash focus areas from this study. Excerpts from this study are included in Appendix A.
Figure 2-5: All Crashes by Emphasis Area in Pasco County, 2012–2016

- Lane Departure: 29%
- Intersection: 27%
- Impaired Driving: 17%
- At-Risk Drivers (Aging Drivers & Teens): 14%
- Distracted Driving: 9%
- Commercial Vehicle: 9%
- No Restraint: 8%
- Vulnerable Road Users (Pedestrians, Bicyclists, Motorcyclists): 8%
- Aggressive Driving: 2%
- Impaired Driving: 2%

Figure 2-6: Fatal Crashes by Emphasis Area in Pasco County, 2012-2016

- Lane Departure: 18%
- Intersection: 14%
- At-Risk Drivers (Aging Drivers & Teens): 11%
- Distracted Driving: 9%
- Commercial Vehicle: 3%
- No Restraint: 3%
- Vulnerable Road Users (Pedestrians, Bicyclists, Motorcyclists): 21%
- Aggressive Driving: 3%
- Impaired Driving: 3%
Section 3: ITS

Intelligent Transportation Systems (ITS) integrate advanced communication and electronic technology with transportation infrastructure and vehicles to enhance safety, mobility, and system efficiency. Various agencies oversee ITS architecture at local, regional, and statewide levels, with the intent that these architectures will be consistent with each other through coordination of stakeholders overseeing or contributing to them. These architectures serve as the platforms to provide ITS services that improve transportation outcomes.

Regarding Pasco County, Figure 3-1 shows the existing, funded, and potential future corridors with ITS infrastructure. The projects represented on these corridors include County and FDOT infrastructure. Table 3-1 provides a descriptive list of Pasco County and FDOT District 7 projects that will expand ITS connections and services. Appendix B includes a comprehensive list of the various ITS services which explicitly note involvement of Pasco County according to FDOT District 7’s Regional ITS Architecture website along with the associated stakeholders involved with providing these services.

The different stakeholders coordinate via data exchanges among their ITS architecture and infrastructure components. For example, the two key ITS centers involved with operating roadways in Pasco County are the Pasco County Traffic Operations Center and the FDOT District 7 Tampa Bay SunGuide Center.
Figure 3-1: Corridors with Existing and Future Intelligent Transportation Systems (ITS)
Table 3-1: Pasco County & FDOT District 7 ITS Architecture Projects

<table>
<thead>
<tr>
<th>Agency</th>
<th>Project Name</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasco County Public Transportation</td>
<td>Regional SmartCard Project</td>
<td>Development of a single regional SmartCard that would work for all transit agencies in the region</td>
</tr>
<tr>
<td>FDOT District 7</td>
<td>FDOT Dynamic Tolling</td>
<td>This project would enable dynamic tolling on express lanes in District 7. Under this scenario, the FDOT D7 SunGuide Center would calculate tolls based on traffic data, which would then be posted on equipment and sent to SunPass, where tolls would be posted to accounts</td>
</tr>
<tr>
<td>FDOT District 7</td>
<td>FDOT Wrong-Way Driver Detection</td>
<td>More advanced version of wrong-way driver detection using Vehicle to Infrastructure communication technologies.</td>
</tr>
<tr>
<td>Coat Guard Security Video</td>
<td></td>
<td>The Coast Guard is installing security equipment around the port (and potentially at bridges). This project is to bring the video from security equipment being installed by the Coast Guard back to the ATMS.</td>
</tr>
<tr>
<td>FDOT Arterial DMS</td>
<td></td>
<td>Install Dynamic Message Signs on arterials leading to highways</td>
</tr>
<tr>
<td>FDOT Emergency Weather Conditions</td>
<td></td>
<td>Get emergency weather information from National Weather Services and provide emergency weather condition dissemination through web and DMS.</td>
</tr>
<tr>
<td>FDOT Fog Detection System</td>
<td></td>
<td>District 1 will deploy a fog detection system on I-4, which, pending acceptance, will then be operated by FDOT District 7.</td>
</tr>
<tr>
<td>FDOT Port Project</td>
<td></td>
<td>Implement a fiber connection to the regional ports and the Coast Guard; implement CCTV, DMS, CV HAR to provide information on interstate and connector traffic</td>
</tr>
<tr>
<td>FDOT Wrong-Way Driver Detection</td>
<td></td>
<td>Detection of wrong-way drivers on limited access ramps</td>
</tr>
<tr>
<td>Gateway Project</td>
<td></td>
<td>Develop Managed Lanes leading to I275. Includes Open Road Tolling and ITS devices.</td>
</tr>
<tr>
<td>Tampa International Airport Expansion</td>
<td></td>
<td>Tampa International Airport (TIA) is also undergoing a major expansion, adding DMS, and will eventually interface with the ATMS. D7 has signed an agreement with TIA to exchange information.</td>
</tr>
</tbody>
</table>

Section 4: Technology

ACES Overview

Incorporating technology considerations in long-range transportation planning is more vital than ever given emerging technologies that have the potential to completely transform prevailing transportation practices. Yet there is great uncertainty, with outcomes depending on a variety of factors such as the types and rate of technology adoption and market penetration. Discussion of emerging transportation technologies in Florida has been categorized as “ACES,” representing:

- Automated - vehicle guiding itself with little or no input; minimal effects are anticipated with lower levels of automation, yet profound effects are possible with the highest levels of automation where the human occupant is removed from the driving process.
- Connected - devices linking vehicles and the transportation infrastructure for improved safety and efficiency
- Electric – vehicles using one or more electric motors for propulsion
- Shared-use – vehicles used and not necessarily owned by more than one person or organization

While these technologies are distinct, communities will likely adopt them to some degree in a combination. As a result, one effort of long-range planning with regards to these technologies is developing locally tailored scenarios. The Federal Highway Administration has developed six scenarios based on a future year of 2035 as starting points for input and local scenarios for the purposes of LRTPs (Figure 4-1).


There are both gains and negative impacts to consider in the adoption of these different technologies. Figure 4-2 broadly summarizes benefits by driving externalities with a relative comparison among the different technology types. Safety emerges as a key benefit in adopting these technologies, echoed by several tenets of the Institute for Transportation Engineers position paper on CV/AV technology.²

Figure 4-2: Potential Benefits of ACES Technologies

<table>
<thead>
<tr>
<th>Driving Externality</th>
<th>Connectivity (Full V2X)</th>
<th>Autonomy* (L4, L5)</th>
<th>Shared Autonomy (L4, L5)**</th>
<th>Electrification ***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Congestion</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Emissions</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Land Use</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mobility</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

² Institute of Transportation Engineers (December 4, 2018) ITE Statement on Connected and Automated Vehicles.
Florida Department of Transportation (July 18, 2018) Future Mobility Research Synthesis. Prepared by RSG.

A more comprehensive overview of potential impacts of these technologies are listed by theme below, based on a review of relevant ACES research and documentation;³ note that these impacts are potential given the uncertainty of how technologies will evolve.

**Safety**
- Automated and connected vehicles provide enhanced warning notifications and may reduce crash rate due to human error, although partial automation may increase risk due to driver complacency; there are also concerns over safety in mixed-traffic scenarios or where there are non-CV/AV vehicles
such as motorcycles. The Florida Connected Vehicle Program Initiative, run out of FDOT TSMO Office, identifies roadway hazards and alerts drivers. Technologies include:

- Emergency Vehicle Preemption
- Freight Signal Priority
- Global Positioning System Navigation
- On-Board Units
- Roadside Units
- Signal Phase and Timing (SPaT)
- Transit Signal Priority
- Vehicle Sensors
- Wireless Communications

- ACES may increase safety for cyclists and pedestrians yet could also make the urban transportation system more complex and harder to navigate for these users.
- There may be more space for other land uses and walking/cycling infrastructure if vehicle space needs are reduced with emerging technologies (due to accuracy, efficiency, and reduced parking needs).

Travel Demand

- ACES may reduce time or eliminate first/last mile trip to get to/from main mode of transport (e.g., walking to parked car or transit) if more door-to-door service is provided.
- People may accept longer trip lengths due to the ability to do activities other than driving while in transit.
- Increased automation or shared-use may increase car trips due to people who could not drive before using automated vehicles and a potential shift away from traditional transit use or active transportation.
- Automation may increase zero-occupancy trips.
- Opportunities for higher vehicle occupancy with shared-use which can reduce congestion, yet also may involve more zero-occupancy trips; trip-chaining and algorithms could reduce zero-occupancy trips in shared-use vehicles but can reduce door-to-door service.
- Lower costs overall (higher use of capital investment and lower variable costs such as insurance) may lead to more discretionary trips.
- Shift in how transit is defined with rise of microtransit.
- Telecommuting and e-commerce may replace trips.

Roadway System and Infrastructure

- Dedicated AV/CV-only lanes to allow coordinated speed control on limited-access highways and arterials.
- Increased roadway capacity due to reduced space and safety buffer needs, reduced vehicle size, balancing of roadway use across routes and times.
- Need for highly visible pavement markings and signs.
- Need for curb space, although increased ability for off-hours deliveries with delivery lockers may temper need for loading zones; emergence of special automated vehicle areas in downtown or multi-use districts.
• May increase ability of people to “age in place”, affecting road and streetscape design needs to accommodate older populations (curbside loading zone design, placement of benches, etc.)
• Eventual possibility of fully connected and autonomous vehicles not requiring signals and stop signs
• Potential changes in need for ITS infrastructure. Smartphones and vehicle connections to the cloud using existing 4G wireless broadband technology will allow for connected vehicle applications; advanced traffic signal control systems are using cloud-sourced vehicle location data and smartphone detection equipment to manage congestion
• Need for more charging infrastructure for electric vehicles, with implications for power generation and distribution

Transit System and Active Transportation
• Reduction in transit use that may result in shared-use vehicles replacing transit, particularly more diffuse transit service and active transportation; this possible outcome would likely cause transit to focus on high-quality major corridors with a potential for increased transit priority corridors in these areas. Shared-use vehicles have been used in partnership with transit in the following markets – first/last mile connections, night and weekend service, underserved areas, and ADA paratransit. This has also led to more integration of payment and opportunities for further coordination as more intercity transit options come online.
• Need to redefine transit as providing shared mobility instead of just traditional transit

Funding and Financing
• Reduction in fuel tax revenues due to electric vehicles
• Increased reliance on alternative funding sources, such as vehicle registration fees, which may be impacted if vehicle ownership rates change due to technologies such as shared-use vehicles, and VMT-based fees
• Increased safety and less influence of human error may reduce revenue from traffic violations
• Reduced need for parking may reduce parking revenues
• There are incentives offered to promote ACES, such as EV incentive programs
• Vehicles may be more expensive to fix
• Reduced crash costs
• In view of possible changes to transit uses listed previously, a decline in support for funding of traditional public transit is possible

Equity and Engagement
• Expanded transportation options for persons who cannot or do not drive
• Lower access of underserved communities to transportation due to inability to access new technologies at rates of other communities and reduction of existing services (e.g., traditional bus service) with rise of new services
• Access to new services affected by access to supporting technologies, such as smart phones and internet-accessible banking and credit cards
• Accommodating different abilities
• Rural communities may face lower access due to lack of density and cost barriers
• VMT-based fees as an alternative funding source may affect populations that may have to drive more currently for affordability reasons (living further away from core), yet it is unclear how land/housing costs further away from urban cores will be affected by new technologies.
• As in the past, government action will be needed to ensure equity with application of new technologies.
• Where remote parking will be located – perhaps disproportionately in marginalized communities.
• Automation of jobs related to driving.
• Engagement may become more complex requiring additional resources and technical knowledge to communicate.

Land Use
• Residential location may be affected since driver can be doing activities other than driving in autonomous vehicles; note that many other factors affect location choice. Residents in suburbs and exurbs may prefer owning a personal connected/autonomous vehicle, which would undermine collective benefits of shared-use.
• Increasing e-commerce and delivery patterns shifts affect the location of brick-and-mortar stores.
• Rise in use of delivery lockers; freight vehicles may become “lockers on wheels” to allow for movement of coded lockers and preparation of deliveries while vehicle is in motion.

Parking
• Reduced parking demand and repurposing of garages.
• Parking may arise in more remote locations.
• Need for vehicle maintenance/upkeep sites for shared-use vehicles; note how this might relate to current private ownership vehicle maintenance sites.

Efficiency
• Potential for fuel efficiency with more accurate and coordinated driving (e.g., freight, near signals).
• Potential for reduced energy use and emissions with higher occupancy vehicles in shared-use (although it is unclear if this would be off-set by zero-occupancy trips).

Security
• Data collection, storage, and security needs will change and increase.
• Potential cybersecurity failure (e.g., systems get hacked).
• Infrastructure will need to be resilient to hazards; shared-use may complicate evacuation efforts. Participation of vehicle owners in evacuation processes may need to be mandated.

Legislative & Agency Response
States vary in terms of whether they have adopted or are considering legislation regarding autonomous vehicles, and rules vary among states that have passed these laws. Federal agencies such as the U.S. Department of Transportation (U.S. DOT) and Congress have taken steps to move towards more standardized guidance and requirements to address this technology in transportation. In 2016, U.S. DOT

released non-binding performance guidance on autonomous vehicles.\(^5\) In 2019, it released *Automated Vehicles 3.0: Preparing for the Future of Transportation*, which includes:

- Principles for guiding the federal approach to shaping policy for automated vehicles
- Roles in engaging with automation at the federal level; at the state, local, and tribal government levels; and in the private sector
- Implementation strategies moving forward

Key principles guiding U.S. DOT’s approach include:

- Prioritizing safety
- Remaining technology neutral
- Modernizing regulations
- Encouraging a consistent regulatory and operational environment
- Preparing proactively for automation
- Protecting and enhancing mobility choice freedoms (including the freedom to drive one’s own vehicle)

While the document does not explicitly call out a specific MPO role, many initiatives geared towards more localized entities may apply to the efforts of the MPO. These initiatives relate to the following themes:

- Public engagement and education
- Research to understand impacts of automation, remove barriers, and address market failures and public needs
- Identifying data needs and opportunities for data exchange
- Scenario development
- Assessment of roadway readiness and support for piloting/safety testing
- Improving organizational capacity and expertise related to automation

Initiatives related to other roles will contextualize these efforts, such as the development of policy/regulatory guidance to remove barriers to automation and voluntary standards and safety assessments, including those related to vehicle design.

In addition to the guidelines from U.S. DOT, federal legislation is also under consideration to influence the direction of autonomous vehicle technologies. A recent policy brief by John Paul MacDuffie of the University of Pennsylvania Wharton School summarizes some of the implications of H.R. 3388, or the SELF-DRIVE Act, awaiting a vote in the Senate, as well as policy trajectories of autonomous vehicles.\(^6\) The SELF-DRIVE Act in its latest form would include provisions for:

- A uniform standard for technology and safety
- Prohibiting states from blocking use of automated vehicles without human controls within their borders

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\(^6\) John Paul MacDuffie, PhD (May 2018) The Policy Trajectories of Autonomous Vehicles, University of Pennsylvania Penn Wharton Public Policy Initiative, Issue Brief, Vol. 6, No. 4
• Prohibiting state from setting rules on automated vehicle production and testing standards
• The exemption of self-driving car manufacturers from existing safety standards up to a certain number of cars in the first year
• Requiring self-driving car manufacturers to demonstrate the safety of their vehicles

While some observers support the safety provisions, others are concerned at the pre-emption of state authority to set safety standards without clear regulation at the federal level to fill the gap.

MacDuffie highlights additional policy considerations summarized below.

• “Geo-fencing” may be particularly relevant to local and regional transportation planning efforts.
• Whether federal guidance may support an approach to increased automation that includes levels where the automated system monitors the driving environment, but the human driver is still “in the loop” to take over driving in certain situations; some argue that having drivers come back into control is too risky, which supports an increase in automation from vehicles where the human driver is predominantly monitoring the driving environment straight to full-blown automation.
• The possibility of enforcing a single standard for performance evaluation (e.g., a “driver’s license” for automated vehicles) and ethical dilemmas
• How to invest in infrastructure; some argue that “smart” infrastructure is necessary for the success of automated vehicles, while some have moved forward with automated vehicles that are not reliant on direct communication with other cars or upgraded infrastructure.
• The allowance by local jurisdictions for testing and expansion of automated vehicles, in conjunction with meeting local priorities (e.g., expansion of green vehicles); “geo-fencing,” or the ability to limit the activity of automated vehicles to certain geographic areas mapped in detail, is one aspect of this method of increasing testing and expansion of this technology.
• How liability will shift with the emergence of automated vehicles and the need for expanded public and supporting private insurance

The American Planning Association provides additional policy guidance in its PAS Report 592 that provides a starting point for discussion in regional and local jurisdictions7, providing a basis for the summary below. This guidance responds to many of the issues and opportunities posed by emerging technologies discussed earlier in this section.

General Planning:

• Quality planning that adheres to foundational goals and principles (e.g., protecting environmentally sensitive land, providing a range of transportation and housing options, etc.) remains highly important with the emergence of autonomous mobility technology; proactive planning with the ability to regularly re-assess for changing circumstances allows for these principles to shape outcomes instead of the technology itself.

7 Jeremy Crute; William Riggs, AICP; Timothy S. Chapin; and Lindsay Stevens, AICP; American Planning Association (September 2018) PAS Report 592: Planning for Autonomous Mobility
- Integrate autonomous vehicle discussions into planning and public engagement processes, including use of visioning exercises and generation of alternative scenarios to achieve the vision, identify and harness benefits, and identify and address issues.
- Explore opportunities to assess and facilitate data sharing behavior (e.g., between Transportation Network Companies that provide shared mobility, planners, and policy makers)

**Land Use:**

- Re-evaluate land use regulations and regional growth management strategies to promote compact development and limit the potential for increased sprawl from autonomous vehicle use. Plan for increased density and intensity to promote shared mobility, which is more viable in these environments.
- Address parking standards and requirements to address potential reductions in amount needed, relocation of parking to more peripheral areas, and revised building and engineering codes for garage design better suited for autonomous vehicles; provide incentives to redeveloped what may become underutilized parking facilities for higher and better uses. During the transition to autonomous vehicles, there can be a mix of on-site parking for human-driven vehicles and remote parking for autonomous vehicles.

**Modal Considerations and Right-of-Way Planning:**

- Incorporate automated vehicles into transportation demand models and planning efforts.
- Transition to Level of Service standards that include pedestrian, bicycle, and transit service; eventually transition to VMT-based models.
- Increase transportation demand management efforts and link these efforts to shared and autonomous mobility; enhance TDM programs to offer balanced transportation choices, including support of active transportation.
- In view of the opportunity to “right-size” roads to a human scale with the reduced space needs of autonomous vehicles, re-evaluate use of the right-of-way, including space that may be freed up. A transition to autonomous vehicle use will likely include separated lanes for these vehicles to address the mix of human-driven and autonomous vehicles.
- Transition additional roadway capacity to use by bicycles, pedestrians, transit, or shared vehicles.
- Create a modal hierarchy for roadway space and modes; adopt pedestrian- and bicycle-friendly planning, safety, and design standards, building on Complete Streets best practices and integrating innovative approaches to transportation engineering. These efforts can include developing ways for pedestrians to safely cross free-flowing automated vehicle intersections. Explore car-free downtowns.
- Establish locations, updated design standards, and management schemes for pick-up/drop-off areas and lanes; these can be put in place during the transition to autonomous vehicles.
- Invest in basic infrastructure with the aim of consistency; it may be best to wait on “smart” infrastructure upgrades until the degree of need of infrastructure for autonomous vehicles is clearer (for instance, it is possible that eventually these vehicles may not require any infrastructure).
- Explore creative and innovative use of right-of-way space.
Transit:

- Pursue opportunities to apply autonomous technologies to transit, including pilot projects such as autonomous BRT and customized vehicles tailored to different roles.

Freight:

- Evaluate opportunities to integrate automation into freight and plan for impacts, including topics such as regulating “platooning” (caravans of autonomous trucks), adjusting land use at the periphery of cities to adjust to new logistics and distribution needs, and exploring local freight scenarios and autonomous delivery systems.

Equity:

- Include considerations for equitable access to shared mobility, as shared mobility may be concentrated in denser urban areas, increasing the gap between the high-income populations in the urban area and low income urban and rural populations.
- Maintain robust transit service and explore becoming an autonomous mobility provider to ensure access.
- Establish access standards for Transportation Network Companies and fleets.

Pasco County Opportunities

While the timeframe and degree of uptake of the ACES technologies are uncertain both generally and within the local Pasco County context, there are several initiatives currently underway in the County that may inform what scenarios are more likely than others. These initiatives relate to current plans around technology and land use; they include the Connected City, Mixed Use Trip Reductions Measures (MUTRM), Market Areas, and ITS projects.

Connected City

In April of 2015, the state legislature established Pasco County as a pilot for the Connected City program (F.S. 163.3246(14)). The Department of Economic Opportunity certified a 10-year pilot program (DEO-15-102). Planning principles for the Connected City are laid out in its Comprehensive Plan Amendment document. Principles relate both to the promotion of advanced technology and the creation of more compact, mixed-use, walkable spaces. For example, the first planning principle aims to “Promote the use of advanced technology for economic development and the improved quality-of-life for current and future residents, business owners, and workforce members.” To this end, the Connected City program includes the provision of infrastructure to support Gigabit Technology. This level of data transfer may support ACES technologies, particularly connected vehicles that may be able to use these communication networks. Additionally, the Connected City has wide paths to accommodate electric and autonomous vehicles. More generally, promoting ACES overall may align with these aims in showcasing the most cutting-edge

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8 Pasco County, FL (February 7, 2017) Connected City Comprehensive Plan Amendment. Prepared by Heidt Design
9 Laura Coffey (March 1, 2019) How the Nation’s First Connected City Found it Home in Pasco County, Tampa Bay Business Journal
technologies, which it is hoped will stimulate economic development, particularly given that the area hopes to attract high-tech companies.

Technology promotion should also consider the planning principles supporting compact, mixed-use, walkable spaces, such as the following:

- Put people first – includes prioritizing people’s movement over that of the automobile
- Encourage flexibility and promote a mix of uses – includes providing opportunities not only for shorter trips, but also non-vehicle trips such as walking, biking, and transit
- Encourage alternative transportation modes for multiple travel options – may include walking, biking, transit, autonomous vehicles, and neighborhood vehicles
- Create communities that support a healthy lifestyle – includes opportunities for walking and biking

It will be important to evaluate how new transportation methods will impact walking and biking, which are key to several of the Connected City principles listed above. As noted in the previous Travel Demand discussion in this section, ACES technology may increase vehicle trips by replacing transit or active transportation trips; they may also create a more complicated built environment for those engaging in active transportation. Alternatively, it may be possible that the use of shared and autonomous vehicles will complement active transportation in certain circumstances, depending on pricing, trip lengths, and relative comfort/convenience of modes. Shared and autonomous vehicles may also reduce parking needs or allow for relocation of parking, which may enhance walkability. Regarding transit trips, a refined definition of transit may be helpful in merging these technology and walkability aims; traditional transit may focus more on a specific high-quality corridor, while new types of transit may take hold, such as shared-use vehicles including neighborhood electric vehicles.

In comparing these factors to the FHWA scenarios in Figure 4-1, a few scenarios begin to stand out as conceivable in the Connected City. The high-quality Gigabit Technology may facilitate connected vehicles, as in the “Ultra-Connected” scenario. Given the emphasis on technology as an economic development tool, a more comprehensive and robust application of ACES technologies might be desirable, such as with the “RoboTransit” scenario. The shared-use vehicle aspects of this scenario and others in the “Driver Becomes Mobility Consumer” category may be able to complement, as opposed to undermining, walkability aims. In any case, these scenarios will also have to consider impacts on equity and affordability.

**Additional Compact Land Use Opportunities**

In addition to Connected City, there are regulatory provisions and incentives to promote compact land uses with less of an explicit technology focus. These include Mixed Use Trip Reductions Measures (MUTRMs) and certain provisions associated with the Market Areas.

MUTRMs provide an optional land development regulatory procedure to allow for a higher vehicle-to-capacity ratio when preparing a traffic analysis for a development project or a lowered mobility fee if certain measures are taken to promote connected, mixed-use, and compact development.

Pasco County also has five major sub-areas, called “Market Districts,” to distinguish key growth and development characteristics of each area of the community. Certain urban districts, such as the West Market Area also known as “The Harbors,” are promoting compact, walkable, and mixed-use development.
These areas may provide multi-modal opportunities that could benefit from integration of ACES technologies, particularly shared-use vehicles and new forms of transit as shown in the “Driver Becomes Mobility Consumer” FHWA scenarios (Figure 4-1), or at the very least more moderate safety improvements in the “Slow Roll” scenario. Yet there will still be a need to account for many of the same considerations of whether new technologies will ultimately aid non-vehicle transportation or undermine it, as mentioned in the Connected City discussion of this section.

**ITS Projects**

The ITS investments coming online in Pasco County discussed in Section 3 (see Map 3-1) provides potential opportunities to further connected vehicle technologies in addition to typical transportation management aims, such as signal coordination.
Section 5: Security

Overview
Federal mandates continue to require security as a consideration in LRTPs. The planning process should provide for consideration and implementation of projects, strategies, and services that will increase the security of the transportation system for motorized and non-motorized users. Security goes beyond safety and includes planning to prevent, manage, or respond to threats of a region and its transportation system and users.

USDOT defines transportation system security as freedom from intentional harm and tampering that affects both motorized and non-motorized travelers and may also include natural disasters. Types of security hazards span a broad range, including environmental hazards, infrastructure failures, terrorism, and technological failures and threats, among others. Pasco County is particularly vulnerable to environmental hazards, such as hurricanes, wildfires, floods, and tornadoes/severe weather; moreover, the risks associated with these hazards may increase in the future due to climate change. Cybersecurity will also increase in importance as more emerging technologies become operational, as described in Section 4.

Federal Resources
The Department of Homeland Security (DHS) is the main executive agency overseeing security at the federal level. It encompasses key sub-agencies that oversee topics and programs particularly relevant for LRTP security considerations:

- **Cybersecurity and Infrastructure Security Agency** – this new agency, created in 2018, highlights the increased emphasis on cybersecurity, which is of growing importance with the emergence of new technologies (see Section 4)
- **Federal Emergency Management Agency** – oversees the Public Assistance Program in aftermath of major disasters or emergencies
- **U.S. Coast Guard** – responsibilities include but are not limited to waterway and maritime security, as well as regulation of hazardous materials shipping and response to pollution events, such as oil spills
- **Transportation Security Administration** – oversees security of transportation systems, including airports and mass transit and passenger railroad

The DHS also oversees the Urban Areas Security Initiative (UASI) program, which focuses on enhancing regional security preparedness in major metropolitan areas. Despite a downsizing of urban areas eligible to apply for funding, the Tampa UASI District, which includes Pasco and eight neighboring counties, remained eligible as of Fiscal Year 2018. This district was established to coordinate with the Florida Division of Emergency Management to expand regional collaboration and develop integrated regional systems for prevention, protection, response, and recovery.

The Fiscal Year 2018 program guidelines indicate the following areas of improvement for core capabilities:

- Cybersecurity
- Supply Chain Integrity and Security
- Infrastructure Systems
- Natural and Cultural Resources
- Economic Recovery
- Risk Management for Protection Programs and Activities
- Housing
- Activities
The guidelines also include a new requirement for a cybersecurity investment justification, again highlighting an emphasis on cybersecurity.

The U.S. Department of Transportation also provides resources that support security efforts. Notably, the Federal Highway Administration (housed in the Department of Transportation) awarded a Resilience and Durability in Extreme Weather grant to the Hillsborough MPO in collaboration with the Pinellas MPO, Pasco MPO, Tampa Bay Regional Planning Council, and the Florida Department of Transportation District 7. The grant funded a pilot project to meet new federal mandates that LRTPs work on "improving the resiliency and reliability of the transportation system and reducing or mitigating the stormwater impacts of surface transportation ...", ultimately informing updates for three MPOs and the regional LRTP. Main components of the project include a vulnerability and asset risk assessment, identification of critical links, development of adaptation and mitigation strategies, and strategies to include findings in the decision-making process.

Local Emergency Preparedness

Local governments are critical entities in planning for local emergency preparedness. They must develop hazard mitigation plans to be eligible for federal funds through the Hazard Mitigation Grant Program (required by the Federal Emergency Management Agency under 44 CFR Part 201). Pasco County has a Comprehensive Emergency Management Plan and a Local Mitigation Strategy that outline information for response to emergency situations and mitigation against hazards. These documents also include risk assessments for specific hazards and other background analysis and information. The environmental hazards with moderate to high probability identified between these two plans include:

- Hurricanes and coastal/severe storms
- Flooding
- Coastal and riverine erosion
- Sinkholes
- Tornadoes/severe weather
- Wildfires
- Lightning
- Drought/Heat Wave
- Winter storms/freezes

Note that the risks and impacts of many of these hazards will be increased by the effects of climate change. An important consideration in this regard is sea level rise, which can affect coastal flooding and storm surges. Figure 5-1 shows areas that would be inundated with five feet and ten feet of sea level rise.

The County continues to actively coordinate its responses to emergencies with local, regional, and federal agencies. The County operates the 9-1-1 system to assist in this coordination and to serve the local communities/agencies with emergency communication services and coordinates with the Florida emergency management “all-hazards” program on domestic security and natural and technology hazards.
A key transportation consideration in responding to many of the most probable hazards is evacuation. Figure 5-2 shows evacuation routes, zones, and emergency shelters in Pasco County that can inform an evaluation for further needs. Given its established route network and facilities, Pasco County Public Transportation (PCPT) plays a critical role in these emergency evacuations, particularly in providing transport for citizens without access to a private vehicle or with special needs. In addition to providing secure bus facilities, PCPT coordinates with the Pasco County Emergency Operations Center and other public and commercial transportation providers to provide transportation to designated shelters.
Figure 5-2: Evacuation Routes, Zones, and Emergency Shelters in Pasco County
Recommended Security Strategies

- Integrate findings from Resilience and Durability in Extreme Weather pilot Program into the LRTP.
- Coordinate/partner with local and regional agencies to incorporate transportation security into regional and local projects and plans. These processes can begin to introduce considerations and planning for emerging topics such as cybersecurity. In this regard, the MPO’s role may include:
  - Providing opportunities to convene agencies and stakeholders for information exchange/collaboration and acting as a liaison between these entities
  - Providing a clearinghouse of best practices in resilient design and supporting local data
  - Continued coordination with Pasco County Hazard Mitigation Committee and Office of Emergency Management to update and implement mitigation actions related to the multi-modal network.
  - Identifying and implementing ITS and other technologies, including DMS, signage/wayfinding, Advanced Traffic Management Systems (ATMS), Automatic Vehicle Location (AVL), and other traffic and transit technologies to improve communications and information gathering during hazards/emergency events. Evaluate how emerging technologies (see Section 4 technologies and cybersecurity discussion) might apply to hazards response.
  - Coordinating/partnering with local and regional agencies and stakeholders on public education efforts related to security risks, increasing security awareness among community members, and how to assist agencies involved in security efforts.
Appendix A. Pasco Countywide Pedestrian and Bicycle Safety Action Plan (excerpts)
Florida Department of Transportation

PASCO COUNTYWIDE PEDESTRIAN AND BICYCLE SAFETY ACTION PLAN

MARCH 2019
3.2.1 Crash Focus Corridor 1 – US 19
Over 25% of all bicycle and pedestrian crashes in the county, 437 crashes in total between 2013 and 2017, occur within ¼ mile of US 19. This corridor is a six-lane divided corridor with a 45 mph posted speed limit. Incidents are spread along the corridor, with 19% of crashes at intersections and 64% at high-activity midblock areas. 70% of crashes occurred in areas with no traffic control device. It is important to note 48% of crashes occurred at night. US Census Bureau data reveals the neighborhoods surrounding US 19 experience concentrations of poverty and disabled persons, shown in Section 3.4.
3.2.2 Crash Focus Corridor 2 – SR 54/56
Nearly 12% of all bicycle and pedestrian crashes in the county, 195 crashes in total between 2013 and 2017, occur within ¼ mile of the SR 54/56 corridor. This corridor is also a six-lane divided corridor with posted speed limits from 45 to 55 mph. The highest concentration of crashes along this corridor occurred at the intersection with US 41. 13% of crashes occurred at the intersections, 60% at high-activity midblock areas, 65% occurred where there was no traffic control device, and 31% of crashes occurred at night.

Map 3: Crash Focus Corridor 2 – SR 54/56
3.2.3 Crash Focus Corridor 3 – SR 52
Nearly 7% of all bicycle and pedestrian crashes in the county, 115 crashes in total between 2013 and 2017, occur within ¼ mile of SR 52. These crashes are concentrated primarily in the urbanized areas on the west side of the county between US 19 and Chicago Boulevard and in Dade City. 19% of crashes were concentrated around the intersections and 53% at high-activity midblock areas. 48% of crashes occurred in areas with no traffic control device present. 35% of crashes occurred at night.
3.2.4 Crash Focus Corridor 4 – US 301
Over 6% of all bicycle and pedestrian crashes in the county, 110 crashes in total between 2013 and 2017, occur within ¼ mile of US 301. This crashes are concentrated primarily in the urbanized areas of City of Zephyrhills and Dade City. 38% of crashes were concentrated around the intersections and 42% at high-activity midblock areas. 57% of crashes occurred in areas with no traffic control device present. 44% of crashes occurred at night.
3.2.5 Crash Focus Corridor 5 – Ridge Road
Among non-state highways, Ridge Road from US 19 to Little Road has a high number of non-motorized user crashes with 75 bicycle and pedestrian crashes from 2013 – 2017. There are somewhat more bicycle crashes than pedestrian crashes on this corridor (39 vs 36) with only about 22% of crashes occurring at night. In addition to the intersection of US 19 and Ridge Road, the intersection with Little Road has the highest number of non-motorized user crashes.

Map 6: Focus Corridor 5 – Ridge Road (US 19 to Little Road)
3.2.6 Crash Focus Corridor 6 – Little Road
From 2013 -2017, Little Road had 52 non-motorized user crashes with areas of concentration at the intersections of New York Ave, Fivay Road, SR 52, and Ridge Road. These included 21 pedestrian crashes and 31 bicycle crashes with about 34% of crashes occurring at night.

Map 7: Focus Corridor 6 – Little Road (Ridge Road to New York Avenue)
3.2.7 Crash Focus Corridor 7 – Massachusetts Avenue
From 2013 – 2017, 36 non-motorized crashes occurred along a Massachusetts Avenue between Maddison Street and Little Road with a concentration of crashes occurring at or adjacent to the intersection of Massachusetts Avenue and Congress Street which is flanked by retail land uses. Crashes along this corridor are split between bicycle and pedestrian crashes with approximately 27% of crashes occurring at night.

Map 8: Focus Corridor 7 – Massachusetts Avenue (Madison Street to Little Road)
3.2.8 Crash Focus Corridor 8 – Embassy Boulevard
From 2013 – 2017, 33 bicycle and pedestrian crashes occurred along Embassy Boulevard from US 19 to Little Road. Of these, 15 were pedestrian crashes and the remaining 18 were bicycle crashes with only 21% occurring at night. Unlike other corridors, crashes along Embassy Boulevard are relatively dispersed with only small concentrations at Regency Park Boulevard, Little Road, and a larger cluster at US 19.

Map 9: Focus Corridor 8 – Embassy Boulevard
3.2.9 Focus Intersection 1 – US 19 at Moog Road

Crashes at this location show a mixture of fault between drivers and non-motorized road users with most crashes clustered around the south leg of the intersection. Relatively high poverty levels, compared with the county as a whole, and a mixture of retail and residential land uses surrounding the intersection are likely contributing factors.
Focus Intersection 2 – US 19 at Beach Boulevard

As shown in the graphic above, bicyclists as well as pedestrians at this intersection are involved in crashes at almost the same rate. The most common type of bicycle crash is bicyclists riding the wrong way in either the unbuffered bicycle lane or roadway, followed by pedestrians in the sidewalk darting onto the roadway. Due to the high number of households in poverty, biking and walking are typically the major modes of transportation in this area. This unsignalized intersection could benefit from a midblock crosswalk since the nearest crossing is located approximately 1500 ft south of this intersection and there is a Walmart Supercenter on the southeast quadrant.
3.2.11 Focus Intersection 3 – SR 52 at Chicago Avenue

At the intersection above, pedestrian compliance seems to be a predominant issue. Even though all pedestrian features are present at the intersection, sidewalks are missing along both sides of the south leg and along the east side of the north leg. A public high school is located in the northwest quadrant of the intersection, and this creates a higher than typical demand. Increased enforcement and education of laws and rules of the road may help reduce the number of pedestrian and bicyclists crashes at this intersection.
3.2.12 Focus Intersection 4 - US 19 at Main Street

As with other locations along US 19, this intersection is surrounded by retail land uses with residential uses beyond the commercial corridor including a mobile home community northeast of the intersection and an apartment community to the west of the intersection. Most crashes involve cyclists and pedestrians crossing adjacent to the traffic signal or against the traffic signal; however, there is no crosswalk on the north leg of the intersection which is a disincentive for pedestrians to use the signal. All documented non-motorized crashes at this location involve pedestrians or cyclists attempting to cross US 19.
3.2.13 Focus Intersection 5 - US 19 at Trouble Creek

This intersection is surrounded by retail uses with residential behind. There is no clear pattern in the crashes around this intersection though consistent with other parts of US 19, fatal crashes involve non-motorized users attempting to cross US 19 either outside of crosswalks or against the walk signal.
<table>
<thead>
<tr>
<th>ID</th>
<th>High Priority</th>
<th>Summary Description</th>
<th>4E AREA(S)</th>
<th>MODE(S)</th>
<th>Cost Range</th>
<th>Time Frame</th>
<th>Implementation Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>Implement speed management strategies, including changes to roadway typical section and signal operation in focus areas.</td>
<td>X</td>
<td>X X X</td>
<td>Med</td>
<td>Long</td>
<td>May impact motor vehicle travel times</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>Increase speed enforcement in targeted ped/bike areas. Utilize Bluetooth Data to identify speeding locations along US 19 and SR 54.</td>
<td>X X</td>
<td>X X</td>
<td>Med</td>
<td>Med</td>
<td>Requires hiring more officers and additional funding</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>Add more pedestrian and bicycle-focused enforcement.</td>
<td>X</td>
<td>X X X</td>
<td>Med</td>
<td>Long</td>
<td>Increase funding for enforcement and hire more officers</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>Enhance lighting on high pedestrian and bicycle corridors, and specifically upgrade the lighting along US 19 to LED.</td>
<td>X</td>
<td>X X X</td>
<td>High</td>
<td>Med</td>
<td>May have minor impacts on motor vehicle travel times and driver education is necessary for unconventional intersection designs</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>Improve geometry at major intersections for all road users and apply Intersection Control Evaluation (ICE) process for improvement projects.</td>
<td>X</td>
<td>X X X</td>
<td>High</td>
<td>Long</td>
<td>May have minor impacts on motor vehicle travel times and driver education is necessary for unconventional intersection designs</td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>Incorporate “complete streets” improvements into County resurfacing program similar to current FDOT efforts.</td>
<td>X</td>
<td>X X</td>
<td>Med</td>
<td>Med</td>
<td>Some improvements may be beyond the scope of resurfacing projects</td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td>Add more shared-use paths along higher-speed roadways to supplement bike lanes; consider making this standard practice.</td>
<td>X</td>
<td>X X</td>
<td>Med</td>
<td>Med</td>
<td>Requires sufficient right-of-way to install; potential drainage impacts</td>
</tr>
</tbody>
</table>

Table 4: High Priority Action Items
<table>
<thead>
<tr>
<th>ID</th>
<th>High Priority</th>
<th>Summary Description</th>
<th>4E AREA(S)</th>
<th>MODE(S)</th>
<th>Cost Range</th>
<th>Time Frame</th>
<th>Implementation Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>X</td>
<td>Increase funding for maintenance of pedestrian and bicycle facilities.</td>
<td>X</td>
<td>X</td>
<td>X X</td>
<td>Low</td>
<td>Low Long</td>
</tr>
<tr>
<td>9</td>
<td>X</td>
<td>Inventory, evaluate, and prioritize existing and planned pedestrian and bicycle facilities countywide.</td>
<td>X</td>
<td>X</td>
<td>X X</td>
<td>Low</td>
<td>Med Med Incorporate in existing processes (e.g.: LRTP and Congestion management Process)</td>
</tr>
<tr>
<td>10</td>
<td>X</td>
<td>Add/improve sidewalks and connectivity.</td>
<td>X</td>
<td>X</td>
<td>Med</td>
<td>Med</td>
<td>Requires sufficient right-of-way to install; potential drainage impacts</td>
</tr>
<tr>
<td>11</td>
<td>X</td>
<td>Add bike lanes in high bicycle volume areas where not currently present.</td>
<td>X</td>
<td>X</td>
<td>Med</td>
<td>Med</td>
<td>Requires sufficient right-of-way to install; potential drainage impacts</td>
</tr>
<tr>
<td>12</td>
<td>X</td>
<td>Extend the hours of transit routes, especially on high pedestrian and bicycle corridors such as US 19.</td>
<td>X</td>
<td>X</td>
<td>X X</td>
<td>Med</td>
<td>Med Requires additional funding and cooperation of transit agencies</td>
</tr>
<tr>
<td>13</td>
<td>X</td>
<td>Continue and increase Walk Wise outreach in targeted areas to pedestrians and bicyclists, including pop-up campaigns.</td>
<td>X</td>
<td>X</td>
<td>X X</td>
<td>Med</td>
<td>Med</td>
</tr>
<tr>
<td>14</td>
<td>X</td>
<td>Increase type &amp; frequency of safety messaging and produce targeted PSA's for seasonal residents and visitors.</td>
<td>X</td>
<td>X</td>
<td>X X X</td>
<td>Med</td>
<td>Med</td>
</tr>
<tr>
<td>15</td>
<td>X</td>
<td>Enforcement should continue educating road users on the rules of the road; add safety messages on cruisers; and provide pamphlets with the Florida Statutes related to pedestrian and bicycle laws.</td>
<td>X</td>
<td>X</td>
<td>X X X X</td>
<td>Low</td>
<td>Med</td>
</tr>
</tbody>
</table>

Table 5: Additional Action Items
<table>
<thead>
<tr>
<th>ID</th>
<th>High Priority</th>
<th>Summary Description</th>
<th>4E AREA(S)</th>
<th>MODE(S)</th>
<th>Cost Range</th>
<th>Time Frame</th>
<th>Implementation Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Engineering</td>
<td>Education</td>
<td>EMS</td>
<td>Pedestrian</td>
<td>Bike</td>
</tr>
<tr>
<td>16</td>
<td>X X X X Low Med</td>
<td>Educational outreach should utilize drivers' education courses.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>17</td>
<td>X X X X X Low Med</td>
<td>Establish more long-term partnerships/coalitions for education and outreach and nominate and designate Bike Friendly Businesses.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>X X X X X Low Short</td>
<td>Distribute fluorescent yellow-green safety vests for pedestrians and bicyclists and light kits for cyclists.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>19</td>
<td>X X X X X Low Short</td>
<td>Enhance the Arrive Alive Portal to facilitate better coordination between agencies.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>20</td>
<td>X X X X X Low Med</td>
<td>Provide safe locations for speed enforcement details.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>21</td>
<td>X X X X X Low Med</td>
<td>Install more speed feedback signs to monitor speeding locations with high ped/bike crashes.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>22</td>
<td>X X X X X Low Med</td>
<td>Continue to utilize roll call videos for first responders.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>23</td>
<td>X X X X X Med Med</td>
<td>Install passive pedestrian and bicycle detection where appropriate.</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>Med</td>
</tr>
<tr>
<td>24</td>
<td>X X X X X Low Long</td>
<td>Work with the Pasco court system to enforce tickets.</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>25</td>
<td>X X X X X Med Med</td>
<td>Secure funding for additional research/data on the issues.</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Med</td>
</tr>
</tbody>
</table>

Table 6: Additional Action Items (Continued)
### Appendix B. Local ITS Services & Associated Stakeholders Involved with Service Provision

<table>
<thead>
<tr>
<th>Service</th>
<th>Stakeholders</th>
</tr>
</thead>
</table>
| **Demand Response Transit Operations** | Pasco County Public Transportation  
Pasco County Traffic Operations Division  
Transportation Disadvantaged service provider systems  
Roadway maintenance and construction systems  
FDOT District 7 |
| **Transit Fare Collection Management** | Pasco County Public Transportation  
County sheriff and local police agencies  
Financial institutions |
| **Transit Vehicle Tracking** | Pasco County Public Transportation  
Local agency traveler information systems  
Private sector traveler information services  
FDOT District 7 |
| **Transit Security** | Pasco County Public Transportation  
County sheriff dispatch  
Local police dispatch  
Local agency traveler information system  
Private sector traveler information services |
| **Transit Traveler Information** | Pasco County Public Transportation  
Local agency traveler information systems  
Private sector traveler information services  
OneBusAway App |
| **Transit Fixed-Route Operations** | Pasco County Public Transportation  
Pasco County Traffic Operations Division  
County public works agencies  
County and city roadway maintenance and construction systems  
City of Tampa Transportation and Stormwater Services  
Florida's Turnpike Enterprise |
| **Transit Fleet Management** | Pasco County Public Transportation  
County School District |
| **Multi-Modal Coordination – Transit Schedule Coordination** | Pasco County Public Transportation  
Other local, regional, national transit and transportation authorities/providers |
| **Transit Signal Priority and Control** | Pasco County Public Transportation  
Pasco County Traffic Operations Division |
| **Regional Traffic Management** | Pasco County Traffic Operations Division  
County and local public works and infrastructure agencies  
County and local traffic engineering agencies  
Hillsborough County Aviation Authority  
FDOT District 7 |
| **Traffic Information Dissemination** | Pasco County Public Transportation  
Pasco County Traffic Operations Division  
Regional public safety agencies – 911 emergency call centers  
County fire EMS/rescue dispatch  
Local fire/EMS and police dispatch  
Florida Highway Patrol |
<table>
<thead>
<tr>
<th>Service</th>
<th>Stakeholders</th>
</tr>
</thead>
</table>
| Broadcast Traveler Information Florida 511 | Pasco County Public Transportation  
Pasco County Traffic Operations Division  
County and regional transit and transportation authorities/providers  
Local and county fire EMS/rescue and police/sheriff dispatch  
Local and county public works and infrastructure agencies  
Local traffic engineering agencies  
Local venue promoters  
Florida Highway Patrol  
FDOT District 7  
Florida’s Turnpike Enterprise  
NOAA |
| Traffic Incident Management System | Pasco County Traffic Operations Divisions  
County fire EMS/rescue and sheriff dispatch  
Local fire/EMS and police dispatch  
Emergency operations centers |
| Traffic Probe Surveillance          | Pasco County Public Transportation  
County and regional transit and transportation authorities/providers  
County and local fire/EMS dispatch  
Private data collection providers  
FDOT District 7  
Florida’s Turnpike Enterprise |
| Emergency Routing                  | Pasco County Traffic Operations Division  
County fire EMS/rescue dispatch and vehicles |
| Wide Area Alert                    | Pasco County Public Transportation  
Pasco County Traffic Operations Division  
County and regional transportation and transit authorities/providers  
County emergency management agencies  
County and local roadway maintenance and construction systems  
County school districts  
County and local public works and infrastructure agencies  
Local traffic engineering agencies |
| Early Warning System               | Pasco County Public Transportation  
County and regional transit and transportation authorities/providers  
County school districts  
County emergency management agencies |
| Disaster Response and Recovery     | Pasco County Public Transportation  
County and regional transit and transportation authorities/providers  
County school districts  
County emergency management agencies |
| Evacuation and Reentry Management  | Pasco County Public Transportation  
County and regional transit and transportation authorities/providers  
County school districts  
County emergency management agencies  
FDOT District 7 |
| Standard Railroad Grade Crossing   | Pasco County Traffic Operations Division  
Pinellas County Public Works Department  
Rail operator |
<table>
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<th>Service</th>
<th>Stakeholders</th>
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| Railroad Operations Coordination             | Pasco County Traffic Operations Division  
County and local public works and infrastructure agencies  
County and local traffic engineering agencies  
Rail operator  
FDOT District 7  
Pasco County Public Transportation  
County and regional transit and transportation authorities/providers  
County and local fire EMS/rescue, police and sheriff dispatch  
County school districts  
FDOT District 7  
Florida Highway Patrol |
| Maintenance and Construction Activity         | Coordination Pasco County Traffic Operations Division  
County and local public works and infrastructure agencies  
County and local traffic engineering agencies  
County and local roadway maintenance and construction systems  
FDOT District 7  
Florida’s Turnpike Enterprise |
| Roadway Maintenance and Construction         | Pasco County Traffic Operations Division  
County and local public works and infrastructure agencies  
County and local traffic engineering agencies  
County and local roadway maintenance and construction systems  
FDOT District 7  
Florida’s Turnpike Enterprise |
| Work Zone Management                         | Pasco County Traffic Operations Division  
County and local public works and infrastructure agencies  
County and local traffic engineering agencies  
County and local roadway maintenance and construction systems  
FDOT District 7  
Florida’s Turnpike Enterprise |
| Network Surveillance                         | Pasco County Traffic Operations Division  
FDOT District 7 |
| ITS Data Warehouse                           | Pasco County MPO  
Pasco County Public Transportation  
County fire EMS/rescue and sheriff dispatch  
County public works agencies  
Local agency fire/EMS and police dispatch  
City of St. Petersburg  
Archived data users  
FDOT District 7 |
| Transportation Decision Support and         | Support and Demand Management Pasco County Public Transportation  
County and regional transit and transportation authorities/providers  
Parking facilities operators  
FDOT District 7  
Florida’s Turnpike Enterprise |
| Demand Management                            | Weather Information Processing & Distribution Pasco County Traffic Operations Division  
County and local public works and infrastructure agencies  
County and local traffic engineering agencies  
County and local roadway maintenance and construction systems  
FDOT District 7  
Florida’s Turnpike Enterprise  
NOAA |