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EXECUTIVE SUMMARY

The growing use of shared mobility along with the emerging use of autonomous vehicle technologies to support public transit are emerging issues that will require innovative and creative responses from state and local governments. As these trends alter the public's mobility options, they will inevitably impact the built environment. To ensure the safety and efficiency of the transportation system, urban planners will need to rethink how roadways, transit infrastructure, curbsides, and parking areas are designed. Recognizing the growing need to address these issues, Plan Hillsborough contracted Florida State University's (FSU) Mark & Marianne Barnebey Lab to develop design guidance for accommodating all aspects of shared mobility including ride-hail, rideshare, and mass transit drop-off and pick-up, livery points, fueling, and parking.

To accomplish this, the project developed a series of urban design templates and accompanying policy recommendations to facilitate and incentivize urban adaptation for shared mobility solutions. Design templates were created for four design contexts (urban stadium, urban downtown, suburban shopping center, and a rural destination) based on a review of best practices in shared mobility design, a review of the regulatory framework shaping the implementation of shared mobility applications, and an extensive stakeholder engagement process. Ultimately, this project provides specific guidance for effectively integrating shared mobility into a community's transportation infrastructure and urban form.

The Key Principles of Design found to guide the urban design templates for each context area:

**Shared Mobility for All**
Each context should be designed to accommodate the needs of all users, ages, and abilities.

**Aesthetics**
Design should promote an environment that is both aesthetically pleasing and economically viable.

**Access**
Mobility is often less about the means of transportation and more about the proximity and convenience of accessing destinations.

**Adaptability**
To accommodate user demands for flexible, on-demand transportation, the built environment must accommodate flexible, on-demand design.

**Technological Accommodation**
Adapting dedicated curbside public transit space with technological and built environment changes supportive of shared mobility and autonomous vehicle alternatives is integral to maintaining, augmenting, and facilitating ridership.

Project Tasks

1. Literature Review and Policy Ordinance Review
2. Conceptual Designs
3. Recommendations for Implementation
5. Final Report & Presentation

The Key Policy Recommendations to facilitate shared mobility are:

I. Complete Streets policy guidelines are necessary to implement equitable and accessible shared mobility transportation options that are safe for all ages.

II. Ensure future land uses can promote residential and employment density to warrant shorter distance transportation trips that shared mobility options can easily accommodate.

III. Reducing parking minimums and requirements can provide incentives for developers who can spend less money on parking stalls and instead incorporate other, less expensive shared mobility amenities.

IV. Consider the future population for which you are planning. In Florida, aging in place is an important issue that planners must consider as the Baby Boomer generation retires.

V. Flexibility and adaptability in urban design and policy is one of the easiest and most effective ways of allowing cities and regions to quickly make changes that reflect unexpected or sudden technological, environmental, and socioeconomic shifts.
1 INTRODUCTION

In the future, there will be an increased demand for shared mobility, which is a type of travel that generally refers to transportation modes that can be shared by multiple users, whether by vehicle, bicycle, scooter, bus, or other forms of transit. Municipalities need to plan now for the next thirty years of infrastructure to facilitate current changes in transportation (shared mobility) as well as future trends (autonomous vehicles). Planning for the current and future transportation needs can be performed simultaneously if infrastructure is multi-modal friendly, flexible, and adaptable to future social and technological changes. Increased safety, access, equity, public health, sustainability, and economic development are the outcomes of planning for a future where shared mobility and autonomous vehicles complement public transit.

Background

A product of the “sharing economy,” shared mobility leverages technology to provide a service model that allows entrepreneurs and consumers “to share resources, save money, and generate capital” (Cohen and Shaheen, 2018). These services generally include alternative transit services, bikesharing, carsharing, courier network services, e-Hail apps, pedicabs, personal vehicle sharing, ridesharing, ridesourcing/transportation network companies (TNCs), scooter sharing, and taxi services (Cohen and Shaheen, 2018). Each service is briefly described in Table 1.

Much of the recent success in shared mobility has come from shifting demands and the convenience of technology. The successes of ridesourcing platforms, like Uber and Lyft, use a smart phone application to connect travelers with local vehicle owners who can provide an on-demand, door-to-door transportation service at a reasonable price. Other shared mobility services, such as scooter-, car-, and bike-sharing, utilize similar methods that accentuate the benefits, but not the costs, of ownership (Cohen and Shaheen, 2018).

While it may be too early to conclude whether people are substituting car ownership for shared mobility, the mass movement of people to cities -- where parking fees and congestion collide -- is likely to play a role in the rise of alternative transportation options.

Depending on the density of development and availability of modes, shared mobility may increasingly replace single-occupancy vehicle (SOV) trips and funnel users into the public transit system by meeting first- and last-mile travel demands. On the other hand, there is also the propensity for growth in ridesharing services to negatively impact public transit ridership over time (Boylan, 2019). If people replace their use of public transit with shared mobility, then the demand for public transit decreases; therefore, there may not be enough demand to support certain transit routes. Not only does shared mobility change how people are moving, it also changes how goods are moving. There could be an increase in SOV trips due to the use of shared mobility to deliver goods such as meals and groceries. Without sufficient data, it is too early to know the definite impacts of shared mobility on the number of SOV trips. The imminent introduction of connected autonomous vehicles (CAVs) is also likely to set new precedents for land use, urban design, and travel behavior, unveiling opportunities and threats to the current state of transportation planning. Despite these uncertainties, economic, environmental, and social equity implications will remain vital for the field of urban planning to consider. Acting now to incorporate policy and urban design changes which accommodate shared mobility within the built environment ensures a future in which communities can derive the benefits associated with this growing trend.
Purpose

The purpose of this project is to develop a series of urban design templates and accompanying policy recommendations to facilitate and incentivize urban adaptation for shared mobility solutions and autonomous transit services. This project is being prepared for PlanHillsborough, the metropolitan planning organization (MPO) for Hillsborough County. PlanHillsborough contacted the Florida State University (FSU) Department of Urban and Regional Planning - Mark & Marianne Barnebey Planning and Development Lab (BPDL) to conduct research on design guidance for accommodating ride-hail, rideshare, and mass transit drop-off and pick-up, livery points, fueling, and parking. The scope includes selecting four design context areas (urban stadium, urban downtown, suburban mall/shopping center, and a rural destination) for regional location within the City of Tampa and unincorporated Hillsborough County. Conceptual urban design templates based on literature findings, a plan review, and stakeholder engagement will then be created for each of the four areas selected. Finally, recommendations for implementing the urban design templates will be provided to give each client a road map to turn the conceptual designs into reality.

Table 1: Shared Mobility Services (Shaheen, Cohen, And Zohdy, 2018).

<table>
<thead>
<tr>
<th>Alternative Transit Services</th>
<th>Generally fixed-route or flexible-route, on-demand services with fixed schedules to provide access to public transit, jobs, healthcare, or other destinations in the form of shared shuttles, paratransit, or private-sector microtransit solutions.</th>
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<tr>
<td>Bikesharing</td>
<td>Station-based kiosks or free-floating bikesharing facilitate one-way or round-trip bicycle access at a very low cost with options of returning the bicycle to a specific kiosk station or any location within a given area. Varying pick-up and drop-off locations create a low emission, on-demand form of mobility.</td>
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<tr>
<td>Carsharing</td>
<td>Individuals access a vehicle for a given period of time typically by joining an organization that maintains a fleet of cars within a variety of locations. While participants pay a per-use fee, the costs and responsibilities of ownership, such as parking, maintenance, and gasoline, is provided by the carsharing operator.</td>
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<tr>
<td>Courier Network Services</td>
<td>Packages, food, or other items delivered to individuals by delivery drivers connected via a smart-phone application or website platform.</td>
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<tr>
<td>E-Hail Apps</td>
<td>Taxi drivers and passengers are connected through smart-phone apps.</td>
</tr>
<tr>
<td>Pedicabs</td>
<td>Transport service provided by a manpowered cycle with three or more wheels and room for passengers</td>
</tr>
<tr>
<td>Personal Vehicle Sharing</td>
<td>Companies facilitate the sharing of privately owned vehicles by providing resources, including an online platform, auto insurance, safety measures, customer support, etc.</td>
</tr>
<tr>
<td>Ridesharing</td>
<td>Also known as carpool/vanpool, drivers and passengers with similar starting and ending points share formal or informal rides, sometimes to avoid or reduce transportation costs.</td>
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<tr>
<td>Ridesourcing/Transportation Network Companies</td>
<td>Also known as transportation network companies (TNCs), ridesourcing services utilize smartphone applications and web-based platforms to allow users to book and pay for prearranged, on-demand transportation.</td>
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<tr>
<td>Scooter sharing</td>
<td>Similar to carsharing, individuals gain access to scooters for roundtrip or one-way trips by joining an organization that maintains a fleet within a variety of locations. Participants pay a per-use fee, but the responsibilities of ownership is provided by the operator.</td>
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<tr>
<td>Taxi services</td>
<td>Through a negotiated price or taximeter, passengers can street hail, book in advance, or e-Hail drivers providing a for-hire, on-demand vehicle service.</td>
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The project is composed of five major tasks with the first three to be completed by the students in the Spring 2019 graduate capstone studio course (hereafter referred to as the “Studio Team”), Advanced Planning Problems. The last two tasks will be completed by the Principal Investigator for the project, Dennis Smith, and the FSU BPDL Senior Planner, Jeremy Crute.

Task 1: Literature Review and Policy Ordinance Review
- Task 1a - Literature Review: conduct a review of relevant literature on shared mobility for six areas: role of government, equity and accessibility, health and safety, environment and sustainability, economic development, and technological innovation.
- Task 1b - Design Background: review design literature and best practices for designing for shared mobility, to be incorporated in the BPDL conceptual design templates.
- Task 1c - Plan Review: examine local ordinances, plan policies, and other guiding documents specific to each case study that may either inhibit or promote shared mobility and the researched design standards or retrofits.

Task 2: Conceptual Designs
- Task 2a - Context Area Selection: a collaboration between BPDL and PlanHillsborough to select the relevant case studies for each design context.
- Task 2b - Stakeholder Outreach: a combination of community engagement through stakeholder meetings, preference surveys, and design charrettes, in addition to consultation with an expert panel.
- Task 2c - Conceptual Design Templates: preparing conceptual design templates for the four design contexts.

Task 3: Recommendations for Implementation
- Task 3a - Amend Local Policy Barriers: recommendations for addressing the barriers to shared mobility identified during plan review.
- Task 3b - Incorporation of Shared Mobility in Local Policies: develop recommendations to incorporate into existing plans, regulations, and ordinances; determine incentives for incorporating shared mobility designs into new developments and how communities can apply the design recommendations to their local context.

Task 4: Draft Final Report and Draft PowerPoint Presentation
- A draft final project report and draft PowerPoint presentation on Shared Mobility Design and Policy Guidance will be provided PlanHillsborough, for review and approval.

Task 5: Final Report and PowerPoint Presentation
- A final project report and draft PowerPoint presentation on Shared Mobility Design and Policy Guidance will be provided to PlanHillsborough for approval.
Context Area Site Selection

This project developed conceptual urban design templates for incorporating shared mobility into four context areas (urban stadium, urban downtown, suburban mall/shopping center, and a rural destination) within Hillsborough County. The sites for each context area were selected through a collaborative process between the FSU Studio Team and client staff. Recommendations and suggestions were made by the clients in guiding the selection process of the four design areas for the Tampa locations. Final selections were made based on the impacts shared mobility alternatives would bring to the area. The selected sites for each context area are briefly described below. Figures 1-4 provide photographs of each site, Figure 5 displays where each site is located within their respective regions, and Figures 6-9 provide areal photographs of each site.
Figure 5: Overview Map of the Hillsborough County Context Areas
Figure 6: Amalie Arena/Water Street

Figure 8: West River Redevelopment Area
**Figure 7: Citrus Park Mall**

**Figure 9: Keystone Park / Civic Center**
To complement planning, design, construction, and operation of a statewide, context-sensitive Complete Streets network, the Florida Department of Transportation (FDOT) has implemented a system to classify roadway and land use characteristics into contexts to “determine key design criteria for all non-limited-access state roadways” (FDOT, 2017). These contexts aim to tell a story about “who the users are along the roadway, the regional and local travel demand of the roadway, and the challenges and opportunities of each roadway user” (FDOT, 2017). Ranging from natural to urban core (see Figure 10), context classification allows policy leaders to consider zoning, future land use, block length, block perimeter, and intersection density when evaluating the existing and future roadway features these contexts may require as they change over time. Identifying context classification is an essential first step, and consistent with national best practices, in evaluating future design, or redesign, criteria elements (FDOT, 2017). This project referenced the FDOT Classification Contexts to be used as examples and possibly integrated into future design guidance. This project examines four context areas for each client: urban downtown, urban stadium, suburban shopping mall, and rural destination. Each of these contexts fits into an FDOT context classification which is further discussed in the following sections.

1 **Suburban Commercial**

FDOT describes roads in a suburban residential context as having single-family residential and institutional land uses; buildings that are 1-2 stories; detached buildings with medium setbacks on all sides; and off-street parking in the front of the building. Suburban commercial contexts have retail, commercial, and light industrial land uses; detached buildings with large setbacks on all sides; and parking on all sides. For this project, the rural destination, Crawfordville Highway in Wakulla County, fits in between the suburban residential and suburban commercial context classification. The Keystone Civic Center in Hillsborough County fits between rural town and suburban residential. The suburban shopping mall, Citrus Park Mall in Tampa would fall under this classification.

2 **General Urban**

FDOT describes the general urban context classification as having single-family and multi-family residential and neighborhood-scale retail and office land uses; buildings with 1-2 stories; detached buildings with minimal front and side setbacks; and off-street parking mostly inside, occasionally in rear or front. For this project, the West River Redevelopment Area in Tampa would be classified as general urban.
The urban center context classification includes retail office, institutional, and commercial land uses; buildings with 1-5 stories (with some taller buildings); mostly attached buildings with no setbacks, and a few with minimal setbacks; rear and garage parking. For this project, the Amalie Arena in Tampa would be classified as urban center.

Report Outline

The remainder of the report will follow the project tasks outlined in the Project Task and Timeline section. Sections 2 through 5 will summarize the results of Task 1's Literature Review. The review starts by outlining major trends in the design and use of shared mobility using examples from around the world, across the United States, and within Florida. Section three will then provide guidance for how proper urban design can capitalize on many of shared mobility's potential benefits, such as improved community health and safety, a more environmentally sustainable transportation system, and promising economic development opportunities. However, in addition to these opportunities, shared mobility will also provide several planning challenges including concerns over equitable access to transportation services. Section four will examine how urban design features can be used to mitigate these challenges before they become major problems for a community.

Based on the findings of the literature review, Section five will provide specific guidance for effectively designing a community's transportation infrastructure and urban form around shared mobility. This will culminate in identifying key principles of design for shared mobility that will guide every aspect of the urban design templates. Section six then conducts a detailed review of the regulatory framework shaping the implementation of shared mobility applications in each context area at the federal, state, and local level. The plan review serves to identify regulatory barriers and enablers that will facilitate or limit the use and implementation of shared mobility and the design principles listed in Section five.

Building upon the information provided in the previous sections, Section seven visualizes the urban design templates by applying the design principles to the existing conditions of each context area. Finally, section eight provides recommended actions steps to implement the design templates. By providing Plan Hillsborough with actionable urban design principles, features, and implementation steps to integrate shared transportation options into the urban fabric, this report hopes to provide state, regional, and local governments with the tools to improve mobility through these rapidly growing modes.
2 TRENDS IN SHARED MOBILITY

The literature review began with an extensive accumulation of resources related to shared mobility from both a policy and a design perspective. Background on the international, national, and local context were included to provide examples of policies and programs that facilitate shared mobility. This section will outline these findings to provide ideas for how shared mobility is already beginning to reshape urban design practices around the world and in the United States. This baseline of trends in Shared Mobility will serve two purposes. First, it will identify best practices in urban design for shared mobility. Second, it will identify the major benefits and challenges that shared mobility presents to communities moving forward. The following two sections will then go into more detail describing how sound urban design can capitalize on the benefits of shared mobility while mitigating the challenges it creates.

International Trends in Shared Mobility

Examining shared mobility in an international context is important to this project because it provides examples of what other countries are incorporating to facilitate shared mobility. In recent years, despite increasing levels of urban mobility worldwide, access to places, activities, and services have become increasingly difficult and less convenient in terms of time, cost, and comfort (UN-HABITAT, 2013).

Equating mobility with transportation has fostered an increasing dependence on motorization and a propensity to expand the network of urban roads, which has caused environmental degradation, social isolation, as well as the neglect of public transport—the “backbone of accessibility-based urban mobility” (UN-HABITAT, 2013). Sustainable mobility, or “the degree to which the city as a whole is accessible to all its residents, including low-income earners, the elderly, the young, the disabled, as well as women with children,” has an important social equity dimension since all people rely on mobility to fulfill basic human rights (UN-HABITAT, 2013).

One of the main problems with prioritizing motorization in transportation planning is car ownership rates grow faster than road infrastructure is built. Simply put, there are not enough roadways to keep up with current demand. This is an important consideration for this project because shared mobility has the potential to increase or decrease the number of vehicles on the road.

In the past, urban planners believed that increasing road capacity to accommodate car use would decrease traffic congestion. They have since realized that increasing capacity invites more people to drive their own vehicles, thus shortly returning the transportation network to preexisting (or worsened) congestion levels (Small, 2018). To curb urban sprawl, roads cannot continue expanding. As a result, innovations in shared mobility have shaped the direction of the country’s mobility ecosystem. China is an example of how shared mobility can contribute to economic development.

Like many other countries, China’s current shared mobility market includes five modes: bikesharing, ridesharing, carsharing, and traditional car rental. In the past five years alone, this market has attracted over 168 billion RMB (roughly $25 billion) with 80% comprising the rise of ride-hailing platforms like Didi Chuxing, which has a monopoly on the Chinese ride-hailing industry (Hecker et al., n.d.).

Bikesharing in China

In the bikesharing world, dockless companies -- where users check out a bike by scanning a code with their smartphone, pay by the hour, and leave the bike wherever they want once their trip is completed -- have dominated the market, although most major cities have suffered from overloaded deployment (see Figure 15) (Hecker et al., n.d.; Taylor, 2018). In areas with low population densities, China’s bikeshare programs have eaten into the short distance travel market for ride-hailing, but increased the use of public transit by providing “last mile” solutions: 60% of bikesharers ride short distances of up to 3 kilometers (just shy of two miles) to connect to a transit node during commuting time (Hecker et al., n.d.).

Takeaway

This example demonstrates the ability of ridesharing to provide first and last mile connections to public transit.
Key Findings from the International Trends

- Transportation strategies and interventions should work to prevent the negative externalities associated with mobility, particularly motorization.
- Increasing road capacity does not necessarily decrease congestion. Furthermore, shared mobility may increase or decrease the number of cars on the road; facilitating shared mobility should aim to decrease the number of cars on the road.
- Shared mobility is increasingly demanded worldwide and is contributing to economic development.
- Young consumers around the world are a significant driving force behind the increase in shared mobility.
- Shared mobility can complement public transit by providing first and last mile connections.

National Trends in Shared Mobility

The national context of shared mobility is important to this project to provide examples for implementing shared mobility at a local level. While innovations in technology for shared mobility have the capacity to improve mobility, “failure to integrate shared mobility with[in] the established system of roads, public transit, and other modes and services could diminish this potential, create greater challenges, or limit progress toward public goals” (USDOT FHWA, 2018). Redundancies and inefficiencies in offering transportation for these under-served populations, particularly disabled and aging users, is usually tied to inadequate funding and inconsistent service models (FTA, 2017).

On the national level, transit agencies may be able to use shared mobility innovations to leverage new technologies that can help disadvantaged populations achieve higher levels of mobility, as outlined in the Mobility Services for All Americans (MSAA) initiative established by the U.S. Department of Transportation (USDOT). This policy ultimately seeks to incorporate intelligent transportation systems (ITS) and other forms of coordination to provide “one call-one click” service for users (FTA, 2017). The Federal Transit Administration (FTA) has also established Title VI requirements to ensure equitable fare and service changes in terms of their “discriminatory impact based on race, color, or national origin” (FTA, 2012).
Across the United States, cities and transit agencies have tried to understand and apply the appeal of shared mobility to more traditional forms of public transportation. One such solution has been to replace low-ridership, fixed-route transit service with a more flexible service model that can provide demand-responsive transportation options.

Municipalities have also revised their codes to encourage developers to include alternate transportation and shared mobility. In April 2016, the City of Indianapolis adopted a revised consolidated zoning and subdivisions ordinance. Under the revised zoning code, developers will be permitted a cumulative reduction in required parking of up to 35% (Indianapolis, 2016). The code includes the following shared mobility-related parking reductions:

- **Shared vehicle, carpool, or vanpool spaces**: The minimum number of required off-street parking spaces may be reduced by four for each shared vehicle, carpool, or vanpool space provided. Each shared space counts toward the minimum number of required parking spaces.
- **Electric-vehicle charging stations**: The minimum amount of required off-street parking may be reduced by two parking spaces for each electric-vehicle charging station provided. Each charging station counts toward the minimum number of required parking spaces.
- **Bicycle parking**: For every five bicycle parking spaces provided in excess of the required bicycle parking spaces (or where no bicycle parking is required), the minimum number of required off-street parking spaces may be reduced by one or up to a maximum of five.
- **Proximity to public transportation**: The minimum number of off-street parking spaces required for any development may be reduced by 30% if the developer builds within a quarter-mile of a sheltered public transit stop or public transit corridor. The minimum number of off-street parking spaces required may be reduced by 10% if the development is between a quarter-mile and a half-mile of a stop or public transit corridor (Cohen et. al., 2016).

From a global to a national scale, shared mobility has and will continue to change the transportation system as it exists today. From establishing equitable regulations to incorporating more flexible transit service and incentives for shared mobility, cities have been racing to respond to the ways in which this growing form of transportation will shape their communities. The next section will focus on the local context, briefly addressing Florida’s transportation goals and vision for the future which will inevitably set the stage for unprecedented statewide policies guiding the development of shared mobility.

**Public-Private Partnerships for Shared Mobility: California**

In 2015, California’s Alameda and Contra Costa Counties advertised a Request for Proposals (RFP) from “a qualified transit information systems firm to assist in a one year flex service pilot project” that would provide 30-minute, demand-responsive flexible service connecting passengers to two fixed schedule transit hubs in low-density, low-demand areas (AC Transit, 2015).

**Takeaway**

Municipal governments can use RFPs to utilize private companies to fill transportation gaps with shared mobility.

**Key Findings from the National Trends**

- Shared mobility has the potential to provide transportation disadvantaged populations increased mobility.
- Municipalities can incentivize developers to include shared mobility and alternative transportation.
- Shared mobility reduces the need for parking, providing more opportunities for development.
Local Trends in Shared Mobility

This project takes place in Florida, so it is important to understand how Florida is preparing for an increased demand for shared mobility. Many of Florida’s 27 Metropolitan Planning Organizations (MPOs) plan for and incorporate shared mobility, including CAV and electric vehicle (EV) technology as well as bicycles and pedestrians, into their Long Range Transportation Plans (LRTP). Florida Statute 163 requires municipalities to have a comprehensive plan with transportation as one of its elements. A guiding document of all statewide transportation planning is the Florida Transportation Plan (FTP), produced by the Florida Department of Transportation (FDOT) and last updated in 2015. The FTP’s policy element focuses its goals on specific objectives and indicators to observe throughout the next 25 years. The focus of the FTP’s Vision Element for the next 50 years can be summarized by the following (FDOT, 2015):

1. Safety and Security for residents, visitors, and businesses.
2. Agile, resilient, and quality transportation infrastructure.
3. Efficient and reliable mobility for people and freight.
4. More transportation choices for people and freight.
5. Transportation solutions that support Florida’s global economic competitiveness.
6. Transportation solutions that support quality places to live, learn, work, and play.
7. Transportation solutions enhance Florida’s environment and conserve energy.

Safety is of great concern within Florida, particularly since over 5,400 pedestrian fatalities have occurred within the state between 2008 and 2017 (Smart Growth for America, 2019). Therefore, the FTP prioritizes the prevention of transportation-related fatalities and serious injuries by combing strategies for improved design, engineering, enforcement, education, and emergency response (FDOT, 2015). The FTP also aims to achieve public transportation ridership growth, reduced delays for people and freight, and a decrease in transportation-related greenhouse gas emissions and air quality pollutants (FDOT, 2015). The overarching goals of the FTP that act as guiding principles for the future of Florida’s transportation system play a salient role in how this report has established its literature review methodology, and how this project aims to address shared mobility policy and design.

Key Findings from the Local Trends

- Many municipalities in Florida are planning for shared mobility.
- The Florida Transportation Plan calls for safe, resilient, efficient, multi-modal transportation, which should include shared mobility.
- Florida has a high number of pedestrian fatalities, which makes safety a high priority for transportation planning in Florida.
Technological Trends in Shared Mobility

As was demonstrated in the International Context section, the trend towards shared mobility and the “sharing economy” is happening worldwide. This global movement is occurring in both developed and developing countries, including those in Europe, Asia, Africa, and Latin America. In the 21st century, the world feels like a much smaller and more connected place than ever before. This is made most apparent by the international trend to integrate AV technology. In 2018, KPMG International produced an autonomous vehicles readiness index in assessing countries’ openness and preparedness for autonomous vehicles. The index was based on four pillars of readiness: policy and regulation, technology and innovation, infrastructure, and consumer acceptance.

![Figure 12: Society of Automotive Engineers Automation Levels (CarandDriver.com, 2018).](image)

Twenty countries, based on their economic size and progress in adopting AVs, were identified in the report. The most AV-prepared countries each had “governments willing to regulate and support AV development, excellent road and mobile network infrastructures, private-sector investment and innovation, large-scale testing powered by a strong automotive industry presence, and a proactive government that [regularly] attracts partnerships with manufacturers” (KMPG, 2018). The United States ranked third in overall country readiness, but first in technology and innovation with strong industry partnerships (KMPG, 2018).

There are five levels of autonomous vehicle technologies that we see in cars driving on today’s streets as can be seen in Figure 12 (CarandDriver.com, 2018). The most substantial change occurs between Levels 2 and 3, when dependency on monitoring the driving environment shifts from the driver to the system. As AV integration and shared mobility alternatives begin to impact the future of built communities, the alignment of future land use and transportation objectives will increasingly come to shape the structure of our streets, communities, cities, and neighborhoods.

Growth in Autonomous Vehicles

Similar to the disruption caused by the invention of mass automobiles in the early 20th century, the impact of autonomous vehicles and their transition to a primary method of transportation - both for leisure and for business - has large implications on the direction of land use policies set forth by all levels of government. The emergence of autonomous vehicles is mirrored within their growth in the global market. In 2019, the market includes hardware, software and specialized equipment—is estimated to reach 17% market capitalization by 2035 globally” (Cushman and Wakefield, 2019). Overall, experts project a $555 billion value for the market of connected AV mobility by 2035 (Cushman and Wakefield, 2019). The growth in the market of AVs is most directly attributed to eliminations in accidents caused by human error and less carbon dioxide emissions and gas consumption (Garsten, 2018).

Leveraging Digital Infrastructure

Digital technology should be seen as the link between travelers (consumers), the mobility providers, and their drivers as well. Harnessing this technology can enable seamless connections, regulate good behavior, and manage price controls. “This digital link is the key to making effective designated drop-offs and parking zones that are easy for rideshare drivers or e-scooter users to find and access, and for local agencies to track usage. It’s an immediate communication tool that has the potential for built-in enforcement” (Crowther, 2019).
Shared Mobility and Autonomous Vehicles

Shared mobility alternatives will play a critical role in the integration of public transit with self-driving vehicles. Thus, it is imperative that policy makers, transportation leaders and transportation network companies work with one another to integrate the mobility system on both a local and federal level. At 21% of the major markets, ridesharing is already becoming widely adopted in the U.S (Cushman and Wakefield, 2019). With revenue in 2018 approximately $15.6 billion and forecasted to grow to $26.3 billion by 2023, rideshare companies are looking to fill the gap in profit values as drivers account for 50% of rideshare costs (Cushman and Wakefield, 2019). In recent years, shared mobility has shifted from being a disruption to transit systems to an opportunity for transit and transportation network companies to work together and build partnerships. This need for partnerships is because of “the potential to capture the cost savings of automated transit to improve bus frequency and routing, providing a viable path for enhanced services for under-served riders and improvements to transit systems” (Feigon, 2018).

Ridesharing is already reducing the use of public transit and increasing miles traveled and congestion. Trends will accelerate with widespread AV use (Cushman and Wakefield, 2019). In the 2018 National Shared Mobility Summit, the role of ride-hailing companies as a disrupter to transit systems was discussed. Leaders in transportation are seeing the potential to capture the cost savings of automated transit to improve bus frequency and routing, providing a viable path for enhanced services for under-served riders and improvements to transit systems in general (Shared-Use Mobility Center, 2018). Through shared mobility, the opportunity for greater transportation equity is possible and with autonomous vehicle integration, that potential becomes safer and more efficient.

Key Findings from Technological Trends

- Technological changes in transportation are emerging.
- Autonomous vehicle technology, whether semi-automated or fully-automated, will be widespread.
- Designing for shared mobility now will help support and enable AV integration, regardless of its implementation or adoption timeline.
- To increase transportation service, accessibility, and efficiency in high-density areas, integrate autonomous vehicle technology with mass transit.
3 BENEFITS OF SHARED MOBILITY THROUGH USING URBAN DESIGN

Health

Physical Health

Shared mobility prioritizes people and their well-being over vehicles. Many people are experiencing an increasingly sedentary lifestyle which is harmful to their health. In 2016, almost 30% of Florida’s adult population was sedentary (FL Health Charts, 2016). A reduced rate of physical activity is associated with those who rely exclusively on their personal vehicles for transportation. This is a public health concern in the United States, where the leading causes of death -- diabetes, heart disease, stroke, and some types of cancer -- are generally associated with overweight and obese individuals (CDC, 2017).

Shared mobility services, such as bikeshare, allow individuals the opportunity to increase their amount of daily physical activity by encouraging more active modes of transportation, such as walking or biking. Even public transit users “spend a median of 19 daily minutes walking, which nearly achieves the target of 22 daily minutes of moderate physical activity” (VTPI, 2005). According to the World Health Organization’s recommendations for physical activity, those who cycle or walk reduce their risk of mortality by 10% (Kelly et. al., 2014). Utilization of shared mobility transportation also helps counter physical inactivity by decreasing both the amount of time and the distance traveled in a motor vehicle (McCormack, 2014). This connection is influential since higher levels of driving are associated with increased weight (McCormack, 2014).

Access to Healthcare

An integrated shared mobility system can allow people to improve their standard of living through safe access to healthcare. This system emphasizes the availability of reliable transportation options, especially for low-income families and those in more rural areas (Criden, 2008). With the expansion of cities and public amenities away from the central business district towards the suburbs, access is increasingly important. Due to this outgrowth, and with lower income households residing in more rural areas and central cities, many of these individuals experience increased isolation from healthcare, such as routine doctor’s visits and preventative care treatments, as well as government services and programs (Criden, 2008).

Mental Health and Emotional Well-Being

Implementation of shared mobility and efforts to prioritize the overall wellness of the population can also create a positive impact on mental health and emotional well-being. This is supported by looking into the connection between shared mobility and the built environment’s promotion of walkability and public transportation (Cohen and Shaheen, 2018). Public transportation can support mental health by expanding independence and social interaction. Key benefits from the availability and use of active transportation in natural environments are the restorative properties and association with decreased depression and perceived general health status (Morita et. al., 2007; Rappe et. al., 2006). This research shows the positive impact the physical act and experience of walking can have on social cohesion, community strength, and an individual’s emotional well-being.
Key Findings for Health

- Shared mobility restores a people-oriented versus a car-oriented focus.
- An integrated shared mobility system can provide people with easier and better access to healthcare; and therefore, increase their health.
- Shared mobility can support mental health and emotional well-being by encouraging active transportation, social cohesion, and community strength.
- Designing shared mobility facilities to encourage active modes of transportation can improve public health outcomes.

Aging in Place

“Aging in place” primarily concerns older individuals whose transportation mobility greatly reduces after retirement, forcing them to be somewhat or solely dependent on family and friends to get around. Adversely, most of their daily activity, such as getting groceries or reaching doctor’s visits, requires frequent automobile use. Seniors aged 65 and older make 15% fewer trips to the doctor and 65% fewer trips to visit family and friends, thus increasing the likelihood of social isolation (DeGood, 2011). Aging in place allows seniors the freedom and independence to remain active participants in their communities, maintain their normal living standards, and facilitate their own health and mobility needs without a vehicle. In Florida, where the 65 and older demographic is growing fastest, policies such as these can make a marked difference in how people maintain their quality of life.

Takeaway

Shared mobility designs and policies should accommodate aging in place for senior populations.

Safety

According to the 2019 “Dangerous by Design” report from Smart Growth America and the National Complete Streets Coalition, Florida is the deadliest state for pedestrians, with nine of the twenty deadliest U.S. cities for pedestrians located in Florida (Smart Growth for America, 2019). In 2015, a pedestrian was killed on average every 1.6 hours and injured every 7.5 minutes due to traffic crashes (NHTSA, 2015). The belief that policy makers share in the responsibility of ensuring all individuals have the right to travel in their communities safely was emphasized across the world with the creation of the “Vision Zero” movement. This initiative asserts that traffic-related crashes and fatalities are more than just ‘accidents’ occurring beyond our control; they are preventable (Vision Zero Network, 2018). One action that can be taken by cities to reduce severe injury or fatality for pedestrians is lowering speed limits. It has been shown that pedestrians and cyclists are significantly safer in low speed environments.

Figure 13: Likelihood of Death Due to Speed (U.S. DOT, 2000).

As demonstrated by Figure 13, a pedestrian has a 40% chance to die when struck by a vehicle going 30 miles per hour (mph) and 80% as likely when struck at 40 mph (McCauley, 2017). The addition of shared transit modes has been correlated directly to “lower traffic fatality rates” (Litman, 2015). Public transportation in practice has relatively low crash rates per unit of travel (see Table 2). For utilization of car and passenger travel modes, the average is 7.28 deaths per billion passenger-miles whereas the number of passenger fatalities per billion passenger-miles for a bus, 0.11, is significantly lower (Savage, 2013).

Table 2: Passenger Fatalities per Billion Passenger-Miles 2000-2009 (Savage, 2013).

<table>
<thead>
<tr>
<th>Travel Mode</th>
<th>Deaths per Billion Passenger Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car or light truck driver or passenger</td>
<td>7.28</td>
</tr>
<tr>
<td>Commuter rail and Amtrak</td>
<td>0.43</td>
</tr>
<tr>
<td>Urban mass transit rail (subway or light rail)</td>
<td>0.24</td>
</tr>
<tr>
<td>Bus (transit, Intercity, school, charter)</td>
<td>0.11</td>
</tr>
<tr>
<td>Commercial aviation</td>
<td>0.07</td>
</tr>
</tbody>
</table>
**Bikesharing**

Bikesharing collision and injury rates are lower than personal bicycling as explained by rider behavior and design (Martin et. al., 2016). These bicycles commonly promote stability through the use of wider tires combined with both larger and heavier frames to ensure balance over potholes and train tracks. They are also brighter with eye-catching color which is more visible to cars and other cyclists, especially during dawn and dusk. Since much of urban design already includes shared infrastructure, there is less of a need for riders to switch between curb and road cycling, thus increasing the safety of the ride. While shared mobility design is still expanding, there could be a short-term adjustment period in which collisions increase, but long-term predictions suggest a safer built environment for riders.

**Shared Mobility Instead of Drunk Driving**

Shared mobility gives an effective, safe alternative for drivers to get to their final nighttime destination without driving if alcohol consumption is a factor. Reducing risk by not operating a vehicle is a benefit to the surrounding population since 31% of fatal traffic accidents “involve an impaired driver” and 30% “involve speeding” (NHTSA, 2012).

**Takeaway**

Shared mobility provides people with the option to choose safety over drunk driving.

**Key Findings for Safety**

- Shared mobility saves lives by decreasing traffic fatality rates.
- Shared mobility provides an alternative to driving under the influence; and therefore, reduces traffic fatalities that result from intoxicated driving.

**Environment & Sustainability**

The transportation sector is the largest contributor to greenhouse gas (GHG) emissions in the U.S. The increased prevalence of new transportation technologies like AV and shared mobility have the potential to provide transportation, land use, environmental benefits. Huge environmental benefits can be achieved if AVs are also electric and shared; GHG emissions per mile could drop by about 90% compared to the conventional passenger trip (Greenblatt and Shaheen, 2015). This benefit is important to consider since the United Nations Development Programme has reported that GHG emissions are already 50% higher than they were in 1990 and are still continuing to rise (UNDP, 2019). Even though more research is needed to know the magnitude of AV and shared mobility impacts on the environment, the time for the incorporation of multi-modal transportation is now.

Autonomous vehicles may have impacts on land-use and the environment due to the reduced necessity for parking and an increase in road use. Reducing the need for parking would reduce vehicle emissions emitted from locating parking or idling in a parking lot (Greenblatt and Shaheen, 2015). It is estimated that AVs could reduce energy use by around 80% due to “efficient traffic flow and parking, safety-induced light weighting, and automated ridesharing” (Greenblatt and Shaheen, 2015). Conversely, the ability of AVs to give those unable to drive access to a vehicle may increase the number of trips vehicles make, reduce the use of public transit, or increase commutes and vehicle miles traveled (VMT) (Greenblatt and Shaheen, 2015).

According to Figure 15 the main environmental benefit of carsharing is the reduction in vehicle ownership; “each carsharing vehicle removes 9-13 vehicles (postponed and sold) from the road,” (Greenblatt and Shaheen, 2015). Considering this number of postponed vehicle sales and purchases, there is an average 27%-43% reduction of VMT each year (Shaheen and Chan, 2015). Carsharing users are also more likely to increase their overall use of public transportation as well as use of non-motorized active transportation (i.e. walking, biking, rail), which both reduce GHG emissions and VMT (Shaheen and Greenblatt, 2015). Since carsharing tends to expand individuals’ modal usage away from single-vehicle ownership, it can also be used as a tool in heightening overall environmental awareness. Bikesharing usage mirrors carsharing experiences in the program’s ability to increase active transportation and subsequently decrease personal auto ownership. On average, bikesharing leads to a 58% increase in cycling and a 5.5% increase in sold vehicles or postponed purchases which can be seen in Figure 15 (Shaheen and Chan, 2015).
The reports of the connection between bikesharing and single-vehicle ownership seem to be higher in large cities where individuals are able to use cycling as the connecting piece from residence to bus lines and from bus lines to final destination (see Figure 15). Usage of bikeshare can also be environmentally beneficial due to reduced fuel consumption. Being a dominantly auto-centric society, 97% of oil consumption in the U.S. is used to fulfill transportation needs (Securing America’s Future Energy, 2006). This dependence on oil is a detriment to the atmosphere because once oil is burned and the carbon dioxide is released, it remains trapped heat for over a century (Sandalow, 2008). Coupled with an increase in global warming, emissions from oil consumption are also a leading cause of urban smog and subsequent health problems (Sandalow, 2008). Reductions in GHG emissions are needed all across the world but especially in large urban cities because of the link to improved air quality (Cohen and Shaheen, 2018). In the U.S., transportation alone accounts for almost one-third of the carbon dioxide emissions (Boriboonsomsin and Barth, 2008). Carbon dioxide accounts for around 81.6% of all GHG emissions due to human activity (EPA, 2018). An effort to further reduce the amount of carbon dioxide and GHG emissions for the future means looking deeper into the creation of efficient traffic flow and reduction of traffic congestion. Shared mobility can be used in combination with planning and public policy goals as a tool in mitigating congestion and air pollution (Cohen and Shaheen, 2018). In addition, the connection of shared mobility in lowering vehicle miles traveled, decreasing GHG emissions, improving air quality, and reducing fuel consumption creates the potential for shared mobility to be used as an overarching transportation strategy in achieving global climate action targets (Cohen and Shaheen, 2018).

**Key Findings for Sustainability and Environment**

- Shared mobility as a transportation strategy can be incorporated into environmental sustainability goals by lowering vehicle miles traveled, decreasing greenhouse gas emissions, improving air quality, reducing fuel consumption (and, therefore, lessening U.S. oil dependence).
- The bikeshare service model can be especially helpful in reducing single-occupancy vehicle travel by helping to solve first- and last-mile transportation connections.
People with a physical or cognitive disability have difficulties navigating shared mobility options. People with disabilities often have no or limited public transit options and lack a personal motor vehicle, reinforcing an environment which makes it difficult to use and access quality transportation. Currently, bus and rail stations are increasing ADA accessibility, but there is still a gap for ADA accessibility in shared mobility. Ridesourcing vehicles are often not equipped to accommodate wheelchairs or drivers may not be trained to accommodate the physiological needs of persons with disabilities. Insufficient requirements for ADA accessibility in shared mobility present unique issues that governments will need to evaluate and address (Shaheen et. al., 2017).

Shared mobility presents an opportunity to reduce barriers for persons with disabilities accessing transportation. Ridesourcing may be an option for curb-to-curb transportation for older adults. Additionally, Lyft has partnered with medical facilities to provide non-emergency transportation options (Shaheen et. al., 2017). Furthermore, on-demand mobility options can be beneficial to seniors and those with disabilities when paratransit or public transit are lacking or too expensive.

New mobility options, such as shared mobility services, present the opportunity to address past inequities by promoting "a public transit-based mobility system...open to people of all ages and abilities, [which] is fundamentally more equitable than one based primarily on private vehicles" (NACTO, 2016). Shaheen et. al. (2017) created the STEPS (Spatial, Temporal, Economic, Physiological, and Social) framework which outlines how shared mobility can address the transportation barriers that exist in current transportation planning (Table 3).

Below are specific examples of shared mobility addressing the transportation barriers listed in Table 3:

- **Spatial**: In St. Petersburg, Florida, Pinellas Suncoast Authority (PSTA) offers subsidies of up to $5 for ridesourcing trips that begin or end at designated bus stops within defined zones (Shaheen et. al., 2017; Cochran, 2016).
- **Temporal**: Shared mobility can address temporal barriers to transportation by providing the same reliability of an automobile, albeit without the cost, or general access when public transit is lacking (Shaheen et. al., 2017).

**Key Findings**

- Equity and accessibility must be the foundation for shared mobility designs and policies.
- Shared mobility can improve quality of life by improving safety and mobility.
- The goal of shared mobility should be to increase accessibility for transportation disadvantaged individuals already under-served.
- Shared mobility needs to complement, not compete with, public transit.

- **Economic**: Shared mobility can reduce the need for car ownership, a household cost of roughly $8,500 a year, according to the American Automotive Association (Shaheen et. al., 2017; Stepp, 2016).
- **Physiological**: In most cities, paratransit is an incredibly expensive service to offer. Federal requirements state that fares for these trips cannot exceed twice the fare for fixed-route trips. In the City of Tallahassee, where StarMetro provides transit services, fare revenues attributable to the Dial-A-Ride (paratransit) program totaled approximately $186,000, $179,000, and $196,000 in 2014, 2015, and 2016, respectively (Fletcher, 2017). StarMetro’s expenses reported for these fiscal years totaled approximately $1.7 million, $2.1 million, and $2.1 million, respectively (Fletcher, 2017).
- **Social**: Shared mobility has the ability to allow different languages to be viewed in the mobile application which can minimize language barriers. Furthermore, shared mobility service providers can implement tailored community outreach to get feedback about the needs of the population (Shaheen et. al., 2017).
Table 3: Spatial, Temporal, Economic, Physiological, and Social Transportation Equity Framework (US DOT FHWA, 2017).

<table>
<thead>
<tr>
<th>Transportation Barrier</th>
<th>Definition</th>
<th>Shared Mobility Opportunities</th>
<th>Shared Mobility Challenges</th>
</tr>
</thead>
</table>
| Spatial                | Spatial factors that compromise daily travel needs (e.g., excessively long distances between destinations, lack of public transit within walking distance) | • Public operators and ridesourcing first- and last-mile partnerships  
• Microtransit for lower-density areas | • Higher operating costs in lower density exurban and rural settings  
• Limited curb space for increasing variety of mobility services |
| Temporal               | Travel time barriers that inhibit a user from completing time-sensitive trips, such as arriving to work (e.g. public transit reliability issues, limited operating hours, traffic congestion) | • Dynamic microtransit  
• Late-night ridesourcing and shuttle services  
• Commuter carpooling services | • Wait-time and travel-time volatility on congested roadways  
• Unpredictable wait times due to supply fluctuations |
| Economic               | Direct costs (e.g., fares, tolls, vehicle ownership costs) and indirect costs (e.g., smart phone, Internet, credit card access) that create economic hardship or preclude users from completing basic travel | • Shared mobility subsidies for low-income users  
• Multiple payment options for shared mobility services  
• Multi-modal hubs with Wi-Fi access | • Credit/debit card payment  
• High cost for longer distance and peak-demand trips  
• Maintaining affordability, while providing livable wages |
| Physiological          | Physical and cognitive limitations that make using standard transportation modes difficult or impossible (e.g., infants, older adults, and disabled) | • Older adult focused shared mobility services  
• Voice activated mobility app features | • Maintaining legacy technology access  
• Ensuring adequate driver training |
| Social                 | Social, cultural, safety, and language barriers that inhibit a user’s comfort with using transportation (e.g. neighborhood crime, poorly targeted marketing, lack of multi-language information) | • Ridesourcing app interface that minimizes profiling  
• Targeted outreach to low-income and minorities  
• App information in user’s native language | • Attracting marginalized groups  
• Driver prejudice against riders  
• Providing security at unmanned vehicle stations |
Economic Development

Shared mobility promotes economic development by reducing the need for vehicle ownership, allowing people to have more money to spend on other goods and services. Also, shared mobility is a part of the “gig economy” which provides people the opportunity to earn a living by driving for a TNC or sharing their vehicle with others. Shared mobility also encourages transit oriented development, which generates more tax revenue. Cities, regardless of their sizes, may be able to benefit from shared mobility. However, not every jurisdiction may be able to make use of the same combination of modes or shared mobility service models.

Some cities, such as Minneapolis, St. Paul, and Austin may have moderately sized bikesharing systems but are missing other relatively widespread modes such as one-way carsharing or ridesourcing (Shared Use Mobility Center, 2016). Other cities such as Ann Arbor, Boston, Los Angeles, and Philadelphia may possess a wide range of shared mobility options that are clustered in higher-income areas or offer systems that are larger than average but lack the fleet to appropriately serve the needs of smaller, more compact neighborhoods in the exterior low-income neighborhoods (Shared Use Mobility Center, 2016).

The connection between areas of disinvestment and flourishing opportunity must be sought after by governance structures to realize the full economic potential. In 2014, a number of apartment complexes within transportation-oriented development (TOD) districts in Maryland and Virginia generated between $1.13 and $2.20 in tax and non-tax revenues for every $1 spent on public services for residents and employees (Urban Land Institute, 2017). Regulatory instruments allow local governments to direct economic development to areas which may have previously been void of mobility investments. Research shows that there is still untapped potential for shared mobility in urban downtowns, small city downtowns, and moderately dense neighborhoods in proximity to transit, inner-ring suburbs, and densely populated low-income neighborhoods (Shared Use Mobility Center, 2016).

Fostering Economic Development through Shared Mobility in Different Contexts

Urban Core

Neighborhoods or downtowns with moderate to high density pose the highest potential to facilitate shared mobility by augmenting access to retail or employment centers. While all shared mobility modes could be used well in these contexts, the private market may seek to invest in these locations first because of historical success or continuing current trends (Shared Use Mobility Center, 2016).

Outer Downtown Core

Low to moderately dense areas may offer opportunities for redevelopment or design retrofits for shared mobility, especially if cities are interested in expanding bicycle and pedestrian infrastructure or introducing congestion pricing or metered parking during peak travel hours to generate additional revenue. Redevelopment and mixed-use infill could increase ad valorem taxation and sales tax revenue. These neighborhoods could support all shared modes, but strategic planning and enabling policies should be in place for shared mobility to fully succeed (Shared Use Mobility Center, 2016).

Suburban

Shared mobility can offer first- and last-mile connections in a suburban context. Commercial activity is mainly located in strip malls located along major arterial roadways that are difficult for shared modes to access due to the absence of safe or appropriate facilities for bicycles and pedestrians, dangerously high speed limits, or inappropriate roadway design for pick-up/drop-off locations that would otherwise impede traffic flow. When modeled, these areas have shown potential for shared mobility policy and design that could increase access to commercial areas and play a key role in economic revitalization (Shared Use Mobility Center, 2016).

Key Findings for Economic Development

- Shared mobility policies can direct economic development to areas in need.
- There is still untapped potential for shared mobility in urban downtowns, small city downtowns, moderately dense neighborhoods near transit, inner-ring suburbs, and densely populated low-income neighborhoods.
Role of Government

Governments need to anticipate and mitigate new challenges presented in accommodating shared mobility. The government plays a role in the following areas:

1. Harnessing the opportunities and mitigating the potential negative externalities presented by shared mobility and autonomous vehicles (AV).
2. Regulating the emergence of autonomous vehicle technology.

Harnessing Opportunities and Mitigating Negative Externalities

Governments can play a role in facilitating the integration of shared mobility with the current transportation infrastructure to ensure sustainable, people-oriented communities (Crute et al., 2018). Technology-enabled services, such as bikesharing, carsharing, ridesourcing, and AV, are attempting to fill transportation gaps, make first/last mile connections with public transit, reduce traffic congestion, cut household transportation costs, and decrease harmful greenhouse gas emissions. When used independently, these services may not meet user demands for a complete transportation network, but as an integrated system they can provide substantial access and additional benefits for all (Shared Use Mobility Center, 2016).

The role of state and local transportation agencies is to develop, maintain, manage, and improve the transportation system in a way that enables individual mobility, supports economic activity, and improves quality of life. As government entities, these agencies aim to serve a broad public interest and provide services that might not otherwise be available in the market. Planners must consider the built environment’s role in providing an equitable and accessible transportation system.

While ridesharing, ride-hailing, and carsharing have already begun to influence metropolitan transportation systems (for better or for worse), connected automated vehicle (CAV) technologies may profoundly change personal, freight, and public transport in unpredictable ways (Crute et al., 2018). If the technology continues to advance at such a pace, highly, if not fully, autonomous vehicles are expected to be available to the public within the next 10 years (Kuhr et al., 2017).

Regulating the Emergence of Autonomous Vehicles

Communities have the opportunity to adapt to and incorporate technologically-advanced mobility alternatives that, left unregulated, have the capacity to do more harm than good. Leaders in planning and transportation have formulated certain policy guidelines and recommendations that can serve as overarching principles for policy makers considering AV emergence, such as Making Transportation Safer for Everyone, Not Just Motorists; Integrating Self-Driving Vehicles with Mass Transit to Reduce Congestion; and Improving Access to Transportation on an Equitable Basis (Union of Concerned Scientist, 2017).

A recent white paper published by the American Planning Association outlines four principles to guide AV planning efforts:

1. Now is the time to begin planning for autonomous vehicles
2. Use proven and effective planning techniques
3. Anticipate the disruptive effects of technology
4. Account for the uncertainty of the implemented technology (Henaghan et al., 2018).
5. Planners must begin applying best practices and planning principles, and consider a range of possible futures flexible enough to accommodate rapid changes in technologies and behaviors (Crute et al., 2018).
A recent white paper published by the American Planning Association outlines four principles to guide AV planning efforts:

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5. Planners must begin applying best practices and planning principles, and consider a range of possible futures flexible enough to accommodate rapid changes in technologies and behaviors (Crute et. al., 2018).

Public agencies may regulate the degree to which CAV technologies will be allowed to operate within the system. Regulatory instruments require firms or individuals to comply with specific standards, such as technological, performance, or locational requirements. With these tools, governing bodies have the power to influence the private sector to accommodate public health, safety, and welfare. Planning efforts should address shared mobility and the impacts of CAVs on the built environment. New technologies will allow cities to alter local and regional growth management strategies, as well as reclaim space developed for parking, curbside management, and traffic signalization (Crute et. al., 2018).

**Key Findings for Role of Government**

- Local governments will need to harness the opportunities AV technology presents, mitigate potential concerns, and ensure sustainable, people-oriented communities.
- The mechanisms through which public agencies typically achieve their broad goals include economic, regulatory, and planning instruments.

**Potential Equity Concerns**

**Inequities in Current Transportation Planning**

Planning history in the U.S. has been marked by inequities due to lack of community engagement and racist planning policies. Equity and accessibility should be the foundation when planning for shared mobility, which has the opportunity to address inequities in transportation planning. Transportation planning -- favoring the movement of cars over people -- has disproportionately negatively affected individuals with limited mobility due to income, access, ability, and age (Fleming, 2018; Shaheen et. al., 2017).

Low-income and minority communities suffer the most from the negative externalities of transportation, such as congestion and air pollution, and contribute the least to greenhouse gas (GHG) emissions, yet receive the fewest benefits from transportation planning. On average, low-income residents spend a higher proportion of their income (42%) on transportation-related expenses than the rest of the population (Fleming, 2018; Transportation Equity Network, n.d.). Additionally, rising housing costs are displacing low-income residents to less urban areas where public transit is often limited and car ownership is a necessity. Consequently, low-income populations and minorities, who are already less likely to own a vehicle, are faced with increasing commute times and distances, often without proper access to transportation (Fleming, 2018; National Equity Atlas, 2016). For those who must rely on public transit, almost 30% of households without access to a vehicle are more than a half-mile away from a transit stop (Fleming, 2018; Center for Neighborhood Technology, 2018).
Potential Sustainability Concerns

As planners, effective urban design can contribute to protecting the environment, promoting livability, and structuring spaces for a number of varying goals and objectives. Within urban design, “shared mobility can support sustainability principles by promoting walkability, cycling, and public transit use, while reducing the need to own personal vehicles” (Cohen et. al., 2016). Urban design is a multidisciplinary and synergistic process which incorporates design guidelines and principles relating to the “built environment (buildings), public space, streets and streetscapes, transport system inclusion, and landscaping” (Urbandesign.org, n.d.). Transportation design includes “road, rail, bicycle, and pedestrian networks, [that] together form the total movement system of the city” (Urbandesign.org, n.d.).

Historically, urban design has related to the structure of public and open spaces within the city. As information and mobility technologies, such as ride-hailing applications and on-demand mobility services, are further integrating into mobility networks, the tenets of urban design are shifting to accommodate a more flexible and integrated transportation system. Through an approach known as New Urbanism, planners attempt to “bridge architecture, city planning, real estate development, housing and transport policy, government, environmental protection, and civic activism” (Urban Design Associates, 2013). In regards to shared mobility and the dynamic nature of the transport system, a key tenet of this approach is “a well-connected network of streets that disperse traffic, promote greater choice of routes, ease of wayfinding, and support conveniently located transit service” (Urban Design Associates, 2013). These principles will guide and inform the context area design decisions on which this project will focus, hoping to ensure future planned developments recognize accessibility, universal design, and the integration of mobility services are of paramount importance.

Aligning the goals of shared mobility with those of design requires careful consideration about context. For example, the curbside management challenges of a downtown urban area will differ greatly from a suburban shopping mall, just as the challenges of retrofitting an existing developed area will vary from implementing shared mobility concepts at the design phase of a new development. Transit has become more flexible and dynamic, and consumer demands regarding preferences of mobility and transportation have shifted. Today, “travelers acting as daily and hourly consumers of mobility services are now setting the standard of expectation for efficiency and convenience in a way not previously possible with public transit, taxis, or other options” (Crowther, 2019). With carpool programs, ride-hailing apps, and bike-share facilities, citizens are increasingly aware of, and rely on, a suite of flexible, convenient, and affordable mobility choices that fit their needs (NACTO, 2016). This dynamism allows residents to make better decisions on how they want to move about the city.
The growing use of shared mobility will require innovative and creative responses from state and local governments. As these trends alter the public’s mobility options, they will inevitably impact the built environment. To ensure the safety and efficiency of the transportation system, urban planners will need to rethink how roadways, transit infrastructure, curbsides, and parking areas are designed. By applying sound urban design practices to streetscapes, curbsides, and mobility hubs, shared mobility efforts can improve safety and mobility for all residents. This section will provide design features and principles to guide the application of shared modes.

Designing for the Future

Overall, the future of shared mobility is not clear, in terms of its societal benefits or hidden costs. Yet, due to the slow nature of public transportation planning and design, solutions for today must accommodate future demand in an equitable and cost-effective manner. Jean Crowther, in Complete Streets 2.0: Responding to The Fast Pace of Change in Transportation identifies that even with fast-paced innovation through technology services, planners must still guide this process and “we can do it by building from what we already know works and what local agencies are experienced in doing.” This approach includes, making room within the existing corridor or streetscapes, by “re-assign[ing] space to serve the objectives we are trying to meet,” testing it out, through demonstration design projects, and measuring the “right” outcomes, such as “[a] shift toward measuring person throughput rather than vehicle throughput.” This approach rooted in the “Complete Streets Movement” identifies eight guiding principles which, themselves, aid planners, and designers, in promoting design that is environmentally sound, equitable, and adaptable, these principles are as follows:

- Prioritize street uses
- Design for safety (regardless of the mode)
- Assume point-to-point access for micro-mobility and shared vehicles
- Assume trips are multimodal
- Plan (and design) for complete networks
- Leverage digital infrastructure
- Choose nimble and movable components whenever possible
- Commit to an outcomes-based approach to planning, design, and engineering

These principles can then guide designs based on four interrelated factors (see Table 4):

1. Mode
2. Speed
3. Demand
4. Capacity

E-Scooter Dilemma

Within Florida, consider that e-scooters are not road legal, nor are they legally allowed on the sidewalk, this service which can serve a market travel speed between a personal vehicle and that of walking, is in context, illegal. It is also illegal in New York City, but some places like Boulder, Colorado, have allowed e-scooters.
Mode • Modes are context-dependent  
• Mobility hubs are intended to link transportation modes together

Speed • Different modes travel at different speeds  
• Delineating and prioritizing use of space by travel speed creates a more efficient use of roadway space

Demand • Demand and curbside management work together to allocate “space based on its highest and best use at that time”

Capacity • Prioritizing the movement of people (rather than cars) creates “more efficient, equitable, and economically-viable transportation systems”

Table 4: Factors to Guide Designs (Abe, 2019)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Speed</th>
<th>Demand</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modes are context-dependent</td>
<td>Different modes travel at different speeds</td>
<td>Demand and curbside management work together to allocate “space based on its highest and best use at that time”</td>
<td>Prioritizing the movement of people (rather than cars) creates “more efficient, equitable, and economically-viable transportation systems”</td>
</tr>
</tbody>
</table>

Streetscape Contexts

Neighborhood Streetscapes

Context is very important in determining effective roadway design solutions, which includes shared mobility. The National Association of City Transportation Officials, in their guide, Transit Street Design Guide, identify the streetscapes of three environments that can be applied to most city contexts. The first classification they delineate is “Neighborhood Streets” (see Figure 16). These streets can include but are not limited to, mixed use (or single use) main streets, and surrounding residential streets. These neighborhood streets, with no more than one lane in each direction, have “moderate pedestrian and bicycle traffic, with low-speed vehicular traffic” (Coffell, 2012). The availability and capacity of land is scarce with little road space to augment, posing an additional challenge for transit and shared-mode reliability. In these contexts, “designating space for deliveries and drop-offs, and setting a fair price for curbside parking, relieve[s] common sources of delay for transit and private vehicles alike, and create[s] a safer place to bike as well” (NACTO, 2016). Concurrently, these streets, which are typically communal spaces where residents to gather, can be designed to accommodate events like festivals and farmers’ markets (BTD, 2013).

Figure 16: Neighborhood Streetscape (NACTO, 2016)
**Corridor Streetscapes**

The second classification identified, Corridor Streets (Figure 17), are “long and direct, transit corridor streets” that support “high-frequency transit service at the center of regional mobility” (NACTO, 2016). These wide corridor streets are prototypical of streets designed for the automobile. These corridors are oftentimes arterial and highway-like, with less emphasis placed on pedestrian or bicycle mobility. However, compared to their neighborhood counterparts, space is ample to redesign and accommodate modes of transit and shared mobility. “Wide corridor streets are sometimes-overlooked candidates for the assignment of general-traffic lanes to transit, making the street more organized, easier to use, and more predictable, while reducing aggressive driving” (Stamatiadis, Nikiforos, & Kirk, 2012). This classification is primarily applicable to suburban corridors or major arterials leading into the city, and varying design components can act as complements to the transition.

![Figure 17: Corridor Streetscape (NACTO, 2017)](image)

**Downtown Streetscapes**

The third and final context classification, Downtown Streets (Figure 18), are situated in the heart of major urban activity centers and tend to attract high volumes of pedestrians and transit users due to a commercial presence (NACTO, 2016). Downtown streets benefit from a wealthy supply of transit and human-scale, pedestrian-friendly activities, but lack the space to ensure separation of differing modes (bike, bus, car, transit): “Congestion, commercial vehicle traffic, and high volumes of pedestrians and bicycles, combined with relatively short blocks and numerous irregular intersections, make achieving the right modal balance a considerable challenge” (BTD, 2013). This classification area requires a more fluid form of design reliant on flexible zones for loading and unloading passengers and goods, in-lane stops for transit, and a clustering of transit options for accessibility at all scales.

![Figure 18: Downtown Streetscape (NACTO, 2016)](image)
Design Elements

Curbside Management

Land use implications of self-automated vehicles will most predominantly be seen in the curb management allocations of neighborhoods and cities. Instead of the conventional approach of streets as places used for linear passage, planners look to integrate pedestrians, cyclists, and AVs in urban environments that promote health, physical well-being, culture, and commerce. Within curbside management and curbside reconfigurations, the opportunity for more flexible loading and unloading zones are present for freight and businesses. Requirements for passenger loading and unloading will need to be managed through local zoning ordinances. “Sensors will allow autonomous vehicles to travel closer together than human-controlled vehicles, reducing the necessary pavement width and freeing up space for wider sidewalks, bike lanes, and other amenities” (Henaghan, 2018). Subsequently, “key curbside management strategies should support reliable transit and safer streets in one of two ways: either by directly making room for transit, or supporting transit projects by better managing the many demands on the urban curb” (NACTO, 2017). Through this method, critical uses such as transit stops, transit lanes, and bike-ways are first addressed. In addition, transit-and business-supportive uses are managed in a way that prevents blockages or congestion from conventional transit methods like a city bus. Theses uses are seen through bikeshare stations, commercial loading, and accessible passenger loading zones. Curbs should also be dedicated to provide for public spaces that integrate green spaces, parklets, stormwater infrastructure and pick-up and drop-off zones for for-hire private vehicle companies. The accessibility infrastructure of these areas should be addressed concurrent to area peak times so the opportunity for more efficient transit and mobility options are working effectively. “Transit riders, transit agencies, city governments, and local merchants all have a stake in more reliable transit and better public space (NACTO, 2017).

Station Design

In regards to the design of the station itself and the stop elements, several elements can be included or excluded dependent upon the desired goals and accessibility needs of the population. To redesign an intersection, street, or to add an additional transit stop or adjust an existing one, it is important to consider compliance with the current policies and codes. An inventory of the current design requirements along with the feasibility of the design must be undertaken to ensure ADA compliance, needs assessments, allocation of resources, and an equitable distribution of services. Station design should consider the following principles when implementing a shared mobility strategy as seen in Table 5.

These principles can assist transit agencies and city officials seeking to better integrate transit into their transportation systems by evaluating how to properly design an efficient, economic, and equitable transit or shared mode system. Furthering this, artistic principles such as tactile cues, color contrast, lighting, and audible cues all work in concert to make these stations not only safe, but equitable. Ultimately, these streets should become places that correlate with adjacent development and transform the first 30 feet (9.1 m) of space extending from buildings into an activity-filled, indoor/outdoor public realm. Streets should be designed with a ‘nature first’ concept where the opportunity for more permeable surfaces are available for stormwater cleaning. Green spaces should offer fresher air and comfort while at the same time promoting the local culture and economy through retail shops and outdoor eateries. In addition, these spaces should be welcoming and active environments for walkers, runners, and cyclists. In taking back space allocated almost exclusively for parked cars and vehicle lanes, integrated streets can become dense, vibrant places that incorporate human activity within livable areas (ULI.org). Boston’s Department of Transportation formulated a “Complete Streets Guide” in which they outline: transit prioritization, intelligent signaling, electric vehicle charging, ease of maintenance, accessible and permeable surfaces, bicycle lanes, bicycle/car share stations, minimum lane widths, landscaping, smart metering, wide sidewalks, and integrated information (such as signage, wayfinding, or community bulletins) as core design visions for what constitutes a complete street (BDT, 2013). While Boston differs greatly in terms of spatial organization from most southern cities, the concepts can still be applied.
### Table 5: Principles for Implementing Shared Mobility Strategies (NACTO, 2016)

<table>
<thead>
<tr>
<th>Principle</th>
<th>Questions to Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stations are Gateways</td>
<td>How does the station/stop interact with the sidewalk and adjoining building?</td>
</tr>
<tr>
<td>Facilitate Movement</td>
<td>Are there clustered transit options at stops/stations?</td>
</tr>
<tr>
<td>In-Lane Stops Save Time</td>
<td>Are transit or ride-hailing services able, or required to pull out of traffic and up to the curb?</td>
</tr>
<tr>
<td>Universal Design</td>
<td>Can riders of all ages and ability levels access/interact with this stop/station with relative ease?</td>
</tr>
<tr>
<td>Safety</td>
<td>Is the stop/station safe? (based on design standards of lighting, transparent shelters, and nearby all-hours activities)</td>
</tr>
<tr>
<td>Integrated Vehicle and Platform Design</td>
<td>Is the stop/station designed to facilitate ease in boarding?</td>
</tr>
</tbody>
</table>

**Sidewalk Design**

When designing for shared mobility, it is a simultaneous and iterative process of designing for pedestrians. By ensuring that they have adequate space, mobility options, and activities, planners can effectively incentivize multi-modal transportation and ridership along the given corridor, or at the given intersection, stop, or station. To enhance the vitality of the walkable, pedestrian space, sidewalks must provide a vibrant, all-weather walking environment accessible by all that incorporates “intelligent systems for wayfinding, transit information, or ticket purchasing” (BTD, 2013). For cities, sidewalks should be easy to maintain, made from “durable, long-lasting materials,” and allow for “effective management of stormwater and snow” (BTD, 2013).

**Key Findings from Design**

- Designs are context-dependent.
- Make designs universal.
- Design for future flexibility and adaptability to social and technological changes.
- Design with an outcomes, and people-based approach.
Key Principles of Design

The literature review was conducted to provide the studio team with sufficient information to establish principles of design for guiding the conceptual urban design templates for a variety of design contexts. These principles incorporate the government’s role in shared mobility, equity and accessibility, health and safety, environment and sustainability, economic development, and technological innovation. Technological innovation, socioeconomic trends, and environmental challenges are reshaping the ways people access goods and services. These Key Principles of Design can help communities prepare for an increasing public reliance on shared mobility by establishing new norms of urban design and transportation use. For this project, the Key Principles of Design will be integrated into everything that follows: Plan Review, Conceptual Designs, and Recommendations for Implementing Shared Mobility.

The Five A’s

I. Shared Mobility for All
   Each context is designed to accommodate the needs of all users, ranging from 8- to 80-year-olds.

II. Aesthetics
   Design should promote an environment that is both aesthetically pleasing as well as economically viable.

III. Access
   Mobility is less about the means of transportation and more about the proximity and convenience of accessing destinations.

IV. Adaptability
   To accommodate user demands for flexible, on-demand transportation, the built environment must accommodate flexible, on-demand design (i.e. sleek and efficient utilization of space for pick-up/drop-off zones).

V. Technological Accommodation
   Adapting dedicated curbside public transit space with technological and built environment changes supportive of shared mobility and autonomous vehicle alternatives is integral to maintaining, augmenting, and facilitating ridership.
Methodology

The first step in the methodology of the plan review consisted of research and analysis on federal and state issued plans as well as the regional and local plans for Hillsborough County. Through the analysis of the plans, barriers and enablers to the implementation of shared mobility urban designs were identified. These barriers and enablers either progress or limit shared mobility through funding programs, planning tools, and land use implementations within the plans. Policies and recommendations resulting from the plans guided the studio team in determining the feasibility of shared mobility alternatives from a top-down lens. The barriers and enablers ultimately provided key findings to give strength to the recommendations made in the final report and the design of the context areas.

Barriers and Enablers Analysis

The following section will summarize the barriers and enablers that could potentially facilitate or inhibit the implementation of shared mobility in the federal, state, regional and local contexts.
Federal Context

Fixing America’s Surface Transportation (FAST) Act

The FAST Act was placed into law in 2015 under President Obama demonstrating a prioritization on safety as a dedicated source of federal funds were provided for surface transportation infrastructure on a long-term basis. The certainty of funding for infrastructure planning and investment creates opportunity for coordination between the transportation system and progressive grant programs with an emphasis on safety, access and mobility. This has overall benefits by enabling the growth of multi-modality choices. Economically, this act is also important because it places funding down at the state, regional and local levels to impact their transportation systems based on the specifics of the area’s environment and desired goals.

State Context

Florida Transportation Plan

In response to the projected growth in population and economy, the Florida Transportation Plan posits on providing a statewide overarching plan that identifies the transportation needs and preferences of residents, visitors, and businesses within the Sunshine State. Initiatives directed at transportation solutions that promote Florida’s environment and an agile, resilient, and quality infrastructure within the transportation system looks to be the guiding principle as the planning framework for regional and local transportation planning. The goals and objectives of the policy element are informed by a collaborative effort on the part of transportation partners on all levels of transportation planning.

Regional Context

The regional planning level provides guidance to the region and seeks to foster intergovernmental coordination of plan making. The regional planning framework provides an opportunity to examine components which guide the creation of local regulatory framework, planning, and foster regional economic growth. The plans produced at the regional level are typically informed through intergovernmental coordination, and provide regional goals, objectives, and policies to guide local planning efforts. Below we will identify the observed barriers and enablers to the implementation of a shared mobility site plan as identified through the following plans:

- Imagine Hillsborough 2040: Long Range Transportation Plan
- Plan Hillsborough Transportation Improvement Program
- Hillsborough Area Regional Transit Authority: Transit Development Plan Update (2019-2028)
- Hillsborough Transportation Disadvantaged Service Plan (2018-2023)
- Tri-County Area Regional Mobility Needs
- Vision Zero Action Plan
- Hillsborough County Wide Bicycle Safety Action Plan, 2011
- Greenways and Trails Plan, Adopted 2016
When identifying appropriate barriers and enablers to the implementation of a site design, it is important to address the current regulatory, planning, and economic framework in place. Within the larger-scale policies, these city-wide plans and projects provide a more localized concept of the current framework with which, we can address obstacles or best practices in the realm of implementing such a design. Below we will identify the observed barriers and enablers to the implementation of a shared mobility site plan as identified through the following plans:

- City of Tampa Comprehensive Plan
- Plant City Comprehensive Plan
- City of Temple Terrace Comprehensive Plan
- Comprehensive Plan for Unincorporated Hillsborough County
- West River Plan
- City of Tampa Walk-Bike Plan
- Citrus Park Vision Plan- Hillsborough County Livable Communities
- Keystone/Odessa - Hillsborough County Livable Communities

Through an analysis of these plans the overarching barriers and enablers to implement a shared mobility design strategy are listed in Table 6.
The following section identifies the main existing barriers and enablers towards the implementation of shared mobility designs at the regional level for the Tampa Bay Area. The "barriers" within each plan represent opportunities to improve language, facilitate greater understanding, and to ultimately reframe the objectives and policies which may disincentivize, or discourage the extent to which public and private transit providers are able to incorporate shared mobility designs into the urban environment. On the other hand, the "enablers" in these plans represent policies and objectives that can promote shared mobility urban designs and construct a facilitating framework to their implementation, from promoting language, to strategic policy efforts.

**Imagine Hillsborough 2040 LRTP**

Imagine 2040 is the Long Range Transportation Plan update for the Hillsborough MPO. The Plan is also being updated together with the Comprehensive Plans of Hillsborough County, and the cities of Tampa, Temple Terrace, and Plant City. The purpose of updating the plan is to plan for the anticipated approximately 600,000 new people that are projected to call Hillsborough County home in 2040.

**Enablers**

1. Goal I - Enhance the safety and security of the transportation system for both motorized and non-motorized users.
2. Goal III - Improve the quality of life, promote energy conservation and enhance the environment, while minimizing transportation-related fuel consumption, air pollution and greenhouse gas emissions.
3. Goal IV - Promote accessibility and mobility by increasing and improving multi-modal transportation choices, and the connectivity across and between modes, for people and freight.

**Barriers**

1. Policy 2.1A - Prioritize transportation projects that serve major employment centers and freight corridors.
2. Policy 2.1C - Promote transit oriented design for select activity centers.

**PlanHillsborough TIP**

The TIP lists the regionally significant transportation projects of the local governments, authorities, and the Florida Department of Transportation (FDOT), which are within the designated Metropolitan Planning Area – Hillsborough County for the upcoming 5-year period.

**Enablers**

1. Number One: Preserve the System - Transit vehicle Replacement Schedule
2. Number Four: Real Choices When Not Driving - Incorporating shared mobility into what constitutes “real choices” would set a precedent for these programs/projects
3. Number Five: Major (Capacity) Investments for Economic Growth - Strategic Intermodal System

**Barriers**

1. Number Three: Minimize Traffic for Drivers & Shippers - This barrier may favor investment for congestion management rather than multimodal development
2. Local Agency Capital Improvements by Work Type - The majority of capital improvements (65%) are focused on ports, and about 14% is dedicated to road widening which has been proven to not reduced congestion because of induced demand, while capital improvements for both transit and bike/ped combined only account for about 10% of the investment.
**Transportation Disadvantaged Service Plan**

The purpose of the Transportation Disadvantaged Service Plan (TDSP) is to improve transportation services for the Transportation Disadvantaged (TD), who are identified as persons with disabilities, older adults, individuals with lower incomes, and children-at-risk, by ensuring that Hillsborough County coordinates transportation resources provided through multiple federal and state programs.

**Enablers**

1. Objective 1: Promote an efficient transportation system - Strategy 1.2 & Strategy 1.5
2. Objective 2: Promote a reliable transportation system - Strategy 2.2, Strategy 2.3, Strategy 2.6, and Strategy 2.8
3. Objective 3: Promote a safe transportation system for the TD by maximizing available bicycle and pedestrian facilities - Strategy 3.3 & Strategy 3.4

**Barriers**

1. 1.5.1. Funding: The two largest providers of service within the coordinated system are HART and Sunshine Line. Both entities have experienced declining or static revenue. This will pose a problem in future years without additional funding due to the projected increase in Transportation Disadvantaged.
2. 1.5.2. Limited Fixed-Route Bus Service: Approximately 52 percent of the population in Hillsborough County has access to fixed-route transit. Also, 32 percent of the existing population is considered TD. Transit access for much of the county’s low-income population is not readily available. Early morning and late night service that is vital for low-income individuals who tend to work in industries such as retail, food service, etc., is even more limited.
3. 1.5.3 Gaps in Bicycle and Pedestrian Facilities: The lack of continuous sidewalks and bicycle facilities impact a TD individual’s ability to navigate transportation corridors in a comfortable and safe manner.

**Vision Zero - Action Plan**

Hillsborough County’s recent alarming numbers of crashes recorded has brought forth attention to unsafe street conditions and contributing factors to decreased levels of safety. Engineers, planners, law enforcement officials, and educators have launched programs and projects across the county to provide safe, comfortable travel conditions for residents and visitors. This Action Plan builds on the many state and local agency safety programs, projects and initiatives underway already. Vision Zero Hillsborough provides an umbrella under which these efforts can be organized, connected, and promoted.

**Enablers**

1. Paint Saves Lives - Goal 1 & Goal 2
2. One Message Many Voices - Goal 1 & Goal 2
3. Consistent and Fair - Goal 1 & Goal 2
4. The Future will Not Be Like The Past - Goal 1 & 2

**Barriers**

1. Biking or walking makes you especially vulnerable. The Tampa Bay area’s pedestrian fatality rate is higher than almost any other metro area in the United States. On average, at least one person walking and one person biking are involved in a crash every day. A significant portion result in serious injury or death.
2. A third of the roads within the transportation system account for 3/4 of the county’s severe crashes.
3. Aggressive driving accounted for 33 percent of all fatal crashes on our roads. This figure includes driving, walking and bicycle crashes.
4. Dark, unlit roads were a factor in 39 percent of fatal pedestrian crashes and 24 percent of fatal bicycle crashes.
5. Electronic distraction was reported in 19 percent of fatal and incapacitating injury vehicle crashes, but may be higher than show in law enforcement reports.
The following section identifies the main existing barriers and enablers towards the implementation of shared mobility designs at the local level for the Tampa Bay Area. The "barriers" within each plan represent opportunities to improve language, facilitate greater understanding, and to ultimately reframe the objectives and policies which may disincentivize, or discourage the extent to which public and private transit providers are able to incorporate shared mobility designs into the urban environment. On the other hand, the "enablers" in these plans represent policies and objectives that can promote shared mobility urban designs and construct a facilitating framework to their implementation, from promoting language, to strategic policy efforts.

**Tampa Comprehensive Plan - Land Use**

As an urban city, Tampa has a defined city form that encompasses many components such as employment centers, urban villages, mixed-use corridors, mixed-use centers, transit stations, and neighborhoods.

**Enablers**

1. GOAL 1 (Obj. 1.1): To build a livable city that enhances the unique attributes of Tampa's diversity where heritage is appreciated and celebrated creating diverse communities and neighborhoods, inter-connected through walking, cycling, and transit through excellent urban design, with public spaces that are beautiful and functional.
2. GOAL 3 (Obj. 3.6): Encourage the formation of attractive, vibrant, compact, mixed-use, connected places that will support multi-modal transit alternatives.
3. Create inspired urban design while respecting Tampa's human scale, unique history, aesthetics, natural environment, and sense of community identity as the City changes and evolves.

**Barriers**

1. Multimodal connections between downtown Tampa and the region remain a challenge.
2. Downtown Tampa is crisscrossed by bus lines, yet most do not run frequently enough or late enough to attract choice riders.
3. Although a majority of voters in the City of Tampa cast ballots in favor of a referendum in 2010; county-wide voters, rejected the proposal which would have funded a greatly expanded bus system and a 56-mile regional rail system. Voters want a balanced system, focused on cost-effective improvements to traffic flow coupled with lower-cost, incremental transit expansion.

**Tampa Comprehensive Plan - Mobility**

Mobility, the potential for movement, refers to a transportation network that is multi-modal, capable of moving people and goods efficiently and interconnected within and between modes. Our multi-modal system consists of highways and streets, bicycle facilities, pedestrian spaces, freight and people movement facilities, transit, bus, and future rail.

**Enablers**

1. MBY GOAL 3: Provide a safe, convenient, and efficient mass transit system to provide for mobility throughout the City and serve as a viable alternative to single-occupant vehicle (trips) - MBY Objective 3.3
2. MBY GOAL 5: Preserve livability, optimize the efficiency of the roadway network and protect the natural environment through travel demand management and other supportive strategies.
3. MBY Objective 5.2: Decrease single-occupant vehicle (SOV) mode share.
4. MBY Policy 5.2.2: Continue to support ridesharing such as carpools, vanpools, and transit through the implementation of park and ride lots as well as through the subsidy of transit passes for City employees.
5. Millennials are more mobile, are less interested in larger homes and two-thirds of all millennials say access to high quality public transportation is a top three criteria when deciding where to live.
6. Pedestrian-Supportive Development Review

**Barriers**

1. MBY Objective 1.2: Prioritize and implement roadway and intersection improvements consistent with the City’s growth projections, land use plan, and urban infill and redevelopment demand.
2. The Port, Tampa International Airport and the Interstate Highway System all contribute significantly to the County and City’s mobility for movement of goods and people. It is clear that the ability to compete globally should be linked to the provision of highly functional mass transit options that include managed toll lanes, bus rapid transit and rail.
Temple Terrace Comp. Plan - Land Use

This diverse population and its resulting strong capacity for community-building in a social sense, coupled with the City’s early Mediterranean-revival architecture and historic layout, has given it a unique identity with a unique active citizenry. That diverse citizenry’s growing sophistication and cosmopolitan character is leading it to recognize its social and physical uniqueness, which is presently demonstrated by the community’s commitment to a citizen-driven active redeveloped town center, an enormous respect for the Hillsborough River and its shoreline, the creation and implementation of a grass-roots Vision for the community, the preservation of its historic buildings, the recognition of its strategic location between the University of South Florida and Tampa Executive Airport, and the development of a more understandable and relevant comprehensive plan. This plan is considered to be the most conducive plan for the implementation of shared mobility in the region.

**Enablers**

1. LU Policy 1.1.7: Attempt, according to its resources, to use, develop, or improve special ordinances or its Development Codes and Regulations, but not limited thereto, to achieve, address, or adopt: Form-based codes, design standards, locational policies for interconnectivity, and sustainability policies.
2. LU Policy 1.3.2: Strive to protect and, as feasible, acquire or gain public access to or rights-of-way for such greenways, trails, bicycle paths, future transit corridors, pedestrian paths, and alternative mobility options, as may be identified or needed to create, enhance, connect, or interconnect its mobility systems or needs.
3. LU Objective 4.2: Require street design that creates public space that is safe and welcoming for pedestrians and bicyclists.
4. LU Objective 5.3: Promote multi-modal transportation choice.
5. LU Objective 8.1: In all actions of the City, urban sprawl shall be discouraged
6. Bonus Intensity Zone Overlay (BIZ-O)

**Barriers**

1. Protect single-family residential neighborhoods by requiring that any other land uses within single-family areas meet applicable locational criteria
2. Prohibit the expansion or replacement of commercial uses which do not meet applicable locational criteria and have an adverse impact on adjoining or nearby uses

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Temple Terrace Comp. Plan - Mobility

The Goals, Objectives, and Policies contained in this section represent the policy framework designed to serve as guidance for the transportation decision making process for the next 25 years. These give direction to decision making, but are meant to be flexible in their execution. They act as an overall policy master plan that, if followed, will help to transform the City through the creation of a more diverse transportation system with multimodal options that will serve all current and future users.

**Enablers**

1. MBY GOAL 1: Provide a safe, efficient, environmentally sensitive, and integrated multimodal transportation system for the movement of people and goods in the City of Temple Terrace.
2. Temple Terrace Mobility Fee Exemption Area
3. The City of Temple Terrace shall implement multimodal street cross sections, design standards, and operational measures to ensure streets are safe, convenient and appealing for all modes of travel, including transit, automobiles, trucks, bicycles and pedestrians. Strategies shall include marked crosswalks, wider sidewalks, on-street parking, bus turnouts, traffic calming, raised medians, adequate drainage or other appropriate safety enhancements that reduce hazardous conflicts between modes and are consistent with the planned functions of the roadway.
4. MBY Objective 2.2: Make Complete Streets practices a routine part of Temple Terrace’s everyday operations.

**Barriers**

1. MBY Policy 1.1.2: When new development chooses to construct new public roadway facilities, these facilities may be “oversized” if warranted and feasible, to provide additional capacity for future development which must use the same facility
Enabler Barriers

- Places emphasis on the safety of non-motorized users and motorized users alike
- Promotes accessibility and mobility by increasing and improving multi-modal transportation choices, and the connectivity
- Promotes quality of life
- Seeks a strategic intermodal system for economic growth
- Emphasis on frequency of 10-15 minutes per fixed-route transit
- Understanding of Transportation Disadvantaged/Captive riders and their needs
- Identification of innovative funding mechanisms through intergovernmental coordination, private sector involvement, not-for-profits, etc.
- Declining or static revenue/funding of transit, bicycling, and pedestrian facilities
- Prioritization of transportation projects which serve major employment centers and freight corridors.
- Focus on minimizing traffic for drivers and freight
- Infrastructure spending share on ports and roads
- Provide basic, low-frequency (bus every 30-60 minutes) transit service in areas of low existing ridership and lower density
- Low density/intensity development patterns
- Low levels of service for quality of life trips outside traditional bus schedules
- Gaps in Bicycle and Pedestrian Facilities
- Lack of regional paratransit services

Imagine Hillsborough 2040 LRTP Key Barriers

“The Imagine Hillsborough 2040 Long Range Transportation Plan is being updated together with the Comprehensive Plans of Hillsborough County, and the cities of Tampa, Temple Terrace, and Plant City. The purpose of updating the plan is to plan for the anticipated approximately 600,000 new people that are projected to call Hillsborough County home in 2040. The plan guides transportation improvement for the region through 2040 and has several key enablers of shared mobility. However, the plan also provides a key barrier to facilitating shared mobility. A policy states that transportation projects that serve major employment centers and freight corridors should be prioritized. This policy further supports the building of major transportation projects which are primary port projects, and high-capacity roadway improvements. The Transportation Improvement Program delineates that 64.66 percent of capital improvements were based around the ports, and 13.89 percent of capital improvement projects were roadway construction. Spending on bicycle and pedestrian projects are much less than these two capital improvements and will need a more equitable split in spending to further the development of modes of transportation which facilitate shared mobility. This is a major barrier to shared mobility because pennies on the dollar are currently being invested into projects which serve a broader range of mobility such as bicycling, pedestrian, and transportation disadvantaged populations mobility.”

Table 7: Local Barriers and Enablers for Hillsborough County

<table>
<thead>
<tr>
<th>Enablers</th>
<th>Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shows a formalized understanding of the connection between design, land use and transportation.</td>
<td>A continued focus on infrastructure maintenance as the primary</td>
</tr>
<tr>
<td>Focus on curbing urban sprawl and reducing auto dependence</td>
<td>A continued focus on ports and road widening</td>
</tr>
<tr>
<td>Emphasis of multi-modality as an important mechanism for social and economic development</td>
<td>From the plans it was identified that political resistance and/or residents’ will may be a barrier for implementation</td>
</tr>
<tr>
<td>Understanding of Transportation Disadvantaged/Captive riders and their needs</td>
<td>Lack of “Complete Street” Section in Tampa/Plant City</td>
</tr>
<tr>
<td>Identification of innovative funding mechanisms through intergovernmental coordination, private sector involvement, not-for-profits, etc.</td>
<td>The ongoing and historic pattern of development is low density suburban</td>
</tr>
<tr>
<td>Use of planning tools such as overlays, TCEAs, TODs, and form-based codes as planning tools to ensure an adaptable and dynamic land/transportation management system</td>
<td>1. The plans seek to support arterial capacity</td>
</tr>
<tr>
<td>A focus on improving economic-well-being</td>
<td>2. The plans seek to preserve residential integrity of historic neighborhoods which limits the feasibility of shared mobility development in these areas</td>
</tr>
<tr>
<td>Continued coordination with state/regional/local actors</td>
<td>No plan identified had a regulatory framework in place to address ride-hailing TNCs, and/or demand-responsive transit options.</td>
</tr>
</tbody>
</table>
At each scale of policy we identified the barriers and enablers to implementing a shared mobility urban design. Consolidating this information, we sought to identify four key barriers and enablers, governments at all scales, have, within their plans. This is by no means an exhaustive list, however, we believe that if public entities seek to understand, improve, or adopt shared mobility based urban designs they should consider their current strengths and weaknesses. The four key barriers and enablers are listed in Table 8.

Table 9 & 10 includes a breakdown of each plan as sorted into enabling and barrier categories. The enabling categories include multi-modality, innovative funding, qualitative metrics, and special districts. The barrier categories include priority of funding, land use, lack of a framework for technological innovation, and parking and codes. These categorical barriers and enablers were the result of a breakdown of each of the key barriers and enablers assessed for all the plans considered in this review.

<table>
<thead>
<tr>
<th>Key Enablers</th>
<th>Key Barriers</th>
</tr>
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<tbody>
<tr>
<td>A renewed focus on multi-modality</td>
<td>Investment favors freight, roads, and maintenance</td>
</tr>
<tr>
<td>Identification of innovative funding streams</td>
<td>Current and historic land development patterns cater to sprawl</td>
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<tr>
<td>Inclusion of qualitative metrics for success</td>
<td>Lack of a regulatory framework for pace of tech innovation</td>
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<tr>
<td>Adaptability of planning tools such as TCEA, TODs, Overlays, etc.</td>
<td>Code requirements for, and quantity of, surface parking facilities</td>
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### Table 9: Categorical Summary of Enablers by Plan

<table>
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<tr>
<th>Multi-Modality</th>
<th>Innovative Funding</th>
<th>Qualitative Metrics</th>
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<td>Florida Transportation Plan</td>
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<td>City of Temple Terrace - Land Use</td>
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<tr>
<td>City of Tampa - Land Use</td>
<td>City of Temple Terrace - Land Use</td>
<td>City of Temple Terrace - Land Use</td>
<td>City of Temple Terrace - Mobility</td>
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<tr>
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<td>Unincorporated Hillsborough - Land Use</td>
<td>Unincorporated Hillsborough - Land Use</td>
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<td>Unincorporated Hillsborough - Transportation</td>
<td>Unincorporated Hillsborough - Transportation</td>
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### Table 10: Categorical Summary of Barriers by Plan

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<td>Plant City - Land Use</td>
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<td>City of Tampa - Mobility</td>
<td>City of Temple Terrace - Mobility</td>
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<td>Plant City - Mobility</td>
<td>Unincorporated Hillsborough - Land Use</td>
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<tr>
<td>Unincorporated Hillsborough - Transportation</td>
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</tbody>
</table>
7 CONCEPTUAL SHARED MOBILITY DESIGNS

This project utilized the FDOT Context Classifications, Transit Street Design Guide streetscape designs, and literature for design elements as a foundation for conceptual designs that would improve access and service of shared modes. Furthermore, the key findings from the literature review were included to guide the established Principles of Design which will be integrated in the designs as well. Below is a breakdown of the conceptual designs utilized for the design charrettes. A before and after snapshot of these designs informs the changes that were made according to feedback received during the charrettes.

For the final SketchUp designs that narrow in on specific design changes for each context area, the feedback from the design charrettes were also used to inform these designs. The design templates featured in this chapter will be broken down by region. A completed set of templates was accomplished for the PlanHillsborough client and Tampa region.

Downtown - Tampa

**West River Redevelopment**

Significant changes can be seen between the "before" and "after" images of the West River Redevelopment Area, which is being redeveloped according to a site plan that can be found in APPENDIX C: Existing Conditions. Due to the shifts occurring in this area, it was difficult to determine the best shared mobility options for this mostly residential block. As captured in the existing conditions section of this report, there are a few schools nearby that could act as facilitators for a ride-hail pick-up/drop-off location. Because the apartment complex near Rome Avenue and Chestnut Street is slated for senior living, the placement of another ride-hail pick-up/drop-off location and a bikeshare facility is ideal for these residents who may be limited in their mobility options. This thought process also explains the addition of a transit hub and the addition of protected bike lanes. The studio team wanted to ensure that this neighborhood is safe and accessible for the varying age ranges of the individuals living and visiting this location whether for school, employment, or just living day to day.

Figure 20 depicts the incorporation of a protected bike lane with augmented crosswalks to ensure pedestrian visibility. Pedestrian-scale lighting can create a comfortable and safe environment during the day and at night for the area’s residents. The brick roads have been maintained to accent the unique character of the West River area, which also connects to the Hillsborough River Walk just east of this neighborhood block. The brick has an additional traffic calming benefit as cars tend to move slower along streets that have a differing visual and textural articulation comparative to the more ubiquitous asphalt. These traffic calming measures can also include more traditional features such as speed bumps, or can include community signage, intersection murals, or even colorful paint. Figure 20 also features a ride-hail pick-up/drop-off location adjacent to the transit hub. A flex zone has been incorporated into the design to portray the FSU research team’s forward thinking about how retail options are and will continue to change with the rise of online retailers. Flex zones can allow the apartment complex and area to easily accommodate and plan for scheduled food and goods deliveries, and provide additional benefits by providing employment to individuals in the West River area. This design feature, while new, entails and incorporates smaller-scale warehousing and shipping to improve access to goods in the area, which is critical for places which experience the negative externalities of food deserts. Based on feedback from the design charrettes, the studio team worked to incorporate the ideas of many stakeholders.
Adequate and pedestrian-scale lighting is an integral part of complete streets designs, it promotes a greater sense of place, and contributes to safety by creating buffers between cars and pedestrians.

By maintaining some of the existing brick roads in the area, this design feature can promote traffic calming as automobiles are less likely to speed on bumpy roads while also promoting community character.

This design feature is intended to incentivize non-auto transportation and due to the aging population of the area, can facilitate a more active lifestyle for the elderly promoting aging in place,
CONCEPTUAL SHARED MOBILITY DESIGNS

This relatively new concept incorporates smaller-scale warehousing and shipping facilities into the urban fabric increasing access to goods and promoting employment in this relatively low-income area.

**Flex Loading / Unloading Zones**

This design feature is incredibly important for transit riders and Floridians as a whole. It allows for transportation disadvantaged individuals to utilize transit during times of rain, or intense heat promoting equity.

**Covered Pedestrian Waiting Areas**

---

**Table 11: West River Design Features’ Application of the 5 A's**

<table>
<thead>
<tr>
<th></th>
<th>For All</th>
<th>Aesthetic</th>
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<th>Accommodation</th>
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</tr>
<tr>
<td>3 - Bike Lanes</td>
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<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4 - Flex Zone</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5 - Waiting Area</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Amalie Arena

Significant changes can be seen between the “before” and “after” images of the Amalie Arena/Water Street context area. Some of these changes reflect planned developments scheduled to occur in the next decade or so. For these reasons, the pedestrian waiting area and ride-hail pick-up/drop-off circulator could not remain a design consideration as they were initially located in Figure 23. In Figure 24, some of the highlighted changes made thanks to public feedback garnered from design charrettes and consideration for the Water Street Master Plan include pedestrian lighting and wayfinding signage. The trolley line has been added to insinuate its importance as a unique feature of Tampa’s downtown waterfront area. Some comments from the public included an extension of the trolley line, as reflected in Figure 24 with a ride-hail waiting area/trolley park-and-ride facility option around the Channelside District and Ybor City. These suggestions from some of Tampa’s stakeholders demonstrate the public’s keen interest in the transportation options available at the stadium, which is often in high demand when sports games and music concerts occur there.

Figure 25 shows the Amalie Arena pedestrian waiting area improvement on Water Street. This street view depicts the trolley station with an additional area for pedestrians to wait comfortably for a ride-hail vehicle to pick them up or for the trolley to arrive. A wayfinding station has been added and a bikeshare station (not featured in the image) was also added to encourage cycling on the downtown River Walk just south of this location. A covered pedestrian area can also provide additional space in which people can socialize in green space after a concert or hockey game. This space, since it is significantly set back from the street is also an ideal place for children to play without fear of interacting with vehicles.

Figure 26 shows the Channelside Drive pick-up and drop-off loop that naturally creates an ADA-accessible area. This loop is perfect for a ride-hail circulator since the one-way direction of Channelside Drive easily facilitates getting in and out of traffic without much hassle. The waiting area also features a staffed ride-hail kiosk that allows ride-hail rides to be ordered and paid for without the need for a smart phone -- a clear benefit for the elderly. Having personnel staff the kiosk with a customer service agent allows for the greatest equity and accessibility for all ages, particularly those who might not have access to smart phone technology or who need help ordering a ride-hail due to age or inebriation. These safety considerations reflect the key design principle of ensuring that shared mobility is an option for everyone who wishes to use it.
Figure 23: Amalie Arena Conceptual Design BEFORE

Figure 24: Amalie Arena Conceptual Design AFTER
This feature facilitates greater accessibility of information to tourists and residents regarding local activities and transit opportunities to move more freely about the city and in turn, promote the local economy.

Because this area experiences times of extremely high demand, by utilizing the existing streetcar system with park & ride lots near Ybor and others there can result in a reduction of congestion during events.

This feature, much like wayfinding, builds a sense of community by allowing residents to freely advertise local events or jobs, promoting a sense of community and employment opportunities.
This design feature is multipurpose in that it can be utilized to provide pedestrian-scale lighting & safety, and can also be used for security purposes by making it impossible for vehicles to pass into pedestrian space.

Facilitating greater access to transit information for transportation disadvantaged individuals this feature can inform users of the transit options available and can act as a mobility "concierge" for users.

### Bollards

4

### Mobility Kiosks

5

Table 12: Amalie Arena Design Features' Application of the 5 A's

<table>
<thead>
<tr>
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<td></td>
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<tr>
<td>2 - Park &amp; Ride</td>
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<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3 - Boards</td>
<td>X</td>
<td></td>
<td>X</td>
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</tr>
<tr>
<td>4 - Bollards</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
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<tr>
<td>5 - Kiosks</td>
<td></td>
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<td>X</td>
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</table>
Citrus Park Mall

Citrus Park Mall in unincorporated Hillsborough County was selected as the suburban shopping mall example where shared mobility design ideas could be implemented. The two design charrettes held in Tampa yielded strong opinions as to how the mobility options available at this context area could be improved. As reflected in the before and after conceptual designs (see Figures 27 and 28), public feedback indicated the need for bike-share to connect to the Upper Tampa Bay Multi-Use Recreation Trail one mile east of the mall, a multimodal transit hub for public and private transit, designated ride-hail areas, sidewalk widening, and pedestrian-scale lighting. A more complete background and analysis of public feedback is captured in APPENDIX B: Stakeholder Engagement.

Conceptual designs for Citrus Park Mall place an emphasis on multimodality alternatives in addition to pedestrian havens and walkable areas. The new design incorporates pedestrian multi-use areas that serve as a ride hail hub and additional access to bikeshare options. ADA pick-up and drop-off locations look to serve people of all ages. Pedestrian-scale lighting and landscaping additions look to be both aesthetically appealing while placing an emphasis on safety. Loading and unloading flex zones are located away from ride rail and transit hub locations to alleviate congestion during the mall’s peak operating hours.

Some other important ideas included additional multi-family housing in the area and especially along Citrus Park Drive within the Citrus Park Mall shopping complex. Since the parking area remains mostly empty aside from the high demands of the holiday season, it makes sense to fill in the surplus land space with high-density housing that could draw more people to the area’s retail opportunities. While this suggestion was made to the studio team during the Tampa design charrettes, it is not reflected in our conceptual designs because it falls outside the scope of our shared mobility project. However, land use is incredibly important in facilitating a more equitable and accessible transportation system that is both walkable and livable.

Figure 29 shows the updated entrance of Citrus Park Mall with the conceptual design changes reflected. These include pedestrians and transit riders who walk to the main entrance of Citrus Park Mall from the bus stop located on the same side of Citrus Park Drive (see Figure 29). Adding a more visible crosswalk augments pedestrian safety and designates the mall entrance as a space that is welcoming and accessible for pedestrians, not solely vehicles. This ride-hail pedestrian waiting area serves also as a placemaking feature for Citrus Park Mall since it people of all ages and abilities can mingle, wait for their ride-hail, or be dropped off.

Figure 30 depicts the regional transit hub that incorporates public transit as well as ride-hail pick-up and drop-off stalls and lanes designated by purple paint to set them apart. The location of this transit hub outside the entrance to the AMC movie theater is strategic. Not featured in the image is a bikeshare station geared towards those who prefer to cycle or are interested in accessing the Upper Tampa Bay Multi-Use Recreation Trail. The design also places an emphasis on connectivity to the surrounding community by improving bicycle and pedestrian connections to the Tampa Bay Multi-Use Recreational Trail and to the schools and neighborhoods surrounding the Mall. The transit hub provides additional, highly visible crosswalks for pedestrian connections to and from the mall for these transportation options. Appropriate amounts of seating can accommodate peak demand times in which the mall gets crowded. While some parking has been reduced to create the transit hub, the accessibility of the movie theater to those who are transit dependent or prefer a shared mobility option, can be augmented.
Figure 27: Citrus Park Mall Conceptual Design BEFORE

Figure 28: Citrus Park Mall Conceptual Design AFTER
Parking lots are not conducive spaces for pedestrian mobility and through the integration of pedestrian signage such as Rapid Flashing Beacons (see right) this feature increases pedestrian safety and slows cars.

Landscaping such as tree planting, flower beds, or bioswales can have amazing benefits, such as reducing the urban heat island effect, helping local plant species and reducing the harmful effects of run-off.

In the context of a mall, seating can have profound effects on "staying behavior" for shoppers looking to take a break. Style and availability of seating can have both aesthetic and utilitarian effects as well.
Color

Color and paint can be used to delineate spaces made for vehicles and those made for pedestrians, the utilization of the purple color within the designs indicate that space is for ride-hail pickup and drop off.

Regional Connectivity

Within this context, by removing surplus parking space and incorporating a bus depot residents have greater accessibility to the greater Tampa Bay region, downtown, and the airport connecting these siloed areas.

<table>
<thead>
<tr>
<th>Table 13: Citrus Park Design Features’ Application of the 5 A’s</th>
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<tbody>
<tr>
<td>1 - Signage</td>
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<td></td>
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<td>3 - Seating</td>
</tr>
<tr>
<td>4 - Color</td>
</tr>
<tr>
<td>5 - Connectivity</td>
</tr>
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</table>
Rural Destination - Tampa

Keystone Park / Civic Center

Figure 31 shows the “before” look of the conceptual design of Keystone Civic Center, which already has existing plans for renovation. A variety of shapes and colors were used to capture certain design elements that could be flushed out in greater detail in the final street views for each site’s conceptual design. To see the accompanying visual design legend that was made available to the public in the design charrettes, please see APPENDIX B: Stakeholder Engagement. These additional features that the studio team looked to incorporate include bikeshare, rideshare, and transit accessibility.

Figure 32 shows the conceptual design as updated after the design charrettes. The charrette feedback process and key takeaways that informed the changes are both captured in APPENDIX B: Stakeholder Engagement. The major changes include stakeholder-recommended traffic calming measures on Gunn Highway to promote walkability and bike-ability. Traffic calming can encompass a large suite of options including reduction of speed limits on Gunn Highway, intersection murals and textural changes to the pavement, signaled pedestrian crossings, speedbumps, and also signage. A stakeholder during the design charrette suggested a sign which states “Life Moves Slower in Keystone,” these traffic calming features can be integrated into the existing environment easier than the traditional speed bumps especially on FDOT managed roads. Further design features include a pedestrian signal to allow for safe and accessible connecting to the Upper Tampa Bay Multi-Use Recreation Trail from the park, a road connector containing additional ADA parking to facilitate easy access to both the library and recreation center facilities, and a covered pedestrian waiting area near the proposed ride-hail pick-up/drop-off circulator to incentivize ridesharing alternatives.

Please note that the connector road with parking is planned to occur. This information was brought to our attention after our initial site visit to the Keystone Civic Center and reinforced through stakeholder engagement by the Keystone Civic Association at a design charrette held in Tampa (see APPENDIX B and C).

Figures 33 and 34 reflect the proposed conceptual designs for Keystone Civic Center. For Figure 34, these include bikeshare, electric vehicle charging stations, and designated ADA parking stalls located in front of the recreation center. Since the park is very accessible to recreationists on the Upper Tampa Bay Multi-Use Recreation Trail, ensuring amenities exist for bikeshare and cyclists in general with the presence of bike racks is another means of creating accessible shared mobility options for all.

Figure 35 shows a ride-hail pick-up and drop-off location as well as the addition of electric vehicle charging stations, and the preservation of ADA parking stalls in front of the Austin Davis Library. Additional bike racks and bikeshare facilities are also featured near the ADA parking stalls. The importance of creating spaces that are adaptable to new technologies while still preserving the park’s traditional character was a major consideration for the studio team, as is reflected in the key principles of design.
Figure 31: Keystone Park Conceptual Design BEFORE

Figure 32: Keystone Park Conceptual Design AFTER
Within close proximity to the Upper Tampa Bay recreational trail, this design feature promotes an active lifestyle and allows residents without access to bicycles to utilize the urban space for them and their families.

By integrating bike storage facilities, this feature can incentivize bike trips that would otherwise have been taken by automobiles and promoting ease of mind when leaving a bike unattended.

It was apparent from the charrette process that this area, and especially Gunn Highway necessitated traffic calming features which can be varied such as speed bumps but can also include intersection murals and others.
To promote ease of access to this rural destination, utilization of the loop in front of the library as the primary entry point can be used by ride-hail consumers and reduce the distance of travel for ADA individuals.

**Electric Vehicle Charging**

Because this is a rural destination and most individuals drive to this area, by providing electric vehicle charging we can incentivize commuters to utilize cleaner vehicles as they become more ubiquitous.

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8 SHARED MOBILITY IMPLEMENTATION GUIDANCE

Based off of the cumulative review of the existing literature on shared mobility; a plan review that included state, regional, and local policies pertaining to Hillsborough County; the design-specific literature review and key principles of design; the design workshops conducted in Tampa; and the analysis of existing conditions and public feedback, below are the five policy recommendations the studio team offers to each client. While these recommendations are somewhat broad, they appropriately capture the advantage of vague language in allowing each locality to apply these concepts as best fits the needs of their own transportation networks.

I. A Complete Streets policy guideline is necessary to implement equitable and accessible shared mobility transportation options that are safe for all ages. The City of Plant City's Comprehensive Plan is a good example of a plan that includes Complete Streets guidance. For more details, refer back to Chapter Three: Plan Review.

II. Ensure future land use can promote residential and employment density to warrant shorter distance transportation trips that shared mobility options can easily accommodate.

III. Reducing or eliminating parking minimums and requirements can provide incentives for developers who can spend less money on parking stalls and instead incorporate other, less expensive shared mobility amenities, such as designated ride-hail pick-up/drop-off locations, bikeshare, and carshare parking options.

IV. Consider the future population for which you are planning. In Florida, aging in place is an important issue that planners must consider as the Baby Boomer generation gets closer to retirement. Thinking about how shared mobility can accommodate the elderly, such as through the incorporation of ride-hail kiosks, can create a more equitable transportation system that considers 8-year-olds and 80-year-olds.

V. Flexibility and adaptability in urban design and policy are some of the easiest and most effective ways in which cities and regions can quickly make changes that reflect unexpected or sudden technological, environmental, and socioeconomic shifts.
To implement the design features identified above it is critical that the studio team provides appropriate guidance for the implementation of the designs. While each contextual design ranges in the goals and principles they are attempting to address, from safety, to economic development, the following details a list of applicable grants and funding programs to promote the feasible developments of these designs. This section details the available funding sources at the federal and state level, and also identifies various other grant and programmatic sources. Further, this section outlines the available partnerships and organizations within Hillsborough to aid in the implementation of the designs set forth.

### Integrated Mobility Innovation Program - FTA

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<tr>
<td>DESCRIPTION: Funds projects that demonstrate innovative and effective practices, partnerships and technologies to enhance public transportation effectiveness, increase efficiency, expand quality, promote safety and improve the traveler experience</td>
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### Strong Cities, Strong Communities Visioning Challenge - USDOC & HUD

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<td>ELIGIBILITY: Cities</td>
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<td>DESCRIPTION: Funding will support the development and implementation of comprehensive economic development strategic plans. Grant recipients run a local Challenge Competition, inviting multidisciplinary teams to submit proposals for comprehensive economic development strategic plans establishing and promoting a vision and approach to stimulate local economic development.</td>
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### Access and Mobility Partnership Grants, ICAM Pilot Program - FTA

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<tr>
<td>ELIGIBILITY: Designated recipients, states and local government authorities, private non-profit organizations, operators of public transportation</td>
<td>80% of Project Costs</td>
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<tr>
<td>DESCRIPTION: The ICAM Pilot Program awards funds competitively to finance innovative capital projects for the transportation disadvantaged that improve the coordination of non-emergency medical transportation services.</td>
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</table>
**Capital Investment Grants - New Starts Program - FTA**

**ELIGIBILITY & DESCRIPTION**

- **ELIGIBILITY:** State & Local government agencies, for projects with a total estimated capital cost of $300 million or more, or that are seeking $100 million or more in Section 5309 CIG program funds.

- **DESCRIPTION:** The program provides funding for fixed guideway investments such as new and expanded rapid rail, commuter rail, light rail, streetcars, bus rapid transit, and ferries, as well as corridor-based bus rapid transit investments that emulate the features of rail.

**MAXIMUM AWARD**

- 60% Program Share

**Capital Investment Grants - Small Starts Program - FTA**

**ELIGIBILITY & DESCRIPTION**

- **ELIGIBILITY:** State & Local government agencies, for projects with a total estimated capital cost of less than $300 million and that are seeking less than $100 million in Section 5309 CIG program funds.

- **DESCRIPTION:** The program provides funding for fixed guideway investments such as new and expanded rapid rail, commuter rail, light rail, streetcars, bus rapid transit, and ferries, as well as corridor-based bus rapid transit investments that emulate the features of rail.

**MAXIMUM AWARD**

- 80% Program Share

**BUILD Transportation Discretionary Grant Program - USDOT**

**ELIGIBILITY & DESCRIPTION**

- **ELIGIBILITY:** State, local, and tribal governments, including transit agencies and MPO's

- **DESCRIPTION:** The BUILD program will give special consideration to projects which emphasize improved access to reliable, safe, and affordable transportation for communities in rural areas, such as projects that improve infrastructure condition, address public health and safety, promote regional connectivity or facilitate economic growth or competitiveness.

**MAXIMUM AWARD**

- $25 Million USD

**Mobility on Demand Sandbox Projects - FTA**

**ELIGIBILITY & DESCRIPTION**

- **ELIGIBILITY:** Providers of public transportation, including public transit agencies, state/local government DOTs, and federally recognized Indian tribes, they also must include an eligible partnership

- **DESCRIPTION:** Project activities leading to the demonstration of the innovative MOD and transit integration concept, such as planning and developing business models, obtaining equipment and service, acquiring/developing software and hardware interfaces to implement the project, and operating the demonstration.

**MAXIMUM AWARD**

- 80% of Project Costs
**County Incentive Grant Program - FDOT**

**ELIGIBILITY & DESCRIPTION**
- ELIGIBILITY: Counties (and municipal partners)
- DESCRIPTION: Eligible projects include those that improve the mobility on the State Highway System (SHS); encourage, enhance, or create economic benefits; foster innovative public-private partnerships; maintain or protect the environment; enhance intermodalism and safety; and those that advance other projects. New technologies such as intelligent transportation systems that enhance the efficiency of projects also are eligible.

**MAXIMUM AWARD**
- 50% of Project Costs

**Park & Ride Lot Program - FDOT**

**ELIGIBILITY & DESCRIPTION**
- ELIGIBILITY: Local agencies, facilities must be sited, sized, and promoted in such a way that there is a reasonable expectation of at least an average 60 percent occupancy.
- DESCRIPTION: Provides for the purchase and/or leasing of private land for the construction of park and ride lots, the promotion of these lots, and the monitoring of their usage. This program is an integral part of the commuter assistance program efforts to encourage the use of transit, carpools, vanpools and other high occupancy modes.

**MAXIMUM AWARD**
- 50% of Project Costs

**Public Transit Block Grant Program - FDOT**

**ELIGIBILITY & DESCRIPTION**
- ELIGIBILITY: Urbanized areas, greater than 50,000 persons, responsible local officials and publicly owned operators of transit services
- DESCRIPTION: Funds may be used for eligible capital and operating costs of providing public transit service. Program funds may also be used for transit service development and transit corridor projects.

**MAXIMUM AWARD**
- 50% of Project Costs

**Beautification Grants - FDOT**

**ELIGIBILITY & DESCRIPTION**
- ELIGIBILITY: Local governments
- DESCRIPTION: funds may be used for eligible planting, construction, maintenance, and labor costs to improve beautification and aesthetic value on the State Highway System (SHS)

**MAXIMUM AWARD**
- $100 Thousand USD
### Public Transit Service Development Program - FDOT

<table>
<thead>
<tr>
<th>ELIGIBILITY &amp; DESCRIPTION</th>
<th>MAXIMUM AWARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ELIGIBILITY: Public agencies providing or implementing public transit services and Community Transportation Coordinators which are public agencies are eligible recipients. The projects must not have a duration of greater than three years.</td>
<td>50% of Project Costs</td>
</tr>
<tr>
<td>• DESCRIPTION: Projects involving the use of new technologies; services, routes, or vehicle frequencies; the purchase of special transportation services; and other such techniques for increasing service to the riding public. Projects involving the application of new technologies or methods for improving operations, maintenance, and marketing in public transit systems are also eligible.</td>
<td></td>
</tr>
</tbody>
</table>

### Transit Corridor Program - FDOT

<table>
<thead>
<tr>
<th>ELIGIBILITY &amp; DESCRIPTION</th>
<th>MAXIMUM AWARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ELIGIBILITY: Community Transportation Coordinators or transit agencies.</td>
<td>50-100% of Project Costs</td>
</tr>
<tr>
<td>• DESCRIPTION: Projects and services which are designed and expected to help reduce or alleviate congestion or other mobility issues within the corridor.</td>
<td></td>
</tr>
</tbody>
</table>

- OTHER SOURCES -

### Community Challenge Grant - AARP

<table>
<thead>
<tr>
<th>ELIGIBILITY &amp; DESCRIPTION</th>
<th>MAXIMUM AWARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ELIGIBILITY: Counties (and municipal partners)</td>
<td>50% of Project Costs</td>
</tr>
<tr>
<td>• DESCRIPTION: Each of the projects are designed to: create vibrant public spaces, demonstrate the tangible value of &quot;Smart Cities,&quot; deliver a range of transportation and mobility options, and support the availability of a range of housing.</td>
<td></td>
</tr>
</tbody>
</table>
Partnerships

This section provides a list of organizations Hillsborough County can partner with to aid in the implementation of the shared mobility designs outlined in the previous section. These organizations include economic development corporations, intergovernmental, library services, public health, transportation, and urban affairs. These professionals will serve as valuable resources to support the implementation of the design features. Contact information as of September 2019 were provided for each organization.

**Economic Development Corporations**

<table>
<thead>
<tr>
<th>Corporation</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunshine State Economic Development Corporation</td>
<td>(941) 720-3779</td>
<td>sunshineedc.com</td>
</tr>
<tr>
<td>Plant City Economic Development Corporation</td>
<td>(813) 756-7140</td>
<td>plantcityedc.com</td>
</tr>
<tr>
<td>Tampa Hillsborough Economic Development Corp.</td>
<td>(813) 218-3300</td>
<td>tampaedc.com</td>
</tr>
</tbody>
</table>

**Foundations**

<table>
<thead>
<tr>
<th>Foundation</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiregrass Ranch Foundation</td>
<td>(813) 994-4171</td>
<td>wiregrassfoundation.org</td>
</tr>
<tr>
<td>Community Foundation of Tampa Bay</td>
<td>(813) 282-1975</td>
<td>cftampabay.org</td>
</tr>
<tr>
<td>Florida Greenways &amp; Trails Foundation</td>
<td></td>
<td>fgtf.org</td>
</tr>
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</table>

**Intergovernmental**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida League of Cities</td>
<td>(850) 222-9684</td>
<td>floridaleagueofcities.com</td>
</tr>
</tbody>
</table>

**Library Services**

<table>
<thead>
<tr>
<th>Library Cooperative</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hillsborough County Library Cooperative</td>
<td>(813) 273-3652</td>
<td>hcplc.org</td>
</tr>
</tbody>
</table>

**Public Health**

<table>
<thead>
<tr>
<th>Public Health Association</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida Public Health Association</td>
<td>(386) 462-1551</td>
<td>fpha.org</td>
</tr>
</tbody>
</table>

**Social Services**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>FirstLight Home Care of North Tampa &amp; East Pasco</td>
<td>(813) 549-7808</td>
<td>firsthomelightcare.com</td>
</tr>
<tr>
<td>Lions Club of Wesley Chapel</td>
<td>(813) 308-9574</td>
<td>wclions.org</td>
</tr>
<tr>
<td>CARES: Community Aging &amp; Retirement Services</td>
<td>(727) 862-9291</td>
<td>caresfl.org</td>
</tr>
<tr>
<td>Make a Difference, Inc.</td>
<td>(352) 437-3466</td>
<td>makedifference.org</td>
</tr>
<tr>
<td>Corporation to Develop Communities of Tampa, Inc.</td>
<td>(813) 629-1944</td>
<td>cdoftampa.org</td>
</tr>
<tr>
<td>Seniors in Service of Tampa Bay</td>
<td>(813) 932-5228</td>
<td>seniorsinservice.org</td>
</tr>
<tr>
<td>REACHUP, Inc.</td>
<td>(813) 712-6300</td>
<td>reachupincorporated.org</td>
</tr>
<tr>
<td>Unity in the Community, Inc.</td>
<td>(813) 752-1275</td>
<td>unityinplantcity.org</td>
</tr>
<tr>
<td>Plant City Lions Club</td>
<td>(813) 752-7202</td>
<td>plantcitylionsclub.com</td>
</tr>
<tr>
<td>Community Training Works, Inc.</td>
<td></td>
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### Transportation

<table>
<thead>
<tr>
<th>Organization</th>
<th>Phone Number</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>JMZ Adaptive Driving &amp; Wheelchair Transport</td>
<td>(813) 973-2090</td>
<td>jmz12019.wixsite.com</td>
</tr>
<tr>
<td>American Consulting Engineers of FL, LLC</td>
<td>(813) 435-2600</td>
<td>acp-americas.com</td>
</tr>
<tr>
<td>Bikes 4 Christ</td>
<td>(813) 533-9177</td>
<td>bikes4christ.com</td>
</tr>
<tr>
<td>Tampa Hillsborough Expressway Authority</td>
<td>(813) 272-6740</td>
<td>tampa-xway.com</td>
</tr>
<tr>
<td>Tampa International Airport</td>
<td>(813) 870-8700</td>
<td>tampaairport.com</td>
</tr>
<tr>
<td>Bike/Walk Tampa Bay Coalition</td>
<td>(813) 974-9215</td>
<td>bikewalktampabay.org</td>
</tr>
<tr>
<td>Tampa Bay Cycle</td>
<td>(813) 974-9799</td>
<td>tampabaycycle.com</td>
</tr>
<tr>
<td>New North Transportation Alliance</td>
<td></td>
<td>newnorthalliance.com</td>
</tr>
<tr>
<td>HART</td>
<td>(813) 254-4278</td>
<td>gohart.org</td>
</tr>
<tr>
<td>BullRunner</td>
<td>(813) 974-3990</td>
<td>usf.edu</td>
</tr>
<tr>
<td>BlueOne Transportation</td>
<td>(813) 282-7351</td>
<td>blueonetransportation.com</td>
</tr>
<tr>
<td>Downtowner</td>
<td></td>
<td>ridedowntowner.com</td>
</tr>
<tr>
<td>SP + Gameday</td>
<td>(407) 648-0213</td>
<td>spplus.com/gameday</td>
</tr>
<tr>
<td>Super Shuttle Transportation Systems Tampa Bay</td>
<td>(727) 572-1111</td>
<td>supershuttle.com</td>
</tr>
<tr>
<td>Tampa Bay Mobility Alliance</td>
<td></td>
<td>gotbmo.com/#about</td>
</tr>
<tr>
<td>Tampa Bay Transportation Management Area Leadership Group</td>
<td></td>
<td>planhillsborough.org/tampa-bay-tma</td>
</tr>
<tr>
<td>All for Transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tampa Historic Streetcar, Inc.</td>
<td>(813) 254-4278</td>
<td></td>
</tr>
<tr>
<td>Transit Now Tampa Bay</td>
<td></td>
<td>transitinowtampabay.com</td>
</tr>
<tr>
<td>Walk Bike Tampa</td>
<td>(813) 263-4785</td>
<td>wilkbiketampa.org</td>
</tr>
<tr>
<td>USF Bicycle Action Committee</td>
<td>(813) 974-9216</td>
<td>bikewalktampabay.org</td>
</tr>
<tr>
<td>Walk Wise Florida</td>
<td></td>
<td>walkwiseflorida.com</td>
</tr>
<tr>
<td>Florida Bicycle Association</td>
<td></td>
<td>floridabicycle.org</td>
</tr>
<tr>
<td>Florida Bicycle &amp; Pedestrian Partnership</td>
<td>(850) 414-4817</td>
<td>fdot.gov</td>
</tr>
<tr>
<td>Tampa Bay Next</td>
<td>(813) 975-6398</td>
<td>tampabaynext.com</td>
</tr>
<tr>
<td>Florida Public Transportation Association</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida Transportation Builders Association, Inc.</td>
<td>(850) 942-1404</td>
<td>ftba.com</td>
</tr>
<tr>
<td>Florida Transportation Commission</td>
<td>(850) 414-4105</td>
<td>ftc.state.fl.us</td>
</tr>
<tr>
<td>Floridians for Better Transportation</td>
<td>(850) 521-1256</td>
<td>bettertransportation.org</td>
</tr>
<tr>
<td>Intelligent Transportation Society of Florida</td>
<td>(727) 430-1136</td>
<td>itsflorida.org</td>
</tr>
</tbody>
</table>

### Urban Affairs

<table>
<thead>
<tr>
<th>Organization</th>
<th>Phone Number</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tampa Downtown Partnership, Inc.</td>
<td>(813) 221-3686</td>
<td>tampasdowntown.com</td>
</tr>
<tr>
<td>Westshore Alliance</td>
<td>(813) 289-5488</td>
<td>choosewestshore.com</td>
</tr>
<tr>
<td>Visit Tampa Bay</td>
<td>(813) 223-1111</td>
<td>visittampabay.com</td>
</tr>
<tr>
<td>Improvement League of Plant City</td>
<td>(813) 757-6760</td>
<td>improvementleague.com</td>
</tr>
<tr>
<td>Community Tampa Bay</td>
<td>(727) 568-9333</td>
<td>communitytampabay.org</td>
</tr>
<tr>
<td>USF Student Planning Organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,000 Friends of Florida</td>
<td>(850) 222-6277</td>
<td>1000friendsofflorida.org</td>
</tr>
</tbody>
</table>
Cost Estimates

Cost estimates were developed for each of the redevelopment designs to provide Plan Hillsborough with an understanding of the relative cost of each intervention. Each design was broken down into the specific features necessary to implement the design. Cost estimates for each feature were then obtained from RS Means, and were summed to find the total cost of the design. Low estimates include the basic features that could successfully provide a baseline level of shared mobility service. The high cost estimate includes all of the features seen in the conceptual designs that could provide a high level of shared mobility service.

**West River Redevelopment Area Cost Estimates**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amt (Low)</th>
<th>Amt (Hi)</th>
<th>Unit</th>
<th>Cost</th>
<th>Total Cost (Low)</th>
<th>Total Cost (High)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bike Rack (10’)</td>
<td>4</td>
<td>4</td>
<td>#</td>
<td>$717.00</td>
<td>$2,868.00</td>
<td>$2,868.00</td>
</tr>
<tr>
<td>Bike Lane Post (Plastic Bollard)</td>
<td>50</td>
<td>100</td>
<td>#</td>
<td>$135.00</td>
<td>$6,750.00</td>
<td>$13,500.00</td>
</tr>
<tr>
<td>Bike Lane Paint</td>
<td>500</td>
<td>1000</td>
<td>Length</td>
<td>$1.26</td>
<td>$630.00</td>
<td>$1,260.00</td>
</tr>
<tr>
<td>Bike Lane Paint Signage</td>
<td>2000</td>
<td>4000</td>
<td>Length</td>
<td>$0.37</td>
<td>$740.00</td>
<td>$1,480.00</td>
</tr>
<tr>
<td>Midblock Pedestrian Crosswalk/Signal</td>
<td>2</td>
<td>4</td>
<td>#</td>
<td>$86,000.00</td>
<td>$172,000.00</td>
<td>$344,000.00</td>
</tr>
<tr>
<td>Benches (Concrete/Backs/Wood Rails)</td>
<td>6</td>
<td>6</td>
<td>#</td>
<td>$684.00</td>
<td>$4,104.00</td>
<td>$4,104.00</td>
</tr>
<tr>
<td>8’ Thermoplastic Metal Commercial Picnic Table</td>
<td>4</td>
<td>4</td>
<td>#</td>
<td>650.00</td>
<td>$2,600.00</td>
<td>$2,600.00</td>
</tr>
<tr>
<td>Concrete (waiting area)</td>
<td>2400</td>
<td>2400</td>
<td>Sq. Feet</td>
<td>$4.00</td>
<td>$9,600.00</td>
<td>$9,600.00</td>
</tr>
<tr>
<td>Pedestrian Lights</td>
<td>15</td>
<td>35</td>
<td>#</td>
<td>$1,500.00</td>
<td>$22,500.00</td>
<td>$52,500.00</td>
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<tr>
<td>Steel Permanent Shade Structure (Waiting Area)</td>
<td>4</td>
<td>6</td>
<td>#</td>
<td>$14,000.00</td>
<td>$56,000.00</td>
<td>$84,000.00</td>
</tr>
<tr>
<td>Bike Share</td>
<td>2</td>
<td>6</td>
<td>#</td>
<td>$50,000.00</td>
<td>$100,000.00</td>
<td>$300,000.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>$377,792.00</td>
<td>$815,912.00</td>
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</table>
## Citrus Park Mall Cost Estimates

<table>
<thead>
<tr>
<th>Item</th>
<th>Amt (Low)</th>
<th>Amt (Hi)</th>
<th>Unit</th>
<th>Cost (Low)</th>
<th>Total Cost (Low)</th>
<th>Total Cost (High)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolards w/ lights 42”</td>
<td>25</td>
<td>50</td>
<td>#</td>
<td>$963.00</td>
<td>$24,075.00</td>
<td>$48,150.00</td>
</tr>
<tr>
<td>Midblock Pedestrian Crosswalk/Signal</td>
<td>2</td>
<td>4</td>
<td>#</td>
<td>$86,000.00</td>
<td>$172,000.00</td>
<td>$344,000.00</td>
</tr>
<tr>
<td>Concrete (Entrance Area)</td>
<td>25000</td>
<td>50000</td>
<td>Sq. Feet</td>
<td>$4.00</td>
<td>$100,000.00</td>
<td>$200,000.00</td>
</tr>
<tr>
<td>Concrete (Transit Hub)</td>
<td>13000</td>
<td>26000</td>
<td>Sq. Feet</td>
<td>$4.00</td>
<td>$52,000.00</td>
<td>$104,000.00</td>
</tr>
<tr>
<td>Paint (Curbs for Transit Area)</td>
<td>800</td>
<td>1600</td>
<td>Length</td>
<td>$1.50</td>
<td>$1,200.00</td>
<td>$2,400.00</td>
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<tr>
<td>Benches (Entrance Area)</td>
<td>10</td>
<td>20</td>
<td>#</td>
<td>$684.00</td>
<td>$6,840.00</td>
<td>$13,680.00</td>
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<tr>
<td>Benches (Transit Hub)</td>
<td>30</td>
<td>50</td>
<td>#</td>
<td>$684.00</td>
<td>$20,520.00</td>
<td>$34,200.00</td>
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<tr>
<td>Aluminum Awning (30'x12')</td>
<td>2</td>
<td>4</td>
<td>#</td>
<td>$4,000.00</td>
<td>$8,000.00</td>
<td>$16,000.00</td>
</tr>
<tr>
<td>Bike Rack (10’)</td>
<td>3</td>
<td>6</td>
<td>#</td>
<td>$717.00</td>
<td>$2,151.00</td>
<td>$4,302.00</td>
</tr>
<tr>
<td>Brick Pavers (Bus Area/Transit Hub)</td>
<td>600</td>
<td>1200</td>
<td>Sq. Feet</td>
<td>$16.82</td>
<td>$10,092.00</td>
<td>$6,728.00</td>
</tr>
<tr>
<td>Brick Pavers (Cross Walk/Transit Hub)</td>
<td>200</td>
<td>400</td>
<td>Sq. Feet</td>
<td>$16.82</td>
<td>$3,364.00</td>
<td>$6,728.00</td>
</tr>
<tr>
<td>Wayfinding Signage (Uber/Lyft) Design</td>
<td>6</td>
<td>8</td>
<td>#</td>
<td>$20,000.00</td>
<td>$120,000.00</td>
<td>$160,000.00</td>
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<tr>
<td>Wayfinding Signage (Uber/Lyft) Fab+Impl.</td>
<td>6</td>
<td>8</td>
<td>#</td>
<td>$75,000.00</td>
<td>$450,000.00</td>
<td>$600,000.00</td>
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<tr>
<td>Wayfinding Signage (Basic) Planning &amp; Design</td>
<td>4</td>
<td></td>
<td></td>
<td>$20,000.00</td>
<td>$80,000.00</td>
<td>$-</td>
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<tr>
<td>Wayfinding Signage (Basic) Fabrication &amp; Impl.</td>
<td>4</td>
<td></td>
<td></td>
<td>$75,000.00</td>
<td>$300,000.00</td>
<td>$-</td>
</tr>
<tr>
<td>Wayfinding Signage (Best) Planning &amp; Design</td>
<td>4</td>
<td></td>
<td></td>
<td>$70,000.00</td>
<td>$-</td>
<td>$280,000.00</td>
</tr>
<tr>
<td>Wayfinding Signage (Best) Fabrication &amp; Impl.</td>
<td>4</td>
<td></td>
<td></td>
<td>$300,000.00</td>
<td>$-</td>
<td>$1,200,000.00</td>
</tr>
<tr>
<td>Planters Concrete (48”x 48”x24”)</td>
<td>200</td>
<td>500</td>
<td>#</td>
<td>$750.00</td>
<td>$150,000.00</td>
<td>$375,000.00</td>
</tr>
<tr>
<td>Steel &amp; Glass Frame Awning (Entrance Area) 40’x10’</td>
<td>125</td>
<td>250</td>
<td>#</td>
<td>$2,700.00</td>
<td>$337,500.00</td>
<td>$675,000.00</td>
</tr>
<tr>
<td>Steel &amp; Glass Frame Awning (Transit Hub) 40’x10’</td>
<td>27.5</td>
<td>55</td>
<td>#</td>
<td>$2,700.00</td>
<td>$74,250.00</td>
<td>$148,500.00</td>
</tr>
<tr>
<td>Pergola (Entrance) 20’x20’x10’</td>
<td>1</td>
<td>2</td>
<td>#</td>
<td>$8,800.00</td>
<td>$8,800.00</td>
<td>$17,600.00</td>
</tr>
<tr>
<td>Steel &amp; Glass Frame Awning (Entrance Area) 40’x10’</td>
<td>125</td>
<td>250</td>
<td>#</td>
<td>$2,700.00</td>
<td>$337,500.00</td>
<td>$675,000.00</td>
</tr>
<tr>
<td>Trash / Recycling Receptacles</td>
<td>25</td>
<td>50</td>
<td>#</td>
<td>$400.00</td>
<td>$10,000.00</td>
<td>$20,000.00</td>
</tr>
<tr>
<td>Removing Asphalt Parking Lot (Entrance)</td>
<td>25000</td>
<td>50000</td>
<td>Sq. Feet</td>
<td>$2.50</td>
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<td>#</td>
<td>$650.00</td>
<td>$2,600.00</td>
<td>$5,200.00</td>
</tr>
<tr>
<td>Bike Share</td>
<td>1</td>
<td>2</td>
<td>#</td>
<td>$50,000.00</td>
<td>$50,000.00</td>
<td>$100,000.00</td>
</tr>
<tr>
<td>EV Charger (Tier 1)</td>
<td>10</td>
<td></td>
<td></td>
<td>$2,000.00</td>
<td>$20,000.00</td>
<td>$-</td>
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<tr>
<td>EV Charger (Tier 2)</td>
<td>10</td>
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<td></td>
<td>$5,000.00</td>
<td>$-</td>
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<tr>
<td><strong>Total</strong></td>
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<td></td>
<td><strong>$2,098,392.00</strong></td>
<td><strong>$4,614,944.00</strong></td>
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# Amalie Arena Cost Estimates

<table>
<thead>
<tr>
<th>Item</th>
<th>Amt (Low)</th>
<th>Amt (Hi)</th>
<th>Unit</th>
<th>Cost</th>
<th>Total Cost (Low)</th>
<th>Total Cost (High)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bollards w/ lights 42”</td>
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<td>50</td>
<td>#</td>
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<tr>
<td>Pergola (waiting area) 20’x20’x10’</td>
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<td>4</td>
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<td>$35,200.00</td>
</tr>
<tr>
<td>Planters Concrete (48”x 48” x 24”)</td>
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<td>12</td>
<td>#</td>
<td>$750.00</td>
<td>$4,500.00</td>
<td>$9,000.00</td>
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<td>Benches (Concrete/Backs/Wood Rails)</td>
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<td>24</td>
<td>#</td>
<td>$684.00</td>
<td>$8,208.00</td>
<td>$16,416.00</td>
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<tr>
<td>Kiosks</td>
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<tr>
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<tr>
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<tr>
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<td>$1,200,000.00</td>
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<tr>
<td>Bike Rack (10’)</td>
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<td>5</td>
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<td>$3,585.00</td>
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<td>Solar Street Light (by Trolley)</td>
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<td>$6,000.00</td>
<td>$10,000.00</td>
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<tr>
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<td>$10,000.00</td>
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<td>Aluminum Awning (30’x12’)</td>
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<td>$16,000.00</td>
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<td>Archway (Brick)</td>
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<tr>
<td>Bike Share</td>
<td>1</td>
<td>2</td>
<td>#</td>
<td>$50,000.00</td>
<td>$50,000.00</td>
<td>$100,000.00</td>
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<td><strong>Total</strong></td>
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<td></td>
<td><strong>$559,119.00</strong></td>
<td><strong>$1,845,161.00</strong></td>
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</table>
## Keystone Park/Civic Center Cost Estimates

<table>
<thead>
<tr>
<th>Item</th>
<th>Amt (Low)</th>
<th>Amt (Hi)</th>
<th>Unit</th>
<th>Cost</th>
<th>Total Cost (Low)</th>
<th>Total Cost (High)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV Charger (Tier1)</td>
<td>6</td>
<td></td>
<td>#</td>
<td>$2,000.00</td>
<td>$12,000.00</td>
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</tr>
<tr>
<td>EV Charger (Tier2)</td>
<td>6</td>
<td></td>
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<td>$5,000.00</td>
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<td>$30,000.00</td>
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<tr>
<td>BikeShare</td>
<td>1</td>
<td>2</td>
<td>#</td>
<td>$50,000.00</td>
<td>$50,000.00</td>
<td>$100,000.00</td>
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<tr>
<td>Pedestrian Lights</td>
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<td>20</td>
<td>#</td>
<td>$1,500.00</td>
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<td>$30,000.00</td>
</tr>
<tr>
<td>Removing Asphalt (Entrance on Gunn Hwy)</td>
<td>2000</td>
<td>2000</td>
<td>Sq. Feet</td>
<td>$2.50</td>
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<tr>
<td>Stamped Brick Pavers (For Gunn Highway)</td>
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<td>2000</td>
<td>Sq. Feet</td>
<td>$12.00</td>
<td>$24,000.00</td>
<td>$24,000.00</td>
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<tr>
<td>Bike Rack (10')</td>
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<td>#</td>
<td>$717.00</td>
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<tr>
<td>Planters Concrete (48&quot;x48&quot;x24&quot;)</td>
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</table>
The purpose of this project was to prepare conceptual designs and implementation guidance to facilitate shared mobility for PlanHillsborough. To plan for a future in which technological innovation, socioeconomic trends, and environmental challenges are reshaping the ways people access goods and services, communities must prepare for an increasing public reliance on shared mobility by establishing new norms of urban design and transportation use. It is important to plan for technological changes that are occurring now (ridesourcing, carsharing, and bikesharing) to facilitate technological changes in the next 10 to 50 years (autonomous vehicles).

Shared mobility can provide mobility to transportation disadvantaged populations, but also presents the risk of perpetuating transportation inequities. Governments should harness the opportunities of shared mobility and autonomous vehicle technology while mitigating the potential negative externalities. Not only can shared mobility improve quality of life by providing access to transportation, it also can improve human and environmental health by encouraging active modes of transportation. The future of shared mobility will be a positive one if governments utilize designs for shared mobility that accommodate all users, are aesthetically pleasing, accessible, adaptable, and accommodating of technological innovations.

This report sought to provide Plan Hillsborough with a road map to effectively integrate shared mobility into a variety of urban, suburban, and rural contexts to improve the safety, accessibility, efficiency, and sustainability of the transportation system. The recommended design templates, regulatory framework, and action steps provide the first steps toward creating a built environment that supports and encourages people to move away from personal vehicles to safer and more efficient modes of travel. By designing transportation infrastructure and the urban form to accommodate shared modes, communities can be prepared for the next generation of mobility and may help to pave the way to a smoother transition to autonomous vehicles in the future.
References


