The Role of Florida Transit Agencies in Providing Pedestrian and Bicycle Access Improvements to Transit Stops and Stations

FDOT

BDV25 943-33

August 2016

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FDOT Project BDV25 TWO 943-33

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August 2016

Acknowledgements

The authors wish to thank the study participants representing staff of public transit agencies, Florida Department of Transportation (FDOT) District Offices, local governments, metropolitan transportation planning organizations and transportation planning organizations, who gave of their time to be interviewed and to participate in stakeholder forums that were held in Jacksonville, Tampa and West Palm Beach. We thank our hosts in FDOT Districts 2, 4, and 7 who provided the meeting facilities. The authors also wish to thank colleagues of the USF Center for Urban Transportation Research, Jeffrey Kramer, for his insights regarding MPO processes, and Martin Catalá, for his expertise regarding data sharing.

Executive Summary

Most transit riders access bus stops by walking or bicycling. The pedestrian and bicycle (ped/bike) facilities that serve the street and connect to transit are vitally important to enable patrons to use public transit. However, in most Florida communities, the ped/bike networks can be expanded. This final report contains the results of an examination of the coordination processes between public transit agencies in Florida and their state and local government partners in the provision of ped/bike improvements that facilitate access to transit stops and stations. The research included a review of federal law, regulations, and guidance by the Federal Transit Administration with regard to coordination processes between public transit agencies and their collaborative partners. The research also included a series of stakeholder workshops and telephone interviews with staff of public transit agencies, local governments, transportation planning organizations, metropolitan planning organizations, and staff of five selected Districts of the Florida Department of Transportation (FDOT).

This study is based on the premise that public transit agencies have an important coordination role to play in improving access to transit stops and stations for their patrons who arrive at the stop on foot or by bike. The outcome of this research is to determine the appropriate coordination role for public transit agencies and to provide recommendations about how they can more effectively coordinate with their state and local transportation partners. This is intended to advance the goal of improved ped/bike access to public transit with the result of increased transit ridership.

By defining this coordination role for public transit agencies, it implies that they should consider the entire trip made by their transit patrons. It was clear that the FDOT District, local government, and metropolitan planning organizations (MPO) or transportation planning organizations (TPO) partners agreed that public transit agencies should take a more active role in identifying, planning, and prioritizing ped/bike accessibility infrastructure, to increase both safety and transit ridership. A synthesis of the comments and discussion from the stakeholder workshops and telephone interviews is included in this report. Ideally, transit agencies should be involved in their partners' planning processes on a continual basis as roadway improvement project opportunities develop and progress. However, it is recognized that assuming a greater role in planning beyond the transit stops, has not been customary for many transit agencies. A more active role by the transit agency also requires more staff resources and expertise than many transit agencies can currently offer.

Some limitations upon what transit agencies can do to coordinate are because of limited dedicated funding to operate transit service, and no control over land use policy or right-of-way (ROW). However, within their control, transit agencies have the capability to expand, reduce, or alter transit routes to maximize accessibility by the most people, while creating service efficiencies. In this way, careful route placement also can serve to moderate the distance that must be traveled on foot and by bicycle, to and from the transit stop. Transit agencies can judiciously locate transit stops, in coordination with local and state partners, to align more closely with desired destinations and the existing or planned ped/bike street infrastructure. Transit agencies can anticipate future roadway improvement projects, including safety projects, roadway maintenance projects (such as resurfacing, restoration and rehabilitation (3R) projects, new roadway construction projects, roadway improvements in response to local requests for traffic control, and street improvement opportunities coincident with land development and redevelopment. These future projects may contain opportunities to include ped/bike enhancements.

Transit agencies can collect and analyze data about the transportation service needs of their ridership and develop future service concepts as part of the transit development plan. These activities can include determining "first mile/last mile" ped/bike facility needs. Transit agencies can participate in planning processes of their partner agencies; provide ideas, data and recommendations, and request transit and ped/bike infrastructure. Transit agencies can address their elected officials, their planning counterparts, and the public in their marketing efforts to build support for transit's role as an essential community service, now and in the future.

Transit agencies can improve the facilities within the footprint of the bus stop. Beyond Americans with Disability Act (ADA) compliance for accessible bus stops, transit agencies also can add features, such as bicycle racks. Transit agencies can approach the delivery of such access improvements systematically, by including them in transit stop design guidelines. This may mean anticipating the need for bicycle parking and planning for transit stops of a size that are somewhat larger than the 5-foot by 8-foot minimum standard size. Transit agencies can choose to contribute a portion of their FTA funds to local governments and FDOT for ped/bike facilities that improve access to transit stops and stations.

Going forward, the coordination processes should include the development of a standardized and predictable process to address requests to remove or relocate bus stops due to ADA, safety, or other operational issues. Related to this is the need for a decision making process regarding the addition of right turn lanes that may displace existing bus stops. Coordination processes also should include one in which the transit agency participates in considering requests for traffic control that also may affect the location of transit stops and ped/bike accessibility.

Transit agencies can coordinate better by sharing their data with local and state partners. According to stakeholder input, transit agencies do share data, but it is on a case by case basis, in response to separate requests. Data sharing should include developing a program for transit agencies to provide their bus stop infrastructure inventory (including ADA compliance) and transit rider travel characteristics data regularly, such as automated passenger count data at bus stops, in a standardized format that can be shared with agency partners. This data sharing can aid partners in identifying bicycle, pedestrian, and ADA facility gaps and needs near transit stops, for purposes of project scoping to improve safety and access. The data sharing effort also should be expanded to include the identification of performance measures relating to ped/bike accessibility, the identification of any new data that might need to be collected for this, and an agreement about which agency collects the data and how the data is to be collected.

Transit agencies in Florida can engage in dialogue with their partnering agencies to consider use of some performance measures that are jointly adopted by all the collaborative partners. This would recognize the goals shared in common among the collaborative partners to serve multimodal travel, and to promote joint efforts to better link transit with pedestrian and bicycling modes.

It is hoped that the descriptions of processes and the recommendations contained in this report may serve as a starting point for Florida transit agencies and their local and state partners to review their existing cross-agency working relationships and the institutional structures and procedures unique to their service areas, to further improve coordination in providing ped/bike accessibility improvements to transit stops and stations.

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CHAPTER 1: STUDY INTRODUCTION, BACKGROUND, AND SCOPE

Introduction

Most transit riders access bus stops by walking or bicycling. The facilities that serve the street and connect to transit are vitally important to enable patrons to use public transit. However, in most Florida communities, the pedestrian and bicycle (ped/bike) networks are presently incomplete.

According to 2014 data, 74 percent, or 7,282 centerline miles of non-limited access facilities on the State Highway System (SHS) had bicycle facilities (bike lanes, bike paths, or shared roadways). With regard to pedestrian facilities, 64 percent, or 3,276 urban non-limited access centerline miles on the SHS had sidewalks[1]. Transit service often follows the main roads that also may be major multilane arterials along the SHS.

Safe and ready access to transit is of growing importance in the State of Florida for a variety of reasons, including an expanding senior population who may become more dependent on transit options, and a substantial share of residents without a car. The State of Florida became the third most populous state in 2015. Florida's population that is age 65 years and older was 18.6 percent of the total in 2014 (U.S. Census Bureau) and is projected to increase to 25.5 percent of the total by the year 2040 (University of Florida, Bureau of Economic and Business Research). According to the Transportation Disadvantaged Annual Performance Report, 2015, 41.46 percent of the Florida population is eligible for assistance. According to the 2014 American Community Survey, approximately 7 percent of Florida households have no cars. For these transit dependent populations, as well as for those with more travel choices, a strong public transit system could serve passengers even more successfully if access by bicyclists and pedestrians to public transit were better.

The transit trip begins at home and likely includes a walking or bicycle trip (aka 'first mile') to the stop. After riding the bus/train and alighting, the final leg of the journey is likely another walking or bicycle trip (aka 'last mile') to the final destination. Depending on the existence and condition of ped/bike accessibility linkages, the first/last mile links of a transit journey make the trip either feasible or impractical.

In general, many transit agencies have not focused attention on ped/bike facility needs beyond the transit stop. The primary focus of public transit agencies for bicyclists has been bicycle racks at the stops and bike racks on the buses. For pedestrians, the primary focus has been the installation of accessible facilities, pursuant to Section 504 of the Rehabilitation Act of 1973 and Title IIb of the 1990 Americans with Disabilities Act (ADA), including sidewalk connections from bus stop pads to the sidewalk, if there is one. A second major focus is the provision of shelters within the footprint of the bus stop. These ped/bike features are essential initial priorities made by transit agencies that must function within the constraints of limited dedicated funding.

Opportunities for Coordination

Existing and emerging conditions present new opportunities for successful coordination. For example, state road cross sections for new and reconstructed facilities that are not on the Interstate System must include bicycle facilities and sidewalks within urban areas and within one mile outside the urban area

[1] FDOT, Florida Transportation Trends and Conditions, 2015.

boundary. What may accelerate this process is FDOT's current implementation of its Complete Streets Policy, adopted in September 2014. Complete Streets implementation is a challenging assignment because the historical emphasis of the SHS has been to serve regional traffic and the development of high-speed thoroughfares for the movement of people and freight to support economic development. FDOT is presently revising its manuals and procedures to include Complete Streets considerations into all transportation improvement projects for roadways that are not part of the Interstate system. This report addresses the remaining gaps in ped/bike accessibility linkages to transit and provides guidance to close the gaps at the earliest opportunities.

Likewise, local roads and highways are designed using the standards and criteria found in the Manual of Uniform Standards for Design, Construction and Maintenance for Streets and Highways (Florida "Greenbook,") pursuant to Section 336.045, F.S., it requires uniform standards for county roads, and establishes that ped/bike facilities shall be given full consideration in the planning and development of transportation facilities.

Many local governments have separate ped/bike components to the transportation elements of their comprehensive plans. These components lay out goals, objectives, and policies for non-motorized network development as well as identify and prioritize segments of capital facilities to be built. Some local governments have adopted their own Complete Streets policies. Over time, ped/bike networks in local communities will develop toward complete systems as well.

Limitations to transit service access by walking and bicycling impede travel and pose safety hazards. There is a need to prioritize improving this intermodal accessibility where and when such connection opportunities arise. These opportunities are mainly found in roadway improvement projects and as part of land development projects.

The federal 'Fixing America's Surface Transportation' (FAST) Act, signed into law in December 2015, requires transit agency representation on MPO boards that could provide additional opportunities for coordination.

An effective collaborative role depends on public transit agencies understanding and engaging in the processes that are followed by local governments, the TPOs/MPOs, and FDOT Districts. These processes usually depend on facility ownership and the entity securing the primary funding for the project. Chapter 4 provides details of the processes and recommendations on how to utilize them.

Transit agencies should focus on identifying and anticipating when transit input can best be used by the lead agency at junctures in the processes as well as communicating in an effective manner their required transit planning processes. Also important is sharing their data to help partners identify and prioritize ped/bike facilities relative to the proper placement of transit stops and stations. As for the processes of the partners, the following provides a brief overview.

FDOT processes include:

- transportation improvement projects for building new roads;
- reconstructing existing roads;
- 3R projects;
- safety improvement projects; and
- projects in response to a request for traffic control.

Local government processes include:

- comprehensive plans;
- county and municipal roadway improvement projects; and
- roadway improvements negotiated as part of conditions for approval of land development.

The TPO/MPO processes include:

- transportation improvement studies;
- corridor studies;
- planning studies that might precede the development of a local or state roadway improvement; and
- other processes for identifying needed regional facilities, developing the regional long-range transportation plan, and transportation improvement program for the allocation of awarded federal transportation funds.

Constraints to Coordination

In some locations, there is insufficient street ROW with no chance to add sidewalks due to physical constraints such as canals and drainage features. In some cases, there may not even be sufficient space for ADA compliant bus stop features, such as landing pads. In the downtowns of some older communities, the street and sidewalk may directly abut building structures, with no additional space to include a bicycle lane. Some constraining conditions are fiscal, procedural, or policy-related.

While there is the need for early collaboration in the highway planning and design process, the challenge for transit, even if they have participated in the process from the beginning, is the fact that transit service changes over time, especially so within the multiyear time frames of roadway projects. By the time of construction, conditions might have sufficiently changed for transit needs to be different in some cases.

The transit agency may lack the staff resources to participate fully in coordinative processes, such as the time required attending meetings.

Natural staff turnover, within both the transit agency and its transportation partners, poses challenges to continuity of coordination over the life of a roadway improvement project.

Some transit agencies serve areas with many municipalities, such as Palm Tran with 37 municipalities and PSTA with 23 municipalities. Each municipality may have its own unique administrative processes, for example, for granting permits for the placement of bus shelters.

Ped/bike street infrastructure for accessing transit stops and stations might not be a top priority of some coordinating partners.

Some utility companies may be unable or unwilling to relocate obstructions on sidewalks, such as utility boxes. Drainage district authorities may be unwilling to allow the positioning of box guardrails for ADA features, if these features encroach upon land controlled by them.

Some property owners may be unwilling to provide easements for bus stops and street access features.

Study Scope

The scope for this study focuses upon State roadways, addressing remaining gaps in ped/bike accessibility to transit stops and stations. Sidewalk and bicycle lane prioritization projects often focus on completing facilities along the transit corridor that often follows state arterials. This can take advantage of a roadway improvement project along that corridor. However, it is important to note that some ped/bike connectivity enhancements that improve bus stop access also include the side streets serving residential areas from which transit trips originate. These side streets are more likely to be county roads or city streets.

Figure 1: Properly placed mid-block crossings can provide more direct access to transit stops.

The scope of this project also emphasizes ped/bike *access* to transit, which is different from but related to safety. During a stakeholder workshop, held for collecting input during this study, a participant commented that sometimes roadway improvements intended to improve safety for pedestrians are not used by the pedestrians. This may be because these facilities, such as a crosswalk placed at an unfavorable location, might require pedestrians to go significantly out of their way. Those who walk and bicycle for transportation naturally desire the shortest distance to their destination and might choose the most direct path, even if it is unsafe. As a result of this observation, it stands to reason that roadway improvements that make ped/bike access to the transit stop or station as direct as safely possible, may also improve the safety of transit patrons, because those facilities are more likely to be used (see example in Figure 1).

This observation also speaks to the importance, not just of the types of ped/bike improvements selected, but also of their proper placement to optimize directness of access. Likewise, the location of the transit stop also influences the first mile/last mile path taken. Proper placement of the transit stop accommodates where transit patrons are coming from and their final destination. This is for the purpose of minimizing first mile/last mile distances, where possible, and to provide access improvements that also serve direct paths more likely used. Perceptions of a lack of safety also can thwart access if the result is the transit patron choosing not to travel at all, especially those who are more transit dependent. Ped/bike accessibility improvements to transit stops also should improve a sense of safety and comfort.

The best decisions about the type and location of ped/bike access improvements will likely be made through a coordinated effort between the public transit agency and the government department responsible for designing and building the roadway improvements. This is because these decisions require a combination of data and knowledge that no one agency possesses.

Report Organization

Following this introductory section, Chapter 2 will define ped/bike accessibility linkages and enhancements that increase accessibility of transit stops/stations. Chapter 3 provides a description of the study method used to develop recommendations for public transit agencies to coordinate within the planning and programming processes available to them and their partners. Chapter 4 describes the relevant aspects of these processes, identifies coordination opportunities, provides examples of coordination, and offers the recommended role of public transit and actions to improve coordination. Chapter 5 draws conclusions and summarizes the recommendations that are provided throughout the report.

Textboxes are used to provide either a sample of guidance that promotes coordination or references to practical case examples of ped/bike enhancements achieved through coordination.

CHAPTER 2: DEFINING ACCESSIBILITY LINKAGES

The next sections define the types and locations of ped/bike enhancements and the correlation of ADA implementation with these enhancements.

Relevant Area for Ped/Bike Improvements

Considering the relevant area surrounding transit stops and stations for building ped/bike accessibility improvements results in their more efficient and effective placement. The emphasis of ped/bike project prioritization can sometimes focus upon completing sidewalks and bike lanes along the transit corridor. This can take advantage of a roadway improvement project along that corridor. However, it is important to note that some ped/bike connectivity enhancements also include the side streets from which some transit trips originate.

While there are no federal requirements for public transit agencies to improve access beyond transit stops and stations, FTA has provided multiple grant programs, the funds of which can be used for ped/bike enhancements. If the transit agency decides to use their FTA funds for this purpose, then only those facilities within a defined radius, which are considered functionally relevant to the transit stops, are eligible for use of the funds. These radii include pedestrian facilities that are within one-half mile of a transit stop and bicycle facilities that are within three miles of a transit stop.[2]

Votran conducted a comprehensive operations analysis in 2013 and found through the conduct of a survey, that for some routes, their transit patrons general do not walk more than the equivalent of one or two blocks to access the bus stop. A smaller percentage accesses the bus stop by someone dropping them off and picking them up by motor vehicle.

Furthermore, "Ped/bike improvements beyond these threshold distances may be eligible for FTA funding if the improvement is within the distance that people could be expected to safely and conveniently walk or bicycle to use that particular transit stop or station."[3] Using this provision would require that the transit agency collect information on origin and final destination of transit trips, to determine a relevant radius around a transit stop where bicycle and pedestrian facilities are used and most needed. Some transit agencies already survey their riders to determine by what mode they access the transit stop and from what distance they must travel to and from the transit stop.

Recommendation 1

Transit agencies can survey their patrons to determine by what mode they access the transit stop and from what distance they must travel to and from the transit stop. This may be data collected as part of a comprehensive operations analysis. This enables the placement of facilities based upon knowledge of transit patrons' travel characteristics and needs.

[2] Federal Transit Administration, Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements under Federal Transit Law, 76 FR 52046, August 11, 2011.
[3] Ibid.

Another relevant boundary to consider is a buffer around transit fixed routes. For example, roughly 79 percent of Florida's population resides within three-quarters of a mile of a fixed route transit service.[4] If a person with a disability lives within three quarters of a mile of fixed route transit service, the public transit agency must provide paratransit service, either to the transit stop or, if the person's destination (such as a doctor's office) is not located along a transit route, the transit agency must provide transportation to that destination.

Types of Ped/Bike Facilities

When coordinating with partner agencies, it is helpful for the transit agency to be familiar with the types of ped/bike facilities that partner agencies may consider providing as a part of their roadway improvement processes. Below is a partial list of examples:

- Sidewalks
- Marked and high emphasis crosswalks
- Traffic control devices
- Curb extensions
- Refuge islands
- Ped/bike bridges/underpasses
- Enhanced overhead lighting
- Bicycle lanes
- Wide curb lanes
- Shared lanes
- Shared use paths
- Paved shoulders
- Bike racks at transit stops

Bicycle and pedestrian accessibility improvements are not only physical capital facilities. For example, in Minneapolis-St. Paul, online maps are provided by Metro Transit, which show suggested bike routes to each of the stations of the Northstar Commuter train. Metro Transit also markets the free Guaranteed Ride Home program to bicycle commuters.

The FDOT Plans Preparation Manual (PPM), Chapter 8, defines the location and types of ped/bike facilities that are to be provided on roadways on the SHS, pursuant to Section 335.065, F.S. A higher standard of ped/bike facility is to be provided in or within one mile of an urban area. These are areas where fixed-route transit is more likely provided. On its web site, FDOT posts the Urban Area 1-Mile Buffer Maps in conjunction with the PPM. The maps illustrate the demarcation line that defines the types of facilities to be provided as part of FDOT projects, e.g., beyond one mile of an urban area boundary, a shoulder, both paved and unpaved, would satisfy the need for a pedestrian way.

[4] FDOT, *Florida Transportation Trends & Conditions,* 2015, p. 16.

> *"Sidewalks should be provided along both sides of the roadway that are in or within one mile of an urban area…If continuous sidewalks are constructed on only one side of the street, pedestrians should be provided access to facilities and services located on the opposite side of the street." Furthermore, "A 5-foot wide (minimum) sidewalk that connects a transit stop or facility with an existing sidewalk or shared use path must be included to comply with ADA accessibility standards."* [5]

The PPM also provides guidance for the bicycle facilities that are most appropriate for various types of State roadway projects, as reproduced in Table 1.

Bicycle facilities also might include green color bike lanes for which FDOT has received Interim Approval from Federal Highway Administration (FHWA) to install. Green color bike lanes are used in locations where the path of bicyclists crosses the path of other road users and where road users should yield to bicyclists. These include extensions of bike lanes through intersections, where the bike lane crosses a right turn lane, and where a bike lane is adjacent to a dedicated bus bay. The PPM provides the criteria for the selection and installation of these types of ped/bike facilities, as part of FDOT projects.

In addition to the above (sidewalks, shared use paths, unpaved shoulders, bicycle lanes, wide curb lanes, shared lanes, and paved shoulders), other facilities might include pedestrian/bicycle bridges and underpasses, and ADA accessibility features such as curb ramps, nonslip top surfaces, and detectable warnings.[6] Intersection and midblock improvements for pedestrians might include marked and high emphasis crosswalks, signals, including adaptive signal timing, pedestrian countdown signals, rectangular rapid flashing beacons (RRFB), signage, beacons, curb extensions, raised medians, refuge islands, and enhanced overhead lighting.

The PPM instructs FDOT project managers of roadway improvement projects to coordinate with their FDOT District Modal Development Office and the local public transit agency in FDOT plan development. The PPM Chapter 8 also discusses public transit facilities as it relates to the roadway design process. The PPM references the FDOT "Accessing Transit: Version III, 2013 Design Handbook for Florida Bus Passenger Facilities" that provides guidance for the selection of curbside and street-side transit facilities.[7]

[5] FDOT, *Plans Preparation Manual, Volume 1*, Topic No. 625-000-007, 2016, p. 8-5.
[6] FDOT Design Standards, Index 304, Florida Accessibility Code for Building Construction, 2012.
[7] Tindale-Oliver & Associates, Inc., *Accessing Transit: Design Handbook for Florida Bus Passenger Facilities, Version III*, FDOT Public Transit Office, 2013.

Table 1: Bicycle Facilities that are Appropriate for Various Types of State Roadway Projects

Location	Condition	Type of Work		
		New Construction, Reconstruction	Resurfacing, Restoration, Rehabilitation (RRR)[1,2,3]	Traffic Operations, Intersection Improvements
In or within one mile of an urban area	All	Bicycle Lane	Bicycle Lane or Wide Curb Lane	Bicycle Lane or Wide Curb Lane
Beyond one mile of an urban area	Curb and Gutter	Bicycle Lane	Bicycle Lane or Wide Curb Lane	Bicycle Lane or Wide Curb Lane
	Flush Shoulder	Bicycle Lane or Paved Shoulder	Bicycle Lane or Wide Curb Lane	Bicycle Lane or Wide Curb Lane

1. Widening of existing curbed section for the project length to provide bicycle facilities may disproportionally affect the scope and cost of a RRR project, especially if reconstruction of the curb, sidewalk, and/or drainage system is required, additional ROW is needed, or utilities are impacted. No Design Variation is necessary; however, a statement similar to the following shall be included in the project file:
   "Bicycle facilities have been considered for this project but will not be provided, due to insufficient width between existing curb lines to provide bicycle facilities without substantial reconstruction of the roadway, drainage system and sidewalk (and/or ROW acquisition) is outside the scope of this project."
2. Substantial widening of an existing curbed section is outside the scope of a RRR project and is considered reconstruction.
3. See Section 25.4.19 for options that shall be considered on RRR projects with existing roadways where no widening is planned.

Source: Table 8.1.1 Bicycle Facilities, reproduced here from Florida Department of Transportation, Plans Preparation Manual, Volume 1, Topic #525-000-007, 2014.

Curb-side facilities include bus stop signs, passenger waiting shelters, boarding and alighting areas, curb ramps, benches, leaning rails, and shelter lighting. The standard boarding and alighting area is five feet by eight feet in size. "Bus stops should be located in close proximity to existing intersections, and with sidewalk access"[8]. The boarding and alighting area must be connected to the sidewalk along the roadway or to the roadway where no sidewalk exists.

In addition to pedestrian ways and bicycle facilities, street-side facilities also include bus bays or pullouts to enable a bus to pick up and drop off passengers in an area outside the travel lane. These are often used on Urban Principal Arterials and other roads with high operating speeds.

"Bicycle lanes should be considered part of the larger transit network and should connect transit users to bus stops. They should also be considered a good way to connect park-and-ride lots to neighborhoods via arterial collector streets and may connect users more easily than even major roadways."
(See footnote#10)

If shared-use paths cross over streets that are served by public transit, these locations also provide opportunities to connect pedestrians and bicyclists to transit stops. "Where shared-use paths are

[8] FDOT, Plans Preparation Manual, Volume 1, Topic No. 625-000-007, 2016, p. 8-43.

provided, bus stops must be connected so that they are located in a manner providing accessible shared-use path access points to the roadway".[9]

If a shared-use path is provided along an area that is not within a road ROW, then it is possible that the transit provider should coordinate with the parks and recreation department.

Location of the Transit Stop

Perhaps one of the first considerations with regard to coordinating the provision of ped/bike accessibility linkages to transit stops and stations is the initial selection of the optimum location for the transit stop or station itself, based upon serving adjacent land development. Much recent research has addressed this issue. The optimum location may shorten distances walked or bicycled and may encourage pedestrians to use sidewalks (instead of jaywalking) and encourage bicyclists to safely use the provided bicycle facilities. Locating the optimum transit stop then enables identification and prioritization of the best locations where added ped/bike linkages can provide the most service to transit patrons.

However, when locating the transit stop, transit agencies must balance multiple considerations, not just providing safe access to bicyclists and pedestrians, but also providing safety for waiting passengers and selecting bus stop locations and designs that reduce rear end collisions with buses. For example, bus bays can be located midblock or on the near side of an intersection, or on the far side of an intersection. Some transit agencies have prepared their own transit stop design guidelines with policies for the placement of transit stops. FDOT designers are directed to work with the transit agency in the selection of the most appropriate placement and type of street-side facility, depending on the volume and speed of through traffic.[10]

The Florida Administrative Code, 14-2.004, F.A.C. provides requirements for locating transit stops along a state road by transit agencies. Bus stop location depends on the availability of a public transit route and must serve the needs of transit patrons, maximizing safety for riders, vehicles, and pedestrians. FDOT reserves the right to require modification or removal of a bus stop if its location is determined to be unsafe.

The "Accessing Transit Handbook" lists considerations for determining the optimum location of a transit stop. Such a location provides unobstructed sight lines between the approaching bus and waiting passengers, is close to key destinations, and makes it easy to transfer to another transit route by minimizing walking distance and the number of street crossings required. An optimal transit stop location also is close to marked crosswalks that are protected by traffic signals, connects to existing sidewalk infrastructure, and is located away from driveways. The "Accessing Transit Handbook" provides that "Close coordination with the state and local agencies that operate and maintain roadway facilities is imperative."[11]

A parallel effort that is useful to the discussion of coordinating ped/bike improvements for improving transit stop access is the development and update of the Florida's Pedestrian and Bicycle Strategic

[9] Tindale-Oliver & Associates, Inc., Accessing Transit: Design Handbook for Florida Bus Passenger Facilities: Version III, FDOT Public Transit Office, 2013, p. 152.
[10] FDOT, Plans Preparation Manual, Volume 1, Topic No. 625-000-007, 2016, p. 8-43.
[11] Tindale-Oliver & Associates, Inc., Accessing Transit: Design Handbook for Florida Bus Passenger Facilities: Version III, FDOT Public Transit Office, 2013, p. 147.

Safety Plan (PBSSP). Originally developed in 2013, a 2016 update is underway, with the intent to focus resources on 15 counties where there is greatest representation of the safety issues. These counties include Escambia, Hillsborough, Pinellas, Pasco, Polk, Lee, Sarasota, Duval, Orange, Volusia, Marion, Brevard, Palm Beach, Broward, and Miami-Dade. The PBSSP will support the Vulnerable Road Users Emphasis Area of Florida's Strategic Highway Safety Plan. Statewide efforts to improve bicycle and pedestrian safety also can create opportunities to improve transit accessibility.

The following are relevant excerpts from the PBSSP.[12]

> Goal 3.5 Data, Analysis, and Evaluation: Collect and analyze pedestrian- and bicycle-related data to provide stakeholders with complete, accurate, uniform, and accessible information to make appropriate and timely decisions, and to use a method of evaluating program activities and implementation of Florida's PBSSP.
>
> Objective 3.5.4 Ensure that evaluation results are used to identify problems, plan new programs, and improve existing programs.
>
> a) Utilize the Pedestrian Safety Problem Identification Tool (PIT) to identify community context in order to gain insight into pedestrian safety problems.
>
> Objective 3.7.1 c) Implement improved ped/bike features with ongoing transportation projects.
>
> Objective 3.7.2 Facilitate the establishment and implementation of regional master plans by local governments for bike/ped facilities to ensure that safety and accessibility are addressed.
>
> a) Work with local governments to prepare and implement ped/bike transportation master plans.
>
> Objective 3.7.3 Promote the application of "Complete Streets" to improve bicycle and pedestrian safety and access.
>
> a) Consolidate existing language on CSS [Context Sensitive Solutions] and TDLC [Traditional Design for Livable Communities] into a "Complete Streets" Policy.
> b) Develop training and resource on implementation of "Complete Streets," to include guidance on evaluation of performance trade-offs.
> c) Establish FDOT expertise in urban design.
> d) Support local governments' "Complete Streets" initiatives.
>
> Objective 3.7.4 Promote Road Safety Audits (RSA) to include pedestrian and bicycle safety components.
>
> a) Identify and partner with state and local Pedestrian Safety Audit (PSA) teams.

[12] FDOT, Florida's Pedestrian and Bicycle Strategic Safety Plan Update, Bartow Roundtable Discussion, April 25, 2016.

b) Distribute materials supporting the Pedestrian Road Safety Audit Guidelines and Prompt Lists developed by FHWA.

Objective 3.11.1 Promote linkage of state, local, and regional safety plans to increase coordination between stakeholders.

a) Coordinate a work program to facilitate multimodal projects.[13]

Recommendation 2

Transit agencies, serving one or more of the 15 selected counties, could seek more information on specific action plans for local implementation, as they are developed. Transit agency staff could seek to provide input to PBSSP implementation, with respect to known bicycle and pedestrian safety issues on streets served by transit.

Implementation of the Americans with Disabilities Act

Public transit agencies are subject to compliance with the Section 504 of the Rehabilitation Act of 1973 and Title IIb of the 1990 Americans with Disabilities Act. Federal ADA law requires ADA accessible transit facilities. Transit agencies, and local and state governments are in the process of retrofitting transit stops, stations, and intersections, including incorporating ADA access improvements in conjunction with roadway improvement projects. Public transit agencies are in the process of providing these facilities in compliance with ADA within the transit stop. Bus stop facilities also must connect to the adjacent street and sidewalk.

A correlation exists between pedestrian facilities and accessible facilities that accommodate riders with disabilities. Clearly, sidewalks designed and constructed according to the U.S. Access Board ADA Accessibility Guidelines (ADAAG) to accommodate wheelchairs will also accommodate pedestrians. Although the focus of this research was the connectivity of bicyclists and pedestrians to transit stops, the discussion naturally includes the accessibility of the stop itself to riders with disabilities as set by standards. Some of the minimum pedestrian access design standards according to ADAAG include the following[14]:

- one accessible route that links all facilities and services
- sidewalks with a minimum of 36 inches of clear width
- a curb ramp or other method, if the change of level is greater than 1/4 inch
- cross-slope of no more than two percent

FDOT manages approximately 5,735 miles of public sidewalks and thousands of curb ramps. FDOT includes in the scope of services for each project, the requirement to identify and correct inaccessible features on pedestrian facilities along the SHS. These include sidewalks, curb ramps, crosswalks, and pedestrian signals. Each District implements survey criteria to identify accessibility deficiencies, as part of FDOT's Efficient Transportation Decision Making (ETDM) process, the project development, and

[13] Center for Urban Transportation Research, *Florida's Pedestrian and Bicycle Strategic Safety Plan*, FDOT, 2013.
[14] United States Access Board, *A Guide to ADAAG Provisions*, Accessible Route [4.3].

environment (PD&E) study phase, and the scope of work for design. During the design phase, corrections to deficient existing facilities and new facilities are designed using accessibility criteria from FDOT Design Standards, Plans Preparation Manual, and Standard Specifications. A public input process invites input during the PD&E phase and during design. The District ADA Coordinator is also involved in multiple progress reviews of plans during design.

During the construction phase, FDOT builds new pedestrian facilities and accessible upgrades to existing pedestrian facilities. A project is not closed out until it has been verified that accessible facilities have been completed per guidelines and criteria from construction checklists.[15]

The Utilities Accommodation Manual (UAM) describes the authority of FDOT to permit the use of public rights of way by public and private utility entities. It includes acceptable minimum clearances around above–grade utilities when they are placed in or near pedestrian facilities. In the case where an obstruction exists in the sidewalk that is not feasible to move or to move the sidewalk, then the inspector must document this to the file, per Index 310 and 17302. FDOT can quickly resolve ADA accessibility issues by using "push button" contracts that can correct a specific issue within two to four weeks.

Recommendation 3

Transit agencies should have a plan of action for bringing transit stops up to ADA compliance.

An example of a method to prioritize these stops is discussed in the U.S.DOT report: Optimization Models for Prioritizing Bus Stop Facility Investments for Riders with Disabilities.

In 2006, FDOT adopted criteria described in the draft Guidelines for Accessible Public Rights of Way (PROWAG) as part of the 2006 Design Standards.

> *"The Department is working with local governments and public transportation agencies to coordinate accessibility upgrades to facilities provided by others on the State Highway System".*[16]

Circular FTA C-4710.1 Americans with Disabilities Act (ADA): Guidance was issued November 4, 2015, for the purpose of providing guidance to recipients and sub-recipients of Federal Transit Administration (FTA) funding necessary to carry out provisions of ADA of 1990, Section 504 of the Rehabilitation Act of 1973, as amended, and the U.S. DOT's implementing regulations, 49 CFR Parts, 27, 37, 38, and 39.

Throughout the Guidance, FTA encourages public transit agencies to engage riders with disabilities when making decisions about transit service as well as collaborate with public private entities. Appendix A provides the Optional Facilities Checklist for New Construction and Alterations, reproduced from FTA Circular 4710.1.

Table B-1 in Appendix B provides comments elaborating on FTA suggestions for engaging with the community and other agencies by providing resources with case examples.

[15] These guidelines and criteria are from Construction Guidelist #20, FY2014/2015 QC Category No. 20, *Statewide Inspection Guidelist, ADA Accessibility Issues, and Critical Requirements #20*.
[16] FDOT, *ADA/504 Program 1992 – 2015*, p. 11.

Figure 2 is an illustration of before and after retrofitting a transit stop for accessibility on a state road.

Figure 2: State Road 7 (West Boca Raton) Before and After Enhancements

CHAPTER 3: LITERATURE REVIEW AND STAKEHOLDER INVOLVEMENT

This study was conducted by completing the following tasks:

1) Review of Available Guidance

A review was conducted of federal requirements, opportunities, and guidance to funding and coordination practices, along with examples from the literature to illustrate the use of funding and/or coordination that enhances or provides ped/bike accessibility to transit stops.

Guidance specifies how the different federal funds may be used for ped/bike linkages with transit stops. Because of the federal FAST Act, transit funding remains generally eligible to be spent on bike and pedestrian projects; however, two minor incentives to use transit funds for bicycling projects went away. These are the transit enhancements program (previously a 1 percent set-aside) and the more favorable 90 percent federal match, versus the normal 80 percent federal match. Specific federal guidance on coordination in the use of the funds is not provided. There are eligibility requirements for use of the various funds but there are no requirements to use the funds for ped/bike improvements.

Because these funding sources can be used for a variety of purposes, ped/bike improvements often compete with the same funding relied upon for transit operations.

Jacksonville Transportation Authority (JTA) received Section 5310 funds to make pedestrian improvements beyond bus stops. JTA has used FTA funds for bike/ped improvements via its bus rapid transit program. As part of the First Coast Flyer BRT Downtown & North Corridors, bike/ped improvements including sidewalks and a shared bike/bus lane were implemented with this funding. Additionally, JTA plans to leverage BRT funds from the Southwest and East Corridors to assist in implementing prioritized Complete Street projects (that directly support improved access to the BRT stops) as part of the Mobility Corridors effort. FDOT District 2 also is assisting JTA with State grant funds to make bicycle and pedestrian improvements in and around specific bus stops.

2) Stakeholder Telephone Interviews

Telephone interviews were conducted with 15 representatives of FDOT Districts, local government, and transit agencies to learn about their experiences and insights regarding their coordination processes, outlined in Figure 3. The interviews were conducted to highlight information relating to several topics, from the point of view of the interviewees, including examples of ped/bike access improvements, the most effective improvements to roadway and transit facilities, the roles of the collaborative partners, and challenges and examples of effective practices regarding the collaborative process. In addition, plans, handbooks, and manuals describing roadway improvement project processes also were reviewed. As part of Task 2, several initial telephone interviews with individuals representing FDOT District ped/bike coordinators and face-to-face interviews with staff of FDOT District 7 were helpful in outlining the potential role of transit agencies and were used in developing the three stakeholder forums.

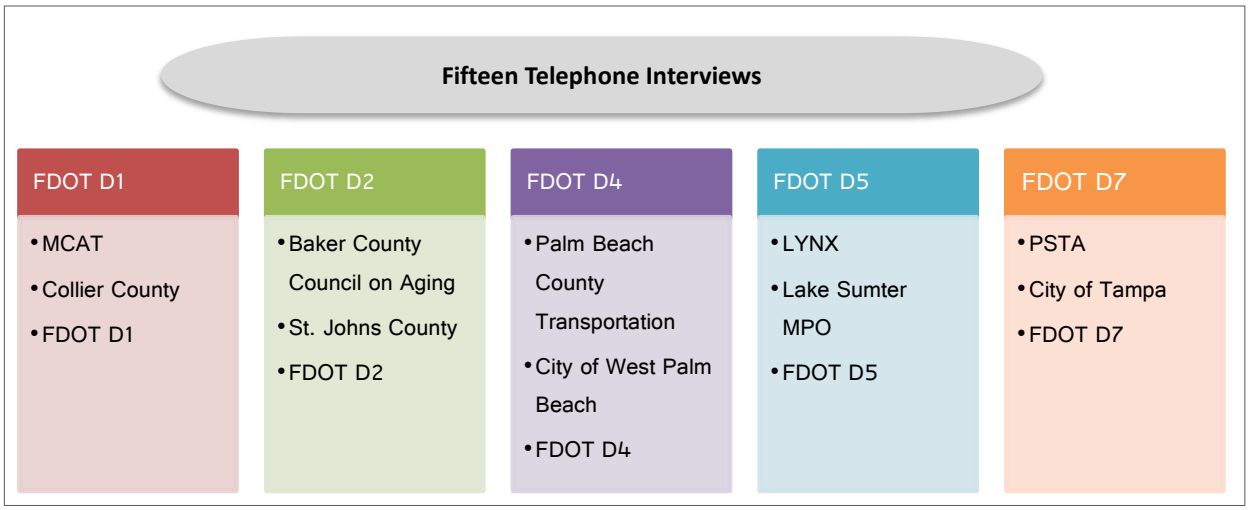

Figure 3: Organizations Participating in Telephone Interviews

3) Stakeholder Forums

Three stakeholder forums also were held in Jacksonville, West Palm Beach and Tampa at the meeting facilities of FDOT Districts 2, 4, and 7, respectively, outline in Figure 4. The purpose of these stakeholder forums was to share the results of our literature review on federal requirements and listen to those who represent agencies that have a stake in the roadway improvement process. Participants included representatives of local government, MPO/TPOs, FDOT, and transit agencies throughout Florida. The discussions focused upon challenges they experience in the coordination process, what outcomes they are seeking, and their ideas on what could be done to improve the process, as well as learn from their success stories. Invitations were issued to listservs for the Florida Public Transportation Association (FPTA), the Florida Transit Planning Network, the Florida Operators Network, the Transit Safety Network, the Florida MPO Advisory Council, and separate lists of FDOT District transit staff and bicycle/pedestrian coordinators, local government transportation planning staff, MPO planning staff, and transit agency planning staff. The stakeholder workshop format included key question categories, as well as an opportunity to talk in large and small groups to provide opportunity for participants to discuss in more detail the various topics that are important to them. The participants also had an opportunity to write down thoughts, observations, ideas, questions, and recommendations of other collaborative partners that the research team should later reach out to for follow up discussions. The variation in the format was intended to help draw out different aspects of an issue. The agenda format also evolved as participant recommendations from the first workshop were applied to successive workshops. The three stakeholder workshops covered much ground, including funding issues, long range planning, and concern over the outlook for transit in Complete Streets, the inclusion of transit, ped/bike needs in state and local road projects, and the role of political support.

Some of the workshop and interview participants had held previous positions with the other coordinating agencies over the course of their careers. Many have had experience working as staff not only for the FDOT Districts, but also as staff within transit agencies and for local governments. Among the FDOT District staff, many have held different internal positions within

the District Office over the course of their tenure as FDOT employees. This work history has given them a wider perspective of the challenges their collaborative counterparts face.

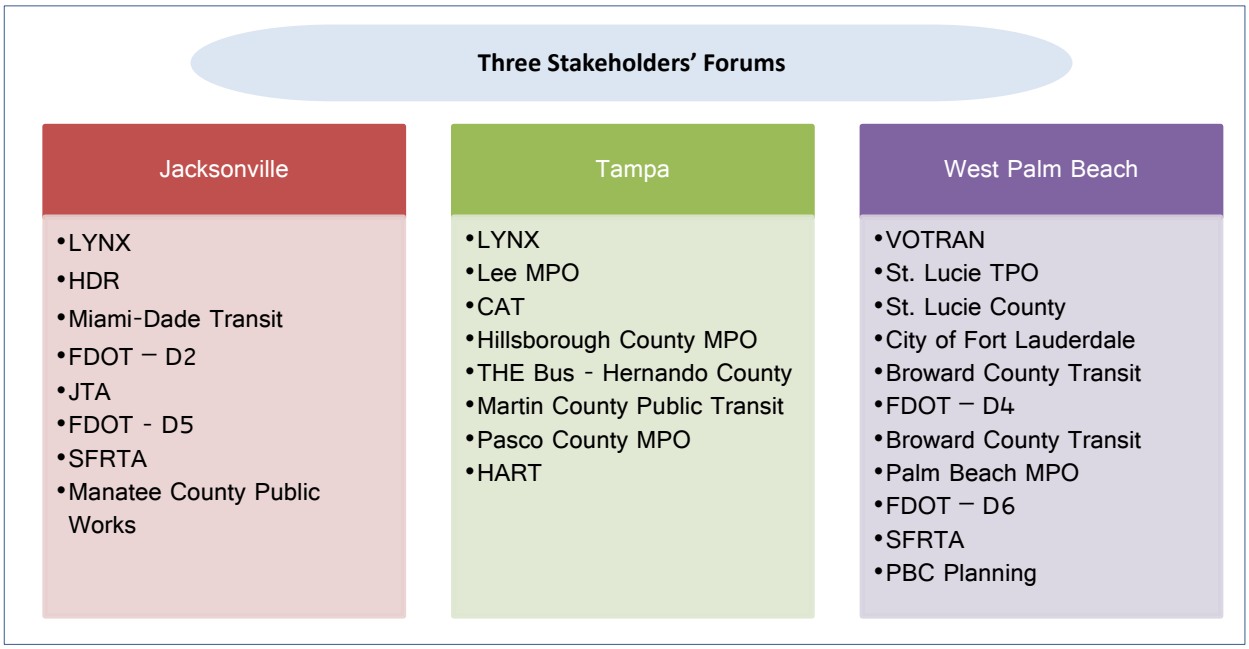

Figure 4: Organizations Participating in the Stakeholder Forums

Main Themes Identified by Stakeholders

Communication

Participants stated that communication by FDOT Districts with their coordinative partners has greatly improved in recent years. Project managers of FDOT transportation improvement projects are involving stakeholders earlier in the process. The electronic review capability provided by FDOT also has been helpful to coordination. The FDOT District Bicycle and Pedestrian Coordinator is a key liaison between the FDOT District and the transit agency regarding FDOT transportation improvement projects.

Ped/Bike Improvements as Priorities

Beyond Transit Stops

In general, many transit agencies do not consider ped/bike facility needs beyond the bus stop. Their primary focus for bicyclists is bike racks at the stops and bike racks on the buses. For pedestrians, it is ADA compliance including a sidewalk connection from the bus stop pad to the sidewalk.

A second major focus is the provision of shelters within the footprint of the bus stop. Transit agencies do not own road right-of-way, do not control land use policy, and must operate bus service within the constraints of limited dedicated funding. As a result, their focus tends to be only upon mission critical elements of transit service provision.

At the Stop

Bike parking is one of the greatest accessibility needs of bicyclists seeking to ride public transportation. According to the interviewees, the most effective ped/bike enhancements are the following.

- Bicycle racks at bus stops
- Bus stop shelters and shade trees
- ADA dimensions for a passenger landing pad for a wheelchair within the footprint of the bus stop
- A bulb out of the curb at the corners of intersections to shorten the length of street that pedestrians must cross
- Striped crosswalk areas
- Pedestrian countdown signals at intersections

In negotiations with land developers, transit improvements, followed closely by ped/bike improvements, are the first items to be traded out for other roadway improvements, according to one forum participant.

Processes and Timelines

The timeline of public transit service development and improvement, particularly public bus service, is an ongoing incremental process that does not always coincide with roadway improvement planning. Transit service revisions potentially can go into effect as frequently as quarterly. This flexibility is an asset of public bus service. However, any transit service improvements that require the addition of changes to physical infrastructure at bus stops and in the vicinity of bus stops may be difficult to accommodate in the FDOT state highway development and improvement process, unless these improvements are identified and incorporated into a roadway improvement concept early, such as during the PD&E study. Even then, it may be a few years before the facility is built.

It may be difficult to foresee how the needs for public bus service along a state highway will have changed years from now, to coincide with the multi-year process for reconstruction, roadway widening, and new construction projects. The highway development timeline can extend 20 years and longer. The Transit Development Plan (TDP) looks just ten years into the future and the TDP often does not address infrastructure needs on the microscale of the bus stop and its surroundings.

It was apparent that the problems with efforts to coordinate are not one-sided, but improvements can be made by all the collaborative partners. In some cases, the problem of collaboration may reside in the process, or the lack of a process. In this case, it has fallen upon the initiative of individuals who recognize the importance of collaboration to follow through. In the absence of a process, or even when there are procedural guidelines, some staff may not be abiding by established procedures.

Champions and Staffs

Transit staff could take it upon itself to communicate to the local government: “Here I am, do not forget about me, and invite me to the table” and much can be accomplished simply by finding an advocate in local government and getting to know people and attending meetings. Sometimes it involves local government staff seeing the transit staff over and over again that builds relationships. Workshop stakeholders did not talk about the need for an explicit written coordination process.

One transit representative noted a change of leadership that turned agency wide attention toward the needs of bicyclists and pedestrians. The influence of good leadership struck a chord with other

participants, noting that the effects of good leadership will be reflected at all levels of the organization. Top down support is needed to prioritize ped/bike projects.

Data Sharing

Transit agencies have data to share that may improve the chances that transit is better considered in roadway projects and in budgeting resources. However, transit data usually are not automatically shared. Government partners must go through a request process. Where data do exist, including at the local government level, gaps, and differences in data type and format make data sharing difficult. There is a need for a convenient system of timely data sharing and updating.

CHAPTER 4: PROCESSES OF TRANSIT AGENCIES AND THEIR PARTNERS

Understanding the Processes

> **"In a fully coordinated effort, state and local jurisdictions can assist in providing sidewalks, crosswalks, traffic signals and other roadside features that improve the safety and accessibility of the transit patrons. Even in these instances, though, close coordination with the transit service provider is necessary to ensure that the stops being considered can be served by the bus system and that operational impacts are given due consideration and resolved before deciding to proceed."**
>
> Tindale-Oliver & Associates, Inc., *Accessing Transit: Design Handbook for Florida Bus Passenger Facilities: Version III*, FDOT Public Transit Office, 2013, p.15.

There was broad agreement of the stakeholders participating in this study that transit needs to be involved sooner in the planning process. FDOT policy provides for requirements for ped/bike facilities on State roads. Local governments must consider ped/bike facilities in the mobility element of their comprehensive plans. There is a requirement for long range plans to demonstrate consistency. The MPO Long Range Transportation Plan contains projects from the other plans for which the MPO seeks federal funds. These requirements create opportunities to coordinate jointly to identify and plan for ped/bike facilities that enhance access to transit stops and stations. Understanding how government processes work is essential for transit agencies to identify where and how to best coordinate. Likewise, transit agency service development processes afford additional opportunities for collaboration among agencies. Table 2 below outlines the kinds of actions taken by various entities where there may be an opportunity for coordination in providing ped/bike facilities. The transit agency has several avenues for searching opportunities to coordinate in the provision of ped/bike accessibility linkages to transit stops and stations. These processes are presented in Figure 5 and discussed in subsequent sections.

Table 2: Actions Taken to Initiate Transportation Improvements may Incorporate Ped/Bike Facilities

Action	Project Initiator		
	Transit Agency	Local Government	FDOT
Add improvements to an existing or new transit stop or station. (no roadway project)	X		
Land development project. A new bus stop pad and shelter could be installed. (no roadway project)		X	
Land development project. Relocate existing bus stop. (no roadway project)		X	
Request for traffic control improvement along a State Highway. (i.e., midblock crossing and RRFB signal)		X	
Local roadway improvement project.		X	
Safety improvement project.			X
Road reconstruction, widening, new road.			X
Resurfacing, restoration, rehabilitation.			X

Figure 5: Processes that Provide Transit Agencies with Coordination Opportunities

Efforts in Data Collection and Sharing

Data collection and sharing is a major area of coordination that could benefit all partnering agencies. The development and sharing of data was a theme taken up in one of the small groups during the stakeholder workshops. There is potential for useful information of the transit agency that, if shared with FDOT and the MPOs, could enable these agencies to help the transit agency address operational, safety, and access needs. The flow of information could be improved to help FDOT and the MPOs prioritize where to spend resources. Some local governments and MPOs are conducting inventories of ped/bike facilities.

Participants at the stakeholders' forum developed four recommendations listed below for a coordinated effort to measure transit accessibility as the basis for identifying infrastructure gaps and identifying needed ped/bike improvements.

1. Clarify goals for ped/bike access to transit. These goals could address problems relating to mobility, health, safety, ADA accessibility, etc. Defining the problem and clarifying the goals is

the foundation for developing performance measures and identifying data that could be collected and used to measure performance.

2. Coordination requires grassroots participation. While there are various citizen committees, such as the ped/bike advisory committee, more public involvement is needed to better define the problem and clarify goals.
3. Inventory pedestrian, bicycle, and transit capital facilities and activity, by transit stop and by corridor. Performance measures need to be consistent across participating coordinating agencies so that data can be shared and compared.
4. Agency cooperation in the collection and sharing of data is needed on all transportation improvement project phases and funding. Form data coordination teams within TPOs, MPOs and transit operators, etc. These teams would meet for the explicit function of exchanging data, establishing goals, and assessing regional performance measures.

General Transit Feed Specification (GTFS) is the format for transit data that was developed by Google. Google provides a free Google Maps Trip Planner capability to transit agencies in exchange for their entering and maintaining their bus route and bus stop data. The core transit GTFS data includes the location of bus stops, the routes, and the service frequency. Presently, 27 Florida transit agencies now have their data in GTFS format. Customarily, transit agencies update their transit schedules quarterly, which means the data must be updated and exported to GTFS from the transit agency scheduling system. Many transit agencies employ an outside company to do the updates for them. For an additional cost, transit agencies can choose to provide add-ons of information (GTFS+) such as automated passenger count data (APC) and bus stop amenities. Many transit agencies have hired consultants to conduct bus stop inventories. This could form the basis for an updatable database in GTFS+.

FDOT District 7 is working on developing a centralized database, known as the FDOT Enterprise GIS Database. This database will contain information from MPOs, transit agencies and FDOT information from the Roadway Characteristics Inventory (RCI) system in data layers. This database is envisioned as something to which all agencies will have access and which all agencies will update with new information to keep the documentation current.

Part of this effort is to convert the transit agency GTFS data into a format that will make it possible to layer the information on top of FDOT specification sheets for roadways. In 2010, a Java app was created, which is a GIS architecture tool that enables import of the transit agency GTFS data into FDOT's system. It enables viewing of the transit data and the FDOT data side by side. The aim of District 7's database is to capture and provide information, and keep documentation on the collaboration process. Presently, roadway safety audits (RSA) are applied only to 3R projects. The plan is to do ongoing RSAs for every project that goes through the system and maintain a web site that documents location, GIS information and the RSAs.

FDOT is developing a data portal or directory of transit agency websites that are the locations for accessing the GTFS data of the transit agencies. APC data, if made available by the transit agency, could be useful to local government staff as part of justification for requests that sidewalks and bicycle facilities be built near transit stops, as part of a condition of a land development approval.

Figure 6 identifies existing and potential internal information sources used by a transit agency to determine where transit service improvements and associated transit stops and stations should be located.

Regional Transportation and Metropolitan Planning Organization Processes

The purpose of regional transportation planning organizations (TPO) and metropolitan planning organizations (MPO) is to prioritize regional transportation investments that use federal funding. Many federal funding sources can be used for ped/bike facilities.

The duties of TPOs and MPOs include developing the long range transportation plan (LRTP) and the transportation improvement program (TIP) for the Federal-aid highway program, which includes public transportation. TPOs and MPOs also foster coordination of local land use and economic development plans with State, regional, and local transportation plans and programs.

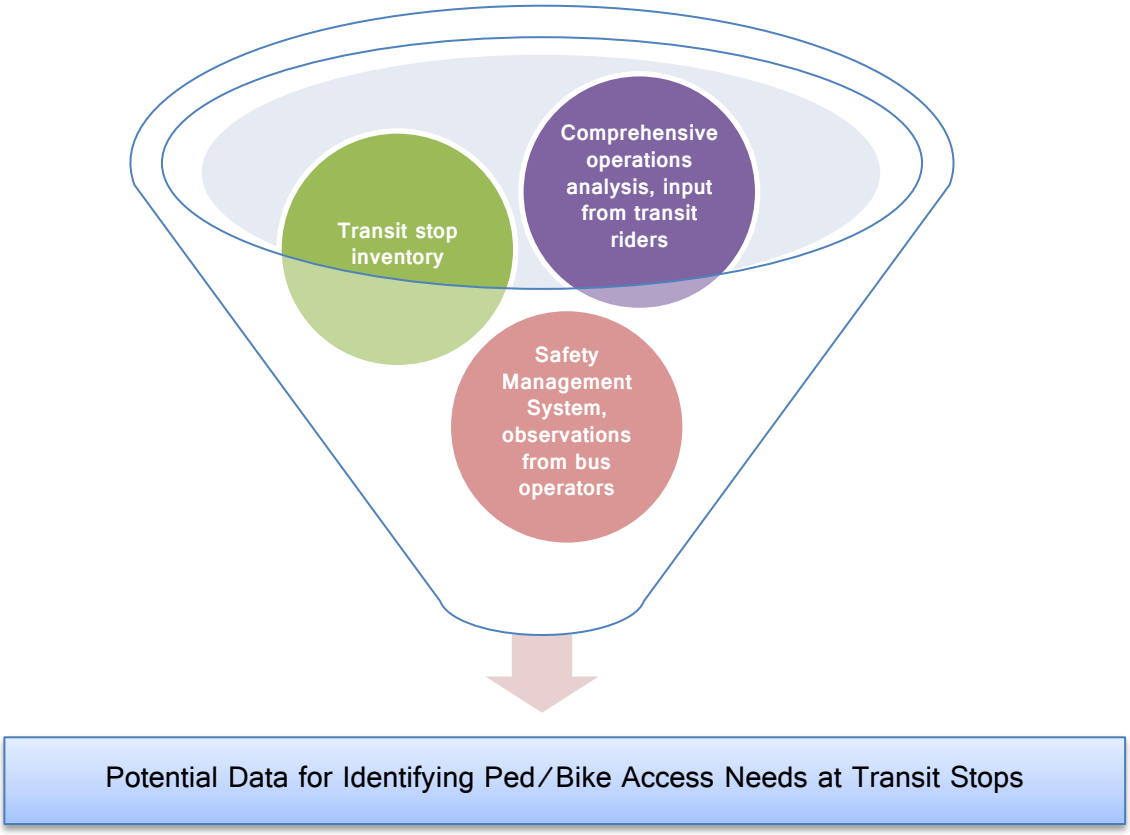

Figure 6: Transit Agency Internal Data and Information Sources

Process Descriptions

Within the context of long range multimodal transportation planning, 23 C.F.R. §450.104 defines coordination as "…the cooperative development of plans, programs, and schedules among agencies and entities with legal standing and adjustment of such plans, programs, and schedules to achieve general consistency, as appropriate."

Special studies

As part of the statewide transportation planning process that covers nonmetropolitan areas, as well as the metropolitan transportation planning process, a State, an MPO, or a public transit agency can conduct a multimodal, systems-level corridor or subarea planning study. The law requires that these studies are to be done in consultation with, or jointly, among the agency partners, to the extent practicable. The results of these studies can be used in the project development process, consistent with the National Environmental Policy Act (NEPA), to determine project purpose and need, define the travel corridor and mode(s), screen alternatives, and eliminate unreasonable alternatives (23 C.F.R. §450.212 and 23 C.F.R. §450.318).

Such a study might signal the beginning phase of a future roadway construction, reconstruction, or widening project. It is important for the public transit agency to participate early in these studies for the purpose of maintaining a high profile for the needs of providing transit service, as part of study development, where appropriate. Such participation includes sharing related transit service plans, sharing data about the travel characteristics and mobility needs of transit patrons in the study area, promoting these needs as part of the project purpose and need statement (or ensuring that the purpose and need is not defined in a way that unnecessarily precludes transit, pedestrian, and bicycle infrastructure), and discussing opportunities for including transit infrastructure and supporting ped/bike facilities as part of the proposed project.

The transit agency can identify these study opportunities as they arise, first, through ongoing contact with planning counterparts from local government, the TPO/MPO, and the FDOT District. Another way is to peruse the FDOT District adopted Work Program that becomes available in July, and the Unified Planning Work Program (UPWP) of the MPO. Local governments often announce requests for proposals for the selection of a consultant to conduct special studies. Following this process and identifying the project manager assigned to guide new studies can help transit agency staff anticipate when opportunities for coordination arise.

TPOs/MPOs provide for a technical advisory committee (TAC) that meets regularly for the express purpose of coordination. Staff members that represent board members discuss ongoing projects.

Recommendation 4

Transit agencies should send knowledgeable staff to these meetings, who are prepared to discuss ongoing projects and plans of the transit agency and those of their coordinating partners.

The Broward County MPO developed the Hollywood/Pines Multimodal Corridor Study in 2004 to develop a congestion management system within the Hollywood/Pines Boulevard Corridor. The plan includes several recommended strategies to improve multi-modal connections between bicyclists, pedestrians, and public transportation. See Table 3.

See Footnote #17.

More on the Hollywood/Pines Multimodal Corridor Study:

Table 3 lists the recommended strategies to be taken to improve these multi-modal connections. Ongoing work in Broward County MPO's mobility program seeks recommendations from localities where connections with local roads will make the system more multimodal and better serve high transit use areas.[17]

Table 3: Recommendations to Improve Multi-Modal Connections on the Hollywood/Pines Corridor

Modes	Recommendations
Pedestrian	• New sidewalks to expand the sidewalk network, improve connections • Filling key gaps in the sidewalk network for sidewalk continuity • Improved pedestrian crossings • School crossing enhancements
Bicycle	• Addition of transit bridge • Addition of bicycle parking in key locations • Addition of bike lanes and multi-use paths
Transit	• Obstacle removal • Addition of 35 shelters • Construction of access path in 17 locations
"Multimodal"	• Relocation of two existing neighborhood transit centers • Addition of "enhanced" benches and shelters

Not all studies have to be about large-scale projects. MPOs often allocate a certain amount of funds per fiscal year for non-capacity projects, such as ped/bike projects, greenways, and transit pullouts. This is because the MPO does not know what the needs will be years from now. Allocations might be on the order of $2-3 million per fiscal year. This may or may not be sufficient. To eliminate the guesswork, transit agencies could request assistance from MPO staff with studies regarding determining where pedestrians and bicyclists are going to and coming from in the vicinity of transit stops and stations, especially special transit markets, such as youth and the elderly.

Recommendation 5

Transit agencies should ask their MPOs to develop an intermodal access program, with input from local governments, to identify and prioritize ped/bike improvements to better serve high transit use areas.

[17] Kimley-Horn and Associates, Inc., *Broward County MPO Transportation Planning Hollywood/Pines Multimodal Corridor Study Final Report*, 2004.

The Miami-Dade MPO developed the Transit System Bicycle Master Plan for Miami-Dade County, 2014. The Master Plan was guided by a multi-agency Study Advisory Committee that included Miami-Dade Transit and the South Florida Regional Transportation Authority. The Master Plan developed recommended bicycle facility street improvements to improve access to rail stations, as well as recommendations for bike parking at stations and provisions for bikes on bus and bikes in rail cars.

Accessed August 5, 2016 at http://www.miamidade.gov/transit/library/reports/transit-system-bicycle-master-plan.pdf

Long Range Transportation Planning

National policy provides that the metropolitan transportation planning process is to be continuing, cooperative, and comprehensive (3C), for the development, operation, and management of a multimodal surface transportation system. Long range transportation plans (LRTP) may be policy documents or they also may include specific projects, identified through special studies, as described above. The provision of accessible pedestrian walkways and bicycle transportation facilities for the mobility of people are explicitly included in the purpose statement of metropolitan planning in 23 CFR §450.300. Eligible projects for FHWA or FTA funding that have been prioritized in regional TIPs and listed in the STIP, may include transportation alternatives and associated transit improvements, trails projects, and accessible pedestrian walkways and bicycle facilities (23 C.F.R. §450.218(g)).

The LRTP is for a planning horizon of 20 years. It is updated at least every four years for areas that are in nonattainment or maintenance, and at least every five years for all other areas. The Transportation Improvement Program (TIP) is updated every four years. Transportation planning requires coordination; however, transit agencies use a 10-year horizon for transit development plans (TDP).

Recommendation 6

Transit agencies should consider coordinating the TDP planning horizon to correspond with other long range planning efforts of the MPO.

Furthermore, MPOs have the option to conduct scenario planning for consideration of transportation needs based upon alternative future growth patterns (23 C.F.R. §450.324(i)). Scenarios considered might be similar to those developed for NCHRP Report 750, each featuring a different set of planning assumptions.[18] Participation by the transit agency in scenario planning may help ensure that transit service development, including ped/bike linkages to transit service, is given full consideration.

On June 27, 2016, a Notice of Proposed Rulemaking was published in the Federal Register on "Metropolitan Planning Organization (MPO) Coordination and Planning Area Reform." Proposed changes to the definition of Metropolitan Planning Area would clarify that it must include the entire urbanized area, and the contiguous area forecast to become urbanized within the 20-year planning horizon. Comments are being accepted from stakeholders through August 26, 2016. If this proposed change is finalized, it might warrant transit agencies to expand their consideration of transit service to these contiguous areas and their associated needs for ped/bike access improvements.

[18] Transportation Research Board, *National Cooperative Highway Research Program Report 750*, Strategic Issues Facing Transportation: Volume 4 - Sustainability as an Organizing Principle for Transportation Agencies, 2014.

The Lee County MPO cited an example of facilitating a $10 million design-build TIGER grant in which the MPO is bringing together agencies for a bicycle and pedestrian master plan, linking new and existing bike paths to transit.

Transportation Improvement Program (TIP)

The TIP is to be designed to make progress toward achieving transportation system performance targets. The TIP includes transportation alternatives (under the FAST Act, the Transportation Alternatives Program (TAP) is now referred to as the STP set-aside), associated transit improvements, trails, accessible pedestrian walkways, and bicycle facilities (23 C.F.R. §450.326(e)). The TIP is a management tool for monitoring progress in the implementation of the LRTP. As such, the metropolitan transportation planning rule provides that the TIP should "…Identify the criteria and process for prioritizing implementation of transportation plan elements (including multi-modal tradeoffs for inclusion in the TIP…." (23 C.F.R. §450.326(n)). Because improved transit service and access to transit service can increase transit ridership and transit mode share, ped/bike accessibility infrastructure can contribute toward the achievement of shared performance measures and targets relating to travel reliability and reduced travel time.

Recommendation 7

Public transit agency staff should participate in the development of the criteria and project prioritization process for the MPO Transportation Improvement Program.

MetroPlan Orlando's policy for funding allocation in its Transportation Improvement Program Prioritized Project List for FY 2020/21-2039/40 was to divide the Federal Surface Transportation funds for FY 2020/21 based on a percentage split of 32 percent for highway projects, 30 percent for transit projects, 21 percent for transportation systems management and operation projects, and 17 percent for bicycle and pedestrian projects.
FY 2016-/17-2020/21 Orlando Urban Area Transportation Improvement Program, Adopted

New Coordination Opportunities from the FAST Act

Some new opportunities for public transit agency coordination for the provision of ped/bike accessibility improvements to transit stops and stations have been created with the passage of the new federal transportation reauthorization, Fixing America's Surface Transportation (FAST) Act, December 2015. It contains provisions for increasing connectivity by improving ped/bike networks. It also contains some changes to the metropolitan planning process to clarify the role of public transportation providers in the regional long range transportation planning process.[19] In May 2016, the Federal Highway Administration (FHWA) and FTA issued final regulations implementing the planning provisions of the law, under 23 C.F.R. §450, regarding metropolitan transportation planning. Figure 7 shows that coordinating with FDOT District, MPO, and local government staff by sharing and exchanging data and

[19] This is established in 23 U.S.C. §134, §150, and in 49 U.S.C. §5303.

plans for transit stop improvements can help determine what ped/bike facilities are needed and where these new facilities should be located.
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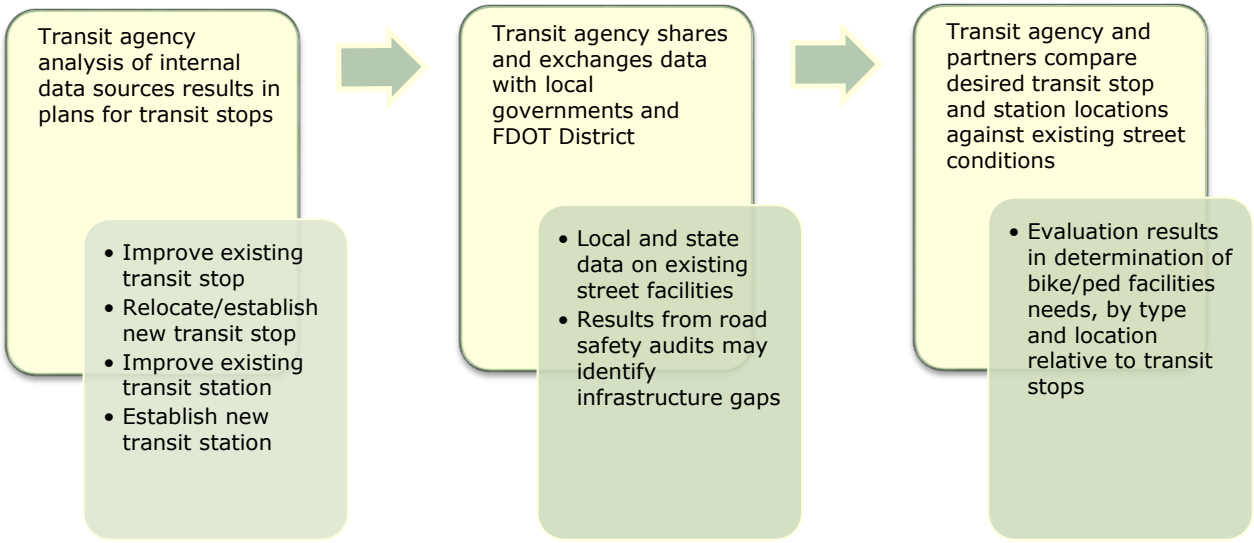


Figure 7: Coordinating with FDOT District, MPO, and Local Government Staff for Transit Stop Improvements

Bicycle and Pedestrian Connectivity with Transit Supports National Goals

It is important to note that public transportation service and related ped/bike infrastructure support national transportation goals and the required considerations for metropolitan transportation planning.

Recommendation 8

During meetings of the MPO Technical Advisory Committee, the public transit staff representative should articulate how transit service and ped/bike infrastructure support national goals and planning considerations.

The prior transportation reauthorization, passed in 2012, Moving Ahead for Progress in the 21st Century (MAP-21) identified seven national goals for transportation. These include safety, infrastructure conditions, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays (23 U.S.C. §150(b)).

Federal law also supports the development and revitalization of public transportation. The purposes of the law include providing funding support, providing support for the development of public transportation that serves all users, improving the delivery of capital projects, and promoting the 3C planning process (49 U.S.C. §5301).

Planning considerations, or factors, that the metropolitan planning process must address include economic vitality, safety and security, including that for nonmotorized users, increasing accessibility and mobility, environmental protection, energy conservation, quality of life, “enhancing the integration and connectivity of the transportation system, across and between modes, for people and freight…”, system efficiency, reliability, preservation, resiliency, the reduction or mitigation of stormwater impacts, and

the enhancement of travel and tourism (23 U.S.C. §134(h)). The FAST Act added the resiliency and tourism planning factors.

Coordination Opportunities for Nonmetropolitan Areas

The State is responsible for coordinating with rural transit providers in setting targets as they relate to transit performance measures. This existing coordination requirement is an opportunity for dialogue. In addition, the FAST Act created the option for states to establish and designate RTPOs to conduct transportation planning in nonmetropolitan areas. The RTPO would be a multijurisdictional organization, composed of local nonmetropolitan officials who volunteer to serve, as well as representatives of local transportation systems (23 C.F.R. §450.210(d)).[20]

Recommendation 9

Where a RTPO is established, this also is an opportunity for rural transit providers to be actively engaged in communicating needs for transit infrastructure and associated ped/bike accessibility improvements.

Public Transportation Representation on the MPO Board Creates an Opportunity

Since the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, there has been the requirement for multimodal representation on the MPO Board. The federal law, Moving Ahead for Progress in the 21st Century (MAP-21), passed in July 2012, further required representatives of public transportation providers to become voting members of MPO Boards in transportation management areas (TMA, urbanized areas with population over 200,000 and designated by the USDOT Secretary).

The Final Rule for the new FAST Act establishes that every MPO that serves a TMA must include on its Board at least one official that is formally designated to represent the collective interests of the operators of public transportation in the metropolitan planning area (MPA, geographic area determined by the MPO and the Governor, where the metropolitan transportation planning process is applied). This official will have equal decision making authority as other MPO Board members.

Recommendation 10

The transit agency should use this coordination opportunity to describe needs for prioritizing ped/bike accessibility infrastructure to transit stops.

[20] Statewide and nonmetropolitan transportation planning requirements are described in 23 C.F.R. §450, Subpart B.

If a public transit agency is an independent authority, the agency chooses its representative for the MPO Board. If a public transit agency is not an independent authority, but instead, is part of a local government, then an elected official of that local government serves as the representative of the transit agency. The purpose of this is to eliminate problems associated with conflicts arising from sunshine laws, as is the case in the State of Florida. This also recognizes the inability of a transit agency executive director to vote independently of his or her local elected representative without potential repercussions.

The FAST Act provides that, "Subject to the bylaws and enabling statute of the MPO, a representative of a provider of public transportation may also serve as a representative of a local municipality."
23 U.S.C. §134(d)(3)(B)

The local government chooses who among its elected officials is to serve on the MPO Board to represent the local government. It may not be clear who among local elected officials is representing the transit agency especially, for example, where there is more than one representative of a local government serving on the MPO Board.

Recommendation 11

Due to this lack of clarity with regard to representation, it is recommended to formalize within the MPO by-laws, the designation of a particular seat of the local elected body, to serve as the transit representative.

Coordination Role of Transit in Metropolitan Planning Agreements

The 1993 planning regulation implementing ISTEA had added provisions requiring cooperatively developed, written metropolitan planning agreements that outline the jointly agreed upon planning responsibilities of the State, MPOs, and the transit providers in metropolitan areas. The regulation requires that the MPO, the State and public transit agency must develop a written agreement that establishes roles for each of the partners and mutual responsibilities for coordination in carrying out metropolitan transportation planning.

The Final Rule for the FAST Act planning requirements extend this mutually agreed upon interagency coordination for performance-based planning and programming, either as part of the metropolitan planning agreements or as part of some other document. Examples of other documents that could contain the agreement include MPO operating procedures, the Unified Planning Work Program, a resolution, or by an addendum to the metropolitan planning agreement. The Final Rule provides that the partnering agencies must mutually decide how they will coordinate. Implementation of the planning requirements of the FAST Act will require the attention and participation of the transit agency general manager or chief executive officer, with the support of key transit agency staff responsible for transit planning and data analysis.

Because of the wide discretion allowed in the development of how coordination will take place among the planning partners, it is possible that the coordinative role of the public transit agency could be

minimal. Some public transit agencies, due to the lack of resources, may prefer to play a minimal role. However, a minimal role during planning may result in a lack of integration of public transit and supporting ped/bike accessibility infrastructure into the overall transportation system. The cooperative development of an agreement over how to coordinate is an opportunity for the public transit agency to reflect upon their optimal role in the planning process to ensure the best outcome for transit patrons in the long term.

Recommendation 12

Particularly with respect to the planning factors involving enhancing the integration and connectivity of the transportation system, across and between modes, it is recommended that public transit agencies can articulate their coordinative role in metropolitan planning agreements by providing information about the intensity of use of transit stops, plans for the locations of transit service changes and expansion, and a priority listing of locations where ped/bike improvements are most needed to serve transit patrons.

The Final Rule of the FAST Act adds that the MPO, State, and public transit agency must jointly agree in writing how they will coordinate with regard to sharing information related to transportation performance data, the selection of performance targets for the metropolitan region, performance reporting, and data collection for asset management for the NHS (23 C.F.R. §450.314(h)(1)). This is discussed earlier on the topic of data sharing.

Congestion Management Plan

The FAST Act has provisions that make public transit more relevant. For example, the FAST Act provides that an MPO that serves a transportation management area may develop a congestion management plan that will include regional goals to reduce vehicle miles traveled (VMT) during peak commuting hours and improve transportation connections between areas with high job concentrations and areas with high concentrations of low-income households. The congestion management plan will identify existing public transportation services that support access to jobs in the region, and identify proposed projects and programs to reduce congestion and increase job access opportunities. Ped/bike accessibility improvements to transit stops and stations would support these purposes. The projects and strategies included in the congestion management plan will be considered in the MPO Transportation Improvement Program (TIP).

Public Transit Agencies and the Expanded Requirements for Public Participation

The FAST Act also provides that MPOs are required to develop and implement a public participation process that includes all stakeholders, including public transportation employees and users of public transportation, to ensure a reasonable opportunity to comment on the transportation plan (23 CFR 450.324(j)).

Recommendation 13

The transit agencies should participate in the development of the public participation process, not only to help identify public transportation employees and

public transit riders to engage in the metropolitan planning process, but also to obtain specific input from them with regard to needs for intermodal connections by ped/bike facilities to transit stops.

MPO stakeholder committees include the Bicycle and Pedestrian Advisory Committee (BPAC), the Livable Roadways Committee, and the MPO Technical Advisory Committee. These committees hold key meetings through which public transit agencies can learn about current project planning as well as discuss transit stop access needs.

The transit-dependent ridership often is not represented on the BPAC, according to one forum participant representing MPO staff. Citizens who ride public transit as a primary means of transportation, should serve on the BPAC so that some of the BPAC discussion addresses the concerns of ped/bike access to transit stops. Instead of just focusing upon crash data, BPACs should be looking at where people want to go. The ped/bike community should recognize that transit is an ally. Reciprocally, BPAC representatives could attend transit advisory committee meetings of the public transit agency to carry the message about ped/bike facilities needs to this group.

Recommendation 14

Guidelines for the composition of citizen advisory groups should ensure that the complete user base is represented, including those who use transit for their primary transportation. If the rules for the composition of BPAC representation do not explicitly identify transit patrons, then these rules should be amended.

In Central Florida, the LYNX service area is a three-county area, which is regional in nature, and which benefits from coordinating with the committees of the MPO. One committee is the Municipal Affairs Committee (MAC) for mayors not represented on the larger MetroPlan Board. This committee is a great way to build consensus among smaller communities. If a consensus is achieved, then smaller communities can be better represented on the larger MPO Board and work toward certain goals. In the literature, it is observed that transit agencies typically have better relationships with the larger cities and poor or neglected relationships with smaller municipalities. The MAC seems like a way to break through that problem.

"Hillsborough Transportation Policy Leadership Group…was established by the Hillsborough County Board of County Commissioners in March 2013 to focus on implementing transportation improvements to support economic development and attract high-wage jobs and retain jobs in targeted industries. The Leadership Group is made up of the HART Board's Chair, BOCC members, and the mayors from the Cities of Plant City, Tampa, and Temple Terrace. The Leadership Group has identified key economic spaces and a spine network of committed and potential transportation projects needed to support the key economic spaces." These areas were identified, not only for transit improvements, but also for Complete Streets programs, in recognition of the needs for bicycle and pedestrian accessibility to transit.

HART, TDP FY 2015-2024 Update, 2014.

Coordination Process

During the FAST Act rule making process, when asked about mechanisms that currently exist or could be created to facilitate coordination, several entities responded, including the Florida MPO Advisory Council. An aggregated description of responses indicated that planning entities "…have well established, long-standing, formal forums or work groups for ongoing discussion and coordination of planning issues and topic areas among the States,

MPOs, and operators of public transportation within a particular State, and that these forums typically meet on a regularly scheduled basis (i.e., monthly or quarterly). These same commenters stated that through these forums, they have built relationships between the various planning organizations within their State for successful collaboration and cooperation. The commenters further stated that these established forums are ideal for coordinating the development and implementation of performance management as part of the planning process, including data collection and analysis, performance target setting, use of analytical tools, standards, and consistency, and system performance reporting."[21]

Federal law requires that the State, MPO, and public transit provider cooperatively develop estimates of funds that will be available to support implementation of the LRTP and the TIP. Once funding levels are known, the metropolitan transportation planning process also requires coordination in target setting, sharing data necessary to support setting targets, use of analytical tools, identification of investments and strategies to achieve targets, and reporting of progress toward achieving targets.

Performance Measures

MAP-21 required a performance-based approach to transportation planning, linking investments to the achievement of performance targets. MAP-21 required the U.S.DOT to establish performance measures and standards for both highway and transit systems. Many of these performance measures are still under development.

MAP-21 also contained requirements that States, MPOs, and public transportation agencies develop a series of performance-based plans and processes, including those for the strategic highway safety plan (SHSP), and the public transportation agency safety plan. As of the date of this report some of these rules, such as for safety, have been finalized. The State, MPOs, and public transportation providers are charged with coordinating in the development of performance targets.

Recommendation 15

Coordinated target setting is an opportunity for public transit agencies to discuss how public transit, supported by ped/bike accessibility infrastructure, can contribute to the achievement of targets, as part of a multimodal system.

The Final Rules for Safety Performance Measures and for the Highway Safety Improvement Program were both published March 15, 2016. The HSIP safety performance measures include one for the number of nonmotorized fatalities and non-motorized serious injuries. The HSIP requires a strategic

[21] Federal Register, Vol. 81, No. 193, 2016, p. 34062.

approach to improving highway safety. States are required to collect and use the Model Inventory of Roadway Elements (MIRE) fundamental data elements for all public roads.

In the proposed National Public Transportation Safety Plan, FTA would establish four safety performance criteria: fatalities, injuries, safety events, and system reliability. Each public transit agency would develop a safety management system. Proposed Rule 49 C.F.R. §673(b), would provide for a safety management policy adopted by each transit agency that allows employees to report safety problems, including "close calls", as observed by bus operators. While ped/bike safety on the street is not considered to be within the purview of the transit agency, it is nonetheless important to consider that bus operators are in a unique position to observe the walking and bicycling behaviors of transit patrons as they approach or leave transit stops.

Recommendation 16

Observations by bus operators could inform considerations for the placement and design of ped/bike accessibility infrastructure, as good accessibility contributes to safety. This could be an important contribution by public transit agencies to coordination.

The proposed NHS performance measures regarding transportation service focus upon travel time (travel time reliability, peak hour travel time, annual hours of delay per capita). Transit measures concern asset management. Both highway and transit have safety performance measures but these appear to apply to their separate realms. If the performance measures, as currently proposed, are finalized, then it appears that there will be little overlap or intersection of performance measures between transit and highways. A concern expressed during rulemaking process was that there may be conflicts due to differing priorities among coordinating partners when it comes to target setting.

The FAST Act planning rule also defines cooperation to mean that the parties involved in carrying out the transportation planning and programming processes work together to achieve a common goal or objective (23 CFR Part 450.104).

Recommendation 17

Transit agencies should encourage the MPO to consider adopting performance measures and targets that reflect shared goals and objectives jointly shared by modal stakeholders. For example, transit patrons need travel time reliability and reduced delay as well as motorists. The total travel time of a transit trip includes access to and from the transit stop. It is further recommended that adopted performance measures and targets include those relating to ped/bike accessibility infrastructure to serve transit stops and stations.

It might be useful to consider that MAP-21 also allows MPOs to adopt additional locally defined performance measures and targets (23 U.S.C. 134(c)(1) & (h)(2)). For example, the Virginia Commonwealth Transportation Board applied a Smart Scale to prioritize projects based upon a scoring

system that uses different types of performance measures, such as multimodal person throughput, and access to multimodal choices.[22]

Public Transit Agency Processes

> **"John Tallmadge, Triangle Transit's Regional Services Development Director, places a strong emphasis on collaboration. He characterizes the collaboration process as follows: Develop a plan; learn the rules; and communicate early and often…Talmadge works from the principle that stops and access to them must be considered first from the transit riders' perspective; operational needs come next. In contrast, the typical approach is to base stop location and bus operations on operational needs first, then consider rider needs. Collaboration with several organizations—the transit agency, various local government agencies, and state DOT—is needed, starting with establishing a common understanding, such as about the trade-offs between customer access and safety with traffic operations, among the transit agency, City engineers, and state traffic engineers."**
>
> NCDOT and City of Durham, *Access to Transit Plan* Draft: A joint pilot project of the North Carolina Department of Transportation's Division of Bicycle & Pedestrian Planning and Division of Public Transportation, July 2013, p. 35.

Avenues for transit agency action regarding improving ped/bike access facilities to transit stops include not only responding to opportunities within the processes of partner organizations, such as those of the FDOT District, local governments, and the MPO/RTPO. They also include using opportunities that arise within the transit agency's own processes. Transit agency involvement in ped/bike facilities that extend beyond the bus stop has not customarily been a primary area of emphasis for most transit agencies. Greater concern has focused upon determining the best location for transit stops, ADA retrofitting of existing transit stops and the provision of shelters and other amenities. These actions also can serve as starting points for coordination with partner agencies for improving ped/bike facilities.

Large Scale Transit Service Improvements

Transit agencies may embark upon new large scale transit services, for example, the establishment of a premium service corridor such as bus rapid transit. In such cases, depending upon the extent of transit infrastructure needed along the roadway, the project could be accomplished in tandem with a roadway improvement project where additional ROW may be acquired. The project might include features such as dedicated transit lanes or bus pullouts, bus queue jumps at intersections, and transit signal priority, as well as sidewalks, bicycle lanes and pedestrian crossing improvements at intersections.

Recommendation 18

Early in transit corridor development, it is recommended that the consultants, designers and other stakeholders complete a few trips from home to work, grocery, etc. by riding the transit service along the corridor under study. This experience can be illuminating with regard to challenges of access to transit by those who may not use transit but who make decisions for future corridor projects. It is helpful for public transit agencies if they have an engineer on staff to provide reviews during the design phase of roadway construction projects, to advocate on behalf of transit.

[22] Virginia Commonwealth Transportation Board, HB2 Implementation Policy Guide, 2015. pp. 16-17.

HART's planning for the MetroRapid East-West included a ped/bike connectivity assessment around several station locations, as part of a project development & environment (PD&E) study, funded by Hillsborough County. "The station locations identified for review were selected based on related crashes…The assessments consisted of a review of primary walk/bike routes in the 1/3-mile walk area around each station. The recommendations provided improvements to enhance pedestrian/bicycle connectivity and safety for the proposed BRT stations."

HART TDP FY2015-2024 Update, 2014, p. 6.

The Jacksonville Transportation Authority (JTA) has undertaken several initiatives to improve transit services and multi-modal connections within the City of Jacksonville, Florida. These initiatives include a bus route optimization initiative and the Mobility Corridors Initiative Program of the JTAMobilityWorks program. JTA has road building authority.

The Mobility Corridors Initiative is a multi-year effort to improve bicyclist and pedestrian safety while improving access to transit services along 14 high-frequency transit corridors with a Complete Streets focus in each corridor. Jacksonville currently has a 2030 Mobility Plan, but does not have an adopted Complete Streets ordinance or law in place.

More on the JTA Mobility Corridor Initiative:

The process of the Mobility Corridors Initiative used the "5D" variables to identify the corridors upon which to focus. The 5 D's are density (units per acre), diversity (use mix), design (urban form and street connectivity index), destinations (key activity centers), and distances to transit services.[23] "The collaborative process included identifying hot spots (Through our 5D process), extensive field research, interviews with system riders, walk audits, engagement with property owners, developers, community activists, FDOT, and iterative design charrettes, etc., led by four design teams with charrettes from August 2015 to February 2016".[24] Figure 8 is an illustration of the cumulative transit demand along the identified corridors.[25]

Made possible by the passage of a local option gas tax extension, the Mobility Corridors Initiative is an effort to harness land development to address gaps in access to high frequency transit corridors. The Mobility Corridors Initiative identifies access enhancements to bus stop locations, including sidewalks. The program includes planning interventions to make locations easier for walking and bicycling. The Mobility Corridors Initiative relies on collaboration with the City of Jacksonville and FDOT District 2.

Through the use of the 5D process, field research, interviews with JTA transit riders, walk audits, and public engagement, it was found that the key themes suggested the necessity for traffic calming

[23] Frederick N. Jones, JTAMobilityWorks, Mobility Corridors Initiative. *FPTA/FDOT/CUTR Professional Development Workshop, and Transit Safety Summit*, 2016.
[24] Ibid.
[25] Ibid., slide 10.

measures and changes to road and street design to improve walkability and enhance access to JTA transit services.[26] Such identified needs included:

Transit Enhancements

- ADA and basic pedestrian and bicyclist access to transit stops and shelters
- Relocation of bus stops to improve sight lines
- Addition of bus stop concrete boarding pads
- Addition of bicycle racks
- Addition of waste receptacles

There also were three levels of Complete Streets Projects. These included the following.

- "Keystone Projects" would be "showcase" projects for complete streets with the intention of immediate effect. These are projects that have a high impact and can be implemented in the near term.
- "Operational/Safety Enhancements" are to be quick fixes that provide immediate enhancements to corridor safety and operations.
- "Long-Term Vision Projects" are bold, more costly investments to be included in long-range planning.

Concepts included Complete Streets makeovers to encourage the use of bicycling and walking as transportation and access to transit. These also included substantial overhauls of street infrastructure, including dedicated bus lanes, trails, and roundabouts in key areas.

Like any major public works project, the Mobility Corridors Initiative requires the cooperation of multiple agencies working together to achieve a desired outcome. The JTA identified FDOT, the City of Jacksonville Department of Public Works, and elected officials.[27]

[26] Ibid.
[27] Ibid.

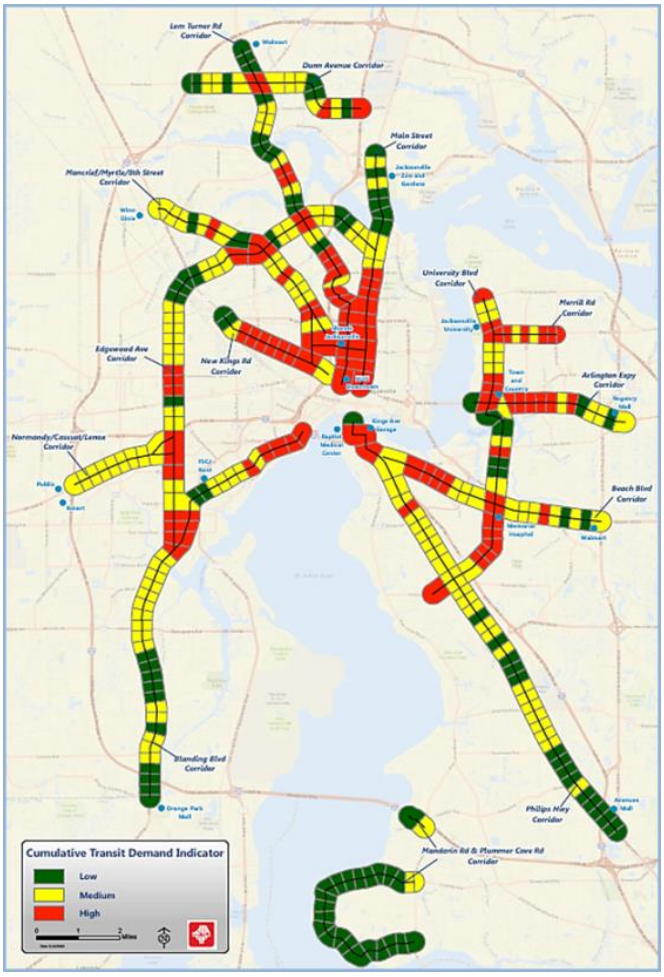


Figure 8: Cumulative Transit Demand on Identified Corridors in JTA Service Area

Incremental Transit Service Improvements

In addition to larger scale transit improvement projects, transit agencies also may consider their existing transit route structures, analyzing observed ridership associated with transit stops, and using scenario planning to make incremental improvements or realignments to transit routes. Such changes may not be related to any roadway improvement project or pending land development project in the vicinity. A comprehensive operations analysis (COA) might be conducted to optimize route configurations from a network perspective, or identify opportunities for new service areas.

The process of making Palm Tran service changes begins with forwarding the proposal for service changes to a route review committee. Palm Tran bus operators serve on the committee. The proposal is then forwarded to the Service Board that meets monthly. Transit riders serve on a planning subcommittee of the Service Board that votes on the proposed service changes. The Service Board members are appointed by the Board of County Commissioners.

Recommendation 19

Transit agencies should apply their knowledge regarding where transit patrons originate and the locations of their final destinations after they leave the transit stop. The resulting identification and prioritization of needed ped/bike infrastructure also could include results of market analysis conducted by the transit agency, such as through the use of the Transit Boarding Estimation and Simulation Tool (TBEST), developed by the Florida Department of Transportation.

Used to model transit ridership, TBEST helps optimize route planning based upon serving the most riders. Used for short to mid-term planning, it can calculate ridership of routing scenarios based on socioeconomic factors and land use. TBEST can perform analysis regarding access to transit. Walk accessibility summarizations use straight-line distance from origin to destination, to capture walk market area, based upon socio-economic conditions. This can provide a starting point for identifying general areas that could be further evaluated for needed ped/bike infrastructure.

Transit Stop Location

The results of a COA often are used in the update of the transit development plan (TDP). Many transit agencies conduct route-by-route analyses of bus stops to determine which stops can be consolidated, alter bus stop locations if necessary, inventory bus stop infrastructure and ADA compliance, and determine what remaining improvements are needed.[28]

Transit agencies can elect to improve an existing transit stop, consolidate transit stops, relocate a transit stop, or develop a new transit stop. Table 4 lists various transit agency-initiated projects and the potential impoacts and opportunities for stakeholders. In general, a new transit stop is established on a pilot basis, marked with a sign. If transit planners determine to make the transit stop permanent, then it may be decided to pursue a local government permit for a shelter and other amenities.

The transit agency may have a specific idea where a transit stop should be placed. The exact location of the transit stop will influence the type and location of needed ped/bike facilities beyond the stop. The best transit stop location requires balancing several considerations, including the following.

- Providing sufficient ROW for ADA compliance
- Minimizing safety risk for the bus as it stops and waits
- Minimizing safety risk for pedestrians and bicyclists as they arrive, depart, and wait at the transit stop
- Minimizing safety risk to other motorists
- Minimizing delay and other operational hazards, relative to driveways, turning lanes, and intersections.
- Providing most direct access to final destinations desired by transit patrons who will walk or bicycle to the final destination.
- Positioning the transit stop to maximize use of existing sidewalk entrances to adjacent land uses.

[28] A primary resource for selecting the best location for a transit stop is *TCRP Report 19: Guidelines for the Location and Design of Bus Stops*, 1996.

In the establishment of a new transit stop or relocation of an existing transit stop, considerations include the magnitude of motor vehicle traffic. For example, a safe location for a bus stop might depend upon a signalized intersection to provide gaps in through traffic to allow pedestrians to cross safely. In some cases, major roads with high volumes of traffic might not warrant a signal if the Average Annual Daily Traffic (AADT) on the cross street is too low. This may create safety problems for bicyclists and pedestrians. A bus stop also may not be feasible in a desired location by installing a new traffic signal because the location may be too close to another signal.

Table 4: Transit Agency-Initiated Projects and Potential Impacts and Opportunities for Stakeholders

Project	Potential Impact on Host Local Government	Potential Impact on State Roadway operation	Potential Impact on Bicyclists	Potential Impact on Pedestrians
Move a bus stop	Traffic flow impacts	Traffic flow impacts	- May improve or reduce access. - May affect where bicyclist crosses street. - Offset bus stop pairs.	- May improve or reduce access. - May affect where pedestrian crosses street. - Offset bus stop pairs.
Provide amenities to existing bus stop	May affect line of sight. Requires maintenance	May affect line of sight. Requires maintenance.	Bike rack may improve access. Improve comfort, security	ADA considerations Improve comfort, security
Add new bus stop	• Traffic flow impacts. • May enhance access to adjacent land development	• Traffic flow impacts	• Improve access. Increase travel time. May affect where bicyclist crosses street. • Offset bus stop pairs.	• Improve access. Increase travel time. • May affect where pedestrian crosses street. • Offset bus stop pairs.
Locate a transit center	• Trip attractor. • Traffic flow and parking impacts.	• Trip attractor. • Traffic flow and parking impacts.	• Improve access. • May affect bicyclist route and location of street crossing.	• Improve access. • May affect pedestrian route and location of street crossing.
Establish a bus pull-out	• Improve traffic flow. • Requires additional street space.	• Improve traffic flow. • Requires additional street space.	• Additional buffer to bicyclists	• Additional buffer to pedestrians
Add new bus route	• Traffic flow impacts. • May support TOD	• Traffic flow impacts	• Improve mobility. • May affect bicyclist route and location of street crossing.	• Improve mobility. • May affect pedestrian route and location of street crossing.
Establish BRT service	• Traffic flow impacts. May require additional ROW or reallocation of street space. • May support TOD	• Traffic flow impacts. May require additional ROW or reallocation of street space	• Improve mobility. • May affect bicyclist route and location of street crossing.	• Improve mobility. • May affect pedestrian route and location of street crossing.
Establish transit signal priority	• Traffic flow impacts	• Traffic flow impacts	• Reduce travel time.	• Reduce travel time.
Install bus queue jump	• Traffic flow impacts. • May require additional ROW	• Traffic flow impacts. • May require additional ROW	• Reduce travel time.	• Reduce travel time.

Recommendation 20

In such cases, it is recommended that the transit agency bring the need for a transit stop to the attention of coordinating partners, including the traffic operations engineer of the host local government or FDOT District.

In the development of guidance for Complete Streets implementation, and in recognition of the need for context sensitive solutions, there may be the possibility for some design flexibility or a consideration of other options.

Recommendation 21

It is recommended that a process for considering bus stop locations and relocations be developed.

In some cases, there may be insufficient ROW along the street to provide ped/bike accessibility infrastructure.

Recommendation 22

Where a state roadway has insufficient ROW for ped/bike facilities to provide access to a bus stop, it is recommended that the transit agency work with the host local government ped/bike planner to consider the development of alternative ped/bike routes via local streets that also may have lower traffic volumes.

Considerations for Adding Transit Stop Amenities

Recommendation 23

Many transit agencies provide their own transit stop design guidelines that illustrate the proposed shelter layout. This is a recommended practice. While the guidelines themselves generally do not address ped/bike access improvements beyond the transit stop, having guidelines is an initial means to engage local governments in ongoing planning for transit service and provides a segue for the larger discussion about the need for improved roadway access to transit stops by pedestrians and bicyclists. Better yet, developing the design guidelines jointly with the host local government is a stronger way to engage the local government as a partner in improving transit service access.

JTA has its own bus stop design guidelines. MCAT's typical design for bus stop improvements has been adopted by the City of Palmetto. Collier Area Transit is developing a transit guidelines manual, based on the LYNX and Palm Beach County manuals. The latest version of the LYNX guidelines resides within the comprehensive operational analysis completed in 2013. LYNX was careful to call them "guidelines" and not standards, so as not to be onerous. The next step is for LYNX to ask the local governments: "Will you incorporate our Guidelines into your Land Development Code?"

Recommendation 24

Transit agencies should advocate that their transit stop design guidelines be adopted by the host local government into its land development code by reference. Such adoption then provides negotiating power to the local government in making requests for transit infrastructure and related ped/bike access improvements as conditions for land development approvals.

Some transit agencies also enter into transit shelter maintenance agreements with host local governments. This gives the local government some control of the style and appearance of the transit stops.

Broward County Transit enters into maintenance agreements for shelters with the many municipalities that it serves.

Transit agencies are required to provide accessibility features at transit stops, compliant with ADA requirements. An inventory of ADA accessibility improvements also may provide a starting point for identifying other needs, including bicycle facilities. If the transit agency conducts a transit stop inventory, this creates a basis for determining where ped/bike improvements beyond the transit stops should be made, and what improvements are needed.

When the transit agency decides that an established transit stop needs more amenities, such as the addition of a shelter, this triggers a permitting process with the host local government. The shelter site may be on a state road or local road ROW. The Florida Administrative Code (14-20.003, F.A.C.) establishes requirements with regard to the placement of bus stop shelters. The transit agency must receive written approval by the host county or municipal government. The local government evaluates the application for a transit shelter to ensure it complies with local regulations.

Recommendation 25

The transit agency should consider conducting a bus stop inventory in coordination with the FDOT District and the local government, to include a compatible data overlay of street infrastructure, provided by the FDOT District for state roads and the local government for local roads. This database should be kept updated and shared with the FDOT District and local government. This would provide a baseline of currently existing ped/bike infrastructure, which could serve as a foundation for identifying and prioritizing ped/bike facilities to improve access to transit stops.

FDOT D7's GIS Enterprise database, currently under development, can serve as a multiagency GIS-based asset management system in which agencies can update their data and access data of other agencies. This is discussed more at the beginning of Chapter 4.

Collier Area Transit's Bus Stop and Facility Accessibility Study, conducted by Tindale Oliver & Associates (TOA), provided a study method for prioritizing bus stop ADA improvements. TOA identified needed bus stop improvements, with directions to CAT to do a GIS analysis to determine which jurisdiction has responsibility to do the improvements. This study resulted in a bus stop inventory that was recommended to CAT to share with FDOT and local jurisdictions. Based upon various factors, the stops were prioritized for ADA improvement implementation. These factors included severity of ADA non-compliance, especially safety problems, operational efficiency characteristics of the bus stop, ridership at bus stops, using Automated Passenger Counter data, and the location of trip generators, and Title IV requirements for accessibility by location of minority population and low income households. This study recommended that bus stop improvements might be prioritized to first improve all those located along a particular corridor if these improvements can be done as part of a road improvement project. TOA recommended that CAT share their GIS bus stop inventory data with FDOT and local governments.

Ped/Bike Facilities Needs Assessment

While transit agencies may have an ongoing dialogue with their host local government about transit shelter design guidelines, permits for their location, and ongoing maintenance agreements, transit agencies may have to reach out to different local government departments for a discussion with the appropriate staff about ped/bike street access improvements.

The Accessing Transit: Design Handbook for Florida Bus Passenger Facilities, Version III, by the Florida Department of Transportation, contains a discussion about ped/bike access to bus stops[29] and a discussion about agency coordination.[30] It identifies key agencies, timelines, and project milestones for coordination.

Recommendation 26

Transit agencies should consider conducting a transit access needs assessment to identify priority locations to make ped/bike improvements. Alternatively, the transit agency could request that the MPO conduct the needs assessment, in coordination with the FDOT District ped/bike coordinator and local government staff, to identify the infrastructure gaps, and recommend ped/bike facility improvements, with input from the transit agency staff, citizen advisory committee and the BPAC. The MPO could work with the transit agency, the FDOT District, and the local government to develop criteria for the prioritization of locations for improvements, and for programming funds for the design and construction of ped/bike facilities.

An inventory of existing conditions provides a baseline for determining the street improvements for ped/bike access to transit stops that should be prioritized. Prioritization criteria could be based upon several conditions, including opportunities that arise for improvements as part of plans by the FDOT

[29] Tindale-Oliver & Associates, Inc., Accessing Transit: Design Handbook for Florida Bus Passenger Facilities, Version III, FDOT Public Transit Office, 2013, p. 147-153.
[30] Ibid., p. 209-222.

District or local government to do a 3R project, roadway reconstruction project, traffic control improvement, or safety project. Many FDOT Districts are now conducting road safety audits (RSA) in coordination with local governments and police, using a systematic audit process developed by FHWA.

FHWA roadway safety audit tool can be accessed at
http://safety.fhwa.dot.gov/rsa/guidelines/documents/FHWA_SA_06_06.pdf

For state roads, FDOT does not construct sidewalks as a stand-alone project. However, ped/bike improvements could be constructed in response to a documented safety problem. A focus on ped/bike safety can sometimes speed prioritization of infrastructure improvements that also can improve accessibility, such as pedestrian crossings at intersections. For example, several projects funded for construction in the Hillsborough TIP were described as pedestrian/bicycle safety projects and crash mitigation, sponsored by the City of Tampa and the Hillsborough MPO.[31]

As fully developed components of the transportation element of the local government comprehensive plan, some local governments may have ped/bike infrastructure plans, for both on-street and off-street facilities. Criteria might be found in these documents, include prioritizing ped/bike access improvements to transit stops that serve education centers, government services, lower income communities, and high intensity employment locations.

The ped/bike improvement needs assessment could be coordinated with an inventory of existing and planned transit stops. The Automated Transit Stop Inventory Model (ATSIM), developed by FDOT, is a free software program provided by FDOT for transit agencies to use to conduct bus stop inventories, prepare maintenance work orders, and prepare asset management reports (http://www.ftis.org/atsim.html). It automates the data collection and analysis process, allowing for the collection of over 100 standard attributes, including GPS locations and digital photos.

[31] Hillsborough MPO, "List of Priority Projects, 2016-2017 Transportation Improvement Program," Table 1: Existing Priorities Funded for Construction, Adopted August 4, 2015, p. 3.

The First-Mile/Last-Mile Coordinator program is a program sponsored by the Florida Department of Transportation (FDOT) District IV through the South Florida Commuter Services agency. This position will require a part-time individual to analyze the first and last mile infrastructure (e.g. sidewalks and bicycle facilities) and their connections to public transportation stations and/or stops. Through the analysis of the top ten busiest bus routes on Palm Tran's system, the Coordinator will:

1. Inventory transit access characteristics
2. Create a grid map for each route
3. Evaluate the network
4. Analyze existing conditions
5. Check for safety and security issues

Through a more detailed analysis of the top five routes, the Coordinator will:

1. Identify major destinations
2. Observe access barriers
3. Collect data (employer, demographics)
4. Identify site specific constraints and opportunities
5. Develop a focused infrastructure improvement strategy
6. Evaluate transit and the pedestrian/bicycle network to identify opportunities to adjust transit routes and improve pedestrian/bicycle infrastructure
7. Refine pathway network

Following these activities, the product will be available for review by the local government development review officer, and for roadway review (Electronic Review Committee), TDP review and analysis, and Complete Streets policy review by the Palm Beach MPO.

Information regarding the First Mile/Last Mile Coordinator Position obtained through direct contact with Palm Tran and South Florida Commuter Services, May 2016.

Other transit agencies have gathered information from transit patrons through surveys regarding their mode of access to the transit stop and distance traveled to the transit stop. This can lend information regarding prioritization of ped/bike infrastructure relative to its distance from transit stops.

Votran's COA did a survey to determine how far their customers walk to the bus stop. This might be a basis for developing a radius for identifying the area for considering improvements. Surveys might also determine where customers are walking/riding from. Doing a survey would be in keeping with the recommendation from the stakeholder workshop to get more grassroots public involvement beyond the BPAC.

Votran & the Volusia TPO Transit Development Plan / Transportation Disadvantaged Service Plan, (FY 2017 - FY 2026).

Figure 9 presents an approach that guides the transit agency, in coordination with partner agencies, to match needed ped/bike facilities, by type and location, for inclusion in proposed roadway improvement projects.

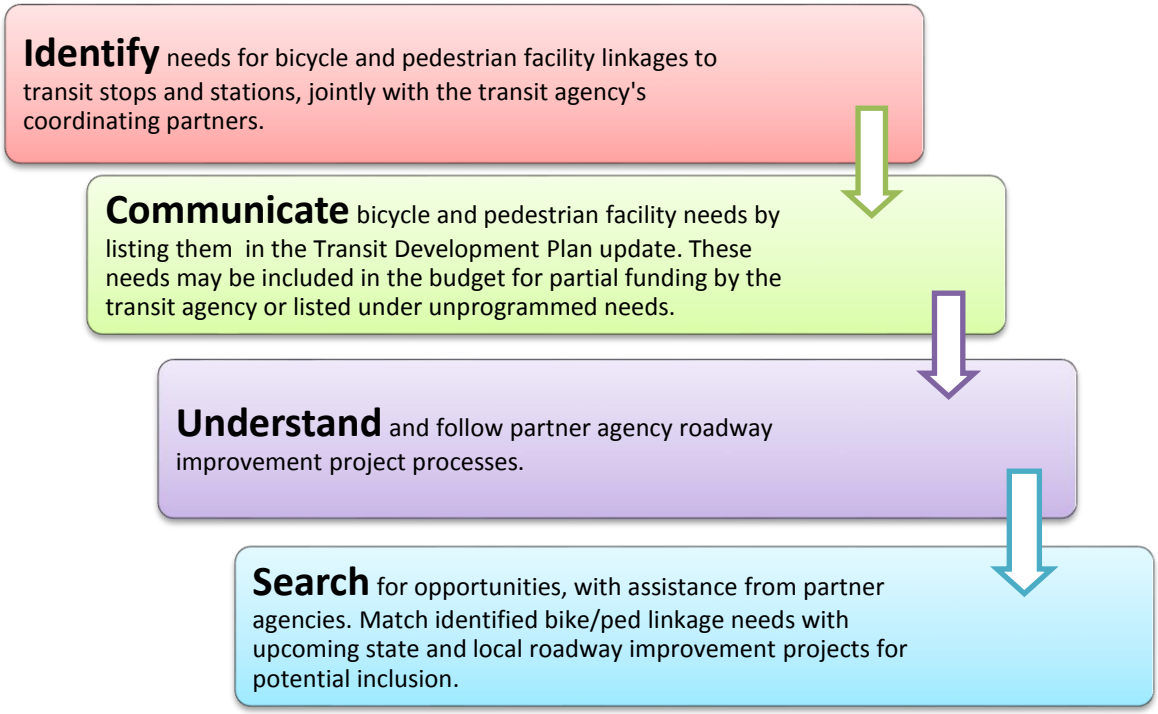


Figure 9: Guiding Approach for the Inclusion of Bike/Ped Enhancements in Roadway Projects

Recommendation 27

A clear presentation of ped/bike access needs to transit stops should be incorporated in the transit development plan (TDP), because local governments refer to the TDP and other related plans as part of the local comprehensive plan update, as well as updates to implementing regulations.

South Florida Regional Transportation Authority's (SFRTA) TDP reflects a commitment to coordinate with other organizations to create a walkable environment around transit stations. "Objective 9.1 Work with the private sector, local governments, Regional Planning Councils, and MPOs to attract and implement transit-oriented, walkable, mixed-use development around Tri-Rail stations and future Tri-Rail Coastal Link stations."

South Florida Regional Transportation Authority, TDP FY 2016-2025 Update, 2015, p. A-7.

Transit Development Plan (TDP)

The preparation of a Transit Development Plan (TDP) by a public transit agency is required under Sections 341.052, F.S., and 341.071, F.S. and within Rule 14-73.001, F.A.C. as a condition of eligibility to receive public transit grant funding from FDOT. The TDP must be consistent with the adopted local government comprehensive plan(s) of the locality(ies) served by transit, as well as the MPO long range transportation plan, regional transportation plans, and the FTP. The TDP describes the plan for the development and operation of transit service and covers after a 10-year planning period, with annual

updates and a major update every five years. The TDP is reviewed by FDOT, the MPO and the regional workforce board.

The TDP includes, among other elements, a situation appraisal that describes socioeconomic and land use trends, as well as state and local government plans. It provides an estimate of transit service demand and how demand is affected by land use development and design patterns. The TDP describes efforts to create more transit-friendly communities by the host local government through land use planning. The TDP includes transit service development alternatives and associated financial plans. The implementation of the TDP includes a listing of projects and services. Each annual TDP update revises this listing. TDPs are submitted to FDOT by September 1.

HART's TDP Major Update FY 2011 has a bus-oriented focus. HART's TDP includes the HART Board Goal: "Enhance Connections within the County and Region".

During the reporting period for FY 2013 and FY 2014, accomplishments toward the achievement of this goal included three sidewalk projects:

- 15th Street Sidewalk Project, west side of 15th Street, from Linebaugh Avenue to south of Fowler Avenue.
- Himes Avenue Sidewalk Project, north of Hillsborough Avenue to Idlewild Street.
- Broadway Avenue Sidewalk Project located on the south side of Broadway Avenue from 50th Street to 66th Street.
- Columbus Drive Sidewalk Project located on the south side of Columbus Drive from 40th Street to 43rd Street.

HART, TDP FY2015-2024 Update, 2013, p.7.

Recommendation 28

Transit agencies should develop a prioritization of recommended ped/bike facility improvements to transit stops. This could be accompanied by a goal articulated in the transit development plan that the transit agency will plan transit services to include accessibility to transit stops.

Recommendation 29

Transit agency should actively share the TDP with its local government counterparts, such as the public works department that prioritizes and maintains sidewalk facilities, and traffic engineering or other departments that plan road improvement projects, the local government growth management department that is responsible for LGCP updates and capital improvement programming, and the land use regulatory office that reviews and approves land development proposals.

SFRTA recently completed the South Florida Regional Transportation Authority Pedestrian Access Plan, May 25, 2016, in collaboration with FDOT, Regional Planning Council staff, MPO staff, and 16 local governments. Developed in-house, the Plan identified areas with missing sidewalks within ¼ mile of rail stations.

Accessed August 5, 2016 at http://www.sfrta.fl.gov/docs/planning/FINAL-Ped-Access-Plan-PDF-5-25-16.pdf

FDOT's Work Program

The contents of the TDP are used in the development of the MPO TIP as well as by the FDOT District in its development of the Five-Year Work Program, updated yearly, and in the FDOT Central Office Program and Resource Plan. FDOT's Program and Resource Plan contains specifications that link the statewide Florida Transportation Plan, the Legislative Budget Request, and the Five-Year Work Programs of all the Districts.

Recommendation 30

The transit agency should review its FDOT District Five Year Work Program that is adopted by the FDOT Secretary every July.

This document will identify in what phase various roadway improvement projects are programmed, and potential opportunities to align transit development projects, including needed ped/bike accessibility linkages to ongoing state projects. This gives the transit agency a window of opportunity, prior to September 1, to highlight in the TDP, the needed ped/bike facilities that might align with FDOT projects in the FDOT adopted Work Program. The FDOT Work Program development is a year round activity. Shortly after the July adoption of the Work Program, the next tentative Work Program comes under development and MPOs submit their project priorities to the FDOT District by October 1.

The preparation of the TDP includes a public participation plan that is approved by FDOT, or uses a public involvement plan of the MPO that is approved by FTA and FHWA. The resulting TDP documents all public participation activities. While transit patrons should be encouraged to contact their transit agency any time of the year to describe ped/bike access issues they experience with respect to transit stops, the public participation process of the TDP development and update process provides additional opportunities to meet with transit patrons regarding the identification of their accessibility needs.

Recommendation 31

The transit agency should use its public participation process to gain input from transit riders about their experiences and concerns regarding bicycling and walking to transit stops.

Local Government Comprehensive Plan

In addition, the local government comprehensive plan (LGCP) mobility element may include ped/bike facilities subelements that list and prioritize proposed improvements. These proposed improvements are selected for inclusion in the local government's capital improvement plan (CIP) that is updated yearly. There is an opportunity for the prioritized ped/bike facility projects programmed into the local government CIP and the FDOT Five-Year Work Program, to be aligned with the ped/bike facility needs of transit patrons.

Bike Parking

"Bikes-on-bus usage has generally grown in Florida." PSTA's monthly bike-on-bus boardings averaged 34,008 in 2014. JTA's monthly bike-on-bus boardings grew 43 percent, from 11,718 in 2012 to 16,704 in 2014.

FDOT, *Florida Transportation Trends and Conditions*, 2015, p. 18.

Transit agency representatives who participated in stakeholder forums and interviews indicated that bicycle parking at transit stops is among the most important intermodal infrastructure. Most transit agencies provide bicycle racks that can hold two bicycles, mounted to the front of buses so that transit patrons can travel with their bikes and have them at the destination end of their trip. However, bicyclists waiting at a transit stop often encounter buses with racks already full. While some transit agencies are considering racks that can hold three bicycles, transit agencies also are considering other options.

Bikes in Buses

Broward County Transit (BCT) has bike racks on all their buses. The bike racks can accommodate up to three per bus, on the system's 275 buses. They are often full and there is one bike rack each at their 1200 shelters, which may be not enough. If BCT implements their Bus Rapid Transit system (BRT) according to plan, they hope to have bikes in the bus.

Metro Transit in Minneapolis-St. Paul not only provides bike racks on the outside of buses, but also provides designated space inside buses, light rail and commuter trains for bringing bicycles inside the vehicles. Portland TriMet allows bicycles inside the MAX light rail cars. This option requires specially equipped vehicles.

"South Florida Regional Transportation Authority (Tri-Rail) reported that test runs were conducted in the summer of 2015 of rail cars that carry bicycles. Ten Bombardier passenger cars will be adapted for first floor bicycle parking, carrying 18 bicycles per car.

South Florida Regional Transportation Authority, *Transit Development Plan, FY 2016-2025,* 2015 Update, p. 3-3.

Recommendation 32

In the meantime, it is recommended to consider developing an Automated Vehicle Locator (AVL) mobile phone application combined with a sensing device that can detect when there is no unoccupied space on the bike rack of the next approaching bus. This can be developed to communicate to the bicyclist ahead of time whether the bus has enough room to accommodate one more bike. This can let the bicyclist know in a timely manner whether to wait or bicycle the whole way.

Bike Parking at the Bus Stop

With regard to parking at the bus stop, the minimum five-foot by eight-foot pad is not long enough to accommodate one bicycle rack. More often, the concrete pad at a transit stop is just the minimum five feet by eight feet in size, which provides no space for a bicycle rack. Transit agencies might consider seeking to obtain a permit from the host local government to expand the footprint of some existing bus stops where there are higher boardings of bicyclists. This also would require locating funds to provide the transit stop improvements, including the bike rack.

Recommendation 33

Transit agencies should consider, as part of their transit stop design guidelines, a larger minimum size concrete pad to accommodate at least one bicycle rack.

Providing bike parking tends to be more common at transit hubs. One example is Union Station Bike Transit Center in Washington, D.C. It provides secure 24/7 access to sheltered bike parking and other services. In Tampa, Florida, HART provided Laurel Street improvements associated with the downtown Tampa Marion Street Transit Center, including a multi-modal area around the station with covered walkways connecting to the main transit center and bicycle racks. Transit agencies also could work with FDOT to retrofit bike parking within park and ride lots.

As seen in Figure 10, Broward County Transit incorporates a bike rack in its bus shelter designs, as part of its Broward County Transit, *Design Standards, and Guidelines Manual*. The Manual provides guidance to local municipalities, design professionals, and private developers for the design of transit facilities in Broward County.

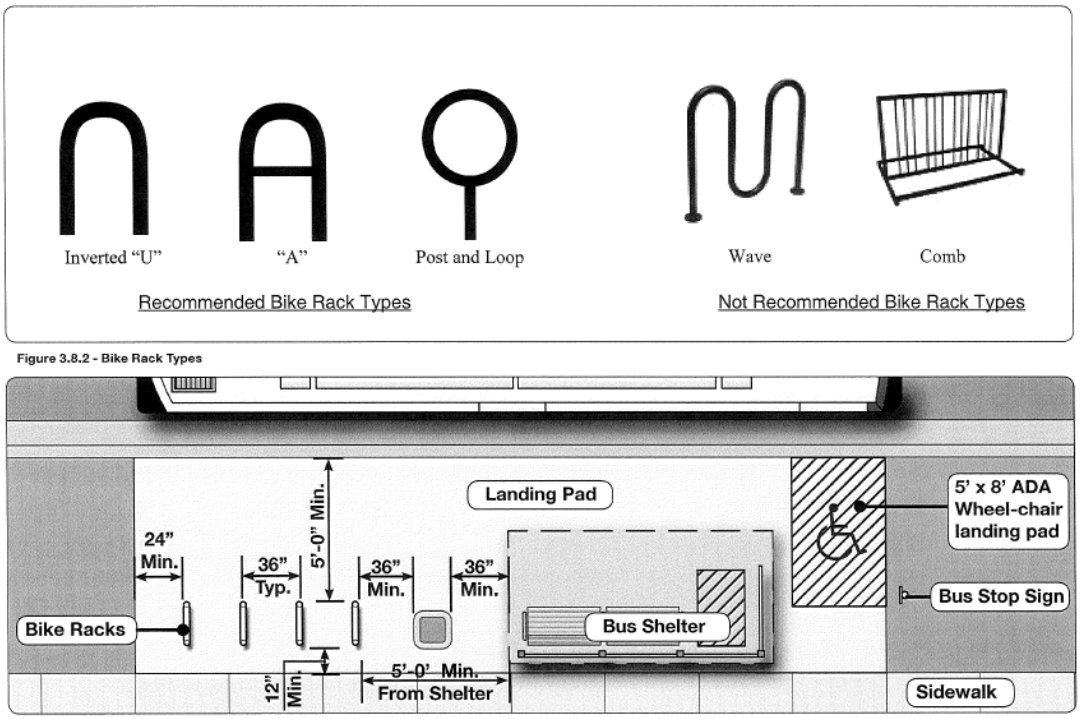


Figure 10: Bike Racks, BCT *Design Standards and Guidelines Manual,* p. 57.

Bicycle Parking in the Vicinity of Transit Stops

If it is not possible to provide bicycle parking at the transit stop, transit agencies also could consider arrangements for bike racks for use by bus riders, which are located in the vicinity of the bus stop. For example, many municipalities are establishing bike share programs. The transit agency could work with the bike share program that might agree to provide bike share parking in the vicinity of major transit stops.

Recommendation 34

Transit agencies also should consider coordinating with regional commuter assistance programs or with local transportation management organizations (TMO) to expand "Bicycle Friendly Businesses" and "Bicycle Friendly University" programs to include provision of bike parking as a credit option toward certification. This bike parking could be designated also for use by transit riders. Such a program also could be coupled with TMO or CAP outreach to those businesses to provide on-site bicycle parking on behalf of their own employees.

The Tampa Downtown Partnership in the City of Tampa, started a bicycle friendly business certification program, using the criteria of the League of American Bicyclists. There are presently 26 locally owned businesses in Tampa, which have earned the distinction. In the application, one of the things that bike friendly businesses can do is provide easements and fund the construction of bicycle amenities.

Recommendation 35

Transit agencies should consider coordinating with TMOs to promote provision of bike parking near public transit stops by employers who are working toward a Best Workplaces for Commuters℠ designation.

Recommendation 36

Transit agencies should consider coordinating with the local government growth management department to pursue a regulatory approach. This would involve bike-parking requirements in the local government parking ordinance, or streetscape plan and ordinance, in a TOD overlay, Multimodal Transportation District overlay, etc.

The Tampa Bay Area Regional Transportation Authority (TBARTA) assembled the Land Use Working Group (LUWG), representing multi-agency staff, and the Land Use Subcommittee of the TBARTA Citizens Advisory Committee (CAC) to coordinate with one another to "develop and review work products, bring recommendations to the CAC and TBARTA Board regarding the LUWG's products, questions and concerns, and encourage officials to work with their government planners and their agency partners to develop and evaluate policies, regulations, and practices relating to TOD" (TBARTA, 2012, pg. 5). The result of this effort was the development of a TOD "toolbox", the TBARTA Transit Oriented Development Resource Guide", 2012, containing a variety of strategies to help interested communities prepare for TOD. Appendix D contains a summary of model mobility policies, contained in the Guide, as they relate to bicycle and pedestrian access to transportation. These are policies that transit agencies can encourage their partner counties and municipalities to adopt.

The transit agency might explore with the local government growth management department, to develop an incentive program, to implement during the land development process, which would include encouraging land developers/property owners to provide and maintain bicycle parking in the vicinity of bus stops. Alternatively, the condition placed upon the nearby proposed land development might be for an easement for bike parking, to supply and maintain bike racks for use by bike riders who use the transit stop.

The City of Lakeland 2010-2020 Comprehensive Plan includes policies to provide abundant bicycle parking in the City. "Policy 16E: The City shall encourage bicycle travel by requiring bicycle parking as a condition of development approval for new development in accordance with the Land Development Regulations, and by participating in the development of a bicycle parking strategy for Downtown Lakeland and a published bike route map for the City. The City shall work with the Lakeland Community Redevelopment Agency, Florida DOT, and Polk TPO to site and fund secure "bicycle stations" at strategic locations throughout Lakeland to provide parking, services, and information to the area bicycling community."

City of Lakeland Comprehensive Plan, 2010. Chapter III. Transportation Element: Goals, Objectives & Policies. p. 225.

Deerfield Beach's Complete Streets Handbook says, "The City will provide bicycle accommodations along avenues, boulevards, and connector streets." And "…secure bike parking must be provided at or within close proximity to a bus stop, preferably sheltered. At a minimum, the accommodations can be bike racks or lockers…"

The Comprehensive Plan says, "Policy TE 1.4.6: The City shall support and incorporate into its Codes and standards the utilization of context sensitive techniques, to provide safe, accessible, attractive, convenient and seamless bicycle lanes, that are consistent with the Deerfield Beach Complete Street Guideline, such as the following…Availability of sufficient bicycle racks."

City of Deerfield Beach, *"Deerfield Beach Complete Streets Guidelines,"* 2013.

Solving the bike parking problem also will likely require data collection and analysis to aid decision making regarding the location and type of bicycle parking facilities needed. For example, data could be collected regarding the bus stop location and number of bikes parked illegally and legally in the vicinity of bus stops. This can be done during periodic bus stop inspections, as well as part of populating new databases developed for bus stop facilities inventories.

Recommendation 37

As a measure of gauging bike parking demand, transit agencies should develop an automated counting capability or enable bus operators to keep tally of the number of bike riders who use the bus rack, and at which bus stops they board and de-board, as well as the number of biker riders who were turned away from boarding the bus, due to no space on the bus rack.

Recommendation 38

Transit agencies should consider conducting surveys of bicycle riders, as part of a comprehensive operations analysis, to determine where bicyclists board/alight the bus, nearest cross street of trip origin/destination to determine route taken to/from the transit stop, and to calculate distance bicycled to the bus stop. Average distance bicycled to/from the bus stop also can be used for planning purposes to prioritize bicycle facility improvements near bus stops.

Recommendation 39

Transit agencies also might seek to identify alternative funding sources for studying and developing a bike- parking program, such as through the FDOT Public Transit Service Development Program for innovative programs. Applications for these funds must be justified in the TDP. FDOT's Transit Corridor Program funds for capital or operating expenses to reduce corridor congestion might also be an option, which must be identified in the TDP or Congestion Management System Plan.

Transit Agency Participation in Meetings

As was discussed in the stakeholder forums, transit agency leadership directs the priorities of the organization.

Recommendation 40

It is recommended that transit leadership should seek to strengthen relationships with their leadership counterparts in other agencies, (i.e., FDOT District Secretary, local elected officials, county and city management) to open the door for lower level transit staff also to have connected relationships with their staff counterparts (i.e., public works and traffic operations departments, etc.).

Several FDOT District Offices hold quarterly meetings with interagency transportation stakeholders to discuss proposed and ongoing transportation improvement projects.

Lee County coordinating partners meet for lunch once a month. There is no agenda and informal discussion covers any topic about what is going on, including projects and friendly conversation. This allows for open discussion and a "heads up" on issues.

LYNX has regular regional working group meetings with the staff level of local governments to seek input on upcoming LYNX board agenda items. Participants discuss new route ideas, funding, and other topics. LYNX staff also sits on various MPO committees to speak on transit issues.

FDOT District Seven has developed the Regional Transportation Interagency Exchange that is a group composed of representatives of the transit agencies in the District, MPO representatives, commuter assistance programs and others as a forum to share information about ongoing projects. This is to improve coordination among partners involved in the provision of public transportation. Another major emphasis is data sharing. A program of evaluating proposals for new projects has also been developed to prioritize projects eligible for available discretionary funds. Potential evaluation criteria under current consideration include an application's ability to improve connections to other modes, as well as technological innovations that can be transferable to other agencies.
Regional Transportation Interagency Exchange (RTIE) Quarterly Meeting, June 21, 2016.

Recommendation 41

Transit agencies should send knowledgeable staff to all these meetings of the FDOT District and local government, where needed ped/bike improvements can be discussed. If the transit agency does not have the staff resources to attend meetings, the transit agency should seek other means to communicate and coordinate on a regular basis. This is to share data and information in usable formats. This also is to provide descriptions of facility needs, such as bus pullouts, bike lanes and sidewalks, on highways with existing transit service as well as where future transit service expansion is anticipated. It is recommended to share the unfunded needs plan of public transit, not just the cost feasible plan.

Local Government Processes

"The State Highway System is 10 percent of the entire Florida roadway network, but it carries 54 percent of all daily traffic." However, it is important to note that "Urban and rural roads functionally classified as "local" comprise 75 percent of the public road centerline miles."
FDOT, Florida Transportation Trends & Conditions, 2015, p. 14.

A review of local government activities in Florida indicates that many local governments are planning and implementing programs for ped/bike improvements in their communities. These activities include incorporating ped/bike planning into the local government comprehensive planning process and the land development code, developing Complete Streets guidance, using opportunities in the land development review process, and incorporating ped/bike improvements into street construction and maintenance projects.

Sometimes studies conducted by local governments to determine the gaps are too limited in scope to just the transit corridor. These corridors are important; however, they may exclude the roads that filter in toward the bus stop from the surrounding area around where the ped/bike infrastructure gaps really are. The true gaps are often not on the main roads but on the surrounding local roads. That information would come from the local governments, counties, municipalities, and MPO staff. For local roads, feedback from the public also is sought, especially for a master plan.

The City of Tampa has a bicycle master plan. Different types of improvements are specified for roadways of different functional classes. The master plan calls for 400 miles of bicycle facilities. Presently, there are 100 miles in place. Within the next three to five years, another 50 miles of bicycle facilities will be added. HART and the City of Tampa have an inter-local agreement that provides for a mechanism for the City and HART to mutually commit to the provision of enhanced transit operations along Primary Transit Corridors or other specific transit corridors for a fixed duration. There also is an agreement between the City of Tampa and HART for a program to complete sidewalks to HART stops. An example is 15th Street from Fowler Avenue to Linebaugh Avenue, using federal funds and local matching funds.

City of Tampa Mobility Policy 3.1.11., Imagine 2040 Tampa Comprehensive Plan, 2016.

Local Roadway Improvement Projects

Local roads and highways are designed using the standards and criteria found in the Manual of Uniform Standards for Design, Construction, and Maintenance for Streets and Highways, pursuant to Section 336.045, F.S. that requires uniform standards for County roads.[32] The Greenbook establishes that ped/bike facilities shall be given full consideration in the planning and development of transportation facilities, including consideration in conjunction with construction, reconstruction, or other improvement projects. The Greenbook indicates that special emphasis should be given to projects in or within one mile of an urban area. Furthermore, all pedestrian facilities must incorporate accessibility features into county and municipal infrastructure, in compliance with the Section 504 of the Rehabilitation Act of 1973 and Title IIb of the 1990 Americans with Disabilities Act.

The Greenbook contains Chapter 13 on public transit, which establishes that public transit should be considered in all phases of project development. The Greenbook also provides that coordination between local governments and public transit agencies during the planning and design stages of a transportation project is essential for maintenance of traffic, rerouting of transit and pedestrian movements, and in providing infrastructure serving public transit in the project. It calls for the use of the TDP as a reference to planned transit needs.

The Greenbook also provides that particular emphasis for bicycle facilities should be given for construction, reconstruction, intersection improvement, and transit projects. Chapters 8 and 9 of the Greenbook provide design standards for ped/bike facilities, respectively. However, the Greenbook also allows use of discretion in the decision to provide ped/bike facilities. Ped/bike facilities are not required where it can be established that the facilities are contrary to public safety, cost prohibitive, or where there is an absence of need.

[32] FDOT. "Florida "Greenbook", 2013. Topic #625-000-015.

Recommendation 42

Public transit agencies should use the TDP to describe transit patron travel needs in terms of the entire trip, including the transit trip and the first mile and last mile segments of the journey, particularly for larger trip generators and attractors. Identification of these segments, usually traveled by walking or bicycling, can help highlight gaps in facilities, and make the case for their need, as part of local roadway improvement projects.

HART has an agreement with the City of Tampa, which lays out the process for circulating local government street improvement plans and utility plans to HART for coordination with transit facility improvements.

Corridor studies for both State and local roads are an early planning effort that can identify needed highway improvements, in addition to the location of transit service routes, fixed guideway transit alignment alternatives, and station locations. If federal funding is involved in the corridor study, FDOT, a transit agency, MPO, or local government may conduct a project development and environment (PD&E) study, or an alternatives analysis study, to identify a locally preferred alternative composed of a set of multimodal transportation improvements.

Recommendation 43

The transit agency should be actively involved in PD&E studies for both local roads and State roadway projects that affect public transit service and access to service. The aim is to incorporate transit and its associated ped/bike access enhancements, as an integral part of the purpose and need for the multimodal street facility. The transit agency should seek to mobilize community support for specific public transit improvements and associated ped/bike accessibility enhancements.

Recommendation 44

The transit agency should offer typical design guidelines for transit stops for use by FDOT and local governments to incorporate into the development of transportation improvement alternatives under study.

At the local level, the power is top down. If the local leadership is uninterested in ped/bike access to transit, then the planning staffs are limited in what they can do. There also is a limitation of staff technical capabilities and staff sometimes has too narrow an understanding. For example, with regard to pedestrian policies, urban design should not be overlooked. Long block lengths can be an obstacle to walking, even with the best sidewalks and amenities.

Palm Tran has a transit planner on the development review board, who insists on transit provisions. Staff with skills and knowledge about land use and transportation planning can help bridge the connection between land development and the access needs of transit service.

Local Government Comprehensive Planning

For counties and cities that wish to strengthen their multimodal systems, the comprehensive planning process and application of land development regulations contain opportunities for public transit agencies to coordinate. Planning and regulation can lay the groundwork for future transportation improvement projects.

The transportation element of the local government comprehensive plan (LGCP) is often referenced as the source of the "project need" in corridor planning studies that initiate FDOT transportation improvement projects. Florida law calls for the transportation element to be multimodal. The local government comprehensive plan transportation element is a key document, particularly the ped/bike components that have the opportunity to cohesively define the needs of bicyclists and pedestrians regarding connectivity with transit service.

"The purpose of the transportation element shall be to plan for a multimodal transportation system that places emphasis on public transportation system, where feasible…Each local government's transportation element shall address traffic circulation, including the types, locations, and extent of existing and proposed major thoroughfares and transportation routes, including ped/bike ways…The element shall reflect the data, analysis, and associated principles and strategies relating to…existing and projected intermodal deficiencies and needs…" and "…How the local government will correct existing deficiencies, meet the identified needs of the projected transportation system, and advance the purpose of this paragraph…" 163.3177(6)(b), F.S.

Recommendation 45

Public transit agencies could recognize the opportunity of the LGCP mobility element to lay the foundation for later projects that more fully incorporate public transit, with ped/bike facilities that support use of public transit.

The content and wording of the LGCP is very important to advancing public transportation, identifying existing and future needs in terms of public transportation, and how ped/bike facilities will address intermodal deficiencies. Plan policies should guide street planning, design and coordination with public transit agencies. Achieving stronger linkages between public transit and ped/bike facilities relies upon voiced support by citizens and stakeholder groups, and coordination with the technical support staff that is guiding the LGCP update process. A comprehensive plan is only as strong as the will to implement it. One possible way to bolster support is active participation in the planning process by groups that local elected officials listen to, including the land development business community, and citizen-based groups. Their active participation can lead to a sense of ownership and sponsorship of the multimodal comprehensive plan. Securing participation can be aided with effective communication materials, like the example below.

JTA has communicated the importance of improving multimodal conditions in JTA's high frequency Mobility Corridors through developing a detailed glossy publication, "JTAMobilityWorks Complete Streets", 2016. It was distributed to local elected officials and stakeholder groups. The publication describes not only the quick operational and safety improvements to be made, but also the planned Keystone Projects and the long-term vision projects. For each of the Mobility Corridors, there is a discussion on the process of public participation and coordination with FDOT for design charrettes and workshops. The publication contains maps, illustrations and photographs to communicate more clearly, the concepts of Complete Streets to a lay audience, particularly local elected officials.

The comprehensive planning process also may be a means to address a problem cited by transit agencies during the stakeholder forums held during this study. The problem involves the scenario in which a highway must be widened, and/or right turn lanes must be added to intersections or at entrances to new development, resulting in the requirement for transit stops to be relocated due to lack of ROW after the road widening. Sometimes this is not a problem, especially if the relocation results in a more convenient and safer location for patrons, such as the far side of an intersection. However, it may be just as likely that the transit stop is relocated several hundred feet from its original location, due to the need to balance multiple objectives of safety, traffic operations, access management, and ROW availability. Sometimes the result is a less than optimal relocation, from the perspective of the transit patron.

The goal of the transit agency is to place the transit stop in the best location, from the standpoint of safety for all roadway users, and convenience to transit patrons. Another goal is to position transit stops and associated amenities in the best location the first time, to avoid the expense of relocating them later. This may require looking farther into the future. While comprehensive plans must address a future time horizon of no less than twenty years, more local governments and MPOs are starting to look at longer time horizons, recognizing the need for longer lead times in making decisions that permanently shape urban form or for the development of major infrastructure.

Recommendation 46

Transit agencies should encourage their host local government to consider the typical section of the highway at community "build-out."

This may involve local governments engaging in scenario planning and visioning exercises to proactively direct a future urban form that can best be served by public transit. Projections of build-out might be beyond a twenty year planning time horizon. In the application of Context Sensitive Solutions, it is important to discuss what the future context of that highway may look like. Results of a longer term planning horizon might be a comprehensive planning policy for the acquisition of compensatory ROW from future land development, or establishing a vision for particular corridors, including ultimate ROW requirements. This also may necessitate that the transit agency envision and engage in service development discussion with transit agency planners and their board, beyond the ten year time horizon of the TDP.

"Design changes demand. As streets become more heavily traveled, repurposing space for transit can dramatically increase ridership, and bringing more activity to the street. Investments in transit-supportive infrastructure attract new riders and reveal latent demand for better transit service. Street design powers a shift to transit, walking, and bicycling, by making them the most attractive travel modes-safe, convenient, efficient, and enjoyable."

National Association of City Transportation Officials (NACTO), *Transit Street Design Guide*, Island Press, 2016.

If a county or a municipality adopts an urban design element as part of their comprehensive plan, pursuant to Part II of Chapter 163, F.S., FDOT will consider the design element during the project development of transportation facilities and construct facilities consistent with that element to the maximum extent feasible.

Recommendation 47

Transit agencies should encourage local governments to develop an urban design component to their comprehensive plans.

Recommendation 48

Transit agencies should work with their local government toward the development of a ped/bike component that includes transit connectivity as part of a master plan with a time horizon that encompasses forecast build-out. This may be longer than 20 years. Those identified gaps in facilities can then be prioritized with a better chance that these needs will be programmed for funding and included within the scope of roadway improvement projects. Long range transportation needs of the local government that also serve a regional purpose (qualifying for federal funding) can then be included in the MPO long range transportation plan (LRTP).

It also helps to articulate a pedestrian master planning goal, such as the prioritization of the development of a citywide environment that enables pedestrians to walk safely and conveniently to transit service. Policies should be developed to guide the planning, design and coordination needed to develop a safe and convenient walking environment.

Recommendation 49

Transit agencies should seek out local government pedestrian, bicycle, and multi-use trail planning processes, and participate on an advisory committee in the updates of these plan components. A strongly weighted criterion for identifying and prioritizing ped/bike improvements should be the locations proximate to transit stops.

Recommendation 50

Transit agencies should participate in the comprehensive plan update process of their host local community(ies) and ask for a broader recognition in policies, objectives, and tactics to strengthen ped/bike connectivity to transit. This also should include a discussion of related issues in the transportation element, including the varying physical ability of travelers, and rural connectivity issues. For example, stakeholders observed that transit dependent persons often seek affordable housing that is located outside urban areas. Rural high-speed roads may have no sidewalks, presenting a danger to pedestrians as they walk to bus stops.

The stakeholder forums and interviews conducted for this study included agency partners from local governments. One of the challenges local government representatives identified is the lack of funds for the maintenance of local transportation facilities. Some local governments are hesitant to build new facilities, particularly if funds are unavailable to maintain existing facilities, such as sidewalks. Many local governments have prioritized the retrofitting of existing sidewalk facilities for ADA compliance.

Funding opportunities to build capital projects, including ped/bike facilities to transit stops and stations include funds from the city transportation fund, federal funds through the congestion management program and the STP set-aside (Formerly the Transportation Alternatives Program), funding matches from the community redevelopment agency for "road diet" projects, resurfacing projects, and safety projects.

Recommendation 51

Transit agencies should assist their local municipal planners to apply to the MPO for STP set-aside funds for sidewalks, and grants for intersection improvements.

With regard to the limited allocation of funding toward bicycle and pedestrian infrastructure, sometimes the connection of walking and bicycling with goals relating to health and welfare is found to be more compelling by local elected officials. The Palm Beach County Health and Human Services Element of their comprehensive plan recognizes the link between health and access to transportation, particularly the physical health benefits of walking and bicycling. Objective 4.2 of the Element encourages community design principles that promote physical activity, including the availability and maintenance of ped/bike facilities to link residential and nonresidential land uses.
Palm Beach County Health & Human Services Element, Revised 10/26/15 p. 11-HS.

In Manatee County, when planners developed a Complete Streets ordinance, they asked the public health department to take the lead to demonstrate the need based upon promoting the overall health of the community. It was felt that public health officials can more convincingly carry the message to local elected officials.

The City of St Petersburg comprehensive plan is a good example of policy coordination with the Pinellas Suncoast Transit Authority. Other examples of local government comprehensive plan policies are located in Appendix C.

Within Chapter 6, Transportation Element of the Comprehensive Plan of the City of St. Petersburg, Florida, explicit policies address access to public transportation for pedestrians and bicyclists. Several relevant policies include the following.

- T9.2 "The City shall include transit facilities such as turn-out bays, pre-emptive signals, bus-only lanes, and transit shelters in the design of road improvement projects and on resurfacing projects, where feasible. The City shall encourage Pinellas County and the FDOT to provide such facilities on county and state roads in St. Petersburg when road projects occur."
- T9.6 "The City shall coordinate with the PSTA to identify locations where the need for pedestrian accommodations between bus stops and adjacent buildings frequented by PSTA users is most pronounced from a safety standpoint."
- T9.9 "The City shall encourage increased use of transit by extending sidewalks and bicycle routes to mass transit stops where feasible."
- T9.10 "The City shall include bicycle and pedestrian facilities in the design and construction of all transit projects where feasible."
- T9.11 "The City may eliminate on-street parking to enable the development of public transit, bicycle, and pedestrian systems."
- T9.12 "The City shall coordinate with the PSTA to provide waiting areas at least 8 feet from curb line with benches, bicycle racks, landscaping, trash receptacles and appropriate shelters where cost feasible."

City of St. Petersburg Comprehensive Plan. 2016.

Local Government Land Development Regulation and Guidance

One stakeholder said that better planning can be accomplished by local government staff, the MPO and the transit agency if they come together early in the planning process and agree on what needs to be accomplished and commit to recommendations and not bow to pressure from developers via elected officials. This alignment of multiagency planning staff needs to happen long before the development review stage to be effective. Some of these commitments can be codified.

The land development code (LDC) of a local government implements the goals, objectives, and policies of the local government comprehensive plan. The LDC can be crafted to support the provision of convenient public transit and associated ped/bike accessibility enhancements. The LDC ensures adequate land development densities and intensities, land use mix, access, internal circulation, urban design, and parking and street design to support transit use, including ped/bike facilities. Supportive regulations might include transit oriented development (TOD) or transit oriented corridor (TOC) overlays as part of the zoning code, and a Complete Streets ordinance.

If such objectives are incorporated into their municipal codes, then the planner at the city can require them of the developer.

Locations of entrances to buildings and pedestrian connections to the street will influence pedestrian activity relative to the location of nearby bus stops. For example, properly located sidewalks interior to the building site and their connections to the street sidewalk may position pedestrians to use marked crosswalks rather than cross the street at random locations. Additionally, thoughtful sidewalk layout interior to a building site may channel pedestrian flow to a specific area, thereby helping to achieve one of the minimum criteria for placing a marked crosswalk midblock or at any uncontrolled location: generating a well-defined pattern of existing pedestrian crossings.[33]

Recommendation 52

Public transit agencies should encourage municipalities in their service areas to guide development along public transportation corridors, increase residential densities and commercial intensities, and apply appropriate design features to roadway layouts to provide ped/bike access to transit stops. Subdivision regulations should stipulate adequate provisions for transit, including space for transit stops, sidewalks on both sides of the street and circulation and access that accommodate transit vehicles, pedestrians, and bicyclists.

Recommendation 53

Transit agencies should work with their local governments to incorporate land development code requirements for sidewalks on both sides of the street.

Transit Oriented Development

Transit oriented developments (TOD) are compact, moderate to high intensity and density, mixed use areas within one half mile of a transit stop or station which is designed to maximize walking trips and access to transit.[34] TOD is usually, but not always, associated with transit service that is considered to be physically permanent in nature, such as fixed guideway. These might include corridors providing commuter rail, light rail, and bus rapid transit and their associated transit stations. The discussion about TOD is usually focused on land use planning and development or redevelopment surrounding transit stations. However, TOD also can be associated with designated areas or districts. Appendix D provides a synopsis of mobility policies relating to ped/bike access to public transit, as described in the "Comprehensive Plan Model Policies for Transit Oriented Development", by the Tampa Bay Area Regional Transportation Authority.

Appendix E provides a portion of the City of Lakeland Land Development Code that describes requirements for ped/bike access. The City of Lakeland uses both transit oriented corridors and transit supportive areas, as described below.

[33] FDOT. *Traffic Engineering Manual*, Section 3.8.5(3)(a).
[34] Renaissance Planning Group, "A Framework for Transit Oriented Development in Florida," FDOT, 2011, p. 3.

Recommendation 54

Public transit agencies should work with their local governments during the comprehensive plan updates to consider adopting strong policies for transit oriented development and its identification on the Future Land Use Map. Such policies can be implemented by a TOD zoning overlay, providing for development to be approved, designed, and built in a manner that supports multimodal mobility.

The City of Lakeland is a designated Bicycle Friendly Community by the League of American Bicyclists. Relating to land development approvals, their Complete Streets program addresses both on-site and off-site facilities. Their coordinative partners include the Polk TPO, FDOT District One, Lakeland Community Redevelopment Agency (CRA), the Lakeland Area Mass Transit District (LAMTD)/Citrus Connection, the land development community and multiple city departments. The City found that "Considering the transit-bicycle/pedestrian interface in the design of our streets and development sites is an important, cost-effective way to address multi-modal infrastructure needs…Even if transit service isn't currently available, development sites and streets should be designed to be "transit ready" to avoid costly retrofits later." The City of Lakeland's policy framework includes multimodal level of service standards, and explicit mobility and connectivity requirements within their Transit Oriented Corridors (TOC) overlay zone and for the Activity Centers within the TOC overlay zone. There also is a designated Central City Transit Supportive Area (CCTSA), where gaps in sidewalks and bicycle facilities are to be addressed. The City also has sidewalk funding prioritization criteria. After safety concerns are addressed, the second priority is sidewalk improvements along designated transit routes providing 30-minute or less headways at least during peak times, and improvement to the network within ¼ mile of these routes and within ½ mile of any passenger rail station site. Concurrency requirements address ped/bike friendly urban form, ADA-compliant pedestrian routes, transit access easements, and bus circulation. Index 900 of the City Engineering Standards Manual (ESM) guides the placement and design of convenient bike parking on site and at the transit stop.

Charles Barmby, "The Role of Transit Agencies in Pedestrian & Bicycle Accessibility—Local Government Perspective, City of Lakeland," FPTA/FDOT/CUTR Professional Development Workshop, 2016, Slide 43.

Recommendation 55

Public transit agencies should assist their local municipal planners to develop TOD districts and multimodal transportation districts.

Recommendation 56

Transit agencies should consider establishing a transit oriented development committee to leverage public private partnerships in areas near transit routes. By definition, TOD includes nonmotorized accessibility. Such a committee could strengthen coordinative relationships and take a comprehensive approach as HART has done.

"The HART Transit Oriented Development (TOD) Committee was formed in 2013 by the HART Board to determine which of the current and proposed MetroRapid [BRT] corridors have the greatest potential for TOD. Local government committee members include the City of Tampa, Planning Commission, Metropolitan Planning Organization, and HART. The private sector members included realtors, builders, and economic development experts. The committee explored the potential for Bus Rapid Transit (BRT) lines to stimulate transit oriented development through various activities including:

- Analyzing the efforts of other cities to stimulate TOD with BRT systems
- Reviewing stops along the MetroRapid North-South route for potential economic development opportunities
- Exploring developer incentives on specific corridors
- Developing public/private partnerships
- Review of Tampa's land use regulations and comprehensive plan."

HART TDP FY2015-2024 Update, 2014, p. 8.

The City of West Palm Beach contains a transit-oriented development (TOD) district in one section of downtown where there is a TriRail/Amtrak station and the Palm Tran multimodal center, where 10 routes meet. The City's regulations specify that development and infrastructure must be pedestrian friendly.

Complete Streets

As of May, 2015, there were 44 local governments in Florida that had adopted a Complete Streets policy or guidelines.[35] These guidelines may be used as part of 3R projects, or in the development of new streets, or to guide land development.

The City of Deerfield Beach released its Complete Streets Guidelines and Complete Streets Implementation Plan in 2013. While the plan covers many aspects of Complete Streets, access to public transportation services is specifically outlined in Chapter 9 of the document. The document lays out specific design elements to be implemented to optimize access to bus stops, light rail, and BRT. The chapter also includes guidelines for bicycle connections and pedestrian access. As it relates to bicycle access, Deerfield Beach's Complete Streets Guidelines state that "secure bicycle parking must be provided at or within close proximity to a bus stop, preferably sheltered. At a minimum, the accommodations can be bike racks or lockers."

City of Deerfield Beach, "Deerfield Beach Complete Streets Guidelines," 2013, p.9-10

[35] Smart Growth America, 2015.

The City of Fort Lauderdale's Complete Streets Manual includes a specific "Transit Component," in which the design elements for bicyclist and pedestrian access are outlined. The Complete Streets Manual also integrates the principles from the Broward County County-Wide Community Design Guidebook and the FDOT District 4 Transit Facilities Guidelines into the Transit Component portion of the document.

City of Ft. Lauderdale Complete Streets Manual. 2013.

The Polk County Local Government Complete Street Policy, prepared by the Polk County TPO, was jointly signed in 2012 by Polk County and by 17 cities and towns within the County. The Polk County TPO also prepared a Complete Streets Manual. It states that bicycles and transit wholly complement one another and that permitting bicycles on transit vehicles can expand the service area of public transportation as well as encourage the use of bicycles as transportation.

Polk County Local Government Complete Street Policy, 2012.

Recommendation 57

Public transit agencies could encourage their local governments to adopt Complete Streets policies. Well written policies would not only preserve sufficient lane widths for transit vehicles to operate safely, but also to provide sidewalks and bike lanes to access transit stops.

The South Florida Avenue Corridor Study (State Road 37) in Bartow, Florida is being carried out at the request of the City of Lakeland by the Florida Department of Transportation District One in partnership with the Central Florida Regional Planning Council and the Treasure Coast Regional Planning Council. The goal is to improve mobility, safety, and quality of life along a 1.4 mile segment of South Florida Avenue in Bartow through community engagement in coordination with municipal governments, neighborhood associations, and other community partners. This is the first FDOT initiated and sponsored "Complete Street Corridor Master Plan" and will serve as a model for the rest of the state. At the time of this report, the plan is in its very early stages. A study area has been identified and public workshops, design studios, and outreach are currently underway.

South Florida Ave (SR 37) Corridor Study

Land Development Project Review

With regard to proposed land development that may be located along an existing or future transit route, local governments commonly encourage a meeting between the land development permitting office and the land developer prior to the time that the land developer submits an application for development approval. This is to go over requirements and expectations before the land developer spends time developing the site plan.

Collier County routes development plans to Collier Area Transit (CAT) for review. For site development plans, Collier County holds weekly group meetings where the engineering, planning, and transit staff all review projects together at the proposal stage and discuss.

Participating in a pre-application meeting provides the transit agency the chance to discuss needs for the location or relocation of bus stops and the needed ped/bike enhancements to improve access to the bus stops. This includes sidewalks within the site that may provide route directness to bus stops, and on-site bicycle parking. There also is usually a methodology meeting to come to agreement regarding assumptions used in a transportation impact study, including mode share. Methodology may be part of the pre-application conference or may be a separate meeting.

What a transit agency is able to achieve with respect to conditions of land development approval, depends greatly upon the orientation of local elected leaders and how local government planners implement directives. This is really the starting point with regard to land development applications, based upon the degree to which the LGCP goals, objectives, policies, and implementing regulations support multimodalism. If that orientation exists, the planner will be more likely to negotiate more strongly for bus stop facilities and associated ped/bike accessibility enhancements.

Recommendation 58

The transit agency should ask to be included in pre-application meetings and methodology meetings, ask their host local governments to route land development plans for transit agency review, be included in the electronic plan review system roster, if the local government has one, and to serve on any site plans and plats review committees.

The City of West Palm Beach is conscientious about notifying Palm Tran staff about upcoming new developments and site plan reviews. City staff sends meeting agendas and invitations to serve on the plans and plats review committee.

Bus stops often are eliminated as a result of the construction of a new right turn lane.

Recommendation 59

Transit agencies should discuss the location of bus stops relative to new right turn lanes,with local governments to proactively develop some options, to be used in negotiations with the land developer, for considering the needs of transit patrons.

Recommendation 60

The transit agency should seek support from the local government traffic engineering department, FDOT District traffic operations engineer, or members of the MPO technical advisory committee to develop a mechanism for better evaluating the need for right turn lanes at private development entrances and at intersections and the impact it has on access to bus stops.

Recommendation 61

The transit agency should seek support from the local government planning staff for assistance with site plan reviews on behalf of transit service. The transit agency may not have a planner, or enough planning staff to participate in meetings, since there may be a high volume of site plan proposals to review. Public transit agencies might consider providing the city staff with a checklist of concerns, and up-to-date information regarding current bus routes and bus stop locations, and future ones. The public transit agency could discuss in advance, the kinds of development conditions that would be beneficial or necessary for transit service, which staff can use in their negotiations with land developers.

City of Tallahassee Land Development Review

Within the City of Tallahassee's Comprehensive Plan, the Mobility Element lays out an explicit multimodal transportation policy for land development. The policy is as follows:
Policy 1.1.8: [M]: "Development projects shall contribute to providing a safe, convenient, comfortable, and aesthetically pleasing transportation environment that promotes walking, cycling, and transit use. Appropriate improvements or enhancements to the multimodal network shall be required as a condition of development approval, such as, but not limited to, the following:

a) Full accommodations for pedestrian access and movement, including shaded sidewalks, benches and enhanced crossings;
b) Full accommodations for bicycles, including lockers, showers, and racks;
c) Direct connections to the regional bicycle/pedestrian network;
d) Installation of shared use paths in accordance with FDOT recognized standards;
e) Well-designed accommodations for transfer of passengers at designated transit facilities;
f) Preferential parking for rideshare participants;
g) Well-designed access for motor vehicle passenger dropoffs and pick-ups at designated transit facilities and at commercial and office development sites;
h) Full accommodation for the mobility impaired, including parking spaces, sidewalks and ramps for handicapped access; and
i) Weather protection at transit stops."

City of Tallahassee *Comprehensive Plan*, 2011, p. 135.

Optional Concurrency

Some local governments maintain optional transportation concurrency management systems to ensure adequate street capacity is available at the time of new development. These local governments will have a concurrency ordinance requiring maintenance of transportation level of service or quality of service as a result of land development. A transportation impact study may be required. If State highways are potentially affected, then FDOT planning staff evaluates the impact of the development on the SHS and recommends mitigation actions. The FDOT *Transportation Impact Handbook* is used to guide development reviews.

At this time, there may be considerations for intersection improvements, right turn lanes, traffic reconfiguration and control, and changes to the location of driveways and medians, which may affect existing transit stops as well as present opportunities for the creation of a new transit stop. This is an opportunity to consider transit improvements, and associated ped/bike accessibility infrastructure, to be provided by land developers to satisfy concurrency. The municipality may provide the option to the developer to pay fees in lieu that could be used for such improvements.

The transit agency's inventory of transit stop assets, by location, and the assessment of conditions at the transit stops is information of value to local and state government partners, as they plan transportation improvement projects, and negotiate conditions of approval with land developers. It should be especially of interest where streets are governed by Complete Streets policies. Such transit data can serve as a lead-in to discussion regarding access to transit.

Recommendation 62

Transit agencies should proactively share their databases regarding the location of transit stops, with a request to prioritize locations near transit stops for ped/bike improvements.

The City of West Palm Beach has been proactive with devising plans for downtown and citywide ped/bike facilities. Part of these planning efforts includes facilities inventories. The City has a Transportation Concurrency Exception Area in its downtown in addition to a transit oriented development district. The City has been active in submitting applications for MPO Transportation Alternatives funding for sidewalks and intersection improvements. The City has also been developing an electronic plan review system.

Florida Department of Transportation Processes

> **"For projects within the operational limits of a local transit agency service area, connectivity of ped/bike facilities with transit stops is required. Where transit service is provided or planned to be established, the designer must coordinate with the District Pedestrian and Bicycle Coordinator, District Modal Development Office Coordinator, District Americans with Disabilities Act (ADA) Coordinator, District Public Transportation staff and the local public transit provider(s) so that access to transit services by pedestrians and bicyclist is provided. Coordination will be required to determine the optimum location of boarding and alighting areas, transit shelters, and bus bays."**
>
> FDOT, *Plans Preparation Manual*, Volume 1, Topic No. 625-000-007, 2016, p. 8-3.

Indeed, coordination is part of the title of several FDOT staff positions with which public transit agencies should establish ongoing working relationships.

The following discussion describes planning processes and transportation improvement project types undertaken by FDOT. This discussion is separate from incorporating ADA compliant features in all new construction, as required by federal law, in Resurfacing, Restoration and Rehabilitation (3R) projects, and in ADA retrofitting in response to a citizen request. State roadway improvement project types where there may be opportunities to incorporate ped/bike linkages to transit stops and stations include the following:

- Resurfacing, restoration and rehabilitation (3R)
- Construction, reconstruction and widening
- Response to a public request for a traffic control device, such as audible pedestrian signals, countdown pedestrian signals, a marked pedestrian crosswalk at midblock or at uncontrolled approach locations, and associated improvements such as curb extensions, raised crosswalks, speed reduction treatments, signage and road markings, flashing beacons, and signalized control.
- "Push button" safety projects

The 2060 Florida Transportation Plan (FTP) includes FDOT goals and objectives, some of which can be supported by improving access to transit. This makes FDOT a natural coordinating partner. For example, under the goal of economic competitiveness and mobility, the objective is to increase transit ridership at twice the average rate of population growth. For the goal of quality of life and environmental stewardship, the objectives include making transportation decisions in the context of community interests, plans, values, and visions and to deliver a transportation system that supports quality of life and environmental stewardship. Providing ped/bike improvements that improve access to transit supports these goals and objectives.

Understanding the FDOT planning and programming process can provide opportunities to better position requests for ped/bike facility linkages to transit stops and stations, as part of State roadway improvement projects. The flowchart in Figure 11 illustrates statewide direction to the FDOT Districts.

Coordination Opportunities

In recent years, there have been many opportunities that have arisen from the evolution of FDOT planning processes. These processes have incorporated concepts such as Complete Streets, lane elimination, Context Sensitive Solutions, and Transportation Design for Livable Communities (TDLC). Some stages of these processes may not include stakeholders outside FDOT.

Recommendation 63

Transit agencies must learn about FDOT processes and keep up-to-date with projects currently undertaken by FDOT, to engage their FDOT counterparts, explaining transit concerns and ideas at opportune times.

This is so that some of these concerns and ideas may receive consideration in the FDOT planning process for transportation improvement projects. This approach relies heavily upon building and maintaining professional relationships with interagency counterparts through ongoing dialogue. FDOT is a decentralized organization and each FDOT District may have its own procedures. Below is a brief description about some of these planning processes.

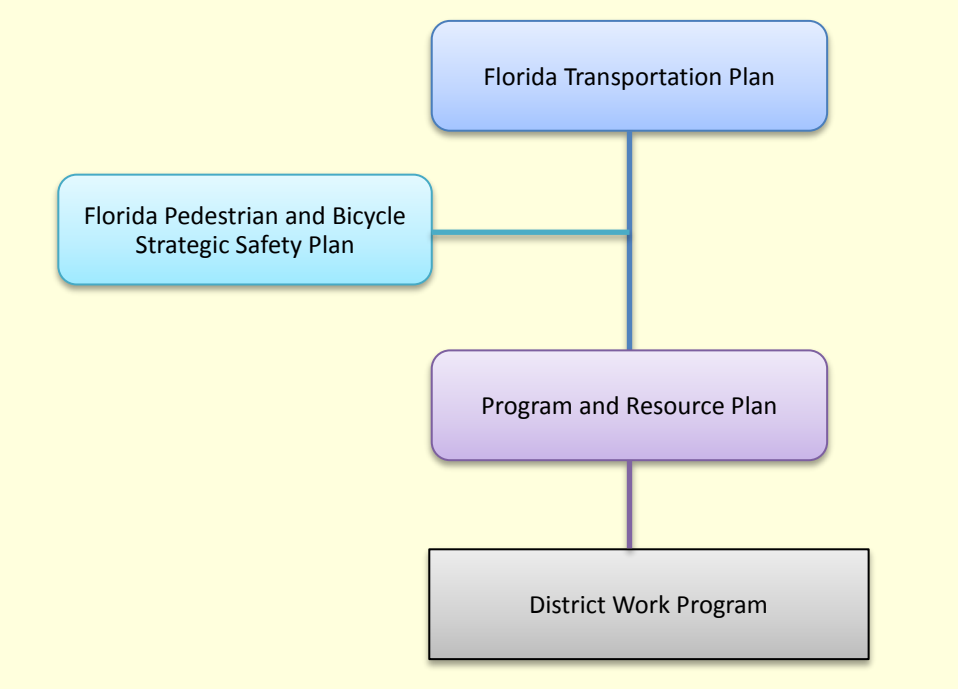


Figure 11: FDOT Planning and Programming Process

FDOT Work Program Development

During the conduct of stakeholder workshops as part of the development of recommendations for this study, one concern raised by transit agencies is a perceived lack of responsiveness to requests that FDOT incorporate various transit improvements into a roadway improvement project. Sometimes these requests are submitted after design is largely complete or even at the beginning of project construction. This highlights a major difference in planning time frames of public transit agencies compared to FDOT and local governments. For example, a resurfacing project may take three years, from design through construction. In comparison, a public transit agency that provides bus service has greater flexibility to alter or expand service routes, necessitating transit stop additions or relocations. Route changes can happen as frequently as quarterly. However, requesting transit-related "add-ons" to roadway improvement projects, even minor changes, may require project redesign, and alterations to ROW and drainage calculations. This may require the FDOT District to revise plans, reallocate budgets and the Work Program, adding to FDOT staff work load. The project may be delayed because Work Program amendments can take several weeks for approval, and ROW and utility reimbursements may be affected. Depending on the magnitude of the change, it may require formal amendments to the MPO Transportation Improvement Program (TIP) and Statewide Transportation Improvement Program (STIP). This explains the need for requests by transit agencies for facilities as part of a roadway improvement project to be made as early as possible. This is a challenge for public transit agencies that strive to make incremental transit service improvements in response to travel demand and needs of transit riders. Nonetheless, it is incumbent upon transit agencies to determine and communicate their roadway facility needs sooner.

Recommendation 64

Transit agencies should examine their FDOT District Work Program to learn about potential FDOT project opportunities for incorporating ped/bike street access infrastructure to transit stops.

Its development is a year round activity. The Work Program lists the specific projects to be funded over a five-year period and is adopted by the Secretary of Transportation each July. The Work Program must be consistent with the capital improvement element of the local comprehensive plan and is developed by each District to use its funds that have been allocated according to FDOT formulas and procedures. The Work Program is consistent with the policies and objectives of the FTP as well as program performance targets.

Several state highway improvement project types are programmed into the FDOT District Work Program that are updated and adopted yearly, (see Figure 12). Each phase of 3R and new construction/reconstruction projects is programmed separately. Traffic control and safety improvements may not be specifically identified, as these projects might have shorter lead times, depending on the nature of the improvement.

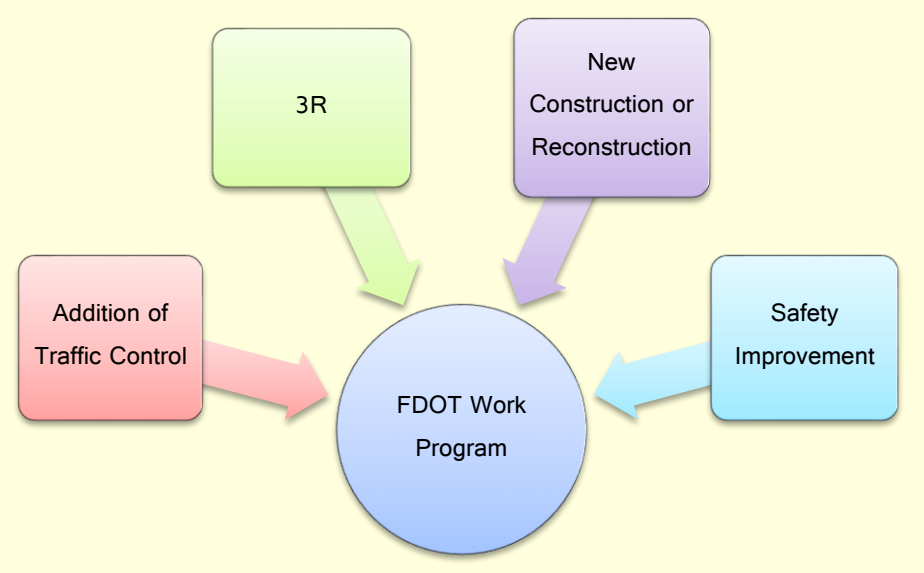


Figure 12: State Highway Improvement Projects

The first phase of a Tentative Work Program development process begins in the fall, and includes project priorities of the MPOs, submitted by October 1. The second year of the current Adopted Work Program moves up to the first year of the Tentative Work Program for the following year. Federal funds are assigned first to maximize their use. Districts develop various funding scenarios and come up with a program that achieves performance targets without exceeding fund allocations. The resulting Tentative Work Program then undergoes MPO review for any necessary changes and public hearings.

Safety projects enter the work program at the discretion of the District. One source of safety projects are those requested by the Community Traffic Safety Team. There is no funding category for a state roadway improvement project for just a sidewalk, unless there is a safety concern.

Several FDOT District offices hold quarterly meetings with interagency transportation partners to provide a forum to share planning and programming information.

Recommendation 65

Transit agencies should send staff to FDOT District interagency meetings. Transit staff should be prepared to share information, formal and informal plans, concerns, and requests. If interagency partners do not meet regularly, it is recommended that the transit agency initiate these meetings.

Opportunities in Resurfacing, Restoration and Rehabilitation Projects

The 2012 federal transportation reauthorization, Moving Ahead for Progress in the 21st Century (MAP-21), required maintaining the National Highway System (NHS) in a state of good repair. Even prior to this, FDOT has had a program of systematic pavement repair. The highway portion of Florida's Strategic Intermodal System (SIS) is a subset of the NHS. The maintenance of the State Highway System is guided by the Florida Transportation Asset Management Plan.[36] This Plan provides for a strategic and

[36] FDOT, *Asset Management Plan: Preserving the State's Infrastructure*, 2015.

systematic process of maintaining pavement and bridges throughout the life cycle of the facilities, and links to the FDOT performance based planning process. Maintaining the system comes prior to building capacity enhancements.[37] FDOT's current target is to resurface three percent of the arterials on the SHS, statewide, annually.[38] FDOT Districts conduct an annual Pavement Condition Survey. Pavement condition triggers programming of a 3R project. See Figure 13. There are possibilities within 3R projects for including, not only roadway transit infrastructure, such as transit pull out bays, but also the provision of ped/bike infrastructure that improve transit stop access.

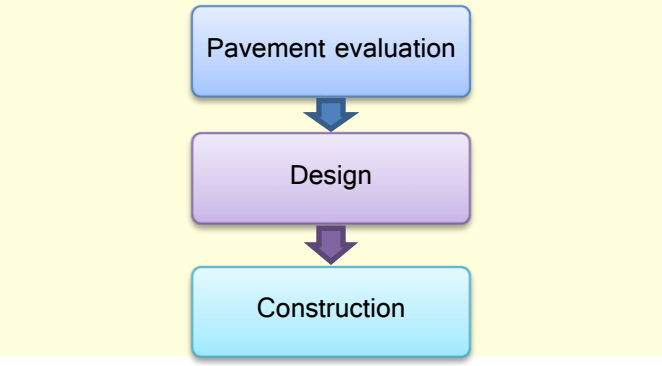


Figure 13: Phases of 3R Projects

Construction for resurfacing projects are entered in the third or fourth year of the new Work Program, with the design phase entered into the first year. This means that 3R project opportunities can suddenly appear, with design to begin as early as midsummer. Because of this, it is important for transit agencies to examine their FDOT District Adopted Work Program as soon as it becomes available in July of each year. Any special requests by the transit agency for FDOT to consider transit, ped/bike infrastructure, need to be submitted early enough so that it is included as part of the scoping process for the 3R design phase. 3R projects have a different set of opportunities and limitations from new construction, reconstruction, or roadway widening projects. Project development and environment (PD&E) studies are not conducted for 3R projects.

These are some examples of the kinds of improvements that can be included in 3R projects, all of which affect the street environment, which bicyclists and pedestrians use and which affect accessibility to the transit stop.

- Lane reconfiguration, lane reallocation
- Optimization of bus stop location
- Incorporation of ped/bike safety improvements
- Review and alteration of access management
- Intersection improvements

[37] Ibid., p. 1-2.
[38] Ibid., p. 4-1.

- ADA upgrades
- Addition of capacity without adding through lanes

"Adding project features that result in additional costs can change the original justification, so the budget should be a major consideration in the scoping process. Districts are allocated 3R funds based on a fixed amount per lane mile for resurfacing plus a limited amount for other improvements and upgrades. When these projects are scoped, clearly understanding project objectives and available funds is critical."[39]

With regard to resurfacing projects, programming may be done prior to project scoping. Resurfacing projects are discretionary, are constrained by limited yearly funding allocations, and work can only be done within the designated physical limits of the project. 3R projects are defined as work undertaken to extend the service life of an existing highway and/or enhance highway safety to enable safe postponement of reconstruction. Adding improvements must be justified. Operational factors, against which 3R project alternatives are evaluated, include extending the life of the existing pavement, improving capacity without adding continuous through lanes, improving operational characteristics, site-specific crash reduction, and general safety modifications. The project primary purpose typically comes from one of these factors. ROW acquisition is rarely considered.

This means that if existing ROW cannot accommodate the addition of sidewalks or bicycle lanes, these facilities likely will not be added in the 3R project, and that the location may have to wait several years until it is time to reconstruct the project before bike lanes and sidewalks can be added.

Recommendation 66

Transit agencies should work with their local government partners to determine where ped/bike improvements can be added to parallel routes.

US 41 in Manatee County heading toward Bradenton is an example of good pedestrian connectivity. Transit serves the US 41 corridor. It is a four-lane facility with insufficient ROW for bicycle facilities. However, an identified local road a few blocks over is signed and striped for a bike lane.

There are some concepts used by FDOT, such as Practical Design, and Complete Streets, which can influence the outcome of a 3R project design. Practical Design is a philosophy to fix only what needs to be fixed. The goals is to maximize improvements to the transportation system by focusing resources on project needs that deliver the highest return on investment based on empirical data, science and engineering judgement, rather than simply on established standards.[40] Cost feasibility is a consideration, based on total construction and maintenance cost of alternatives, cost effectiveness of alternatives, and the benefit/cost ratio of alternatives. It is helpful to know what improvements 3R projects include, do not include, and what kinds of improvements may be considered at the discretion of the project engineer. The transit agency's FDOT District collaborative partners can assist in navigating

[39] FDOT, Project Management Handbook, Part 1 - Issues Common to all Project Managers, Chapter 11: Project Continuity, 2016, p. 6.
[40] FDOT, *Practical Design Handbook: FDOT's Approach to Achieving Practical Design*, 2014.

these specifics and to identify how transit stop access needs might be matched with upcoming 3R projects.

For example, items to remain in resurfacing projects include upgrading curb ramps to meet ADA requirements, construction of multi-use trails, and installation of Pedestrian/Bicycle Railing (Indexes 850/860) in areas with drop-offs greater than 60 inches. Work elements **not** to be included on all resurfacing projects include the following.

- Upgrading of functional pedestrian detectors (push buttons) with newer models (unless FDOT is changing the pedestrian heads/poles for another reason, then ADA is implemented).
- Curb ramps in areas without sidewalk.
- Patterned pavement crosswalks, unless the funding and maintenance of these are the local agency's responsibility.
- Upgrading of existing Pipe Guiderail to Pedestrian/Bicycle Railing when drop-off hazard is less than 60 inches.[41]

According to the Practical Design Handbook, "Other than meeting detectable warning and curb ramp requirements, existing sidewalks and flared driveway turnouts are not required to be upgraded for the sole purpose of meeting ADA requirements. If new sidewalk is to be constructed, nonconforming driveways are not required to be upgraded."[42]

Additionally, "Abandoned driveways with deficient sidewalk cross slope should be removed when possible. This includes construction of new curb and gutter and reconstruction of the sidewalk portion of the driveway." and "The addition or widening of paved shoulders should be evaluated and justified based on safety, capacity, or bicycle/pedestrian warrants." [43]

At the design engineer's discretion, the engineer can add the following things to a 3R project. The engineer must provide information to support or explain the reason for including the item. For those items not included, the engineer also provides support or explanation why the item was excluded, and calculates the capital project cost savings.

- Paved shoulders where none exist or widening of existing paved shoulders where bicycle/pedestrian facilities are not statutorily required (and so documented).
- Bicycle keyholes at right turn lanes, constructed by widening the existing right turn lane, which are not statutorily required and so documented. The engineer is directed by the Practical Design Handbook to investigate the possibility of eliminating paved shoulders in right turn lanes or otherwise narrowing the turn lanes.
- Widening of curb and gutter sections for bike lanes may be appropriate on corridors where the localized widening would cost effectively establish bike lane connectivity with existing contiguous bike lanes adjacent to 3R project.
- Construction of new sidewalks that are not statutorily required and so documented (both sides of the street, connecting transit facilities, where MPO shows no planning during life of facility).
- Construction of new transit/bus amenities (bus bays, pads for bus shelters, bus stop pads, etc.)

[41] *Practical Design Handbook: FDOT's Approach to Achieving Practical Design*, 2014.
[42] Ibid., p. 12.
[43] Ibid., p. 12.

- Curb ramps (replace because of ADA or radius)—ADA needs may be met using other than the typical curb cut ramps shown in index. Often in older urban areas, existing drainage structures and/or utilities need to be relocated to accommodate these standard ramps but there are other alternatives.
- Replacing broken sidewalk slabs that otherwise meet ADA specification.[44]

Regarding the process of considering what gets included in a 3R project, the emphasis is upon implementing only improvements that are necessary, justified by evidence, and cost feasible. This may mean that a case must be made for the inclusion of transit, and ped/bike accessibility infrastructure. Safety projects go through a benefit/cost analysis.

Furthermore, the 3R project design scope is developed based on a project Purpose and Need. Project purpose and need is developed by establishing measurable objectives and justification using evidence. Criteria are selected based on the performance focus and expectations. The design alternatives are evaluated against them. The application of Practical Design makes use of the Design Exceptions and Design Variations processes to determine best criteria based on safety, cost feasibility, and operational performance.

The development of project-specific design criteria for addressing purpose and need relies on collaboration with multiple stakeholders that are internal to FDOT. The aim is for transit-supportive ped/bike infrastructure or reallocating lane space for bicycle lanes, to support the 3R project purpose and need. This means that public transit agencies must rely upon their coordinative partners, the FDOT District ped/bike coordinator and the FDOT District transit planner (or multimodal development coordinator) to contribute to the important internal discussion that shapes the scope of the design. "When these projects are scoped, clearly understanding project objectives and available funds is critical."[45] While more transit agencies are conducting bus stop inventories, ped/bike connectivity infrastructure beyond the transit stop may not be included. A program of ongoing collection of the right kinds of data to measure ped/bike travel demand, need, safety, and performance also is needed.

Recommendation 67

Public transit agencies should discuss data needs and rely upon their coordinative partners, including the FDOT District ped/bike coordinator, multimodal development coordinator and their local government and MPO staff counterparts. An area wide program of ped/bike data collection should be proactively devised based upon FDOT, MPO, and local government planning goals and objectives.

As this database is developed, it will become a resource that can be used to measure performance toward objectives, justifications, and cost/benefit analyses.

[44] Ibid.
[45] FDOT, Project Management Handbook, Part 1 - Issues Common to all Project Managers, Chapter 11: Project Continuity, 2016, p. 6.

FDOT District Five developed a process for evaluating the street environment near transit stops. This process is to be part of preliminary reviews of key transit corridors to identify opportunities to incorporate improvements as part of 3R projects and scope development for other projects on the State Highway System. This process was not about coordination but rather the development of a method for integrating pedestrian safety projects into 3R projects that overlap with transit corridors. While the emphasis of this process is pedestrian safety, a likely additional outcome of improved safety is enhanced pedestrian access to transit stops and stations.

More on the process for evaluating the street environment

This process was developed as part of a pilot project that included incorporating transit considerations in the scoping of key transit corridors where 3R projects were planned. This work resulted in the development of a list of key transit corridors where pedestrian facility gaps could be addressed with identified short-term low-cost and longer-term medium-cost improvements. A conclusion of the pilot project was that

> *"…it is imperative that transit agency planning and operations staff be engaged in the [FDOT] project development process early, to ensure that issues and opportunities are identified prior to design."* [46]

The pilot identified the specific types of transit information that can be supplied by transit agency planners and operations staff, which can be beneficial to the FDOT transportation project development process. The Final Memorandum provides a timeline and a list of data elements to collect as part of field review activities conducted jointly by the transit agency and FDOT. This also includes use of the FHWA *Pedestrian Road Safety Audit Guidelines and Prompts Lists* (FHWA-SA-07-007). The end result is a transmittal to the FDOT Scoping Team Leader of the identified pedestrian safety improvement opportunities near transit stops along the corridor under study. These opportunities could be considered for inclusion in the FDOT District Five Work Program as part of 3R and reconstruction projects.

This project also resulted in recommendations for public transit to play a role in the provision of information. In general, transit agencies maintain databases containing the location of bus stops, service frequency, inventory of bus stop characteristics, and boarding/alighting data by bus stop. Other information may include transit service development plans for new or altered routes, as described in the transit development plan, bus stop consolidation, and identification of bus stops for improvements. Transit agencies also may have a more detailed knowledge of land uses that may be trip generators and attractors and the sources of transit ridership for which proximate transit stop locations may be considered.

The project recommended, due to the need to allocate scarce resources, a method to prioritize the 3R projects based upon some combination of circumstances. These might include greater pedestrian crash history, or street conditions that may place pedestrians at greater risk, such as multi-lane urban arterials, and higher transit activity, especially in locations of two or more bus routes. These may also include locations of local government comprehensive planning emphasis on community redevelopment areas, activity centers, transit oriented development, transit activity or walkability along the corridor. The regulatory environment may point to locations of greater opportunity, where there may be transit oriented development zoning overlays, or designated multi-modal transportation districts. The local government comprehensive plan and capital improvement program may identify Complete Streets initiatives, sidewalk improvement and maintenance programs, ADA transition plans, planned bicycle lanes, lane elimination studies, or proposed land development that may generate transit and pedestrian trips and that

[46] Tindale-Oliver & Associates, "Integration of Transit Access and Pedestrian Safety into Intermodal Project Development Process," November 2011, FDOT District 5, Intermodal Systems Development Office. p. 1.

may be required to mitigate traffic impacts. Priority locations also may include those for which federal, state, or local funding opportunities exist.[47]

Recommendation 68

Coordination is recommended of transit agencies to provide bus stop inventory information to the host municipality or county, to combine this information with the local government's own sidewalk and bicycle facility inventories, for a more complete picture of the remaining gaps relative to transit stops.

Recommendation 69

Transit agencies should obtain feedback from their transit patrons, including persons with disabilities, regarding their experiences walking or bicycling to the transit stop and any difficulties they experienced. Surveying transit patrons and encouraging transit patrons to communicate these difficulties, such as through the mobile app, SeeClickFix, also could help identify the problem areas already experienced by existing transit patrons, and that could be considered for prioritization for ped/bike street enhancements.

Because safety enhancements are prioritized in 3R projects, feedback regarding bicycle and pedestrian safety issues near transit stops could be solicited from the Community Traffic Safety Team.

Although not required, transit agencies may periodically conduct a Comprehensive Operations Analysis to get the details needed to make service adjustments. Types of data that agencies may collect for purposes related to stop access and potential infrastructure needs include GTFS import of stop-level observed ridership, existing and new residential and employment growth centers, and existing and planned development density and intensity. It may also include the conduct of a survey of transit riders and potential transit riders.

Recommendation 70

Transit agencies should coordinate with FDOT before and during scoping of a 3R project, if possible.

The FDOT District 4 representative has a scoping process on their projects that involves all the stakeholders. The form, "Multimodal Scoping Form: Transit Characteristics Summaries" goes to each transit agency to collect information and comments in response to FDOT projects that are under development. Stakeholders can comment on the scope for the project, and they are involved directly in FDOT's review system and can comment on-line. The FDOT project managers must respond to those review comments.

Complete Streets Policy Implementation May Create Opportunities

[47] Tindale-Oliver & Associates, "Integration of Transit Access and Pedestrian Safety into Intermodal Project Development Process," Technical Memorandum #1. April 2011, FDOT District 5, Intermodal Systems Development Office.

The concept of Complete Streets has become a topic of national interest. It is an important opportunity for public transportation agencies to engage in the dialogue regarding the role of transit service as part of a complete transportation system and how public transit issues with respect to transit service development and operations should be incorporated into the Complete Streets planning process. It is helpful to know about concepts that led up to Complete Streets, discussed briefly below.

Since the 1990s, FDOT has been incorporating decisions that balance the mobility of motor vehicle travel with livability into the design of highway projects. These ideas were initially represented in the FDOT Policy on Transportation Design for Livable Communities (TDLC) that was adopted in 1998. TDLC is addressed in Chapter 21 of the FDOT Plans Preparation Manual. The TDLC policy strives to incorporate livability features when desired, appropriate, and feasible, including features that address safety of pedestrians, bicyclists, motorists, and public transit users.

Later, the FDOT Context Sensitive Solutions Policy was adopted to be "…a proactive, collaborative and interdisciplinary approach to transportation decision making, project development, and implementation, taking into account, the views of stakeholders, and the local area…"[48]. Context Sensitive Solutions (CSS) is the balancing of mobility, safety, and community values. The Policy also enlists the participation of communities to contribute financially to enhanced project features and maintenance. CSS is addressed in the discussion of landscape and community features of the FDOT PPM as well as in the FDOT Project Management Handbook.

The FDOT Project Management Handbook, in the CSS Chapter, has this to say about ROW.

> *"Context Sensitive solutions must be planned and designed to fit within existing or planned ROW. If an exceptionally important context sensitive solution requires additional ROW, this need must be identified early in the process and the necessary funding agreed to by all responsible parties."* [49]

In September 2015, FDOT adopted a Complete Streets Policy, Topic No. 000-625-017-a, which states the following.

"It is the goal of the Department of Transportation to implement a policy that promotes safety, quality of life, and economic development in Florida. To implement this policy, the Department will routinely plan, design, construct, reconstruct, and operate a context-sensitive system of "Complete Streets." While maintaining safety and mobility, Complete Streets shall serve the transportation needs of transportation system users of all ages and abilities, including but not limited to:

- Cyclists
- Freight handlers
- Motorists
- Pedestrians
- Transit riders

The Department specifically recognizes Complete Streets are context-sensitive and require transportation system design that considers local land development patterns and built form. The Department will coordinate with local governments, Metropolitan Planning Organizations, transportation agencies, and the public, as needed to provide Complete Streets on the State Highway System, including the Strategic Intermodal System.

This Complete Streets Policy will be integrated into the Department's internal manuals, guidelines, and related documents governing the planning, design, construction and operation of transportation facilities."

[48] FDOT, Project Management Handbook, Part 1 - Issues Common to all Project Managers, Chapter 9: *Context Sensitive Solutions,* 2016, p. 3.
[49] Ibid., p.10.

To accomplish this, FDOT has developed a Work Plan to complete the identified document modifications to guidance, standards, manuals, and policies. In addition to document updates, Complete Streets Policy implementation also includes updating decision-making processes, modifying approaches to measure performance, improving internal and external collaboration, and providing education and training.

The following FDOT documents were identified to be updated first to incorporate the Complete Streets policy. Most of these documents can influence, in some way, the manner in which ped/bike improvements to improve transit access are considered.

- Plans Preparation Manual
- Florida "Greenbook"
- Efficient Transportation Decision Making Manual
- Traffic Engineering Manual
- Level of Service Standards for Highways
- Quality/LOS Handbook
- Intersection Design Guide
- Strategic Intermodal System Standards/Criteria
- Freight Roadway Design Considerations

Transit agencies were just one of twenty external partner categories recognized as needing engagement in this integration process. Transit agencies were not explicitly listed as entities that should participate in training, except that transit agencies might fit into the categories of external partners and others.

As heard during the stakeholder workshops, transit agencies have expressed caution regarding the challenges of balancing the needs of all street users.

Recommendation 71

Complete Streets are for transit patrons too. If transit agencies have concerns, this is a critical time period for transit agencies to engage with their FDOT District counterparts and participate in any workshops or meeting opportunities to which transit agencies may be invited.

If there are no workshops or meetings, it is important for transit agencies to take the initiative to contact their FDOT District Bike/Ped Coordinator and Modal Development Coordinator to express any concerns they may have now.

The leadership of FDOT, in developing explicit principles and processes, will address conflict resolution among the needs of the transportation modes. The goal is for a result that is a balanced and equitable distribution of street space for private motor vehicles and trucks, public buses, bicyclists, and

pedestrians. Transit agencies can work with and support their FDOT Districts as the Districts begin to integrate Complete Streets principles into their planning, design, construction, reconstruction, and operation of a context-sensitive network that serves all modes of travel, all ages and abilities. This integration marks a transition in which the role of FDOT is expanded beyond serving regional and statewide travel to also considering local travel.

Recommendation 72

Here are some actions for transit agencies to take with regard to Complete Streets.

- **Think of transit trip making in terms of the complete multimodal trip that includes a walking or bicycling trip to and from the transit stop or station.**
- **Articulate the role and value of transit service in the development of the Complete Streets network.**
- **Find out who within the FDOT District is involved with Complete Streets implementation.**
- **Provide information to FDOT District staff regarding gaps in the street network where ped/bike facilities are inadequate to serve transit stops.**
- **Collaborate with FDOT District staff in the development and update of a shared GIS database.**

FDOT may be reviewing the performance measures used for Complete Streets. This is an opportunity for transit agencies to weigh in on performance measures that can include measuring access to public transit.

Recommendation 73

Consider performance measures for Complete Streets at different scales that are shared across agencies so that agencies are working together to achieve performance. Scales for measuring performance might include the construction project, the entire highway corridor/transit route, a neighborhood, planned development or district, or the larger network.

Lane Elimination Projects

Lane elimination projects can sometimes be accomplished as part of a Complete Streets project, and might be included in a 3R project. Under Complete Streets, there is no singular design prescription, each street is context sensitive and is designed with the goal to balance safety and convenience for everyone using the road. FDOT Districts 4, 5, and 7 have their own review processes for lane elimination.

FDOT prepared a document, "Statewide Lane Elimination Guidance" [50], the purpose of which is to assist FDOT Districts to develop their own review processes for evaluating requests they may receive from cities, counties, MPOs or TPOs, and private entities, to eliminate a lane(s) along a state road. The

[50] Kittelson & Associates, Inc., "Statewide Lane Elimination Guidance," 2014. FDOT Transportation Statistics Office.

purpose of the Guidance also is to assist in the development and eventual adoption of a statewide lane elimination policy or procedure.

Consideration for the elimination of through lanes is a concept that is gaining interest throughout the United States. Under the right conditions, it is a way to improve the multimodal level of service of a roadway. In Florida, where segments of state roads often are constrained by lack of ROW, the elimination of through lanes, in some cases, might be one option to address the issue of insufficient ROW for the addition of ADA upgrades, sidewalks, bicycle lanes and other facilities to improve pedestrian and bicyclist access to transit stops and stations.

The Guidance cited two Florida examples of lane elimination projects, including certain lengths of street along Edgewater Drive in Orlando, and Nebraska Avenue in Tampa. In these two locations, four through lanes were converted to two through lanes, with the addition of bike lanes on streets, and bus pullouts, upgraded signals, and ADA improvements. On Edgewater Drive, the lane elimination resulted in no noticeable effect on buses, speeding vehicles and crashes were reduced, and ped/bike traffic both increased. On Nebraska Avenue, the lane elimination resulted in reduced motor vehicle, ped/bike crash rates.[51] Other Florida lane elimination projects in Florida have included Atlantic Avenue in Delray Beach and Las Olas Boulevard in Fort Lauderdale.[52]

FDOT has compiled guidance for considering lane elimination, describing several existing review processes for considering requests for the elimination of lanes.[53] These include processes used in FDOT Districts Four, Five, and Seven, as well as processes used in the state of Michigan and in Sunnyvale, CA.

The Guidance discusses an example lane elimination review process and identifies process participants and their roles. Important considerations that may affect transit service and its access by ped/bike facilities include the following, as listed in Table 5 below.

[51] Ibid., p. 40-41.
[52] Ibid., p. 48.
[53] FDOT, "Statewide Lane Elimination Guidance, Phase 1: Resource Document," 2014.

Table 5: Potential Issues/Opportunities Arising from Proposed Lane Elimination Projects on Roadways with Transit Service

Consideration*	Potential effect on transit access by walking and bicycling
Project purpose	Does this support improved access by bicyclists and pedestrians to transit stops and stations?
Project schedule	Does this affect any existing or scheduled transit improvement projects?
Consistency of the proposal with the LRTP, TIP, TDP, LGCP, and other plans and Complete Streets initiatives	What plans or decisions have already been made with respect to transit service along this segment of roadway? Is the roadway identified as a future major transit corridor?
Proposed use of ROW made available after lane elimination	Are there opportunities to improve ped/bike access to transit stops and stations, if new or widened sidewalks, improved bicycle facilities, or improved transit facilities are proposed?
Proposed changes to ROW width	How does this affect existing or proposed transit service on the roadway and bicycle/pedestrian access to transit stops and stations?
Proposed design variation or design exception	Does this affect lane width, transit stops, or ped/bike facilities?
Proposed changes, if any, in functional classification and access management classification.	Might this require any bus stop relocations and subsequent sidewalk and bicycle facility improvements? For example, changes in median openings might alter pedestrian movements and the need for mid-block crosswalks.
Anticipated change in jurisdictional ownership and responsibility for maintenance of the roadway.	Might any existing memoranda of understanding or agreements need to be revised?
Plan for obtaining input and review from businesses, residents, and other stakeholders	Lane elimination project proposals generate supporters and opposition. How does the proposal affect public outlook on transit service and ped/bike connections?

* The considerations listed in the left column are identified in: Kittelson & Associates, Inc., *Statewide Lane Elimination Guidance*, FDOT, 2014, p. 23.

There are other issues and opportunities associated with lane elimination projects, as identified by the Guidance. Depending on future plans for transit service in the roadway, express buses may require a passing lane. Transit signal priority may be considered. There may be a need for bus pullouts due to automobile speeds that may delay a bus from reentering traffic.[54] Lane elimination projects on lower speed roadways may also consider adding on-street parking. The provision of on-street parking is associated with providing greater perception of comfort and safety to pedestrians because the parked cars act as a buffer separating pedestrians from traffic flow. On-street parking also can allow for curb extensions at crosswalks, reducing the distance that pedestrians must cross. However, the on-street parking may be hazardous to passing bicycle traffic as motorists open their car doors. With sufficient ROW, street design can include a five- to six-foot-wide bicycle lane adjacent to an eight-foot-wide parking lane. This configuration can enable a bicyclist to pass without crashing into an opening car door.[55]

Lane elimination projects may affect existing and future transit routes. The process of a lane elimination project may start with the development of a Concept Report by the applicant, submitted to the FDOT District Review Team. Concept reports may address the impact of the proposed lane elimination on ped/bike infrastructure, including mid-block pedestrian crossing locations. Potential impacts on transit stop locations and the transit service itself might include lane width, intersection turning radii, change in posted speed limit, and the addition, removal, or modification of traffic signals. The applicant may desire information from the transit agency, such as the number of transit patrons boarding and alighting at transit stops. The FDOT District Bicycle and Pedestrian Coordinator and Modal Development staff may serve on the Review Team.

Recommendation 74

Transit agency should consider participation in public meetings or workshops related to lane elimination requests. A review of a lane elimination request by the District may be limited to the effects of the proposed lane elimination upon the planning and operation of the affected State roadway facilities.

Recommendation 75

Transit agency may want to request that the District review include potential impacts to and opportunities for improving ped/bike access to transit stops as part of lane elimination. The transit agency may want to request the opportunity to provide input.

Such processes, as they develop and as they are implemented, should be reviewed by transit agencies, not only to provide input regarding the maintenance of safe and effective transit service along the state road, but also to evaluate the potential lane elimination impact on the entire transit trip from home doorstep to final destination. This includes the first-mile and last-mile ped/bike access to the transit stops. In concept, lane elimination projects generally provide additional roadway space for bike lanes and sidewalks, but it is important that each proposed project be reviewed for its individual merits by the transit agency.

[54] Ibid., p. 44.
[55] Ibid., p. 46.

Construction, Reconstruction, Widening Projects

Where additional ROW is needed to install transit facilities, such as bus pullouts, and sidewalks and bicycle facilities, a highway reconstruction will provide greater opportunity than a 3R project. Even if a state highway corridor is not projected to be the site of a future transit route, it may still be located within the ridership service area. If these state highways are located within the service area, they should have ped/bike infrastructure to serve those who may be using this highway as part of their journey to walk or bicycle to the bus stop.

Recommendation 76

Transit agency should consider with its FDOT District partners, what the typical section of the highway may look like at "build-out." Build-out might be later than the current long range planning horizon. In the application of Context Sensitive Solutions, discuss what the *future* context of that highway may look like.

An FDOT participant in the stakeholder workshop commented that "…from an engineering perspective, it takes just as much effort to plan a big project as a small project. Bundle projects together so that they are not so small…" This might require knowing what all the ped/bike facility needs are along a corridor.

Recommendation 77

The transit agency should encourage the local government, if it has not done so already, to develop and adopt a master plan of needed bicycle, pedestrian and transit street improvements that can be used to incorporate all needed improvements into the scope of a project at the stage of programming. In this way, the full funding for all the needed improvements is incorporated at the start.

SR 548, the Lakeland In-Town Bypass in Polk County, has no transit service presently, but FDOT installed bus pullouts in anticipation of future service.

Manatee County has concentrated upon bus stop planning and development. For example, SR 70, from 15th Street East to Lakewood Ranch was a road widening project where FDOT District 1 has been implementing bus stop improvements in the project.

For the construction of a new state roadway, or an existing roadway reconstruction, for both state and local roads that will require use of federal funding, transit agencies should be in dialogue with local and state agency partners well before the design stage. Figure 14 shows where the design phase falls in the sequential processes of roadway construction.

BCT has Planning and Engineering staff that interact almost daily in the Planning/Pre-Design/Design/Construction Phases of projects involving bus stop location/relocation, shelter improvements, pedestrian facilities, and roadway improvements.

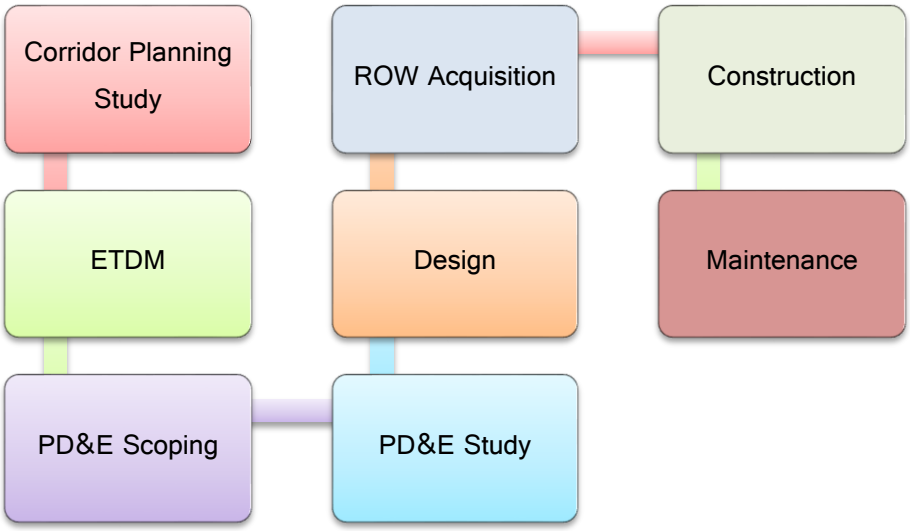


Figure 14: FDOT Processes for Roadway Construction

There are many development phases of a transportation improvement project. This process can take several years. As a result, there may be several Project Managers and Consultants working on the same project over time.

Recommendation 78

The public transit agency should communicate regularly with each successive FDOT project manager for each phase in order to keep current with project development and maintain consideration for needed ped/bike facility improvements near transit stops and stations, as the project develops.

The International Speedway Blvd project in Daytona is an example of successful coordination for placement and design of each bus stop to ensure it provided the greatest accessibility to transit users while reducing pedestrian risk. The entire project included pedestrian channelization devices and the thoughtful placement of bus stops was a key factor to optimizing the channelization devices. Collaborators that worked closely together included the FDOT project manager, the Votran transit analyst, and a consultant who was the designer, and the FDOT District bicycle and pedestrian coordinator. As this was a time sensitive design-build project there had to be a constant flow of feedback between the parties.

Transportation project development for new construction, reconstruction, and roadway widening projects generally follow several chronological steps, including the following.

1. Planning Study
2. Project Development and Environment (PD&E) Study
3. Initial Design
4. ROW Acquisition
5. Final Design
6. Construction
7. Maintenance

While these steps are chronological, they often overlap. For example, initial design may begin during the PD&E Study. The design stage and the right-of-way acquisition stage may overlap as well. The needs of transit should be considered in scoping of all project phases.

Recommendation 79

Transit agencies should participate in the electronic review process that provides the opportunity for review available before the completion of project phases.

Electronic Review Comment (ERC) System

All FDOT Districts use the Web-based Electronic Review Comment (ERC) System. The Electronic Review Comment (ERC) System is an application that tracks the entire review process for plan reviews and project submittals. Users have access to all comments and responses. Users besides FDOT staff use an Internet Subscriber Account (ISA) to access the system. The FDOT Project Manager responds to all review comments received.

FDOT, *Electronic Review Comments (ERC) System User Manual*, 2015.

FDOT Project Planning

Projects begin with a planning study. These go by many names, including area studies, concept analyses, feasibility studies, and corridor analysis and development of a recommended concept. Planning studies include multimodal or investment studies, Strategic Intermodal System (SIS) master plans and action plans, corridor management studies, access management studies, and Congestion Management System (CMS) or transportation systems management studies. These studies may look at five-, ten-, and 20 plus-year planning horizons. These studies may include transit system needs and ped/bike needs.

Planning is when a project need is established, the need of which also has been identified as part of the local government comprehensive planning process and the MPO long range transportation planning process. Need identification often is initiated by traffic modeling that may forecast future travel demand volumes that exceed current facility capacity. What is the project need? Is the need simply for more street capacity for motor vehicles or are there other transportation needs that, if met, will support the developing community as desired and articulated in the comprehensive plan?

The concept of Practical Design calls for strict adherence to highway project development that addresses the articulated "purpose and need" for the project, and no more. Because of this, it is essential in the early stages of state highway project development, that transit service, and the ped/bike access improvements to transit stops, is understood as integral to the function of that highway. This also may necessitate that the transit agency envision and engage in service development discussion among its transit agency planners and board, beyond the TDP ten-year time horizon.

Safety, capacity, cost, and community context must all be considered during planning. A project definition, its objectives, and the established need for the project and design concepts may be developed as early as the planning phase and be contained in the resulting planning report. At this phase, stakeholder issues are expected to be identified. This is an important opportunity for transit input. The decision making regarding project need and its basic concepts are decided during project planning and the PD&E study that follows, so it is critical that transit agencies, and ped/bike representatives get involved at these early stages.

Efficient Transportation Decision Making (ETDM)

To begin a Project Development and Environment (PD&E) Study, the FDOT Environmental Technical Advisory Team (ETAT) reviews databases during the ETDM planning and programming screening. The ETAT also facilitates intergovernmental interaction. The coordination with ETAT members happens through the Environmental Screening Tool (EST). The EST is an interactive database and mapping application that can be accessed on the Internet. Data come from multiple sources and the data are analyzed through GIS. The ETAT members and the public also can provide input on the proposed projects.

Recommendation 80

The transit agency should participate in this early ETAT review. The objectives of a PD&E Study are to study social and environmental characteristics, and to conduct engineering analyses to support decisions about whether a project should be built and what the basic design concept should be. The transit agency can supply helpful information during this review process that can represent the access needs of transit patrons.

There may be different needs according to scale, such as area-wide needs that relate to system deficiencies and local government desires. There also are project corridor needs that relate to route deficiencies and specific community desires within a corridor.

There is a Community Characteristics Inventory that includes demographics and neighborhood characteristics, underserved populations, environmental justice concerns, community cohesion, safety/emergency response, community character, and community goals. Physical environment issues also are reviewed, including infrastructure that includes transit.

Recommendation 81

Transit agencies should coordinate with the FDOT Planning staff and ETDM Coordinator, and Community Liaison Coordinator to provide any relevant information.

By Florida Statute, the PD&E Study is conducted to be consistent with federal National Environmental Policy Act (NEPA) requirements. These requirements apply to any project for which federal funding will be sought. The result of the ETDM process is coordination with the lead federal agency in making a determination of the Class of Action of a project, whether it is a Categorical Exclusion, or requires an Environmental Assessment or an Environmental Impact Statement. This determination is made and reported in the final Programming Summary Report (PSR). The PSR identifies the elements of project concepts that become the basis for the alternatives that are further evaluated in the PD&E Study. Elements include types of facilities, number of lanes, interchanges, intersections, and structures.

FDOT Project Development and Environment Study

A successful example of a PD&E study that addressed transit access needs is from District 4, SR 7 from the Miami-Dade/Broward County line northward five miles to the vicinity of the Ft. Lauderdale Int'l Airport. As the result of a PD&E study, $20 million was provided for the acquisition of ROW for transit stops. SR 7 has high ridership, with both express and local transit service. It is the product of a transit study of the whole corridor. Phase I was completed in 2009.

In addition to the ETDM process, the scope of the PD&E is derived from other previous work, including needs, goals, objectives, policies, and concepts articulated in the LRTP and the LGCP. Often, a planning study of some type, such as a corridor study, is conducted by the MPO that leads to recommendations for alternative corridors and for the next step of the PD&E.

The draft scope of services for the PD&E Study is to be widely circulated for comment among various professional disciplines within the FDOT District, including District planning staff and the District Design Office. The FDOT Modal Development Office and the FDOT Bicycle/Pedestrian Coordinator also should review the scope of services to determine how the project need can be addressed by public transit and how that will require ped/bike linkages. Evaluating the potential for public transit and ped/bike linkages along the corridor to address the need should be considered for inclusion in the scope.

A solid Long Range Estimate is essential to ensuring reasonable budgets are prepared to reflect the true cost of a project. This is important because planned projects are then matched to anticipated revenue. If ped/bike improvements near transit stops are initially left out of a project, it will be difficult to add them later.

During the PD&E Study, social, environmental, economic and community impacts potentially generated by the study alternatives are identified and ROW needs are measured. ROW can sometimes be more expensive than construction costs and often the ROW acquisition process drives the project schedule.

"Purchasing ROW may include ROW purchases for any previously-approved transit facility included in the plans,"[56] Lack of ROW has been cited as a main reason to decide not to include ped/bike facilities.

During the stakeholder forums conducted as part of this study, one transit agency representative described how utility poles suddenly appeared in the middle of a sidewalk, blocking ADA access. "Utility Agencies/Owners (UAOs) are major stakeholders on a majority of transportation projects. Proper location and identification of all utilities on the project and coordination with all utility companies involved is an important aspect on every project."[57]

During the PD&E study, design also begins, especially if design exceptions or variations will be sought. Key FDOT staff in the process include a PD&E project manager and a District Design Engineer. Approvals for any design exception or variations are to be obtained during the PD&E.

Turn lane requirements and lengths are usually established prior to the design phase of a project."[58] The addition of right turn lanes, for example, has been cited as a reason to have to move a bus stop, which can result in more work and expense for the transit agency, and service changes for customers. The placement of the bus stop is determined after the needs of other roadway elements are determined, such as the location of driveways and turn lanes.

Recommendation 82

The PD&E Study is a collaborative process that the public transit agency should participate in, especially if the selected preferred alternative presents potential limitations to public transit, ped/bike access to public transit, or some other transportation impacts to transit markets. At this time, the public transit agency should work with its collaborative partners to discuss how the needs of public transit and access to transit stops and stations by ped/bike facilities can be served.

Any requested changes to the plans and budget of the PD&E report after it has been finalized will require additional work and a supplemental agreement. This is why late requests are sometimes met with resistance. The FDOT PD&E Study Project Manager also may have to prepare an EA or an EIS. After the environmental documents have been finalized, any changes to the project may trigger a Reevaluation requiring the preparation of a follow-up memorandum. These changes might require amendments to design concept, design, or ROW.

The evaluation and comparison of merits of project alternatives often involve the development of a matrix of weighted criteria that include project costs, maintenance of traffic, environmental impact, socioeconomic impact, public sentiment, and fulfillment of project needs and acceptable level of service.

During the PD&E Study, a general discussion of the Build Alternative(s), are provided in the Environmental Document and must include maintenance of traffic within the construction zone, a description of all major intersection improvements, and a discussion of all non-motorized facilities, both pedestrian and bicycle, that are being considered for the project. Also, the PD&E is to "Develop

[56] Tindale-Oliver & Associates, Inc., *Accessing Transit: Design Handbook for Florida Bus Passenger Facilities*: Version III, FDOT Public Transit Office, 2013, p. 215.
[57] FDOT, *Project Management Handbook*, Chap 11: Project Continuity, 2016, p. 12.
[58] Ibid., p. 12.

alternatives to incorporate alternate modes of transportation where need and opportunity exists." And "Evaluate the types of non-motorized facilities required to meet the need as defined in the purpose and need section of the Environmental Document."[59]

During the PD&E Study, sometimes commitments are made to the community. "FDOT may make commitments to the local community during PD&E, which could include context-sensitive solutions or design features like lighting, benches, bicycle or pedestrian facilities, aesthetics treatments, landscaping." And "Before making a commitment, the action involved must be coordinated between each of the project phases. The project manager for each phase ensures that the action involved is feasible in terms of necessity, practicality, cost, and timing. Continuous coordination is vital to ensure that all commitments are appropriate and once agreed to by FDOT, are implemented. All project commitments must be properly coordinated, documented, tracked, and implemented for the project to successfully advance to completion."[60]

In summary, the transit agency should be an active stakeholder of the initial planning study, providing meaningful input to the development of the project purpose and need. The transit agency will have communicated its concerns and ideas to the FDOT Modal Development Office and the FDOT Bicycle and Pedestrian Coordinator who contribute to multidisciplinary review of the scope for the PD&E. Finally, the transit agency is an active stakeholder participant in the PD&E Study process, to maximize the opportunities for any practical design concept that emerges from the PD&E phase will include transit, pedestrian, and bicycle infrastructure right from the start.

FDOT Project Design

After the PD&E study, the project is delivered to a design project manager. The design project scope also is defined. This includes identifying needed data sources, establishing objectives, budget, and schedule. A field review of the location is done before finalizing the scope.

Recommendation 83

The transit agency should participate in the field review and ensure the availability of any needed transit data.

Within the design phase, there are recognized milestones of progress. The completion of Phase I of design corresponds to 30 percent design completion. Completion of Phase II of design corresponds to 60 percent design completion. FDOT coordination with the local government during the design phase normally happens as part of the standard reviews at the end of each design phase. During the stakeholder meetings and interviews, there was discussion about transit agencies making requests for added roadway features during the design process. It is important for the transit agency to know that requests made after 60 percent design completion are highly unlikely to be considered.

The identification of ROW needs, which begins during the PD&E phase, continues in the design phase. The development of the design may, in turn, affect the need for ROW so there may be some iteration between ROW determination and design.

[59] FDOT, Project Development and Environment Manual: Part 2, 2013, p. 6-16.
[60] Ibid., p. 32-2.

Design speed is recognized as a principle design control, and arguably, has one of the most profound impacts upon the street environment as experienced by pedestrians and bicyclists. "Designers must appreciate that the design scale of a moving vehicle is much different from the scale of a pedestrian or bicyclist, who may also be important users of the facility. Roadways in the context of an urban environment, with pedestrians and property access, require a much different scale than roadways in rural areas with expansive view sheds. Travel lanes, parking lanes, shoulders, drainage facilities, medians, clear zones, sidewalks, and bicycle lanes are all cross section elements that can be designed to accommodate vehicles and the needs of other users."[61]

The recalculation of needed ROW continues as the design phase progresses. The FDOT Plans Preparation Manual indicates that in the establishment of ROW requirements, the roadway and drainage design must be developed to a point where all major elements of the project, including transit facilities, are firmly fixed. While many decisions are made during the PD&E study, later decisions can change the design.

Recommendation 84

The public transit agency should continue its involvement beyond the PD&E study and throughout the design phase. Transit agencies should be a participant in the discussions of design scoping, where a field review is conducted and needed data is defined and the transit agency can again emphasize the transit infrastructure and supporting ped/bike access infrastructure that is needed, to encourage that it is included in the design, drainage calculations and ROW calculations. It is recommended that public transit agencies request that they also be notified about changes to median openings and access modifications, to evaluate these changes against current and planned transit routes and how these changes may affect bicycle and pedestrian access to transit stops.

Under conventional procedures, a consultant under direct contract with FDOT completes the design. Then the project is advertised for bids from contractors for the construction phase. "This end-to-end process is time consuming, but it provides excellent review and modification time."[62]

Alternatively, design-build projects can be accomplished more quickly, in which design and construction phases overlap substantially. Construction can usually begin when the final plans are 60 percent complete. Under design-build projects, "There will be constant pressure to deliver a design that will result in the lowest possible construction cost while meeting the project scope."[63] For design-build projects, it may be even more important to be clear about the role of public transit service and ped/bike accessibility enhancements to transit stops in achieving the project purpose and need. Because of less opportunity for review and modification, it is even more important for the public transit agency to use all remaining opportunities to review plans and provide input.

[61] FDOT, *Project Management Handbook*, Chap 11 Project Continuity, 2016.
[62] Ibid, p.6
[63] Ibid, p.8

Maintenance of Traffic

There must be a plan to maintain existing vehicular traffic flow through the work zone during construction. This must include ped/bike access to existing or temporarily moved transit stops. For these purposes, a Maintenance of Traffic (MOT) Plan is developed during the design phase. Usually, a 45 percent submittal includes design approaches to maintenance of traffic.[64]

[64] Florida Department of Transportation. *Project Management Handbook*. Part 2, Chapter 3. Revised 03/02/16. p. 5.

Recommendation 85

Transit agencies should be directly involved in the Maintenance of Traffic Plan development and implementation. Any proposed transit service detour routes and turns should be tested for accessibility by transit vehicles. Plans for relocating transit stops must include access via alternative pedestrian paths and bicycle routes. Bicyclists need a path that is separate from that provided for pedestrians, with signage that directs bicyclists back onto the original route beyond the construction zone. The design engineer must follow the specifications contained in FDOT Design Standards, Index 660, and Index 304.

It is important that transit agency staff review the Maintenance of Traffic Plan for safety of transit patrons and reasonableness. Temporary transit stops also require waiting areas, boarding and alighting areas, and signage. Because transit patrons must be notified in advance of the detours and locations of temporary transit stops, an involved public transit agency will know what to report.

It is important to know that upon commencement of the construction phase, it is possible that the construction contractor will propose an alternative Maintenance of Traffic Plan. Continued involvement in the process ensures that the transit agency will not be blindsided by new decisions and that the transit agency can provide prompt input as questions and issues of concern to transit service arise.

FDOT Construction

With each phase of a highway project, there is a different project manager. The transition from project design to construction also includes a meeting between the design project manager and the construction project manager and all other needed District offices. As a result, it may be important for the transit agency to be in the loop throughout a project, making sure that a transit agency representative is included on the contact list of each new project manager.

When design is complete, the transition to construction includes the implementation of the maintenance of traffic plan that was developed during the design phase. The transit agency and the District ped/bike coordinator should be involved in this and be coordinating with the consultant construction engineer and inspector, particularly as the time approaches to notify the public about transit service detours and alterations in ped/bike access to transit stops and stations.

FDOT Response to a Public Request for Traffic Control

FDOT responds to requests to add traffic control features to State highways. These requests could be for features such as audible pedestrian signals and marked crosswalks at midblock locations. Requests for a marked crosswalk midblock or at an uncontrolled approach location are initiated by a state agency or local government. Requests originating from non-governmental entities must be channeled through their local government. This initiates a study process by the District traffic operations engineer to determine if traffic control is warranted at the requested location, based upon site observations, data collection and analysis and comparison against criteria and standards of the Manual on Uniform Traffic Control Devices. The transit agency may play a role in this process.

Section 3.8 of the FDOT Traffic Engineering Manual establishes criteria for consistent installation and operation of marked pedestrian crosswalks at midblock and unsignalized intersections on the State Highway System. Meeting the minimum criteria is a requirement of approval but does not guarantee

approval of a request. The purpose of providing marked pedestrian crosswalks at midblock and uncontrolled approach locations is to improve pedestrian connectivity where there is documented pedestrian crossing demand, reduce the incidence of pedestrians crossing the street at random locations, and where the nearest controlled intersection crossing location would otherwise result in significant out-of-direction travel for pedestrians. The criteria define the minimum distance to the nearest alternative crossing location at 300 feet.

The District traffic operations engineer reviews the available information about activity at the location against established criteria, including observed pedestrian crossing volumes, average daily traffic volume, and crash history. Site characteristics of the location also are considered, including distance from other crossing locations, proximity to existing pedestrian generators, illumination, stopping sight distance and the location of nearby bus stops. This information is documented in an engineering study. The study must include documentation of any observed pedestrian-vehicle conflicts. It also must include transit stop activity data and the location of transit stops within the vicinity of the proposed crosswalk.

"Are you [the transit agency] moving the bus stop or are we [FDOT] building a crosswalk?"
Issue identified by FDOT District Transit Planner

"Consideration should be given to the location of nearby bus stops when locating a proposed pedestrian crossing. Marked crosswalk placement should seek to minimize conflicts with transit vehicles. Bus stops on the far side of a marked crossing are preferred. If feasible, bus stops can be relocated to better align with a proposed pedestrian crossing".[65]

The use of transit stop activity data and the consideration of relocating bus stops would necessitate coordination with transit agencies. However, it is important that transit agencies be notified early on by FDOT when FDOT receives a request to install a crosswalk midblock or at an uncontrolled location along a highway served by transit. Prompt notification to the transit agency that FDOT intends to conduct a study for a crosswalk along a street with transit service may give the transit agency sufficient time to consider how a crosswalk may affect the location of existing or planned transit stops and how it may affect transit riders. This gives the transit agency the opportunity to communicate related concerns or plans at the beginning of the study and not after the study is completed.

The Florida Code requires that the location of bus stops be placed for maximum safety of bus patrons, vehicles, and pedestrians (Rule 14-20.004, F.A.C.). Pedestrians should not cross the street in front of a transit bus. Placing bus stops on the far side of the street crossing would encourage pedestrians to cross the street behind the bus. However, in some cases, maximum safety may not represent the location of greatest convenience for some bus riders. In these cases, bus riders walking or bicycling to the bus stop or after they have disembarked the bus will be tempted to seek a crossing location that minimizes travel distance to their final destination. This crossing location may not be at an existing crosswalk. As a result, the planning goal is that the bus stop location of maximum safety be the starting point when establishing access locations to adjacent land uses.

[65] FDOT, *Traffic Engineering Manual*, 2016, Topic No. 750-000-005, Section 3.8.5(5)(e).

Recommendation 86

The transit agency should request that their FDOT District traffic operations engineer contact the transit agency whenever FDOT receives a request for traffic control on a street served by public transit, to initiate a joint review.

Minimizing this type of problem in the future may be addressed at the time of the site plan review for land development or redevelopment. The local government has greater control of this than the transit agency; however, transit agency staff can communicate this concern to their local government planning counterparts.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Previous chapters in this report have presented a synthesis of findings from an engagement process with Florida stakeholders representing public transit agencies, FDOT District staff, and staff representatives of local governments and MPOs/TPOs. Also presented, are discussions about the processes of metropolitan planning, local government planning, FDOT roadway improvement project processes, and actions taken by public transit agencies, all of which include opportunities to consider and plan for the placement of ped/bike infrastructure that improve accessibility to transit stops and stations. These discussions identified the timing in the processes that transit agencies can engage and contribute to the effort. The findings below summarize the characteristics of transit agency limitations and capabilities that shape the recommendations for the appropriate role of public transit agencies in the provision of this infrastructure.

During this study process, FDOT District, local government, and MPO/TPO partners agreed clearly that public transit agencies should take a more active role in identifying, planning, and prioritizing ped/bike accessibility infrastructure needs to increase both safety and transit ridership. Ideally, transit agencies should be "plugged in" to their partners' planning processes on a continual basis as roadway improvement project opportunities develop and progress. Since a more active role by transit agencies requires more staff resources and expertise than many can presently offer, it is recommended that opportunities for additional funding for transit agencies be explored to engage transit agency planners in joint development of coordination processes, in a program of data sharing and in the designation of a knowledgeable transit agency liaison to participate in coordination meetings**.**

a) The coordination processes would include the development of a standardized and predictable process to address requests to remove or relocate bus stops due to ADA, safety, or other operational issues, a decision making process to add right turn lanes that may displace existing bus stops, and a process for considering requests for traffic control that also may affect the location of bus stops and their ped/bike accessibility.

b) Data sharing includes developing a program for transit agencies to provide their bus stop infrastructure inventory (including ADA compliance) and transit rider travel characteristics data, such as automated passenger count data at bus stops, in a standardized format that can be shared with agency partners. This data sharing can aid partners in identifying ped/bike and ADA facility gaps/needs near transit stops for purposes of project scoping to improve safety and access. The data sharing effort should be expanded to include:
   - the identification of ped/bike accessibility performance measures (as discussed further below);
   - the identification of any new data needed to support the effort; and
   - an agreement identifying which agency collects the data and how it is collected.

c) Participation in additional meetings includes project scoping, field reviews, and providing input at key junctures in the process. This designated transit agency liaison to attend meetings should be one that is knowledgeable about the process, understands the operational issues being discussed, and is familiar with future service plans. The liaison would follow the process to

accumulate the known history of the project and provide continuity of the dialogue so that a coordinative relationship can be developed by agency partners with that liaison. Alternatively, this liaison role could be outsourced, for example, to a consultant with more experience with roadway improvement processes and who could serve in the role of ongoing coordinator.

Transit Agency Limitations

- Dedicated funding is a major limitation as well as what the agencies can do based on their relative size. Smaller agencies have fewer resources, particularly staff resources and expertise, such as planners and engineers.

- Capabilities based upon their institutional status can be another limitation. For example, a transit agency that is a department within local government may have less control than an independent authority, particularly if locally elected leaders choose not to prioritize transit service. In some cases, the transit agency may not possess an independent vote on the MPO Board if the public transit agency is a department within local government, and an elected local government official is designated as the transit agency representative. While the FAST Act requires that public transit be represented on the MPO Board, the designated local government official who serves in this capacity will require a heightened knowledge of transit operations and facility needs.

- Alternatively, the transit agency might derive more power to take action if, for example, the agency is part of a more centralized organization whose elected leaders support public transportation. For example, JTA has the authority to build roadway improvements enabling transit enhancements to better integrate into multimodal planning.

- Transit agencies may not control or own the transportation corridor ROW upon which bus and rail cars operate. This guest status requires transit agencies to operate within the regulatory environment and planning processes of their transportation facility hosts.

- Transit agencies do not control land use planning, regulation, and development approval decisions. They must plan and operate routes for the existing land development patterns of their service areas. In many Florida communities, service areas may be characterized by dispersed land development and a street network that already limits accessibility.

- Transit agencies also depend upon the support of elected bodies to champion and direct staff to develop multimodal facilities in both transportation corridors and adjacent land development. Without the support of elected leadership, government planners are limited in the assistance they can provide to transit agencies in the placement of ped/bike infrastructure.

- Despite the limitations, transit agencies have other capabilities that provide opportunities to positively improve the walking and bicycling environment surrounding transit stops.

Transit Agency Capabilities

- Within their control, transit agencies have the capability to expand, reduce, or alter transit routes to maximize accessibility while improving service efficiencies. In this way, careful route placement can serve to moderate the distance that must be traveled on foot and by bicycle, to and from the transit stop. Transit agencies can judiciously locate transit stops, in

coordination with local and state partners, to align more closely with desired destinations and the existing or planned ped/bike street infrastructure.

- Transit agencies can anticipate future roadway improvement projects, including safety projects, roadway maintenance projects (such as 3R projects), new roadway construction projects, roadway improvements in response to local requests for traffic control, and street improvement opportunities coincident with land development and redevelopment. These future projects may contain opportunities to include ped/bike enhancements.
- Transit agencies can collect and analyze data about the transportation service needs of their ridership and develop future service concepts as part of the transit development plan. These activities can include determining "first mile/last mile" ped/bike facility needs.
- Transit agencies can participate in planning processes of their partner agencies and provide ideas and recommendations as well as request transit and ped/bike infrastructure.
- Transit agencies can address their elected officials, their planning counterparts, and the public in their marketing efforts to build support for transit's role as an essential community service, now and in the future.
- Transit agencies can improve the facilities within the footprint of the bus stop. Beyond ADA compliance for accessible bus stops, transit agencies also can add features, such as bicycle racks. Transit agencies can approach the delivery of such access improvements systematically, by including them in transit stop design guidelines. This may mean anticipating the need for bicycle parking and planning for transit stops of a size that are somewhat larger than the 5-foot by 8-foot minimum standard size.
- Transit agencies can choose to contribute a portion of their FTA funds to local governments and FDOT for ped/bike facilities that improve access to transit stops and stations.

Recommendations

Recommended Role of Transit Agencies

The options available for public transit agencies in the provision of ped/bike facilities to improve access to transit stops and stations may vary depending upon the extent of leadership demonstrated by a transit agency's collaborative partners and stakeholders. Stronger leadership by partners can enable transit agencies to concentrate upon the following activities.

Data Sharing

With respect to the placement of ped/bike street facilities that could improve access to transit stops and stations, public transit agencies often can respond to opportunities where state or local government is planning for roadway improvements. These could either be stand-alone roadway improvement projects (i.e., new construction, 3R, safety improvement, or traffic control improvement) or as part of roadway improvements needed in response to land development. One of the best ways to coordinate with planning partners is to share transit data, if possible, in a format that partners can use. These data may include output from automated passenger counters that collect counts at the stop level, transit stop inventory data that documents the conditions at each bus stop, and also the routes

and bus stop locations in GTFS. Data may also include socio-demographic characteristics of transit ridership, origin-destination data, market analyses, survey data, and other necessary information collected as part of comprehensive operations analysis and transit development plan updates.

Providing transit service-related data enables state and local government partners to incorporate transit stop and associated ped/bike access improvements into roadway improvement planning and design. Ideally, the transit agency is able to provide data in a format that is requested by the recipient. In general, the best data formats are those that are widely used, thoroughly documented, and are "machine readable."

For example, if the agency wants to share GIS data, the most widely used format is ESRI's shape (shp) file format. Many GIS software applications can read and write this format. The second GIS data type used with Google Maps and Google Earth is called Keyhole Markup Language or KML. These two formats are common and many software applications are able to import, read and/or write to both KML and shape file formats. If the agency wishes to share data that do not have geographic components, then it is recommended to provide the data in text format, such as Excel, Access, comma separated values (csv).

All of the above types of data should also be documented using a data dictionary. The data dictionary will describe what each field of the data means. All data should be machine readable, meaning that software is able to interpret the information and the data residing within the file are shared. The above mentioned formats are machine readable. An example of a non-machine readable format would be a PDF or a jpg (any image file).

The transit agency also possesses the potential to glean a wealth of experiential and observational information from its transit riders and from its own bus operators. No one understands the access problems better than the transit patrons and bus operators. Any observations from transit patrons and bus operators that shed light on access issues to the transit stop could be further investigated and verified through direct observation in the field by transit agency planners and engineers, then brought to the coordination process with interagency partners.

Soliciting input from transit riders regarding their pedestrian and bicycling journeys to and from the transit stop could be conducted through surveys, interviews, or input from social media, phone calls, and phone apps, such as SeeClickFix that follow the Open311 standard. Open311 allows anyone to report problems (like broken bus benches or damaged sidewalks) to the transit agencies or city traffic departments that can fix them. An important aspect of SeeClickFix is the follow through to address the complaint and communicate how the complaint was addressed to the transit patron who took the time to complain. Likewise, explaining how such input will be used in the programming for ped/bike infrastructure improvements, communicates that such input is treated as valuable.

Bus operators also observe pedestrian and bicyclist behavior and should be encouraged to provide information describing how and from where transit patrons are accessing transit stops. Transit agency planners could invite bus operators to share their insights about the environment surrounding transit stops and how bicyclists and pedestrians navigate that environment. For example, bus operator observations could include locations where there is frequent jaywalking or how bicyclists are reaching the transit stop in the absence of bicycle facilities.

A new reporting mechanism could be used to help collect these observations. FTA has recently issued a series of rules to implement safety performance measures as required by MAP-21. Transit agencies will be implementing safety management systems. As part of this effort, there are subcomponents, including a process for hazard identification and analysis.[66] While the locations of interest for transit safety are largely identified only as the environment on the transit vehicles, or at the transit stop waiting areas, and at vehicle maintenance facilities, the process that transit agencies will be taking to develop safety reporting programs for their "front-line" employees also might be extended for reporting observed ped/bike access problems by transit patrons. Safety issues are sometimes caused by problems with access. It also is recommended that transit agency planners and managers consider hiring outside facilitators to conduct focus groups with bus operators for identifying ped/bike problems accessing transit stops.

Performance Indicators

The federal transportation reauthorization law, Moving Ahead for Progress in the 21st Century Act (MAP-21) provided requirements under 23 U.S.C. 150(c), for the establishment of performance measures, including for the areas of safety, the National Highway System (NHS), and performance measures for the Congestion Mitigation and Air Quality (CMAQ) improvement program. These performance measures will affect how Federal and local funding will be allocated. The performance measures will be used by states and MPOs to measure the effectiveness of proposed projects as part of their planning processes.

Actions taken in partnership to increase public transit ridership also can help achieve the goals of congestion reduction, improving system efficiency and enhancing transportation performance while protecting the environment. This may call for asking host municipalities and entities that own transportation rights-of-way to consider and adopt alternative performance indicators and targets that measure intermodal seamlessness and the quality of the entire multimodal trip.

Transit agencies can coordinate with their FDOT District, MPO and local government counterparts to achieve transportation system performance, not only by performance as reported to the federal government, but also by performance as prioritized by the communities that the transit agencies serve.

Participants at the stakeholder forums developed the following recommendations for a coordinated effort to measure transit accessibility as the basis for identifying infrastructure gaps and identifying needed ped/bike improvements.

- Clarify goals for ped/bike access to transit. These goals could address problems relating to mobility, health, safety, ADA accessibility, etc. Defining the problem and clarifying the goals is the foundation for developing performance measures and identifying data that could be collected and used to measure performance. Local government comprehensive planning should address this.
- Coordination requires grassroots participation. While there are various citizen committees, such as the ped/bike advisory committee, more public involvement is needed to better define the problem and clarify goals.

[66] Federal Transit Administration, "The Path Towards Safety Management Systems Implementation." *2016 Florida Safety Summit*, Florida Public Transportation Association, 2016.

- Inventory pedestrian, bicycle, and transit capital facilities and activity, by transit stop and by corridor. Performance measures need to be consistent across participating coordinating agencies so that data can be shared and compared.
- Agency cooperation in the collection and sharing of data is needed on all transportation improvement project phases and funding. Form data coordination teams within TPOs, MPOs and transit operators, etc. These teams would meet for the explicit function of exchanging data, establishing goals, and assessing regional performance measures.

Beyond state and MPO transportation performance reporting to the federal government, states, and communities also can establish additional performance measures. For example, the State of Washington is experiencing growth and development issues similar to those experienced in Florida. The Washington State Public Transportation Plan (WSPTP) contains the goal of access: "Provide and sustain a transportation system that allows people of all ages, ability, and geographic locations to access jobs, goods, services, schools and community activities."[67] The WSPTP aims to develop a decision making framework focused on system performance and multimodal integration, with performance measures to be developed for its *Public Transportation Dashboard* containing the following.

- Quality last mile/first mile transit access
- Special needs access
- Reduced system gaps
- Available transportation by subarea
- Frequency of local transit
- Access to public transportation by race, disability and income
- Access to human services and schools
- Access to jobs through means other than driving alone

Performance measures for access also might include the percentage of intersections in a subarea that are designed for pedestrians, bicyclists, and transit, and the percentage of residents who can travel to key destinations within a 30-minute walk.[68]

Peak period person throughput (PPPT) is an alternative performance measure that emphasizes moving people (rather than vehicles) and preserves a multimodal focus.[69] A performance indicator such as this would support multimodal investment in public transportation and ped/bike facilities.

Local governments also can establish multimodal performance measures as part of comprehensive planning. The National Association of City Transportation Officials has recognized the importance of performance measures in its *Transit Street Design Guide*. The chapter on performance measures discusses measuring the performance of the whole street as a transportation corridor and as a public place. Several potential performance measures are considered, including the number of destinations reachable by residents in set amounts of time. "Applying this measure to the transit-walking system creates a master effectiveness metric that can be applied to evaluate potential large transit investments

[67] Washington State Public Transportation Plan (WSPTP), Olympia, WA, 2015.
[68] Center for Urban Transportation Research, *Transportation Demand Management Guidance for Corridor Planning Studies*, Washington State Department of Transportation, 2016.
[69] Transportation Research Board Committee on Transportation Demand Management (ABE50), *Draft System Performance Measures Input, 2013.*

or changes in network structure."[70] It also could be applied to evaluate the effectiveness of ped/bike facilities as linkages to the transit system.

The 2060 Florida Transportation Plan (FTP) was recently adopted. The FTP includes the goal to make transportation decisions to support and enhance livable communities, with walkability indicators listed as a potential metric for livability. The FTP also includes the goal to improve mobility and connectivity for people and freight with accessibility to public transportation facilities listed as a potential indicator. The FTP addresses implementation, measuring and tracking progress by urging all partners to "Expand the use of consistent performance measures and indicators, based on FTP goals and objectives…"[71] Most recently, FDOT has engaged interagency dialogue as part of the FDOT Performance Summit 2016. The Summit held a series of interactive webinars on several topics, including safety, preservation, economic, mobility, and environment. Within the topic of mobility, one of the core measures for accessibility was ped/bike facilities.[72]

In the update of plans by the transit agency, local government, and FDOT, it is recommended to identify and articulate shared goals, and where plans of different entities interface. Plans include not only the FTP, but also strategic safety plans, bicycle master plans, pedestrian master plans, public trails master plans, the transit development plan, and the local government comprehensive plan.

It is recommended that transit agencies in Florida engage in dialogue with its partnering agencies to consider use of some performance measures that are jointly adopted by all the collaborative partners. This would recognize the goals shared in common among the collaborative partners to serve multimodal travel, and to promote joint efforts to better link transit with pedestrian and bicycling modes.

Recommendations for Processes of Transit Agencies and Their Partners

Throughout the body of this report, recommendations have been provided as they relate to planning processes used by the FDOT District, local government, MPO/TPOs, and public transit agencies. Some of the key selected recommendations are highlighted here.

MPO Processes

Recommendation 7

Public transit agencies should participate in the development of the criteria and project prioritization process of the transportation improvement program.

Recommendation 11

Where the public transit agency is a department within local government, the transit agency should seek a formal designation within the MPO by-laws as to which seat of the local elected body is to serve as the transit representative.

[70] National Association of City Transportation Officials (NACTO), *Transit Street Design Guide*, Island Press, 2016, p. 191.
[71] FDOT, 2060 Florida Transportation Plan, 2015, p. 25.
[72] More information about the Performance Summit can be found at http://www.dot.state.fl.us/agencyresources/performance.shtm

Recommendation 14

Guidelines for the composition of citizen advisory committees should ensure that the complete user base is represented, including those who use transit for their primary transportation. For example, the rules for the composition of Bicycle and Pedestrian Advisory Committee representation should explicitly identify transit patrons.

Public Transit Agency Processes

Recommendation 18

Early in transit corridor development, the transit agency should ask the consultants, designers and other stakeholders to complete a few trips from home to work, grocery, etc. by riding the transit service along the corridor under study, to better understand the challenges associated with pedestrian and bicycle access to transit.

Recommendation 22

Where ROW is constrained along highways with transit service, transit agencies should work with their local government partners to determine where ped/bike improvements can be added to parallel local streets.

Recommendation 23

Public transit agencies should develop transit stop guidelines, if they have not already done so. While the guidelines themselves generally do not address ped/bike access improvements beyond the transit stop, having guidelines is an initial means to engage local governments in ongoing planning for transit service and can start the larger discussion about the need for improved roadway access to transit stops by pedestrians and bicyclists. Developing the design guidelines jointly with the host local government is a stronger way to engage the local government as a partner in improving transit service access.

Recommendation 24

Transit agencies should ask that their transit stop shelter design guidelines be adopted by the host local government into its land development code by reference.

Recommendation 25

Transit agencies should consider conducting a bus stop inventory in coordination with the FDOT District and the local government, to include a compatible data overlay of street infrastructure, provided by the FDOT District for state roads and the local government for local roads.

Recommendation 26

Transit agencies should request that the MPO conduct a transit access needs assessment, in coordination with the FDOT District ped/bike coordinator and local government staff, to identify priority locations and recommend ped/bike improvements, with input from the transit agency staff, citizen advisory committee and the BPAC. The ped/bike needs assessment could be coordinated with an inventory of existing and planned transit stops.

Recommendation 27
A clear presentation of ped/bike access needs to transit stops should be incorporated in the transit development plan (TDP), because local governments refer to the TDP and other related plans as part of the local comprehensive plan update, as well as updates to implementing regulations.

Recommendation 33
Transit agencies should consider, as part of their transit stop design guidelines, a larger minimum size concrete pad to accommodate at least one bicycle rack.

Recommendation 38
Transit agencies should consider conducting surveys of bicycle riders, as part of a comprehensive operations analysis, to determine where bicyclists board/alight the bus, nearest cross street of trip origin/destination to determine route taken to/from the transit stop, and to calculate distance bicycled to the bus stop.

Local Government Processes

Recommendation 47
Transit agencies should encourage local governments to develop an urban design component to their comprehensive plans.

Recommendation 48
Transit agencies should work with their local government toward the development of a ped/bike component that includes transit connectivity as part of a master plan with a time horizon that encompasses forecast build-out. This could be longer than 20 years.

Recommendation 49
Transit agencies should seek out local government pedestrian, bicycle, and multi-use trail planning processes, and participate on an advisory committee in the updates of these plan components. A strongly weighted criterion for identifying and prioritizing ped/bike improvements should be the locations proximate to transit stops.

Recommendation 50
Transit agencies should participate in the comprehensive plan update process of their host local community (ies) and ask for a broader recognition in policies, objectives, and tactics to strengthen ped/bike connectivity to transit.

Recommendation 53
Transit agencies should work with their local governments to incorporate land development code requirements for sidewalks on both sides of the street.

FDOT Processes

Recommendation 64
Transit agencies should review their FDOT District Five-Year Work Program that is adopted by the FDOT Secretary every July.

Recommendation 69

Transit agencies should seek ongoing feedback from their transit patrons, including persons with disabilities, regarding their experiences walking or bicycling to the transit stop and any difficulties they experienced.

Recommendation 78

Transit agencies should work with each successive project manager of the many phases of a roadway construction project.

Recommendation 80

For construction and reconstruction projects, the public transit agency should get involved at the planning and the PD&E study stages.

APPENDIX A: OPTIONAL FACILITIES CHECKLIST FOR NEW CONSTRUCTION AND ALTERATIONS

This optional checklist[73] provides a format for design review of new or altered facilities and for inspection during construction. It can also be used for review of existing facilities to determine whether maintenance or corrective action is needed. The checklist includes all of the Section 810 transportation facility requirements and the Section 201 requirements for stairways. Other requirements in the DOT Standards apply if they are included in transportation facilities (e.g., public toilets and drinking fountains), but are not included in this checklist. In addition, this checklist does not address the exceptions in Section 206.4.4 specific to key stations.

Contents of the Checklist

Section		Complete for new or altered station elements
1	Parking	☐ Yes ☐ No Number of Facilities:
2	Passenger Loading Zones	☐ Yes ☐ No
3	Bus Boarding and Alighting Areas	☐ Yes ☐ No
4	Accessible Routes	Number of Route Segments:
5	Directional Signs	
6	Curb Ramps	☐ Yes ☐ No
7	Entrances	Defined Entrance? ☐ Yes ☐ No Undefined Entrance? ☐ Yes ☐ No
8	Doors	☐ Yes ☐ No
9	Ramps	☐ Yes ☐ No
10	Stairs	
11	Elevators	☐ Yes ☐ No Number of Elevators:
12	Platform Lifts	☐ Yes ☐ No Number of Lifts:
13	Escalators (New Stations)	☐ Yes ☐ No Number of Escalators:
14	Ticketing and Automatic Fare Vending	Ticketing Area? ☐ Yes ☐ No Automatic Fare Vending? ☐ Yes ☐ No Fare Gates? ☐ Yes ☐ No
15	Platforms	Side? ☐ Yes ☐ No Number of Side Platforms: Center? ☐ Yes ☐ No Number of Center Platforms:
16	Mini-High Platforms	☐ Yes ☐ No Number of Mini-highs:
17	Public Address Systems	☐ Yes ☐ No
18	Clocks	
19	Telephones	☐ Yes ☐ No
20	Areas of Refuge	☐ Yes ☐ No

[73] Reproduced from Transportation Facilities Attachment 3-1, FTA Circular 4710.1, Americans with Disabilities Act (ADA): Guidance, November 4, 2015. pp. 3A-1 through 3A-26

Parking

(DOT Standards 208, 502)

Accessible Parking Spaces	
Are spaces provided for visitor self-parking?	☐ Yes ☐ No
Are the spaces owned, leased, or operated by the transit agency? If yes, complete the following for each parking facility	☐ Yes ☐ No
Total parking spaces provided	
Number of designated accessible parking spaces provided	
Number of accessible spaces required per table below (If parking is provided in multiple facilities, standards require accessible spaces to be calculated for each facility, and numbers rounded up to the next whole number (208.2))	
Number of designated van spaces provided	
Number of van spaces required (standards require one in every 6 accessible spaces, but not less than 1 to be designated "van accessible" (208.2.4))	

Total Spaces	**Minimum Accessible Spaces Required**
1–25	1
26–50	2
51–75	3
76–100	4
101–150	5
151–200	6
201–300	7
301–400	8
401–500	9
501–1,000	2 percent of total
1,001 and over	20 plus 1 for each 100 over 1,000

Note: Where parking serves more than one accessible entrance, the standards require parking spaces to be dispersed and located on the shortest accessible route to the accessible entrances (208.3.1)
Parking space and access aisle: Slope ≤ 1:48 (2.1%) (502.4)

Passenger Loading Zones

(DOT Standards 209, 503)

Number	Note OK, No, or N/A. Note dimensions if No
Where loading zones are provided, at least one accessible loading zone space provided (209.2)	
At least one accessible space in every 100 linear feet of total loading zone space (209.2.1)	
Vehicle Pull up Space (503.2)	
≥ 96" wide and ≥ 20' long	
Access Aisle Location (503.3)	
Adjacent to vehicle pull-up space	
Adjoins/connects to an accessible route	
Does not overlap vehicular way	
Access Aisle Dimensions	
≥ 60" wide (503.3.1)	
Extends full length of vehicle pull-up space it serves (503.3.2)	
Surface	
Access aisle marked with surface treatment to discourage parking in access aisle (503.3.3)	
Vehicle pull-up space and access aisle: Stable, firm, and slip resistant and no changes in level > ¼" (503.4) (302.1)	
Vehicle pull-up space and access aisle: Slope ≤ 1:48 (2.1%) in all directions (503.4)	
Vehicle pull-up space and access aisle at same level with no changes in level (503.4)	
Vertical Clearance (503.5)	
At least 114" vertical clearance at vehicle pull-up spaces, access aisles, and vehicular route from entrance to passenger loading zone, and from passenger loading zone to vehicular exit	

Bus Boarding and Alighting Areas

(DOT Standards 209, 218.4, 810)

Identify bus boarding and alighting facilities within the scope of review and complete the following sheet for each of them. Where the transit entity does not control the facility and connections to and from it, coordination with the municipality or other controlling entity is recommended.

Control	Note OK, No, or N/A. Note dimensions if No
Does transit entity control the bus boarding/alighting facility? (209.2.2) (810.2)	
Connections	
Accessible route between all bus stops within site and accessible entrance (206.2.1)	
Accessible route to streets, sidewalks, and pedestrian paths (810.2.3)	
Boarding and Alighting Area (810.2.2)	
≥ 96" perpendicular to the roadway, from curb or road edge	
≥ 60" long parallel to the roadway	
Slope (810.2.4)	
Parallel to the roadway the slope is the same as the roadway, to the maximum extent practicable	
Perpendicular to the roadway the slope is ≤ 1:48 (2.1%)	
Bus Route Signs (810.4)	
Non-glare finish (703.5.1)	
Contrast between characters and background (703.5.1)	
Width of uppercase "O" is between ≥ 55% and ≤ 110% of the height of uppercase "I" (703.5.4)	
Character height meets 703.5.5 to maximum extent practicable (See Circular Facilities Checklist Section 14 – Ticketing and Automatic Fare Vending.) Note: Bus schedules, timetables, and maps not required to comply	
Characters upper or lower case (703.5.2)	
Characters "conventional" in form: no italic, oblique, script, or highly decorative (703.5.2)	
Width of uppercase "I" ≥ 10% to ≤ 30% of the height (703.5.7)	
Closest characters spaced between ≥ 10% and ≤ 35% of the character height (703.5.8)	
Bus Shelters (218.4)	
Connected by an accessible route to bus boarding and alighting area (810.3)	
Clear floor space of ≥ 30" by ≥ 48" entirely within shelter (305.3) (810.3)	
One side of the clear floor space adjoins accessible route (305.6)	
If the clear floor space is confined on any of three sides, width ≥ 36" for front approach or length ≥ 60" for parallel approach (305.7)	
Clear floor space: Surface stable, firm, and slip resistant and no changes in level > ¼" (305.2) (302.1)	

Accessible Routes

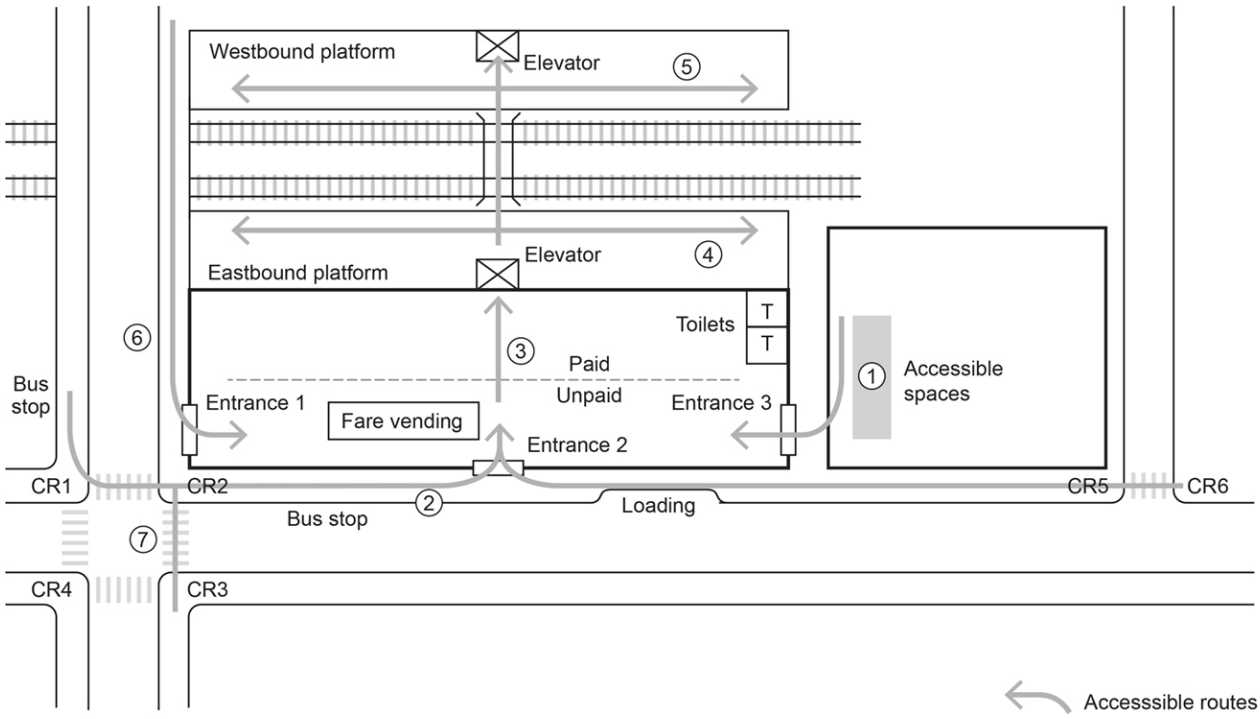
(DOT Standards 206, 207, 402, 403)

Identify routes that people use to get from points of arrival to a platform and all station elements such as ticketing, telephones, bathrooms, etc. Using example below, prepare a sketch or use an available site plan and floor plans. Then number and name each route for use while walking, applying the checklist. For design review, mark accessible routes on plans.

Note arrival points, including:

- Public sidewalks from adjacent land uses/city blocks (include curb ramps (CR) and street crossings adjacent to the facility)
- External bus loading for each adjacent bus route serving the facility
- Each separate area of accessible parking
- Each separate area of accessible loading
- Each accessible entrance Note elements within the facility, including routes:
- To and along each internal bus platform
- To and along the full length of each rail platform
- To each separate area of waiting, ticket vending, telephones, toilet rooms, etc. (group these if appropriate to simplify number of routes)

Example: “Route 1 from accessible parking through station entrance to unpaid area; Route 2 from bus stop and loading to unpaid area; Route 3 from unpaid area via elevator to eastbound platform; Route 4 along length of eastbound platform; etc.”



Sample Drawing of Accessible Routes to Below-Grade Rail Station

Assess each accessible route and note OK, No, or N/A Note dimensions if No	Route					
	1	2	3	4	5	6
Accessible route coincides with general public route and minimizes distance relative to general public route (206.3 as modified by Part 37 Appendix A); If accessible route is longer, record distance						
Accessible routes are interior where circulation paths are interior (206.3)						
At least one accessible route connects all transportation system elements required to be accessible at the same site (206.2.2)						
Doors ≥ 32" wide open to 90° to opposite stop (404.2.3) (See Circular Facilities Checklist Section 8 – Doors)						
Route length no more than 24" if reduced to 32" wide min. (403.5.1)						
Reduced width segment separated by segments ≥ 36" wide for distance of ≥ 48" (403.5.1)						
If route is < 60" wide, space ≥ 60" wide x 60" long at intervals do not exceed 200' (403.5.3)						
Where accessible route makes U-turn around an obstacle ≤ 48" wide,						
Pathway width is ≥ 42" on approaches (403.5.2)						
Pathway width is ≥ 48" in turn (403.5.2) EXCEPT where the clear width at the turn is 60" (1525 mm) minimum compliance with 403.5.2 shall not be required						
Vertical clearance ≥ 80" except at door closers and door stops (307.4)						
Vertical clearance ≥ 78" at door closers and door stops (307.4)						
If area adjoining accessible route has vertical clearance < 80", cane- detectable barrier is ≤ 27" above floor (307.4)						
Objects protrude from walls into the accessible route ≤ 4" between 27" and 80" above the floor, EXCEPT handrails may protrude ≤ 4 ½" (307.2)						
Objects protrude from posts or pylons into the circulation path ≤ 12" between 27" and 80" above the floor (307.3)						
Surface stable, firm, and slip resistant (302.1) and cross slope ≤ 1:48 (2.1%) (403.3)						
Vertical changes ≤ ½" (303.4)						
Vertical changes between ¼" and ½" are beveled with slope ≤ 1:2 (303.3)						
Untreated vertical changes ≤ ¼" (303.2)						
Any opening in floor, surface, or gratings: openings ≤ ½" (302.3)						
Long dimension of openings perpendicular to direction of travel (302.3)						
At track crossings, horizontal gap on the inner edge of each rail ≤ 2½" (810.10) and crossings comply with requirements for surface and level change						

Directional Signs

(DOT Standards 216.3, 216.4, 703)

Locate directional signs identifying routes to station elements (e.g., to accessible entrances and egresses, elevators, bus facilities, etc.). List signs and routes with sequences of signs:

Sign/Route 1: _____ Sign/Route 4: _____
Sign/Route 2: _____ Sign/Route 5: _____
Sign/Route 3: _____ Sign/Route 6: _____

Assess each accessible route and note OK, No, or N/A Note dimensions if No	Sign/Route					
	1	2	3	4	5	6
Where accessible route diverges from general public route, visual signs are required that show direction to accessible egress and route (216.3, 216.4.3, IBC 2003, 1007.7) Is number and location of signs sufficient to show direction?						
Sign Characteristics (703.5)						
Non-glare finish (703.5.1)						
Contrast between characters and background (light on dark, dark on light) (703.5.1)						
Characters conventional in form. No italic, oblique, script, highly decorative, or other unusual forms (703.5.3)						
Fonts where width of uppercase “O” is between ≥ 55% and ≤ 110% of the height of uppercase “I” (703.5.4)						
Stroke thickness: width of uppercase “I” ≥ 10% to ≤ 30% of the height (703.5.7)						
Character spacing: closest characters spaced between ≥ 10% and ≤ 35% of the character height (703.5.8)						
Line Spacing: spacing between the baselines of separate lines of characters ≥ 135% and ≤ 170% percent of character height (703.5.9)						
Sign Character Height (703.5.5 and Table 703.5.5)						
For characters ≥ 40” and ≤ 70” above the ground and viewed from < 72 inches horizontal, height of uppercase letter “I” ≥ 5/8” (703.5.5)						
For characters > 70” and ≤ 120” above the ground and viewed from < 180 inches horizontal, character height of uppercase letter “I” ≥ 2” (703.5.5)						
For signs > 120” above the ground and viewed from < 21 feet horizontal, character height of uppercase letter “I” ≥ 3” (703.5.5)						
Note: Use Table 703.5.5 to increase character height for longer horizontal viewing distances.						

Curb Ramps

(DOT Standard 406)

Curb ramps or ramps are required wherever there is a vertical change of ≥ ½" on an accessible path

(303.4). Identify locations where curb ramps are on the accessible route and/or curbs where there are no ramps. Attach additional sheets for additional curb ramps and identify locations on map or diagram.
Curb Ramp 1: _____ Curb Ramp 4:_____
Curb Ramp 2: _____ Curb Ramp5:_____
Curb Ramp 3: _____ Curb Ramp 6: _____

Note OK, No, or N/A. Note dimensions if No	Ramp Location					
	1	2	3	4	5	6
Ramps (except flared sides) at marked crossings are within the markings (406.5)						
Diagonal curb ramps at marked crossings have ≥ 48" clear from ramp bottom to the marking (406.6)						
Ramp ≥ 36" wide, not including flared sides (406.1) (405.5)						
Landings ≥ 36" long and ≥ width of the curb ramp located at top of ramp (406.4)						
Transition to adjacent surfaces of walks, gutters, and streets shall be at the same level (406.2)						
All ramp slopes, ≤ 1:12 (8.3%) (406.1) (405.2)						
Side flares ≤ 1:10 (10%) (406.3)						
Cross slope ≤ 1:48 (2.1%) (405.3)						
Ramp slopes at sites where space limitations exist,						
≥ 1:10 (10%) to ≤ 1:8 (12.5%) for ≤ 3" rise (405.2)						
≥ 1:12 (8.3%) to ≤ 1:10 (10%) for ≤ 6" rise (405.2)						
Counter slope of adjoining gutter, road, or accessible route surface ≤ 1:20 (5%) (406.2)						
Islands at street crossings either:						
Cut through level with the street surface (406.7)						
Curb ramps provided at both sides of island with a ≥ 48" long ≥ 36" wide level area connecting the ramps (406.7)						
Detectable Warnings (406.8, 705)						
Width: (406.8)						
Full depth of curb ramp or						
≥ 24" from the back of curb						
The detectable warning contrasts visually with adjoining surfaces, either light-on-dark or dark-on-light (705.1.3)						
The detectable warning consists of raised truncated domes with:						
Base diameter ≥ 0.9" to ≤ 1.4" and top diameter 50% to 65% of base diameter (705.1.1)						
Height of 0.2" (705.1.1)						
Center-to-center dome spacing ≥ 1.6" to ≤ 2.4" and base-to-base dome spacing ≥ 0.65" (705.1.2)						

Entrances

(DOT Standards 206, 207)
Label each entrance below (also note on sketch). Also label any exit doors that are not also entrances.
Entrance 1:_____ Entrance 2: _____
Entrance 3:_____ Entrance 4:_____
Entrance 5:_____ Entrance 6: _____

Note OK, No, or N/A. Note dimensions if No	Entrance					
	1	2	3	4	5	6
Accessibility						
At least 60% of all public entrances accessible (206.4.1)						
All direct access to facility from parking structure accessible (206.4.2)						
At least one accessible entrance for each group of transit routes (206.4.4.1)						
If direct connections to commercial, retail, or residential facilities, each must have an accessible route from point of connection to boarding platforms and accessible transportation elements (206.4.4.2). See Checklist Section 8 – Doors.						
Signage at Entrances (216.6)						
If an entrance is not accessible, signage complying with 703.5 at entrance and along path accessible path of travel directs to nearest accessible entrance						
Accessible entrance, when not all entrances are accessible, is designated with ISA						
Signage at Exit Doors (216.4)						
Doors at exit passageways identified by tactile signs complying with 703.1, 703.2, and 703.5. See Advisory 216.4.1 regarding exit passageways.						
Tactile Sign Location						
If visual entrance sign ("station name" or "entrance") is provided at an entrance, then raised letter and braille signs are also provided at all such entrances in uniform location (810.6.1, 703.2, 703.4)						
Single door: Tactile sign is provided at latch side of door						
Double door two active leafs: Tactile sign is provided at right side of door						
Double door one active leaf: Tactile sign is provided on the inactive leaf						
Doors with closers and without hold-open devices: Tactile sign as described above, or push side of door						
If no wall space at prescribed location, sign on nearest adjacent wall						
Signage for Stations with Undefined Entrances (810.6.1)						
At least one tactile sign identifying the station is placed in a central location						
Mounting						
Mounting height ≥ 48" to base of lowest tactile character and ≤ 60" to base of highest tactile character (703.4.1)						
At doors: Signs containing tactile characters located so clear floor space ≥ 18" by ≥ 18" centered on tactile characters, provided beyond arc of door swing between closed position and 45° open position (703.4.2)						
Raised Characters						
Characters raised 1/32" (703.2.1)						
Uppercase sans serif font (703.2.2) (703.2.3)						
Characters ≥ 5/8" to ≤ 2" high (703.2.5)						
≥ 3/8" separation from borders and decorative elements (703.2.7)						
Grade 2 Braille Characters						
Below text; if multi-lined, below entire text (703.3.2)						
Separated from tactile characters and raised borders ≥ 3/8" (703.3.2)						
Braille dots domed or rounded shape (703.3.1)						

Doors

(DOT Standard 404)

Doors that are part of accessible route are required to be accessible (404.1). Identify configuration for each approach to each door (e.g., latch side pull) per Figure 404.2.4.1.

Door 1 _____Door 4: _____
Door 2:_____Door 5: _____
Door 3:_____

Identify each door along each accessible route and note OK, No, or N/A. Note dimensions if No	DOOR					
	1	2	3	4	5	6
Revolving doors, revolving gates, or turnstiles not part of accessible route (404.2.1)						
Clearances						
Clear space needed for manual swinging doors and gates based on approach, parallel or perpendicular to doorway: varies depending on doorway configuration and approach. (See DOT Standards Figure 404.2.4.1)						
Configuration (a) – (k)						
Minimum parallel clearance						
Actual parallel clearance						
Minimum perpendicular clearance						
Actual perpendicular clearance						
Two doors in series: Distance between doors ≥ 48" plus width of doors swinging into space between doors (404.2.6)						
Thresholds						
Thresholds (404.2.5) ≤ ½"; 1/4–1/2" sloped 1:2; ≤1/4" vertical						
Existing or altered thresholds ≤ 3/4" with edges beveled ≤ 1:2 slope (404.2.5)						
Automatic and Power Assisted Doors (404.3)						
Automatic doors and automatic gates comply with 404.3. Full-powered automatic doors comply with ANSI/BHMA A156.10).						
Low-energy and power-assisted doors comply with ANSI/BHMA A156.19 (1997 or 2002 edition)						
Door Clear Width (404.2.3)						
Measured from door face to stop with door open at 90°						
All doors: ≥ 32" wide						
Operation						
Door hardware can be operated with one hand and not require tight grasping, pinching, or twisting or wrist (404.2.7) (309.4)						
Force needed to activate operable part ≤ 5 pounds						
Operable parts of door hardware mounted ≥ 34" to ≤ 48" above ground (404.2.7)						
Interior hinged door opening force ≤ 5 pounds (404.2.9); not applicable to exterior doors						
For fire doors, minimum force allowable by appropriate authority per applicable fire code. (404.2.9)						
Doors with closers: sweep period of ≥ 5 seconds from 90° open position to point 12° from latch (404.2.8.1)						
Double-Leaf Doors and Gates: At least one of the active leaves of doorways with two leaves comply with 404.2.3 and 404.2.4						

Ramps
(DOT Standards 303, 405)

Change in level along accessible route greater than ½" requires ramp (303.4). Identify ramps and locations where ramps are required.
Ramp 1:_____ Ramp 3: _____
Ramp 2:_____ Ramp 4: _____

Note OK, No, or N/A. Note dimensions if No	1	2	3	4
Clearances				
Minimum clear width 36" (between handrails) (405.5)				
Grade Slope				
Running slope ≤ 1:12 (8.3%) (405.2) (See exception in 405.2 for existing facilities)				
Cross slope ≤ 1:48 (2.1%) (405.3)				
Vertical rise between landings not to exceed 30" (405.6); therefore, minimum ramp run length 30' to achieve 1:12 slope, 50' to achieve 1:20 slope				
Landings				
Landings at top and bottom of each run (405.7)				
Landing length ≥ 60" long (405.7.3)				
Landing width along straight run ≥ width of ramp (405.7.2)				
Landings at a change of direction ≥ 60" x 60" (405.7.4)				
See Advisory 405.7 regarding ramps without level landings at changes in direction and potential for compound slopes that will not meet the requirements.				
Surface (405.4)				
Stable, firm, and slip resistant				
No change in level on ramp runs, other than slope and cross slope				
Handrails				
Handrails provided on both sides for length of ramp, if ramp rise > 6" (405.8) (505.2)				
Handrail continuous (505.3)				
Outside rail continuous for length of each run				
Inside rail continuous between runs				
Handrails extend ≥ 12" horizontally beyond top and bottom of ramp (505.10.1).				
End of handrail returned to wall, guard, or floor (505.10.1)				
Handrail extension is not a protruding object and does not project more than 4 inches into the circulation path at a height more than 27 inches above finish floor (307.2)				
Tops of handrails ≥ 34" to ≤ 38" above ground (505.4)				
Clearance ≥ 1 ½" between gripping surface and adjoining surface (505.5)				
Circular handrail diameter ≥ 1 ¼" and ≤ 2" (505.7.1)				
Non-circular handrail perimeter dimension ≥ 4" and ≤ 6 ¼" and diameter ≤ 2 ¼" (505.7.2)				
Handrail protrudes ≤ 4 ½" from wall (307.2)`				
Edge Protection				
Edge protection (A or B below) provided on each side of ramp runs and landings if ramp rise > 6" (405.9) or drop-off > ½" within 10" of landing area (405.9)				
A: Surface of run or landing extends ≥ 12" beyond inside surface of handrail (405.9.1)				
B: Curb or barrier that prevents passage of 4" diameter sphere any portion of which is within 4" of floor/ground surface (405.9.2)				
Wet Conditions				
Ramp landings subject to wet conditions designed to prevent the accumulation of water (405.7)				

Stairs

(DOT Standards 210.1, 504, 302.1, 505)

In alterations, stairs between levels where an accessible route already exists are required to comply only with handrail requirements. (210.1 Exception 2)

Note OK, No, or N/A. Note dimensions if No	1	2	3	4
Risers				
Risers heights are uniform (504.2)				
Risers are 4 inches (100 mm) high minimum and 7 inches (180 mm) high maximum (504.2)				
No open risers (504.3)				
Treads				
Treads have uniform depths (504.2)				
Treads are 11 inches (280 mm) deep minimum (504.2)				
Surface stable, firm, and slip resistant and slope is ≤ 1:48 (2.1%) (504.4)				
Nosing's				
Radius of curvature at the leading edge of the tread ½" (13 mm) maximum (504.5)				
Nosings that project beyond risers the underside of the leading edge curved or beveled (504.5)				
Risers slope under the tread up to an angle of 30 degrees maximum from vertical (504.5)				
Permitted projection of the nosing extends 1½ (38 mm) maximum over the tread below (504.5)				
Handrails				
Handrails provided on both sides of stairs (505.2)				
Handrail continuous (505.3)				
Outside rail continuous for length of each stair flight				
Inside rail continuous between flights				
At top, handrails extend ≥ 12" horizontally beyond first riser nosing (505.10.2)				
At bottom, handrails extend at slope of stair flight for a horizontal distance of at least one tread depth beyond last riser nosing. (505.10.3)				
End of handrail returned to wall, guard, or floor (505.10.1)				
Tops of handrails ≥ 34" to ≤ 38" above stair nosing at consistent height (505.4)				
Clearance ≥ 1 ½" between gripping surface and adjoining surface (505.5)				
Circular handrail diameter ≥ 1 ¼" and ≤ 2" (505.7.1)				
Non-circular handrail perimeter dimension ≥ 4" and ≤ 6 ¼" and diameter ≤ 2 ¼" (505.7.2)				
Wet Conditions				
Stair treads and landings subject to wet conditions designed to prevent the accumulation of water (504.7)				

Elevators

(DOT Standard 206.6, 407)

A passenger elevator complying with the Standards is required to serve each story or mezzanine in all multi-story facilities not served by a ramp or other accessible route (206.2.3). Label elevators by location (use sketch if available).

Elevator 1: _____ Elevator 3: _____
Elevator 2: _____ Elevator 4: _____

Note OK, No, or N/A. Note dimensions if No	Elevator			
	1	2	3	4
Location (206.3)				
Elevator located on an accessible route that coincides or is located in the same area as general circulation paths? (206.3)				
Hoistway Signage (407.2.3)				
Raised and Braille floor designations on both jambs (407.2.3.1)				
Mounting height ≥ 48" from ground to base of lowest tactile character and ≤ 60" to base of highest tactile character (703.4.1)				
At main entry level, tactile star on both jambs (407.2.3.1)				
Characters				
Uppercase sans serif font (703.2.2) (703.2.3)				
Characters ≥ 2" high (407.2.3.1)				
Characters raised 1/32" (703.2.1)				
Accompanied by Grade 2 Braille (703.2)				
Hall Call Buttons (All Levels) (407.2.1)				
Clear floor area at call buttons ≥ 48" deep by ≥ 60" wide by ≥ 80" high (407.2.1.3) (305)				
Up button above the down button (407.2.1.4)				
Visible signals light up when call registered and extinguish when call answered (407.2.1.5) Exception: existing elevators not required to comply with 407.2.1.5				
Centerline of lowest call button ≥ 15" above the floor (407.2.1.1) (308)				
Centerline of highest call button ≤ 48" above the floor (407.2.1.1) (308)				
Button ≥ 3/4" in smallest dimension (407.2.1.2) Exception: in existing elevators, buttons not required to comply with 407.2.1.2				
Buttons raised or flush (407.2.1) Exception: existing elevators may have recessed buttons				
Hall Signals (All Levels) (407.2.2)				
Visible and audible signal at each hoistway entrance (407.2.2.1)				
Signal visible from area adjacent to the hall call button (407.2.2.1)				
Hall lantern fixtures > 72" above the floor at centerline (407.2.2.2)				
Visible signal ≥ 2 ½" high measured at centerline of signal (407.2.2.2)				
Audible signal one for "up" and two for "down" or verbal annunciators (407.2.2.3)				
Door Operations				
Time from notification that car is answering a call until doors begin to close ≥ 5 seconds (407.3.4)				
Door remains fully open ≥ 3 seconds (407.3.5)				
Horizontal gap between car and hall floors ≤ 1 ¼" at all levels (407.4.3)				
Vertical gap between car and hall floors ≤ ½" at all levels (407.4.4)				
Reopening devices effective at heights of 5" and 29" above floor (407.3.3.1)				
Reopening devices do not require physical contact to be activated (407.3.3.2)				

Note OK, No, or N/A. Note dimensions if No	Elevator			
	1	2	3	4
Door reopening devices to remain effective for 20 seconds minimum (407.3.3.3)				
Car Controls (407.4.6)				
Emergency control buttons grouped at bottom of panel (407.4.6.4.2)				
Lowest button centerline ≥ 35" from floor (407.4.6.4.1)				
If > 16 buttons, highest button centerline ≤ 54" from floor (407.4.6.1)				
If ≤ 16 buttons, highest button centerline ≤ 48" from floor (407.4.6.1) (308.2)				
Control buttons ≥ 3/4" in smallest dimension (407.4.6.2.1)				
Control buttons raised or flush (407.4.6.2) Exception: existing elevators may have recessed buttons				
Raised character and braille designations immediately to the left of all buttons (407.4.7.1.2)				
Raised Characters (703.2) Car Controls				
Uppercase sans serif font (703.2.2) (703.2.3)				
Characters raised ≥ 1/32" (703.2.1)				
Characters ≥ 5/8" to ≤ 2" high (703.2.5)				
≥ 3/8" separation from borders and decorative elements (703.2.7)				
Tactile symbols identify main floor, emergency stop, alarm, door open and close, and phone (407.4.7.1.3)				
Floor buttons have visual signals that light when call is registered and extinguish when call answered (407.4.7.1.4)				
Car Position Indicators (407.4.8)				
Audible car position indicator provided				
Visual car position indicator provided above car control panel or door				
Visual indicator over door or over control panel, (407.4.8.1.2)				
Floor number on indicators ≥ ½" high (407.4.8.1.1)				
Visual and audible signal as car passes/stops at floor (407.4.8.1.3)				
Elevator Car Requirements				
Floor covering stable, firm, slip resistant, and no vertical changes (407.4.2) (302) (303)				
Illumination ≥ 5 foot-candles (54 lux) (407.4.5)				
Inside dimensions of elevator cars and clear width of elevator doors comply with Table 407.4.1 (below) Exception: Existing elevator car configurations that provide a clear floor area of 16 square feet (1.5 square meters) minimum and also provide an inside clear depth of 54" (1,370 mm) minimum and a clear width of 36" (915 mm) minimum are permitted				
Width of elevator door complies with Table 407.4.1				
Emergency Communication				
Identified by tactile symbol and characters adjacent to device (407.4.9) and comply with 7.03.2 (see above)				
Highest operable part ≤ 48" above floor (407.4.9, 308)				
Lowest operable part ≥ 15" above floor (407.4.9, 308)				

Elevator Car and Door Dimensions				
Minimum Dimensions				
Door Location	Door Clear Width	Inside Car, Side to Side	Inside Car, Back Wall to Front Return	Inside Car, Back Wall to Inside Face of Door
Centered	42 inches (1065 mm)	80 inches (2030 mm)	51 inches (1.295 mm)	54 inches (1.370 mm)
Side (off centered)	36 inches (915 mm)[1]	68 inches (1725 mm)	51 inches (1.295 mm)	54 inches (1.370 mm)
Any	36 inches (915 mm)	54 inches (1370 mm)	80 inches (2.030 mm)	80 inches (2.030 mm)
Any	36 inches (915 mm)[1]	60 inches (1525 mm)[2]	60 inches (1.525 mm)[2]	60 inches (1.525 mm)[2]

Notes
1. A tolerance of minus 5/8” (16 mm) is permitted
2. Other car configurations that provide a turning space complying with Section 304 with door closed shall be permitted

Platform Lifts

(DOT Standard 410)

Identify lifts along accessible routes.
Lift 1: _____ Lift 3:_____
Lift 2: _____ Lift 4:_____

Note OK, No, or N/A. Note dimensions if No	Lifts			
	1	2	3	4
Platform lift permitted only where exterior site constraints make ramp or elevator infeasible (206.7.5)				
Elevator located on an accessible route that coincides or is located in the same area as general circulation paths (206.3)				
Clearances				
Clear floor area at operable parts outside of lift ≥ 30" by ≥ 48" (309.2, 305.7)				
End doors and gates ≥ 32" wide (410.6)				
Side doors and gates ≥ 42" wide (410.6)				
Clear floor space on lift platform ≥ 36" x ≥ 48" end door (in alcove) (410.3) (305)				
Clear floor space on lift platform ≥ 36" x ≥ 60" side door (in alcove)				
Clear vertical clearance ≥ 80" (410.1)				
Horizontal gap between platform sill and landings ≤ 1 ¼" at all levels (410.4)				
Surface				
Floor surface in lift is stable, firm, and slip resistant (410.2) (302) (303)				
Controls				
If horizontal obstruction ≤ 10", controls mounted between ≥ 15" and ≤ 48" (308.2, 308.3)				
If horizontal obstruction > 10" to ≤ 24", controls mounted between ≥ 15" and ≤ 44" (308.2.2)				
Operation				
Unassisted entry, operation, and exit (410.1)				
Controls are operable with one hand without grasping, pinching, or twisting (309.4)				
Force required for controls ≤ 5 foot pounds (309.4)				
Doors remain open ≥ 20 seconds (410.6)				

Escalators

(New Stations) (DOT Standard 810.9)

Identify escalators along accessible routes.
Escalator 1: _____ Escalator 3: _____
Escalator 2: _____ Escalator 4: _____

Note OK, No, or N/A. Note dimensions if No	Escalators			
	1	2	3	4
Escalators clear width of ≥ 32" (810.9)				
At the top and bottom of each escalator run, ≥ 2 and ≤ 4 contiguous treads level beyond comb plate before risers begin to form (810.9, ASME A17.1 Sec. 6.1.3.6.5)				
Slip resistant strip of contrasting color on the back and side of each tread ≥ 1 ½" and ≤ 2" wide (810.9, ASME A17.1 Sec. 6.1.3.5.6)				

Ticketing and Automatic Fare Vending

(DOT Standards 206, 220, 305, 404, 707, 904)

Note OK, No, or N/A. Note dimensions if No	Accessible Route			
	1	2	3	4
Ticketing				
Located on an accessible route (206.2.4)				
Ticketing, fare vending, and collection areas located on an accessible route that coincides with the route used by general public (206.2.4, 206.3)				
Counter ≤ 36" high above the ground (904.4.1, 904.4.2)				
Parallel approach: Counter ≥ 36" long with clear floor space complying with 305 parallel to 36" dimension (904.4.1)				
Forward approach: Counter ≥ 30" long with clear floor space complying with 305 perpendicular to 30" dimension and knee and toe clearance complying with 306 below counter (904.4.2)				
Automatic Fare Vending and Fare Adjustment Devices				
Fare vending components adjoin or overlap an accessible route (206.3)				
If self-service fare vending provided, ≥ 1 accessible device of each type at each location (220.1)				
If self-service fare adjustment provided, ≥ 1 accessible device at each location (220.1)				
If self-service fare collection provided, ≥ 1 accessible device at each location (220.1)				
Clear floor area in front of accessible fare device ≥ 80" high and ≥ 48" deep by ≥ 30" wide (forward approach) or ≥ 30" deep by ≥ 48" wide (parallel approach) (305.5) (707.2)				
If device in a confined space:				
If forward approach depth ≥ 24", approach ≥ 36" wide (305.7.1)				
If side approach depth ≥ 15", approach ≥ 60" wide (305.7.2)				

Note OK, No, or N/A. Note dimensions if No	Accessible Route			
	1	2	3	4
If coin or card slots or controls necessary for operation including top of touch-screen are provided:				
If forward reach and obstruction ≤ 20" deep, then controls mounted between ≥ 15" and ≤ 48" (308.2.1)				
If forward reach and obstruction > 20" to ≤ 25" deep, then controls mounted between ≥ 15" and ≤ 44" (308.2.2)				
If side reach and obstruction ≤ 10" deep and ≤ 15" high, then controls mounted between ≥ 15" and ≤ 48" (308.3.1)				
If side reach and obstruction > 10" to ≤ 24" deep and ≥ 15" to ≤ 34" high, then controls mounted > height of obstruction to ≤ 46" (308.3.2)				
Controls and operating mechanisms are operable with one hand and do not require tight grasping, pinching, or twisting of the wrist (707.3, 309.4)				
The force required to activate controls is no greater than 5 pounds (707.3) (309.4)				
Instructions and information to complete all transactions are accessible and independently usable by individuals with vision impairments (707.5)				
Input Devices				
At least one tactilely discernable input control provided for each function (707.6.1)				
Key surfaces raised (707.6.1)				
Numeric keys arranged in ascending or descending telephone keypad layout with "5" key tactilely distinct (707.6.2)				
Function keys contrast visually from background surfaces, light-on-dark, dark-on-light (707.6.3.1)				
Characters and symbols on key surfaces contrast from key surfaces				
Function key surfaces have tactile symbols as follows: (707.6.3.2)				

Note OK, No, or N/A. Note dimensions if No	Accessible Route			
	1	2	3	4
Enter or Proceed key: Raised circle				
Clear or Correct key: Raised left arrow				
Cancel key: Raised letter "X"				
Add Value key: Raised plus ("+") sign				
Decrease Value key: Raised minus ("–") sign				
Speech Output				
Machine speech enabled (707.5)				
Braille instructions for initiating speech mode provided and comply with 703.3 (707.8)				
User can interrupt and repeat speech and control volume (707.5.1)				
Where receipts provided, audible balance information, error messages, and information necessary to complete or verify transaction provided (707.5.2)				
Display Screen				
Screen visible from a point 40" above the center of the clear floor space in front of the machine (707.7.1)				
Sans serif font (707.7.2)				
Uppercase "I" ≥ 3/16" high (707.7.2)				
Characters contrast with background, light-on-dark or dark-on-light (707.7.2)				
Fare Gate Components (404.2)				
Landing				
Clear space needed for gates based on approach, parallel, or perpendicular to gate. (See DOT Standards Figure 404.2.4.1)				
Gate Location				
Configuration (a) – (k)				
Minimum parallel clearance				
Actual parallel clearance				
Minimum perpendicular clearance				
Actual perpendicular clearance				
Gate				
Width (404.2.3) Measured from door face to opposite stop with door open at 90°				
All doors ≥ 32" wide				
Kick plate (404.2.10)				
Gate surface on push side between the finish floor and a height of ≥ 10" has smooth surface on extending full width of gate				
Kick plate surface free of changes in depth at joints of ≥ 1/16"				
Operable parts of hardware between ≥ 34" and ≤ 48" above floor (404.2.7)				
Opening force ≤ 5 pounds for interior hinged gate (404.2.9)				

Platforms

(DOT Standards 403, 810)

Fill out survey sheet for each platform assessed. Identify each platform below:
Platform 1:_____ Platform 3: _____
Platform 2:_____ Platform 4: _____

Indicate OK, No, or N/A. Note dimensions if No	1	2	3	4
Clearances				
Along the accessible route to the platform, clear width at least 36" wide, except:				
Clear width may be 32" wide to < 36" wide for distance of ≤ 24" provided that narrower segments are separated by segments of at least 48"(403.5.1)				
At intervals of ≤ 200', route clearance ≥ 60" wide for distance of ≥ 60" (passing space) (403.5.3)				
Platform Width (§§ 37.9, 37.41 37.43, 38.125)				
For a new or altered conventional non-level boarding side passenger platform with a railing or wall on the platform side opposite the track, minimum platform width at least 12 feet. (See DOT Rail Q&A Guidance)				
For a new or altered conventional level boarding side passenger platform with a railing or wall on the platform side opposite the track, minimum platform width at least 8 feet. (See DOT Rail Q&A Guidance)				
Slope (810.5.1)				
Parallel to the track the slope is ≤ 1:48 (2.1%) Exception: if existing track ≤ the slope of the track				
Perpendicular to track the slope is ≤ 1:48 (2.1%)				
Detectable Warning				
Platform boarding edges, not protected by screens or guards, have a detectable warning along the full length of the public use area of the platform (810.5.2, 705.2)				
The detectable warning contrasts visually with adjoining surfaces, either light-on-dark or dark-on-light (705.1.3)				
The detectable warning is 24" wide (705.2)				
The detectable warning consists of raised truncated domes with:				
Base diameter ≥ 0.9" to ≤ 1.4", top diameter 50% to 65% of base diameter (705.1.1)				
Height of 0.2" (705.1.1)				
Dome center-to-center spacing ≥ 1.6" to ≤ 2.4", base-to-base dome spacing ≥ 0.65" (705.1.2)				
Platform Signs				
At least one tactile sign with raised characters and braille on each platform or boarding area identifying the station (703.2, 703.3, 810.6.2). (See requirements below)				
Signs, to maximum extent practicable, in uniform locations within system (810.6.2)				
Mounting height ≥ 48" from ground to base of lowest tactile character and ≤ 60" to base of highest tactile character (703.4.1)				
Clear floor space ≥ 18" by ≥ 18" centered on the tactile characters (703.4.2)				
Indicate OK, No, or N/A. Note dimensions if No	**1**	**2**	**3**	**4**
Route and Destination Signs				
Lists of stations, routes, and destinations served by the station and located in boarding areas, on platforms, or on mezzanines comply with 703.5 sign requirements below (810.6.2). Requirement does not apply to maps.				
Exception: Platform signs and Route and Destination signs are not required to comply with above requirements where audible signs are remotely transmitted to hand-held receivers or are user-or proximity actuated (810.6)				
Raised Characters and Braille (703.2, 703.3)				
Characters raised ≥ 1/32" (703.2.1)				
Uppercase sans serif font (703.2.2) (703.2.3)				
Characters ≥ 5/8" to ≤ 2" high (703.2.5)				
≥ 3/8" separation from borders and decorative elements (703.2.7)				
Accompanied by Grade 2 Braille (703.2)				
Braille characters below text; if multi-lined, below entire text (703.3.2)				
Braille characters are separated from tactile characters and raised borders ≥ 3/8" (703.3.2)				

Indicate OK, No, or N/A. Note dimensions if No	1	2	3	4
Braille dots domed or rounded shape (703.3.1)				
Station Name Signs				
Name signs located at frequent intervals and clearly visible to sitting and standing passengers from within the vehicle on both sides when not obstructed by another vehicle (810.6.3)				
Station name signs comply with 703.5 sign requirements below (810.6.3)				
Visual Characters (703.5)				
Visual characters ≥ 40" above finish floor or ground (703.5.6)				
Character Height (703.5.5)				
For characters ≥ 40" and ≤ 70" above the ground, height of uppercase letter "I" ≥ 5/8" (703.5.5)				
For characters > 70" and ≤ 120" above the ground, character height of uppercase letter "I" ≥ 2" (703.5.5)				
For signs > 120" above the ground, character height of uppercase letter "I" ≥ 3" (703.5.5), except where sign space is limited (810.6.2)				
Characters and background have non-glare finish. Contrast between characters and background: Either light characters on dark background or dark characters on light background (703.5.1)				
Style: Characters in conventional form: Characters not Italic, oblique, script, highly decorative, or other unusual forms (703.5.3)				
Character Proportion: Width of uppercase "O" is between ≥ 55% and ≤ 110% of the height of uppercase "I" (703.5.4)				
Stroke: Width of uppercase "I" ≥ 10% to ≤ 30% of the height (703.5.7)				
Closest characters spaced between ≥ 10% and ≤ 35% of the character height (703.5.8)				
Spacing between the baselines of separate lines of characters within message spaced between 135% and 170% of character height (703.5.9)				
Coordination with Vehicle Floor				
Rapid Rail				
Platform edge within 3" horizontal of vehicle door and ± 5/8" vertical of vehicle floor under all normal operating conditions (§ 38.53(d)) Exceptions: (1) ± 1 1/2" vertical for new vehicles in existing stations; (2) 4" horizontal and ± 2" vertical for retrofitted car and new or key station, under 50% passenger load				
Light Rail				
Platform edge within 3" horizontal of vehicle door and 5/8" vertical of vehicle floor under all normal operating conditions (§ 38.73(d)) Exceptions: (1) ± 1 1/2" vertical for new vehicles in existing stations; (2) 4" horizontal and ± 2" vertical for retrofitted car and new or key station, under 50% passenger load				
Standards require platform to be ≥ 8" above top of rail except where vehicles are boarded from sidewalk or street level				
Note: If station is located on a pedestrian mall, city street, or other area where level boarding is infeasible, lifts, ramps, bridge plates or mini-high platforms are permissible (810.5, 810.5.3 as modified by Part 37 Appendix A). Consult with FTA in these situations.				
For platforms serving a track not also used for existing freight service, platform edge within 3" horizontal of vehicle door and 5/8" vertical of vehicle floor under all normal operating conditions (§ 38.93(d)). See Part 37 Appendix D to § 37.42 discussion of maximum gaps for level boarding and gap mitigation. Exceptions: (1) ± 1 1/2" vertical for new vehicles in existing stations; (2) 4" horizontal and ± 2" vertical for retrofitted car and new or key station, under 50% passenger load				
For platforms serving a track that is also used for freight service, § 37.42(d) requires analysis. In addition, regulations require alternatives to level boarding to be approved by FTA and/or FRA as applicable. (See Circular Chapter 3.)				

Mini-High Platforms

Identify each mini-high platform. Use Checklist Section 9 Ramps to survey mini-high ramps.
Note: Per § 37.42(c), mini-highs are allowable in new construction or altered platforms serving commuter, intercity or high-speed rail only where track is shared with freight service and only if analysis accepted by FTA and/or FRA (as applicable) indicates that level boarding, car-borne lifts, or bridge plates are not feasible.

Mini-high Platform 1: _____ Mini-high Platform 3: _____
Mini-high Platform 2: _____ Mini-high Platform 4: _____

Note OK, No, or N/A. Note dimensions if No	1	2	3	4
Light Rail				
Station is located on a pedestrian mall, city street, or other area where level boarding is infeasible (810.5, 810.5.3 as modified by Part 37 Appendix A). Mini-highs acceptable only at such stations, not other stations on the same line where level boarding is possible.				
Commuter Rail (applicable only for platforms adjacent to existing freight service)				
Level boarding not structurally or operationally practicable and approval for use of mini-highs is obtained from FTA or FRA (§ 37.42(d), 36 CFR 1192.93(d))				
Section 37.42(e) requires space between platform edge and mini-high and other obstructions (stairwells, elevator shafts, seats, etc.) to be ≥ 6 feet, or if full clearance not feasible, regulations require barriers to prevent pedestrian traffic through narrower area. (See Circular Chapter 3.)				
Detectable Warning				
Platform edges, not protected by screens or guards, have a detectable warning along the full length of the public use area of the platform (810.5.2, 705.2)				
Detectable warning conforms to 705.2 (See Circular Facilities Checklist Section 15 -Platforms)				

Public Address Systems

(DOT Standard 810.7)

	Note OK, No, or N/A
If a public address system provides audible messages, the same or equivalent information is provided in a visual format (810.7)	

Clocks

(DOT Standard 810.8)

Assess each clock and note OK, No, or N/A Note dimensions if No	clock			
	1	2	3	4
Where clocks are provided for use by the public, clock face is uncluttered so that its elements are clearly visible				
Hands, numerals and digits contrast with the background either light-on-dark or dark-on-light				
Overhead Clocks (703.5)				
Overhead clock numerals and digits comply with 703.5				
Characters and background have non-glare finish. Contrast between characters and background: Either light characters on dark background or dark characters on light background (703.5.1)				
Style: Characters conventional in form. No italic, oblique, script, highly decorative, or other unusual forms (703.5.3)				
Character Proportion: Width of uppercase “O” is between ≥ 55% and ≤ 110% of the height of uppercase “I” (703.5.4)				
Stroke: Width of uppercase “I” ≥ 10% to ≤ 30% of its height (703.5.7)				
Closest characters spaced between ≥ 10% and ≤ 35% of the character height (703.5.8)				
Spacing between the baselines of separate lines of characters between 135% and 170% percent of character height (703.5.9)				
Character Height (703.5.5 and Table 703.5.5)				
For characters ≥ 40” and ≤ 70” above the ground and viewed from < 72 inches horizontal, height of uppercase letter “I” ≥ 5/8” (703.5.5)				
For characters > 70” and ≤ 120” above the ground and viewed from < 180 inches horizontal, character height of uppercase letter “I” ≥ 2” (703.5.5)				
For characters > 120” above the ground and viewed from < 21 feet horizontal, character height of uppercase letter “I” ≥ 3” (703.5.5)				
Note: Use Table 703.5.5 to increase character height for longer horizontal viewing distances.				

Telephones

(DOT Standards 217, 704)

Note OK, No, or N/A	1	2	3	4
Where coin-operated public pay telephones, coinless public pay telephones, public closed-circuit telephones, public courtesy phones, or other types of public telephones are provided, public telephones must be provided in accordance with 217 for each type of public telephone provided.				
If a single public telephone or a bank of telephones provided on floor, level, or exterior site, at least one wheelchair accessible phone per floor, level, and exterior site provided (217.2)				
If two or more banks of phones are provided, at least one per bank is wheelchair accessible (217.2)				
For forward approach, accessible phone has clear floor space ≥ 48" deep and ≥ 30" wide and counter depth ≤ 20" (704.2.1.2) (305.5)				
For parallel approach, accessible phone has clear floor space ≥ 30" deep and ≥ 48" wide and counter depth ≤ 20" (704.2.1.1) (305.5)				
Highest operable part ≤ 48" (704.2.2) (308) (309)				
The cord from the telephone to the handset is 29 inches long				
Volume control is provided on all public phones (217.3)				
TTYs				
If a public pay telephone provided on floor, at least one TTY is provided (217.4.2)				
Where at least one public pay telephone serves an entrance, at least one TTY is provided to serve the entrance (217.4.7)				
If four or more public pay telephones are provided on exterior site, at least one TTY is provided on site (217.4.4)				
Where four or more public pay telephones are provided at a bank of telephones, at least one public TTY complying with 704.4 must be provided at the bank. Exception: If the bank of public telephones is located ≤ 200' away from and on the same floor as a bank containing a TTY, a TTY is not required at this bank. (217.4.1)				
TTY at a public pay telephone is permanently affixed within, or adjacent to, the telephone enclosure. Where an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the TTY and the telephone receiver. (704.4)				
If an interior bank of public pay telephones has three or more phones, at least one phone provides shelf and electrical outlet for portable TTY (217.5)				
The shelf and electrical outlet for a portable TTY is within or adjacent to the telephone enclosure. The telephone handset is capable of being placed flush on the surface of the shelf. The shelf is capable of accommodating a TTY and has 6 inches minimum vertical clearance above the area where the TTY is to be placed. (704.5)				
Signs				
Where signs provide directions to phones, they also provide directions to TTYs and include the International Symbol of TTY (216.9.2, 703.5, 703.7.2.2)				
At banks of public pay telephones which do not have a TTY, directions to nearest public TTY provided and include the International Symbol of TTY (216.9.2, 703.7.2.2)				
TTY identified by the International Symbol of TTY (216.9.1,703.2.2)				

Areas of Refuge

(DOT Standard 207)

An area of refuge is required if any of the following conditions exist:

< 50 % of the exterior walls are open to the outside (207.1, IBC 2003)	☐Yes ☐No
The facility has no automatic sprinkler system (207.1, IBC 2003 – 903.3.1.1)	☐Yes ☐No
The emergency evacuation route is not accessible (207.1, IBC 2003)	☐Yes ☐No
Elevators or lifts on the emergency evacuation route do not have standby power (207.2)	☐Yes ☐No

Describe each area of rescue assistance:

Area of Refuge 1: _____

Area of Refuge 2: _____

Note OK, No, or N/A. Note dimensions if No	Area of Refuge 1	Area of Refuge 2
Each area of refuge provides at least one wheelchair space for each 200 potential occupants of the area served by the area of refuge, each being ≥ 30" by ≥ 48" (IBC 2003 1007.6.1)		
The wheelchair spaces do not encroach on the required exit width (IBC 2003 1007.6.1)		
Each stairway adjacent to an area of refuge has ≥ 48" clear width between the handrails (IBC 2003 1007.8.2)		
A method of two-way communication, with both visual and audible signals, provided between each area of refuge and the primary entry (IBC 2003 1007.6.3)		
Area of refuge identified by a visual sign that includes the words "Area of Refuge" and the International Symbol of Accessibility (illuminated when exit sign illumination is required) (IBC 2003 1007.6.5)		
Signs displayed at all inaccessible exits and where necessary to identify the direction to areas of refuge (IBC 2003 1007.7)		
Instructions provided for use of the area posted near two-way communication system (IBC 2003 1007.6.4)		

APPENDIX B: SUGGESTIONS AND RESOURCES FOR COORDINATION IN PROVIDING ADA ACCESSIBLE FACILITIES

Table B-1: Suggestions and Resources for Coordination in Providing ADA Accessible Facilities

FTA Guidance	Notes
The Guidance recommends involving individuals with disabilities. As Appendix D to § 37.173 notes, "One of the best sources of information on how best to train personnel to interact appropriately with individuals with disabilities is the disability community itself."	ESPA offers training resources. FDOT's Florida Transit Operator Training Program offers training as well.
During sidewalk closures, there must be a pedestrian maintenance of traffic plan to insure that an accessible alternate path is provided for pedestrians around the closed section of sidewalk. This is pursuant to 36 CFR 1190—Accessibility Guidelines for Pedestrian Facilities in the Accessible Public Rights-of-Way, R205, Spec. 102-3, and Index 660. Many bus agencies have a policy requiring the bus operator to stop the bus only at designated bus stops. If a sidewalk closure prevents a person with a disability from boarding a bus at a designated bus stop, 49 CFR Section 37.169(c)(1)-(3) requires that the bus operator provide "reasonable modification of the policy", by stopping for the passenger at an alternative suitable location.	FTA encourages transit agencies to collaborate with persons with disabilities to help them develop appropriate procedures for devising reasonable modification of policies to satisfy federal regulatory requirements. Appendix E to Part 37—Reasonable Modification Requests
Transit agencies are required to maintain accessibility features in facilities as well as on vehicles in good repair, according to 49 CFR Section 37.161. This also includes keeping facilities free of obstructions. Transit agencies that are in direct control of the facilities have the responsibility to remove obstructions. If the transit agency does not have control, FTA encourages the transit agency to coordinate with other public and private entities to make this happen.	For example, the Massachusetts Bay Transportation Authority (MBTA) keeps agreements with municipalities to prioritize snow removal at stops along the highest ridership routes. (FTA C 4710.1, p. 2-8).
With regard to new construction and alteration of transportation facilities, the 2006 final rule by USDOT, adopting the Access Board's 2004 revisions to the original 1991 ADA Accessibility Guidelines (ADAAG), also made a few modifications. These include that important elements of transportation facilities must be located to minimize the distance that individuals with disabilities must travel to use them. (Section 206.3) Also, with regard to bus boarding and alighting areas, transit agencies must comply with Section 810.2.2 (DOT Standards for construction, alteration, and relocation of bus stops) to the greatest feasible extent that construction specifications are within the control of the transit agency. A common case is when another entity owns the ROW. FTA encourages transit agencies to coordinate with that public entity to ensure ADA compliance. FTA urges use of written supporting documentation or coordination. Compliance includes that bus stops must connect to streets, sidewalks, or pedestrian paths via an accessible route. The requirements located in Appendices B and D to 36 CFR Part 1191 and in Appendix A to Part 37 are together henceforth referred to as the ADA Standards for Transportation Facilities (DOT Standards). The DOT Standards, which are different from the Department of Justice's 2010 standards, contain the requirements that apply to transportation facilities.	In 2006, DOT issued a final rule adopting the Access Board's 2004 revisions and subsequent technical amendments to ADAAG into Part 37 as standards. DOT made four additions or modifications to the Access Board's version: Location of accessible routes (Section 206.3) – DOT retained an existing requirement that important elements of transportation facilities (ramps, elevators, or other circulation devices; fare vending or other ticketing areas; and fare collection areas) be located to minimize the distance that individuals with disabilities must travel to use them. This strengthens the concept that accessible routes coincide with or be located in the same general area as general circulation paths. This includes, for example, not locating elevators at the opposite end of a platform from stairways that provide a shorter route to the boarding areas. Detectable warning on curb ramps (Section 406.8) – DOT retained the requirement for detectable warnings on curb ramps. Bus boarding and alighting areas (Section 810.2.2) – This section retained an existing provision that the requirements for bus boarding and alighting areas apply "to the extent that construction specifications are within [the] control" of public entities; compliance is required to the greatest extent feasible. Rail station platforms (Section 810.5.3) – This section requires low-level platforms to be constructed at 8 inches above top of rail unless vehicles are boarded

FTA Guidance	Notes
	from sidewalks or at street level.
The DOT Standards (Section 209.2.3) also provides that where streets have no sidewalks, the accessible route from the bus stop may be a connection directly to the roadway if that is the only ROW provided. However, the roadway may still be inadequate to enable a person with a disability to access the bus stop. In this case, the individual is eligible for paratransit service. FTA also "…encourages transit agencies to inventory the location of the bus stops in relation to accessible pedestrian routes, and coordinate with owners of public rights-of-way (e.g., local municipalities) to help ensure connections to stops are as accessible as possible." (FTA C 4710.1 p. 3-4)	Design of On-street Transit Stops and Access from Surrounding Areas
Section 209.2.2 addresses bus loading zones and Section 209.2.3 addresses on-street bus stops. The FTA guidance suggests transiting agencies regarding construction plans for new facilities to explicitly specify the ADA specifications, dimensions and other requirements rather than simply directing contractors to construct ADA-compliant facilities. FHWA provides a document, "Designing Sidewalks and Trails for Access." Examples of ADA accessibility features include edge detection on platforms, adequate lighting, enhanced wayfinding and signage, continuous pathways and the removal of obstructions. In regard to accessibility modifications to commuter rail or intercity rail stations, 49 CFR Section 37.49 stresses that all parties should ideally come to their own agreement regarding the allocation of legal and financial responsibility. In the absence of agreement, the Code provides a mechanism to determine which entity bears legal and financial responsibility. Transit agencies that are constructing new commuter rail stations are encouraged to coordinate their efforts as early as possible in the planning process with FTA and FRA.	Designing Sidewalks and Trails for Access Part I of II: Review of Existing Guidelines and Practices Designing Sidewalks and Trails for Access Part II of II: Best Practices Design Guide
Sometimes, transit facilities like a bus transfer center might be constructed by the municipality. Transit service may connect to a commuter rail facility owned by another entity. Again, FTA encourages transit agencies to coordinate with these other entities, and to document such coordination, especially during design, construction, or alteration of transportation facilities, to ensure ADA accessibility. (FTA C 4710.1, p. 3-3)*	APTA Standards Development Program Recommended Practice Design of On-street Transit Stops and Access from Surrounding Areas March 2012

*FDOT incorporates accessibility features into State Highway System infrastructure, in compliance with Section 504 of the Rehabilitation Act of 1973 and Title IIa of the 1990 Americans with Disabilities Act. These are accessibility technical requirements incorporated into FDOT Design Standards are the 2006 ADA Standards for Transportation Facilities (also referred to as the DOT Standards) pursuant to the federal Americans with Disabilities Act (ADA) as amended.

Additional Resources

- ADA Best Practices Tool Kit for State and Local Governments
- ADA Requirements at Bus Stops - a quick reference
- Dean Perkins, RA - ADA Coordinator, FDOT's Office of Design, Production Support, ADA & Public Rights of Way Overview of Current and Up-coming Requirements, FDOT Design Training Expo 2012 – Orlando, FL

APPENDIX C: TRANSIT-ORIENTED DEVELOPMENT RESOURCE GUIDE

Tampa Bay Area Regional Transportation Authority

Tables C-1 and C-2 list the Mobility Policies within the Model Policies element as they relate to ped/bike access to public transportation.[74]

Table C-1: TBARTA Model Mobility Policies Relating to Bike/Ped Access to Transit

Ped/bike Systems	
The City/County shall…	Provide an extensive pedestrian system throughout the station areas that minimizes obstacles for pedestrians, provides connectivity with shorter walking distances, and provides protection from the elements where appropriate.
	Eliminate gaps in pedestrian networks accessing station areas.
	Establish pedestrian and bicycle connections between station areas and surrounding neighborhoods.
	Design the pedestrian system to be ADA-accessible, safe, attractive, and comfortable for all users.
	Design the pedestrian network to accommodate large groups of pedestrians by requiring wide sidewalks and unencumbered walkways on key pedestrian corridors.
	Use planting strips, street trees, on-street parking, and/ or bicycle lanes to separate pedestrians from vehicles.
	Provide bicycle parking and encourage bicycle amenities, such as bicycle repair, rental, and cyclist comfort stations.
	Ensure the conversion of drainage swales to curb and gutter systems where appropriate for storm water management around station areas to create a more pedestrian-friendly environment.
Street Network	
The City/County shall…	Design streets to be multi-modal with an emphasis on ped/bike safety, access, and circulation.
	Set vehicular levels of service to reflect an emphasis on pedestrians and cyclists.
	Redesign existing and design new street intersections with a greater emphasis on safe ped/bike crossings
	Design an interconnected street network to provide connections to existing and planned streets at intervals no greater than the appropriate maximum length for the station type
	Provide ped/bike access to connect dead-end streets, pass through long blocks, and create networks of public paths in station areas.
	Provide mid-block street crosswalks in congested urban areas where there are long distances between signalized crossings.
	Incorporate traffic calming and context sensitive design into the design of streets. Utilize the principles of Context Sensitive Design for new transportation projects and access management for ped/bike travel.
	Accommodate multi-modal local and regional connections for all types of vehicles, including trains, buses, bicycles, cars, ships, boats, aircraft, and taxicabs

Within the TOD Resource Guide, TBARTA includes a chapter, which provides guidance for Station Area Plans (SAPs). Among the planning considerations within station areas are:[75]

- Demographics and Local Economy

[74] Tampa Bay Area Regional Transportation Authority, "Comprehensive Plan Model Policies for Transit Oriented Development,"2012, pp. 1-7 through 1-8
[75] Ibid

- Accessibility (including evaluations of connections to multi-modal transportation options to maximize the use of bicycle, pedestrian, and roadway networks)
- Supportive Zoning, Land Use Controls, and Design Standards
- Real Estate Market Conditions
- Available Land for TOD or Joint Development
- Major Attractions

The importance of a street hierarchy with the Station Area Plan chapter is emphasized, noting that all modes of transportation should be considered and that cul-de-sacs and other obstacles can hinder both vehicular and pedestrian connectivity. Station area plans should include a fully integrated network of streets, sidewalks, and bicycle paths as well as primary and secondary transit stops, multi-use pathways, parks, and greenways that encourage the utilization of non-motorized forms of transportation (TBARTA, 2012).

TBARTA's TOD Resource Guide becomes more specific in regards to ped/bike access in the section of the Station Area Plans chapter dedicated to Bicycle and Pedestrian Circulation Plans (TBARTA, 2012). Important aspects of Bicycle and Pedestrian Circulation Plans in station areas include:

- Setting the desired level of service for bicycle and pedestrian networks in the area
- Identifying major activity nodes and improving connections between the nodes
- Activating the street edges

Other plans that can enhance the connectivity between cyclists and pedestrians to public transportation include Signage & Wayfinding Plans & Open Space and Greenways Plans (TBARTA, 2012).

Lastly, TBARTA includes a chapter that focuses specifically on Zoning, Parking, and Infrastructure, all of which play a critical role regarding the manner in which public transportation services area accessed. Table C-2 outlines the manners listed in TBARTA's TOD Resource Guide in which zoning, parking, and infrastructure impact ped/bike access to public transportation[76].

[76] Ibid

Table C-2: Zoning, Parking, & Infrastructure Impacts on Bike/Ped Access to Transit

Zoning – Bicycle and Pedestrian Considerations	
Sidewalk Treatments	Factors that are critical in the design of effective pedestrian infrastructure within TOD areas include… • Substantial sidewalk width • Smooth surfacing • Free of obstructions • Buffer between sidewalks and the roadway • Minimization of driveway crossings and small corner radii • Clearly marked crosswalks and/or curb extensions, refuge islands, traffic signals, roadway narrowing, lighting, and traffic calming measures to improve the pedestrian experience to transit stations/stops

Bicycle Storage Facilities	The presence, or lack, of bicycle facilities and infrastructure can greatly impact the use of bicycles as transportation in a TOD area. Bicycles are also incredibly useful first and last-mile connectors to public transportation stops/stations. Places to park privately-owned bicycles (not bicycle-sharing bikes) are important components to accommodating cyclists in a TOD area. Such bicycle storage facilities can include…
	• Short-Term Bicycle Parking (exposed racks that can quickly be accessed)
	• Long-Term Bicycle Parking
	  - Standard racks under an eve or awning
	  - Secure areas in a building/structure
	  - Racks with hinged covers

Infrastructure Considerations	
Americans with Disabilities Act (ADA)	Ensuring equitable access to public transportation for those with limited mobility is critical and absolutely necessary in TOD areas. TBARTA notes that, while retrofitting access to meet ADA requirements will likely be a challenge, it is important to implement in order to take advantage of the opportunities that TOD provides.

APPENDIX D: LOCAL GOVERNMENT COMPREHENSIVE PLAN POLICIES

Examples that support bicycle and pedestrian linkages to transit stops and stations

City of Fort Lauderdale

The City of Fort Lauderdale's Comprehensive Plan addresses pedestrian and bicyclist access to public transportation through the following policies of the Transportation Element:

"POLICY 1.2.26: The City will consolidate the City's ped/bike policies and strategies, especially those pertaining to terminals and other multimodal locations, into one document to provide clear guidance to developers, and provide information for policy makers to determine methods by which to accommodate safe and convenient non-motorized transportation"[77].

"POLICY 1.21.4: The City will use language contained in the Broward County Comprehensive Plan and recommendations of City consultants in creating transit-oriented and pedestrian-oriented design standards for future mixed-use developments and redevelopment. In addition, in collaboration with the County, the City shall seek to identify alternative methods of payment for transportation impact fees for transit-oriented and pedestrian oriented redevelopment projects. Additionally, the City will work with the County in the development of quantifiable and qualitative measurements of direct mobility benefits to the City in the event of payment of transit impact fees.

1. The following design standards will be used when determining accessibility, scheduling, passenger amenities, and information systems:

- Accessibility design standards shall include a maximum residential walking distance to a transit stop of ¼ mile for high and medium densities and ½ mile for low density. Bus stop locations of .3 miles apart, except where existing land uses make the standard infeasible.
- Scheduling design standards shall include the provision that transit travel times not exceed two (2) times the automobile travel time for comparable trips, that weekday peak-hour headways for 90 percent of all routes be 30 minutes, and service be available 7 days a week including holidays.
- Passenger amenities standards include bus bench placement at designated bus stop locations.
- The information systems standard is to make timetables available at all major transfer points" (FTL, 2008, pg. 9-30).

City of Deerfield Beach

The City of Deerfield Beach is among the aforementioned municipalities within Florida with a Complete Streets policy and Complete Streets guidelines handbook.[78] The City of Deerfield Beach, like other Floridian cities, also has a comprehensive plan that puts the guidance regarding access to public transportation into policy.[79] The policies within Deerfield Beach's comprehensive plan relating to access to public transportation by foot and/or bicycle are as follows:

[77] (FTL, 2008, pg. 9-6)
[78] City of Deerfield Beach, "Deerfield Beach Complete Streets Guidelines," 2013
[79] City of Deerfield Beach, "Complete Streets Implementation Final Plan", 2015

"Policy TE 1.2.15: In cooperation with FDOT, Broward County, the MPO, and the South Florida Regional Transportation Authority, The City of Deerfield Beach will continue to help implement strategies to maintain Level of Service Standards on the Florida Intrastate Highway System (FIHS), including strategies to facilitate local traffic to use alternatives to the Florida Intrastate Highway System (FIHS) as a means of protecting its interregional and intrastate functions. Among the strategies that the City of Deerfield Beach will continue to help implement are:

15. Improve pedestrian access to transit by supporting efforts that ensure road planning, design, and construct5ion include the necessary walkways on all arterial and collectors under the responsibility of the State, County, and City."[80]

"Policy TE 1.2.21: The City shall encourage the provision of ped/bike infrastructure linking neighborhoods to the transit system."[81]

"Policy TE 1.2.22: By December 2011, the County and City shall coordinate on establishing bicycle and pedestrian LOS standards to be used for concurrency and short/long range planning purposes, in order to implement Policy 3.4.29 of the County's Transportation Element"[82].

"Policy TE 1.2.23: By December 2013, the City shall adopt the County's short-term bicycle and pedestrian LOS standards, and its long-term transit, bicycle and pedestrian standards, per the County's concurrency management system"[83].

"Policy TE 1.4.1: The City will establish an inter-departmental advisory committee to oversee the implementation of Complete Street principles on all streets. The committee will include city staff members from Planning & Development Services, Economic Development, Engineering Division, Parks & Recreation, Fire Rescue, and the City's Manager's office. The committee may include representatives from Broward MPO, Florida Department of Transportation (FDOT) and representatives from the bicycling, disabled, youth and elderly community as relevant"[84].

"Policy TE 1.4.3: The City shall support, in coordination with affected municipal partners and other stakeholders, context sensitive implementation consistent with the Deerfield Beach Complete Streets Guidelines of reduced targeted speed limits, including but not limited to "road diets" and "roundabouts," for roadways classified and/or functioning as collector or arterial facilities, where it is demonstrated that such improvements would safely and seamlessly provide additional choice in mode of transportation (e.g. pedestrian, bicycle, transit), and where coordinated with appropriate surrounding existing and/or planned land uses"[85].

"Policy TE 1.4.4: The City shall support and encourage context sensitive implementation to enhance and/or re-establish street-network connectivity and circulation (e.g. avoidance and removal of barriers which close off or inhibit pedestrian, bicycle and vehicle access to public rights-of way, including construction activities)."[86]

[80] Ibid, p.12-13
[81] Ibid, p.15
[82] Ibid, p.15
[83] Ibid, p.15
[84] Ibid, p.19
[85] Ibid, p.19
[86] Ibid, p.20

"Policy TE 1.4.5: The City shall support and incorporate into its Codes and standards the utilization of context sensitive techniques to provide safe, accessible, attractive, convenient, and seamless pedestrian facilities, that are consistent with the Deerfield Beach Complete Street Guidelines…"[87].

"Policy TE 1.4.6: The City shall support and incorporate into its Codes and standards the utilization of context sensitive techniques, to provide safe, accessible, attractive, convenient and seamless bicycle lanes, that are consistent with the Deerfield Beach Complete Street Guideline, such as the following:

1. Sufficient and safe bicycle lane width with a preferred range between 4 and 5 feet.
2. Use of sufficient and highly visible bicycle land buffers, including door zone buffers or cycle tracks.
3. Highly visible bicycle lanes (e.g. utilizing striped/dashed lane markings thru intersections, painted or colorized bicycle lanes, lighting, signage, signalization).
4. Avoidance of uneven bike path surfaces.
5. Identification and sufficient marking of shared use paths.
6. Consideration and identification of bicycle boulevards and/or use of parallel streets.
7. Bicycle signal detection.
8. In-street bicycle boxes.
9. Availability and placement of sufficient bicycle racks.
10. Coordination of bicycle lanes and facilities with transit routes and facilities to support option of segmented user trips (e.g. bicycle cars on trains, interior bicycle parking on buses).
11. Coordination and connection to existing and planned greenway paths/trails.
12. End of trip facilities (e.g. showers, lockers)."[88]

"Policy TE 1.4.7: The City shall support and coordinate with Broward County Transit the utilization of context sensitive techniques to provide safe, accessible, attractive, convenient and seamless transit, that are consistent with the Deerfield Beach Complete Streets Guidelines such as the following:

1. Traffic signal prioritization for transit, including queue lanes.
2. Dedicated/exclusive lanes for transit, or co-mingled transit/bicycle lanes.
3. Coordination of bus stops locations with pedestrian street crossings.
4. Bus-bulbs.
5. User friendly bus shelters (e.g. sufficient lighting, seating, protection from the elements, real-time transit route information)"[89].

[87] Ibid, p.20
[88] Ibid, p.21
[89] Ibid, p.21

Palm Beach County

Palm Beach County's comprehensive plan was first developed in 1989 and then updated in October of 2015. Policies within the plan as they relate to bicyclist and/or pedestrian access to public transportation are as follows:

"Policy 1.5-e: Palm Tran shall continue the existing program of maintaining signage to mark transit stops"[90].

"Policy 1.5-f: The County (through Palm Tran) shall maintain guidelines to improve the design and functionality of transit stations/stops. Particular attention shall be devoted to how they relate to the surrounding area and how they promote a pedestrian friendly environment and a sense of place. The County shall also require site design evaluation of transit stops that include such features as passenger loading areas, transit user amenities and sidewalks that link to other nodes within a well-connected system"[91].

"Policy 1.9-b: The County shall provide for bicycle, pedestrian, and bus transit facilities in the plans for all major roadway construction and reconstruction projects consistent with adopted standards developed by the County and State, especially when connecting to GLOSS components, unless cost prohibitive or deemed impractical by the County Engineer based upon generally accepted engineering principles"[92].

"Policy 1.9-g: The County shall encourage the use of expanded road rights-of-way corridor cross-sections which allow for multi-use bicycle and pedestrian and equestrian trails cross sections where appropriate, especially when connecting to GLOSS components"[93].

"Policy 1.9-h: Roadway design for areas identified as urban residential shall continue to address pedestrian transportation design at a priority level equal to that of the automobile and public transit; all public roadway projects in urban residential areas shall include sidewalks on both sides of any roadway above the classification of a minor collector, and pedestrian needs shall continue to be considered at the outset of design, to avoid conflicts with retrofitted storm water drainage facilities, new utility placement, new development and the like"[94].

"Policy 1.9-j: As development occurs, the County shall improve pedestrian linkages between residential and non-residential developments as well as connections within neighborhoods by: 1) increasing the number and quality of pedestrian paths or sidewalks; 2) eliminating physical barriers; and 3) locating transit stops within easy walking distance to all residences"[95].

"Policy 1.9-k: The County shall encourage the design of mixed use and multi-use developments and planned developments to be of a pedestrian scale and design by incorporating transit stops and sidewalk connections that follow the accepted general threshold for pedestrian access: 1) approximately five minutes walking time or 2) one quarter mile of distance walked"[96].

[90] Palm Beach County Comprehensive Plan, 2015 Update, Transportation Element, p.58-TE
[91] Ibid, p.58-TE
[92] Ibid, p.61-TE
[93] Ibid, p.62-TE
[94] Ibid, p.62-TE
[95] Ibid, p.62-TE
[96] Ibid, p.62-TE

"Policy 1.9-l: For new residential developments, the County shall encourage cut through linkages for ped/bike access to transit. The County shall also encourage developers of new master plans to include specific circulation planning for ped/bike access"[97].

"Policy 1.9-o: To increase access to linked open space corridors through the use of mass transit public facilities, the County shall use the Pathways Program to ensure that: 1) wheelchair accessible sidewalks are provided in both directions at all Palm Tran bus stop shelters; and 2) appropriate wheelchair street-crossing facilities are located adjacent to bus stop shelters. Appropriate crossings shall be defined on a case-by-case basis and may include mid-block crossings where they are determined to be safer for pedestrians"[98].

City of Lakeland

Policies within the City of Lakeland's Comprehensive Plan Transportation Element relating to bicyclist and pedestrian access to public transportation are as follows:

"Policy 5C: The City of Lakeland will continue to incorporate consideration of bicycle and pedestrian facilities in all roadway improvements, consistent with the appropriate Roadway Typology and Citywide Pathways Plan and to help create complete streets that function safely for all users of the transportation system. The City will work with the Polk TPO, Florida DOT, and Polk County in the identification of locations where sidewalks and bicycle lanes should be included on State and County highway improvements and resurfacing projects within the City. The City will also work with the TPO, FDOT, and Polk County to incorporate bicycle and pedestrian features into intersection projects (e.g., pedestrian signals, intersection bulb-outs, enhanced crosswalks, raised concrete pedestrian refuges ("pork chops")) and in resurfacing projects (e.g., addition of four-foot paved shoulders on open-drainage typical sections). The City shall include designated bicycle lanes or un-designated paved shoulders on each resurfacing project implemented on the City collector road system, unless such treatments are not feasible. In such instances, alternative measures such as "sharrow" markings and "bicycles sharing roadway" signage shall be evaluated for installation. Transit amenities such as transit shelter pads, wheelchair deployment pads and transit bench pads shall be included in all highway improvement and resurfacing projects implemented within the City, where feasible"[99].

"Policy 5J: The City of Lakeland will continue to utilize and when needed to update its Engineering Standards Manual to include standard typical sections for all public and privately funded collector and arterial roadways to be constructed within the City. Future updates to the Engineering Standards Manual shall consider modifications based on the Roadway Typology cross-sections discussed in the Transportation Element. At a minimum, these typical sections shall include five-foot sidewalks on one or both sides of the street and include standard-width bicycle lanes, where appropriate, on-street parking where appropriate and provisions for transit. These typical sections shall also apply to privately funded streets that will serve as a component of a frontage, backage or other access road system for new multiple developments"[100].

"Policy 5N: The City will design, build, and maintain streets that support the Polk TPO Complete Streets Policy as adopted through TPO Resolution 2012-05 on October 11, 2012 and in accord with City

[97] Ibid, p.62-TE
[98] Ibid, p.63-TE
[99] City of Lakeland Comprehensive Plan, 2010, p.213
[100] Ibid, p.215

Resolution 5004 adopted in August 2012, including use of guidelines that promote safe and convenient access and travel for all users of the transportation system. Transportation projects within the City should, where feasible, include amenities such as street and pathway lighting, transit amenities, street parking, medians, street trees and landscaping, and connection and integration of the street and Chapter III Transportation Element: Goal, Objectives & Policies 216 modal networks, all within consideration of local context of land uses and the City's adopted roadway typology"[101].

"Policy 6A: As part of any new or updated neighborhood, sector, or CRA plan, the City of Lakeland will analyze the existing sidewalk network and identify remaining key gaps in pedestrian routes, including near schools and transit stops. Development within the Central City Transit Supportive Area (CCTSA) and Transit Oriented Corridors (TOC) having a significant impact (defined as consuming five percent of the roadway's peak-hour directional service volume on a roadway segment or intersection operating at a failing highway level-of-service) shall be required to fund off-site sidewalk and/or other multi-modal projects to address transportation network gaps in proportion to the project's impacts"[102].

Policy 6B: Funding priorities for future sidewalk improvements shall support transit use and the City's multi-modal transportation level of service standards. The following funding prioritization shall apply within City limits and any of the following may include network improvements for the disabled (e.g., curb cuts for ramps):

a. a critical public safety concern or emergency;
b. improvements to the existing network along designated transit routes providing 30 minute or less headways at least in peak time, and secondarily, improvements to the network within ¼ mile of these routes and within ½ mile of any passenger rail station site (light/commuter or high speed rail services);
c. specific pedestrian needs identified by elementary schools;
d. improvements to enhance multi-modal corridors (including along designated greenways or trails such as the Lake-to-Lake Connector;
e. pedestrian needs identified in City neighborhood, sector or CRA plans, including improved access to City parks;
f. non-elementary school-related pedestrian needs;
g. other identified system needs"[103]

"Policy 6C: Identified sidewalk gaps and deficiencies along and within ¼ mile of the transit routes, including general cost estimates for addressing needed improvements, shall generally be given high priority in capital improvements budgeting for sidewalk construction or reconstruction, as consistent with Policy 6B. Generally streets with no sidewalks in the Central City TSA and/or along TOCs, shall be given funding priority over Chapter III Transportation Element: Goal, Objectives & Policies 217 streets that already have sidewalks on one side; exceptions may include emergencies, safety concerns, or where the gap is within ¼ mile of an elementary school"[104].

"Policy 6E: The City will continue to pursue an update to the Land Development Regulations incorporating elements of a form-based code that recognizes the street as a public place and

[101] Ibid, p.215-216
[102] Ibid, p.216
[103] Ibid, p.216
[104] Ibid, p.216-217

emphasizes a well-connected, walkable urban form that is amenable to the pedestrian, bicyclist and transit user"[105].

"Policy 16E: The City shall encourage bicycle travel by requiring bicycle parking as a condition of development approval for new development in accordance with the Land Development Regulations, and by participating in the development of a bicycle parking strategy for Downtown Lakeland and a published bike route map for the City. The City shall work with the Lakeland CRA, Florida DOT and Polk TPO to site and fund secure "bicycle stations" at strategic locations throughout Lakeland to provide parking, services and information to the area bicycling community"[106].

[105] Ibid, p.217
[106] Ibid, p.225

APPENDIX E: LOCAL GOVERNMENT LAND DEVELOPMENT CODE

Example of Ped/Bike Linkages: City of Lakeland

The City of Lakeland's Land Development Code contains a section specific to pedestrian, bicycle, and transit facilities. This section establishes minimum standards for such facilities and serves as a method to implement the transportation policies of the Comprehensive Plan.

In addition to the Land Development Code's above requirements for transportation facilities, the Land Development Code includes measures to be taken under Transportation Concurrency and Transportation Demand Management Mitigation. The purpose of the Transportation Demand Management Mitigation section is to "make available concurrency mitigation measures for development that adversely impacts constrained roadways within designated Transit Oriented Corridors (TOCs) and the Central City Transit Supportive Area (CCTSA). These measures may be used at the discretion of the Director of Community Development to allow automobile traffic to exceed adopted roadway segment capacities in exchange for the presence of or mitigation funding for bicycle, pedestrian, and transit facilities or services," [107]

Table E-1 outlines and summarizes the requirements as established in the City of Lakeland's Land Development Code as they relate to ped/bike access to public transportation.[108]

[107] Ibid, pp. 10.9 – 10.10
[108] Ibid, pp. 4.85 – 4.92

Table E-1: City of Lakeland Land Development Code on Bicycle and Pedestrian Access to Transit

Facility	Elements
Sidewalks	• Enlarged, Altered, or reconstructed Multi-Family or Non-Residential Principal Structure • Property owner of developer shall construct sidewalks along roadways adjacent to all front and side street lot lines (if sidewalks do not exist) • Subdivisions – Abutting Streets - Developer shall construct sidewalks along subdivision side of each roadway where sidewalk does not presently exist – Internal Streets - the developer shall construct sidewalks along both sides of arterial and collector roadways internal to the subdivision, and along at least one side of local streets internal to the subdivision (alternatives available) • Multi-Family Developments – Developer or property owner shall construct sidewalks along development side of each roadway abutting the development where they do not previously exist – Mobile Home Parks – Developer or property owner shall construct sidewalks along the development side of each roadway abutting the development where they do not previously exist – Shopping Centers – Developer or property owner shall construct6 sidewalks along the development side of each roadway abutting the development where they do not previously exist • Multi-Unit Industrial or Office Park Developments – The developer or property owner shall construct sidewalks along the development side of each roadway abutting the development where sidewalks do not previously exist, except on local streets where a sidewalk presently exists directly on the opposite side of the street, and along at least one side of the principal entrance roadway – All sidewalks shall adhere to the requirements regarding the Pedestrian Circulation System Plan, sidewalk construction standards, protection of street treats, donation of ROW or easements, construction bonds, and maintenance
Multi-Use Pathways and Bike Lanes	• Applicability – Prior to the issuance of a first Certificate of Occupancy, development located on any Priority Pathways Corridor, as designated in the Transportation Element of the Comprehensive Plan, and which generates more than 120 daily automobile trips, shall construct the appropriate pathway or bike lane segment in accordance with the following: – Type of pathway or bike lane shall be in accordance with Table III-17 of the Comprehensive Plan and in accordance with local codes – Pathway or bike lane shall provide a continuous route that connects with either existing or future segments of the Priority Pathways Corridor – All pathways shall adhere with ordinance requirements for design standards
Transit Facilities	• Applicability – Developers may be required to provide transit facilities as specified in Article 10 of the Land Development Code – This section also applies to developers who voluntarily provide transit facilities, who must do so in accordance with the section's standards and requirements • Standards – Location of transit stops on the public streets system or internal to the development site shall be approved by the transit agency – Transit stops must be designed in accordance with the Engineering Standards Manual and must be ADA compliant – Transit stops shall be placed within a ROW or recorded easement – Transit stops shall provide connections to the nearest sidewalk or pedestrian pathway – Where a transit stop is required to be located internal to a development, to the greatest practical extent the site shall be designed to minimize conflicts between transit vehicles and off-street parking areas and shall be located to minimize pedestrian travel distance between the transit stop and principal building entrances

Table E-2 lists the type of development and mitigation measures outlined in the Transportation Demand Management Mitigation Segment.[109]

Table E-2: City of Lakeland Transportation Demand Management Mitigation Measures

Type of Development	Mitigation Measures
Development located adjacent to a transit stop and generating at least 120 daily trips.	• Construction of transit bench pad
Development generating 750 or more daily trips and located adjacent to or within 1/4th mile of a transit stop.	• Construction of a transit shelter pad and transit shelter structure at a location acceptable to the transit agency • Where pedestrian access within 1.4th mile of a transit route has one or more gaps in the sidewalk or side path network to the transit site, such a gap shall be addressed and meet all city standards
Office and public/institutional or non-residential multi-use development containing 40,000 square feet or more and generating at least 750 daily or 50 PM peak hour trips.	• Construction of the transit stop improvements contained in Sub-Section b. (section directly above) • Developer shall request to participate in the FDOT Commuter Services Program or other organization that provides similar commuter assistance services • A minimum of five percent of the required off-street parking spaces shall be dedicated to carpool/vanpool participants.
Development within multi-use master planned sites containing 40,000 square feet of office or institutional uses generating at least 2,000 daily and 150 PM Peak Hour trips (cumulative total for all uses).	• Provision of all mitigation outlined in sub-section c. (section directly above) • Developer shall execute an agreement with the transit agency through which transit passes are purchased for employees or payment is made to allow for fare-free rides for employees and major target user groups within the development • One shower/changing room facility accessible to employees shall be required for the first 40,000 of office or institutional space per building, with one additional facility for each additional 100,000 square foot of office space within the same building.
Retail development generating at least 2,000 daily and 150 PM total peak hour trips.	• Construction of on-site transit shelter within the development site, provided that the site is acceptable to the transit agency. An easement agreement shall be executed with the transit agency to accommodate the transit shelter site as well as the transit vehicle routes.
Single-family residential subdivisions or multi-family residential developments located along fixed transit routes.	• Dedication of and for and construct or provide funding for a transit shelter built in compliance with the Engineering Standards Manual at locations acceptable to the transit agency
Development meeting criteria in Sub-Section 10.4.2.2.d & e above (retail developments generating at least 2,000 daily trips), depending on scale of the project at build-out and the specific impacts of the project on the transportation network may be required to fund and/or implement transportation demand management measures including higher levels of transit services in order to obtain a Certificate of Concurrency.	• Dedication of park-and-ride parking spaces for public use • Funding of transit capital and service improvements • Implementation of staggered work hour or telecommute programs (reduce peak hour impacts)
Development generating 750 or more daily trips and located within the CCTSA or Urban Development Area (UDA) and not directly assessing a TOC.	• Fund construction of off-site sidewalk and bicycle pathways to address nearby network gaps identified in the Comprehensive Plan • Sidewalk and bicycle pathway mitigation requirements shall improve connectivity and/or accessibility to nearby fixed-route transit services operated by the transit agency • Improvement shall be programmed in the Capital Improvement Element prior to the issuance of a building permit. • Development may elect to construct the improvement or provide sufficient funds to complete the project.

[109] Ibid, pp. 10.9 – 10.12