MARTIN COUNTY TRANSIT SERVICE BUS STOP ADA ASSESSMENT FINAL REPORT

March 25, 2015

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CHAPTER 1
INTRODUCTION

1.0 INTRODUCTION

Martin County Public Transit (MCPT) is interested in improving the access to and from, the security at, and the operations at MCPT's approximately 50 stand-alone bus stops.

This study includes a comprehensive inventory of the conditions at MCPT's bus stops and facilities and identifies and helps prioritize improvements to address accessibility, security, operation, and passenger comfort issues. Information relating to the accessibility of each bus stop and facility has been collected. The purpose of this data is to improve MCPT's staff's understanding of accessibility issues pertaining to Americans with Disabilities Act (ADA) requirements. Specifically, how the ADA relates to bus stops and transit facilities, as well as to identify which bus stops and facilities are in compliance with the ADA and which are not. Not only does the placement of bus stops and facilities affect passenger amenities, but service speed and schedule adherence also can be adversely impacted by the implementation of too many stops. However, MCPT recognizes that it is important to have a balance between the potential need to eliminate underutilized stops and the community's need for convenient access to nearby bus service. In an effort to ensure all of MCPT's bus stops are compliant, safe, secure, and operationally efficient, all of MCPT's bus stops were considered in this review.

This document serves as a summary report outlining the development of the bus stop inventory and database, the prioritization of bus stop improvements, and the phasing plan to implement improvements based on anticipated funding available over the next five years. A separate appendix document has also been prepared, which includes a detailed summary of the results of the analysis.

CHAPTER 2
INVENTORY PROCESS

2.0 INVENTORY PROCESS

This section describes the processes and methodologies used to develop the master inventory database, including field data collection, quality control, and compilation of the master database. In addition, this process also included the development of a new tablet based application in order to directly input raw data into a master database. The prioritized list of improvements and phased implementation plan developed as part of this project are the result of the data collection effort conducted during the inventory process.

The data collected are used to record infrastructure, characteristics, and location of each bus stop, which can be utilized by MCPT and other entities to identify infrastructure improvement needs.

2.1 FIELD DATA COLLECTION

TOA staff were sent into the field to collect data using a tablet based questionnaire. The questions and answers used may be found in Appendix A at this end of this report. It should be noted that the data was collected April 2014 and supplemental data was collected by MCPT staff in January 2015.

2.2 BUS STOPS

The first step of the inventory process was to identify the list of the data items to be collected. This list was developed based primarily on the data required to determine the accessibility of a bus stop using the ADA Accessibility Guidelines (ADAAG).

A comprehensive checklist of the data to be collected was prepared and developed into a software interface specifically designed and programmed for this study. The application developed allowed the surveyors to easily enter all the necessary data collected at each bus stop. The program also allowed the collected data to be exported to a database format for the analysis. This interface was accessed by the surveyors using Android tablets and smartphones. These devices all had wireless connectivity and GPS built into each of them. By utilizing the most up to date mobile technology, survey teams could determine the bus stops GPS coordinates, input data with prompted questions, and take photographs using a single tool. The following is a list of the primary equipment utilized by each survey team to conduct the inventory:

- Mobile Tablet or Smartphone
- Smart level
- Measuring wheel
- Compass
- Safety Vest

Figure 2-1 illustrates the primary equipment utilized by the surveyor teams during the data collection process.

Figure 2-1 Data Collection Tools

Following development of the program interface and distribution of the necessary data collection tools, the inventory process began. The inventory process consisted of three stages: a field test, data collection training, and the bus stop inventory.

Field Test – The purpose of the field test was to check the established data collection methodology on several bus stops in order to determine whether any adjustments were needed prior to training.

Data Collection Training – The data collection training presented the data collection process to the surveyors, including step-by-step instructions, reminders and pointers for collecting data at each stop, as well as contact information for appropriate project team members. Pertinent information related to the data collection was compiled into a Data Collection Training Manual for surveyors to use as a reference during the inventory process. The data collection training included one day of in-class training for the surveyors and multiple days of field training, where the surveyors practiced accessing actual bus stops.

Bus Stop Inventory – The inventory data collection was conducted by two-person team at all stand-alone bus stops.

A copy of the Data Collection Training Manual provided to each surveyor during the data collection training class can be found in Appendix B. In addition, a comprehensive list of the data collected as part of the inventory process can be found in Appendix C.

2.3 QUALITY CONTROL AND COMPILATION OF MASTER DATABASE

The initial data collection process was conducted over a period of four months. During this time, quality control (QC) measures were continuously conducted by the project team to ensure that all information collected was complete and accurate. As the database was compiled, all records were reviewed and corrected for missing or incorrect data by matching the record to its corresponding photographs. Corrected information in the database was marked to reveal patterns of incorrect information in the database. Data elements with significant errors were closely analyzed to determine the source of the error (e.g., mis-entries, programming errors). Elements such as presence of benches or shelters could be corrected by viewing the photographs, while elements that require measurement, such as slope or width, could only be determined in the field.

The master database was finalized and prepared for analysis and is included in Appendix D and summarized in Appendix E. Following completion of the analysis, a digital version of the master database will also be transmitted to MCPT.

It should be noted that MCPT intends to continuously maintain and update the inventory database to reflect ongoing changes made to the system's bus stops.

The initial analysis performed on the master database included the development of summary tables for each category of data collected during the inventory. Appendix F provides a series of tables summarizing the frequency and distribution of data for all of MCPT's bus stops collected during the inventory, including any applicable comments noted by the surveyors. Appendix G contains a sample existing bus stops photos as well as proposed example renderings of what an ADA compliant bus stop at that particular location might look like.

The remainder of this report summarizes the development of the Comprehensive Improvement Plan and associated data analysis. The purpose of this Plan is to identify and prioritize needed improvements and recommend a phasing program for implementing the needed improvements, based on anticipated funding.

CHAPTER 3
ADA REQUIREMENTS AND DATA COLLECTION

3.0 ADA REQUIREMENTS AND DATA COLLECTION

An analysis of the collected data was undertaken to develop a comprehensive list of deficiencies present and the subsequent improvement needs. This section provides an overview of the general requirements pertaining to bus stops and facilities and then presents the findings of the inventory process as it relates to the specific improvement needs.

3.1 GENERAL ADA REQUIREMENTS

Three primary guidance documents were utilized during this project to highlight specific design and infrastructure requirements related to accessibility: the ADAAG, the FDOT Accessing Transit Design Handbook for Florida Bus Passenger Facilities, and the FDOT Transit Facility Handbook. The general ADAAG/FDOT requirements for bus stops and transit facilities are as follows:

- The bus stop site must be chosen to provide the greatest degree of accessibility practicable.
- The boarding and alighting area must provide a firm, stable, slip resistant surface.
- The clear area of the boarding and alighting area must be equal to or no less than 60” parallel and 96” perpendicular to the curb or street/roadway edge and connected to the accessible route.
- A 6” raised curb is recommended at all bus stops to insure that the bus ramp is deployed with a compliant slope.
- The bus stop must have an accessible approach to the boarding and alighting pad and all amenities provided.
- The cross slope of the boarding and alighting pad (perpendicular to the curb) must be equal to or less than 2 percent.
- The running slope (parallel to the curb) of the boarding and alighting area should match the slope of roadway.
- The bus stop must be on or connect to an accessible route.
- Bus stop amenities must be connected to the accessible route, allow accessible maneuvering space, and be within 48” maximum reach range of all operating controls.
- If a shelter is provided, it must connect to the accessible route and allow a minimum space of 30” X 48” fully within the shelter.
- If a bench is included within a shelter, it must allow a minimum space of 30” X 48” resting/transfer space at one end of the bench.

Figure 3-1 illustrates a number of these general accessibility requirements.

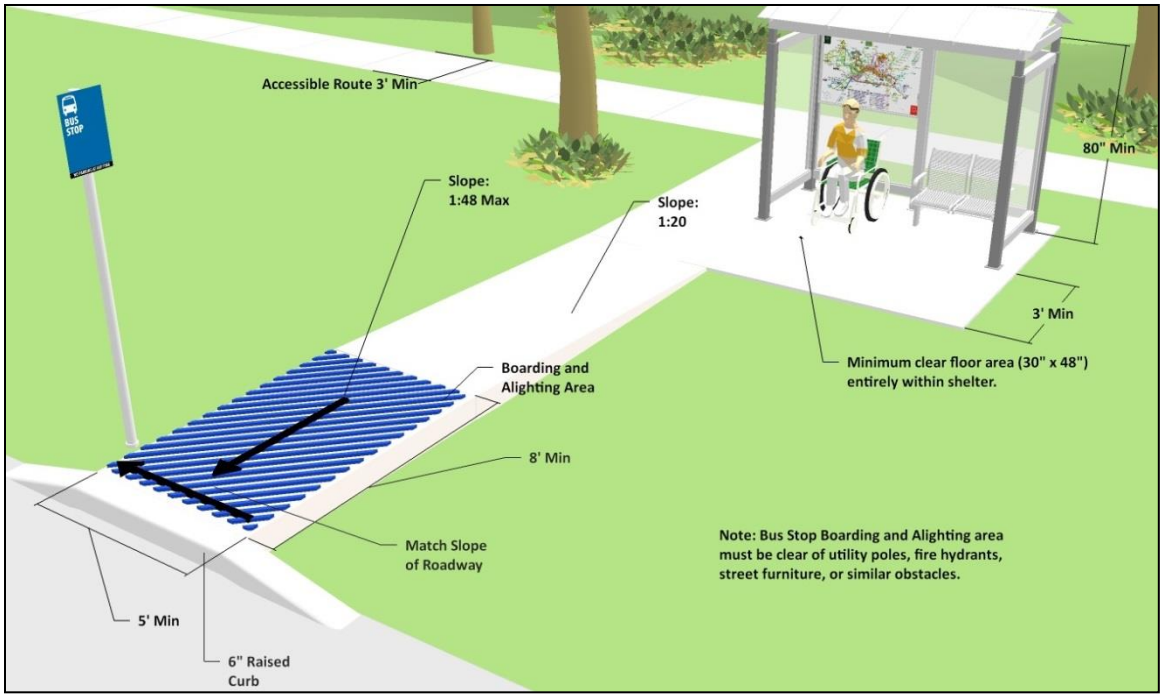


Figure 3-1 General Bus Stop Accessibility Standards Diagram

Many standards that would apply to bus stops located in dense urban environments are not necessarily applicable to bus stops located in suburban or rural locations, where curbs and sidewalks are not present. Currently, some of MCPT's bus stops, especially those located in suburban or rural areas (as determined by census data and the appearance of the surrounding area as determined by the assessor), have no more than a bus stop sign staked in the grass. As previously mentioned, standards for these non-urban stops are significantly less, since MCPT will not be required to implement much infrastructure, such as sidewalks and curbs. In these cases, MCPT will only be required to install a raised boarding and alighting area, and not necessarily a sidewalk connecting the bus stop to the surrounding area. At locations where there is no expectation of a sidewalk, and the shoulder of the roadway may be considered the only usable pedestrian pathway, the boarding and alighting area will only be required to connect to the shoulder of the roadway to be considered compliant.

3.2 BUS STOP REQUIREMENTS

There are five major elements related to bus stops that primarily impact their accessibility and/or compliance with ADA requirements. These include:

- Boarding and alighting pads,
- Bus stop signs,
- Accessible routes and sidewalks,
- Curb ramps, and
- Obstructions.

This section discusses the standards related to these elements and addresses the deficiencies that were noted throughout MCPT's bus system.

3.3 BOARDING AND ALIGHTING AREAS

Boarding and alighting areas (previously referred to as "landing" pads) are critical for the safe and accessible boarding and alighting of passengers onto buses. They are particularly critical for the safe and accessible operation of wheelchair lifts.

Standards

The minimum width and length of the paved boarding and alighting area, as well as surface qualities, are regulated by the ADAAG/FDOT. Many of the same standards for sidewalk surfaces apply to landing areas. The standards for boarding and alighting areas are as follows:

- The clear area of the boarding and alighting area must be no less than 60" parallel and 96" perpendicular to the curb or street/roadway edge and connected to the accessible route.
- The cross slope of the boarding and alighting area (perpendicular to the curb) must be equal to or less than 2 percent.
- The running slope (parallel to the curb) of the boarding and alighting area should match the slope of roadway.
- The boarding and alighting area must provide a firm, stable, slip resistant surface.

Figure 3-2 illustrates some of these standards.

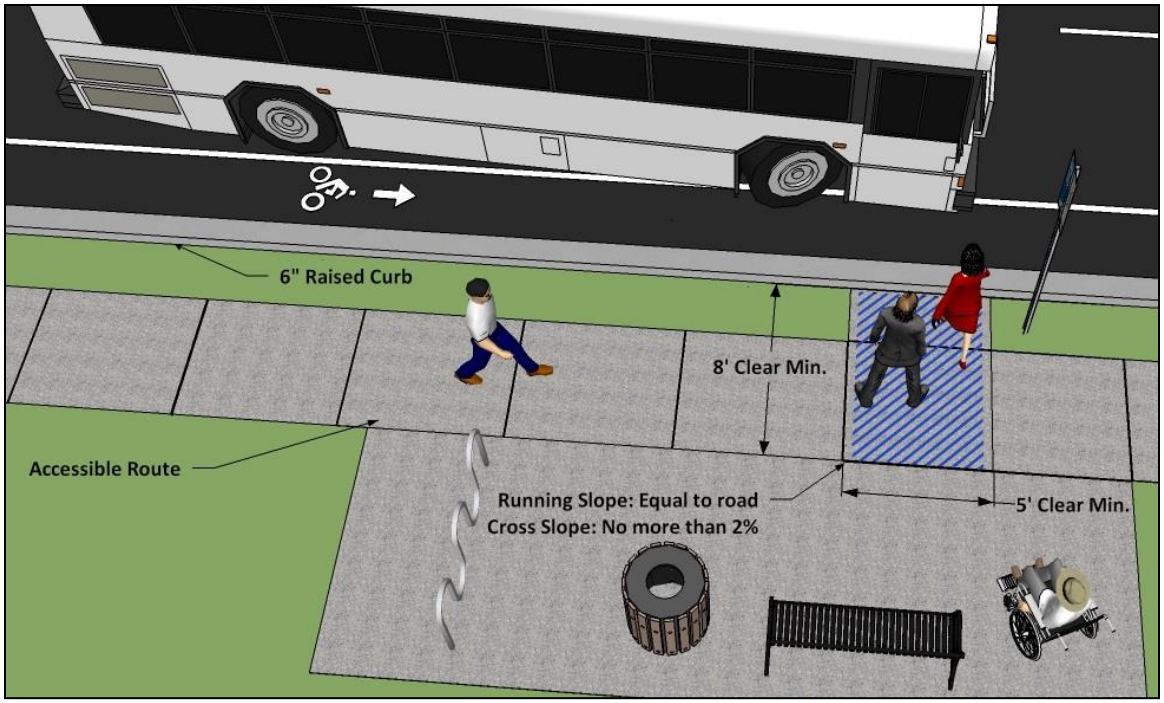


Figure 3-2 Landing Area Standards Diagram

Data Analysis and Results

To determine the deficiencies at each stop, data was collected in the field relating to the boarding and alighting areas. The following data elements were collected:

- Whether there is a boarding and alighting area of any kind present at the bus stop.
- Whether the boarding and alighting area is equal to or greater than 5-foot by 8-foot.
- Material of the boarding and alighting area.
- Whether the boarding and alighting area is free of defects such as cracks in the pavement.
- Whether the running-slope matches that of the road.
- Cross slope measurement.
- Running slope measurement.
- Whether there are any changes in elevation greater than 1/8".
- Whether the stop is located in an urban/sub-urban/rural area.
- Whether there is a raised curb/landing area.

Data collected for the boarding and alighting area at each bus stop were analyzed for each of these elements. The results are displayed in Table 3-1.

Table 3-1 Total Deficiencies for Boarding and Alighting Areas

Deficiency	Total Stops
No boarding and alighting pad [(1)] present at stop	20
Defect in boarding and alighting pad	36
Cross slope is greater than 2%	18
Running slope does not match the road	1
Running slope is greater than 5%[(2)]	1
Elevation changes greater than 1/4"	10
No raised curb	17
Total stops with problematic boarding and alighting areas[(3)]	**37**

Note: A bus stop sign may have more than one of the deficiencies listed in this table. As such, this figure does not represent a sum of the deficiencies in this table. Also, note that these deficiencies are not listed in any particular order. One type of deficiency is not considered more severe than another.

(1) The presence of a boarding and alighting area refers to a clear area in which a person in a wheelchair could potentially access a wheelchair lift or ramp, regardless of standardized dimensions, minimal slope, elevation changes, or connections to the surrounding area. Per the ADAAG, the material does not have to be concrete, but must be a firm and stable surface, such as packed dirt and not grass or gravel.

(2) If the sidewalk or boarding and alighting area has a running slope that does not match that of the roadway and it has a slope that is greater than 5%, it would be considered a ramp and would therefore be non-compliant.

(3) A problematic boarding and alighting area at a stop may have more than one of the deficiencies listed in this table. As such, this figure does not represent a sum of the deficiencies in this table. Rather, this number represents the number of stops with one or more deficiencies.

As presented in Table 3-1, 20 existing bus stops have no boarding and alighting area either, designated or undesignated, 36 bus stops have a defect in the boarding and alighting area, 18 bus stops have a cross slope greater than 2%, 10 bus stops have a change in elevation of greater than ¼", and 17 bus stops do not have a raised curb. Therefore, 37 of the existing bus stops, have some kind of boarding and alighting area deficiency.

3.4 BUS STOP SIGNS

Bus stop signs are important because they identify the location of an active bus stop, but they also serve other important purposes. Bus stop signs are critical for showing passengers the correct area to board the bus and also serve as a guide to bus operators for positioning the bus. Bus stop signs must follow particular standards set by the ADAAG/FDOT for placement and visibility.

Standards

Bus stop signs providing route designations, bus numbers, destinations, and other access information must be designed for use by transit riders with vision impairments. The general ADAAG/FDOT standards for bus stop sign placement and visibility are as follows:

- The bottom of the sign should be at least 7 feet above ground level; however, it may be placed as low as 40 inches above ground level, and should not be located closer than 2 feet from the curb face. Placement of the sign is critical so that both passengers and drivers can identify and read the sign and so that the sign is not an obstruction to passing vehicles.
- Characters and the background of the sign should have a non-glare finish. This makes the sign clear and visible in bright sunlight or headlights.
- Minimum character height must be visible to the passenger and should comply with the ADAAG/FDOT standards are detailed on page 51 of the *Accessing Transit Handbook* and Table 3-2, shown below.
- Other signs sharing the mount location also should be properly mounted.
- Ideally for all bus stops, but required for bus stops that serve more than one route, the bus stop sign must also include the bus route number(s) that provide services to the stop.

Table 3-2 Visual Character Height Standards

Height to Finish Floor or Ground From Baseline of Character	Horizontal Viewing Distance	Minimum Character Height
40 inches to less than or equal to 70 inches	Less than 72 inches	5/8-inch
	72 inches and greater	5/8-inch, plus 1/8-inch per foot of viewing distance above 72 inches
Greater than 70 inches to less than or equal to 120 inches	Less than 180 inches	2 inches
	180 inches and greater	2 inches, plus 1/8-inch per foot of viewing distance above 180 inches
Greater than 120 inches	Less than 21 feet	3 inches
	21 feet and greater	3 inches, plus 1/8-inch per foot of viewing distance above 21 feet

Figure 3-3 MCPT Bus Stop Sign

As shown in Figure 3-3, the MCPT bus stop sign meets the requirements, as specified in section 3.4. All new signage will be located 80" from the ground to the bottom of the sign. The signs will be two faced and will be oriented towards the pedestrian path. In addition, all bus stops that serve more than one route should, at a minimum, also include a route number.

Data Analysis and Results

To determine the compliance of MCPT's bus stop signs with the aforementioned standards, the following data elements were collected in the field:

- Whether there is a sign present at the bus stop.
- Whether the sign is the correct distance from the ground.
- Whether the sign follows the standards for proper visual character height and contrast.
- Whether the sign has an anti-glare surface.
- Whether signs that share the same location are properly mounted.

Following the field data collection, the information for these data elements was analyzed to determine the number of MCPT bus stop signs with specific deficiencies. Table 3-3 shows the stops noted for each element of deficiency.

Table 3-3 Total Deficiencies for Bus Stop Sign Placement and Visibility

Deficiency	Total Stops
No sign at stop	10
Sign not properly mounted	0
MCPT sign not compliant	**10**

In general, the typical sign design for MCPT meets the requirements of the ADAAG/FAC. There are 10 stops without a MCPT bus stop sign and 0 MCPT bus stops that have a bus stop sign that is not properly mounted. Therefore, 10 bus stops have a MCPT bus stop sign deficiency at the bus stop. It was also noted that the stops that appear to serve more than one route were missing the bus route numbers on the sign.

3.5 ACCESSIBLE ROUTES AND SIDEWALKS

Accessible routes and sidewalks leading to and from the bus stop are critical for all passengers, particularly those with disabilities, to reach the boarding and alighting area at the stop and any trip generators surrounding the stop.

Standards

An accessible route must be a sufficiently wide, continuous, and unobstructed path enabling passengers to access the bus stop and surrounding activity centers. The following are the specific guidelines for accessible routes and sidewalks set by the ADAAG/FDOT:

- Must be 36" minimum wide continuous unobstructed path.
- Must have a 32" minimum width at doorways.
- Must have 60" X 60" passing spaces at 200' intervals.

- Running slope (parallel to direction of travel) must be equal to or less than 5 percent (>5% = ramp).
- Cross slope (perpendicular to direction of travel) must be equal to or less than 2 percent.
- Surface must be firm, stable, and slip resistant (wet or dry).
- Changes in level between 1/4" and 1/2" must be beveled at 1:2 slope.
- Changes in level greater than 1/2" are not allowed or must be ramped.
- Gaps in gratings must be no greater than 1/2" wide and openings must be aligned perpendicular to travel.

Figure 3-4 illustrates these accessible route standards.

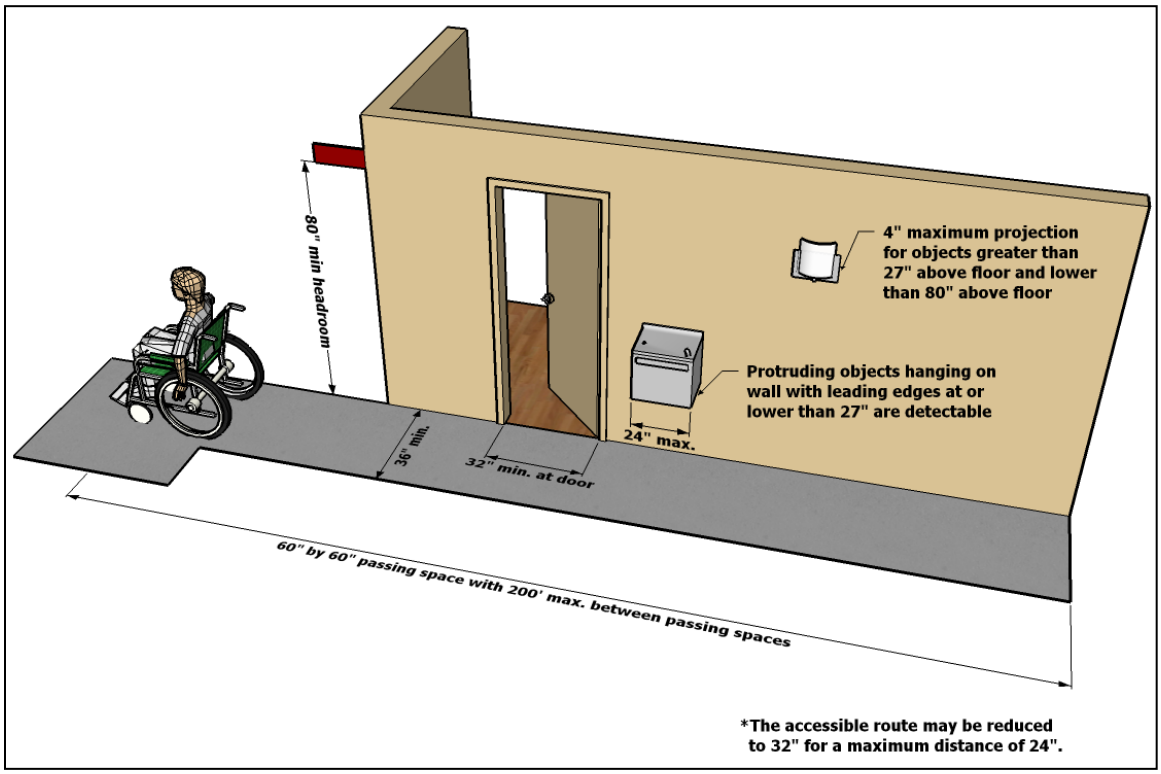


Figure 3-4 Accessible Route Standards Diagram

Data Analysis and Results

To determine the compliance of accessible routes and paths at MCPT bus stops, the following data were collected in the field:

- Whether a sidewalk is present at the stop.
- Whether the sidewalk at the bus stop is greater than or equal to 4 feet.

Following the field data collection, the information for these data elements was analyzed to determine the number of MCPT bus stop accessible routes and sidewalk deficiencies. Table 3-4 shows the stops noted for each element of deficiency.

Table 3-4 Total Deficiencies for Accessible Routes and Sidewalks

Deficiency	Total Stops
No sidewalk present (addition of sidewalk is recommended)	4
Sidewalk less than 4 feet wide	0
Sidewalk not compliant/not present	4

As shown in Table 3-4, there are 4 stops that have no sidewalk present.

3.6 CURB RAMPS

Curb ramps provide a means of easily and safely accessing sidewalks from a crosswalk or other surface and should be provided wherever a curb is encountered along the path to transit services and facilities. These are particularly critical for those with disabilities requiring wheelchairs.

Standards

Particular standards limit the minimum width and maximum slope of the curb ramp to ensure accessibility. The following are the standards for curb ramps required by the ADAAG/FAC:

- The maximum ramp segment slope permitted is 1:12 (8.3%).
- The maximum cross slope permitted is 1:48 (2%).
- Curb ramps must have detectable warning material the full width of ramp and either the full length of ramp or 24” from back edge of curb.
- Curb ramps must have a 36” long landing at top of slope
- The ramped portion must be at least 36” wide. (Exception: Curb ramps that are part of an egress shall be not less than 44” wide.)
- Curb ramps must have detectable warnings in truncated domes with pattern and characteristics defined by regulations, including contrasting color.
- Detectable warnings are required at curb landings and along flush transitions at street crossings.

Figure 3-5 illustrates a number of these standards.

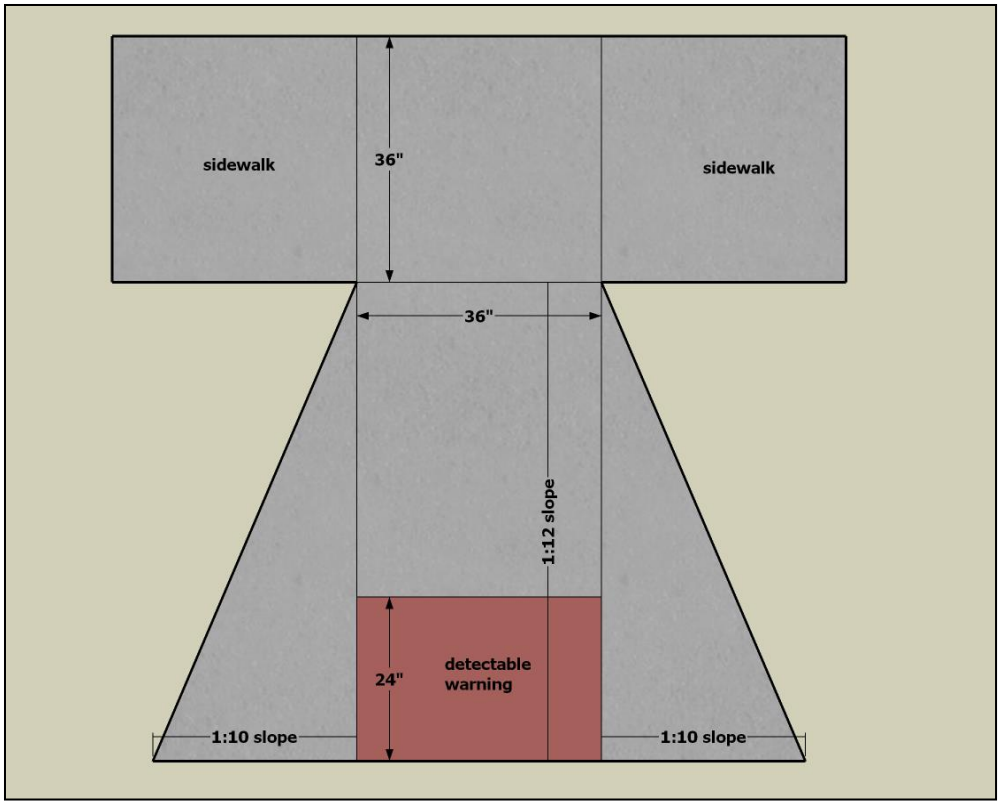


Figure 3-5 Curb Ramp Accessibility Standards Diagram

Data Analysis and Results

The compliance of curb ramps near MCPT bus stops was determined through an analysis and summary of data collected in the field. The following data elements were collected:

- Presence of curb ramps near the bus stop.
- Presence of detectable warnings on curb ramps.
- The condition of the detectable warnings,
- Whether the detectable warning is at least 24 inches from the throat of the ramp and extends the full width of the sidewalk,
- Whether the curb ramps are protected from being blocked by parked vehicles.
- Whether the transition of the curb ramp slope is flush and free of vertical change at top and bottom.
- Whether the slope of the curb ramp is 8.3 percent or less.
- Whether the surface of the ramped portion of the curb ramp is firm, stable, and slip resistant.

The curb ramp data were analyzed for each element. The summary results are presented below.

Table 3-5 Total Deficiencies for Curb Ramps

Deficiency	Total Stops
No curb ramps where sidewalk is present	0
Without detectable warning strips	16
Detectable warning strips in poor condition	3
Detectable warning does not extend the full width of the sidewalk	1
Detectable warning not 24”	1
Without smooth transitions	1
Slope greater than 8.3%	6
Unstable surface	0
Total stops with non-compliant curb ramps(1)	**22**

Note: Many of these deficiencies are the responsibility of other agencies and not MCPT. However, MCPT should notify the appropriate agency of the identified deficiency. Doing so, would help these agencies in coming closer to ADA compliance and would improve the accessibility of MCPT’s bus stops.

(1) A curb ramp at a stop may have more than one of the deficiencies listed in this table. As such, the total does not represent the sum of the deficiencies in the table.

The data show that there is a significant deficiency regarding curb ramps for many of the bus stops in the MCPT system. There are 16 curb ramp locations adjacent to bus stops without detectable warning strips, 3 curb ramps with detectable warnings that are in poor condition, and 6 curb ramps that have a non-compliant slope. There are a total of 22 bus stops in the MCPT system have a deficient curb ramp nearby.

3.7 OBSTRUCTIONS

Care should always be taken when designing or improving bus stops to keep the accessible path free of obstructions. Infrastructure such as shelters, benches, trashcans, utility boxes, and leaning rails should be placed in a manner as to not interfere with the sidewalks or the boarding and alighting area. Not only can these obstructions prevent passengers from using the path, but they can also present a potential safety concern.

To help clear MCPT’s existing accessible paths from obstructions, data were collected in the field on infrastructure such as benches, garbage cans, and newspaper racks to see whether they present an obstruction. Based on the data collected, the difficulty level of removing an obstruction could range from moving a bench out of the path to redesigning the accessible path around fixed infrastructure such as a utility pole. A summary of the obstruction deficiencies noted for MCPT’s bus stops are listed below.

Table 3-6 Total Obstruction Deficiencies

Deficiency	Total Stops
Official Bench is inaccessible	1
Official Bench is an obstruction	1
3rd Party Bench is inaccessible	1
3rd Party Bench is an obstruction	0
Trash Can inaccessible	2
Trash Can is an obstruction	0
Total Stops obstructions/inaccessible amenities(1)	**3**

(1) A stop may have more than one of the obstructions listed in this table. As such, the total does not represent the sum of the obstructions in the table.

As shown in Table 3-6, there is 1 stop that has an inaccessible official MCPT benches, 1 stops where the official MCPT bench is an obstruction, 1 stops where a 3rd party bench is inaccessible, and 2 stops where the trash can is inaccessible. There are a total of 3 bus stopsthat have an amenity that is either inaccessible or an obstruction.

CHAPTER 4

DEVELOPMENT OF IMPROVEMENT PROGRAM

4.0 DEVELOPMENT OF IMPROVEMENT PROGRAM

The improvement needs presented in Section Three were reviewed and organized into categories or groups based on how they should be addressed and/or who would be responsible for addressing them. The development of the improvement program considered several steps, including:

Step 1: Identify the entity responsible for the improvement (MCPT or other).
Step 2: Determine whether stops can be removed, consolidated, or relocated.
Step 3: Prioritize improvements that are MCPT's responsibility through:

- Determining improvements that should be addressed immediately (referred to as "quick fixes");
- Determining whether funds can be leveraged from other entities' projects to cover costs of the improvements; and
- Creating a phased implementation plan of prioritized bus stop improvements.

Figure 4-1 illustrates the process used to develop the phased implementation plan.

Step 1: Identify Responsible Entity

The first step in developing the phased implementation plan was to determine which improvements are the responsibility of MCPT versus those improvements that are the responsibility of other entities. Although many of the identified potential bus stop improvements will need to be addressed by MCPT, it also is the case that a number of the recommended improvements may fall under the responsibility of other entities such as FDOT, Martin County, Stuart and/or other public and private entities. Based on the responsible entities identified for each type of improvement, which are presented in Table 4-1, those improvements identified to be the responsibility of an entity other than MCPT are removed from the list of improvements that are to be included in the phased implementation plan. These improvements will be considered separately, as MCPT will need to coordinate with these entities to specify the needed improvements and determine the best course of action to complete them in an appropriate timeframe.

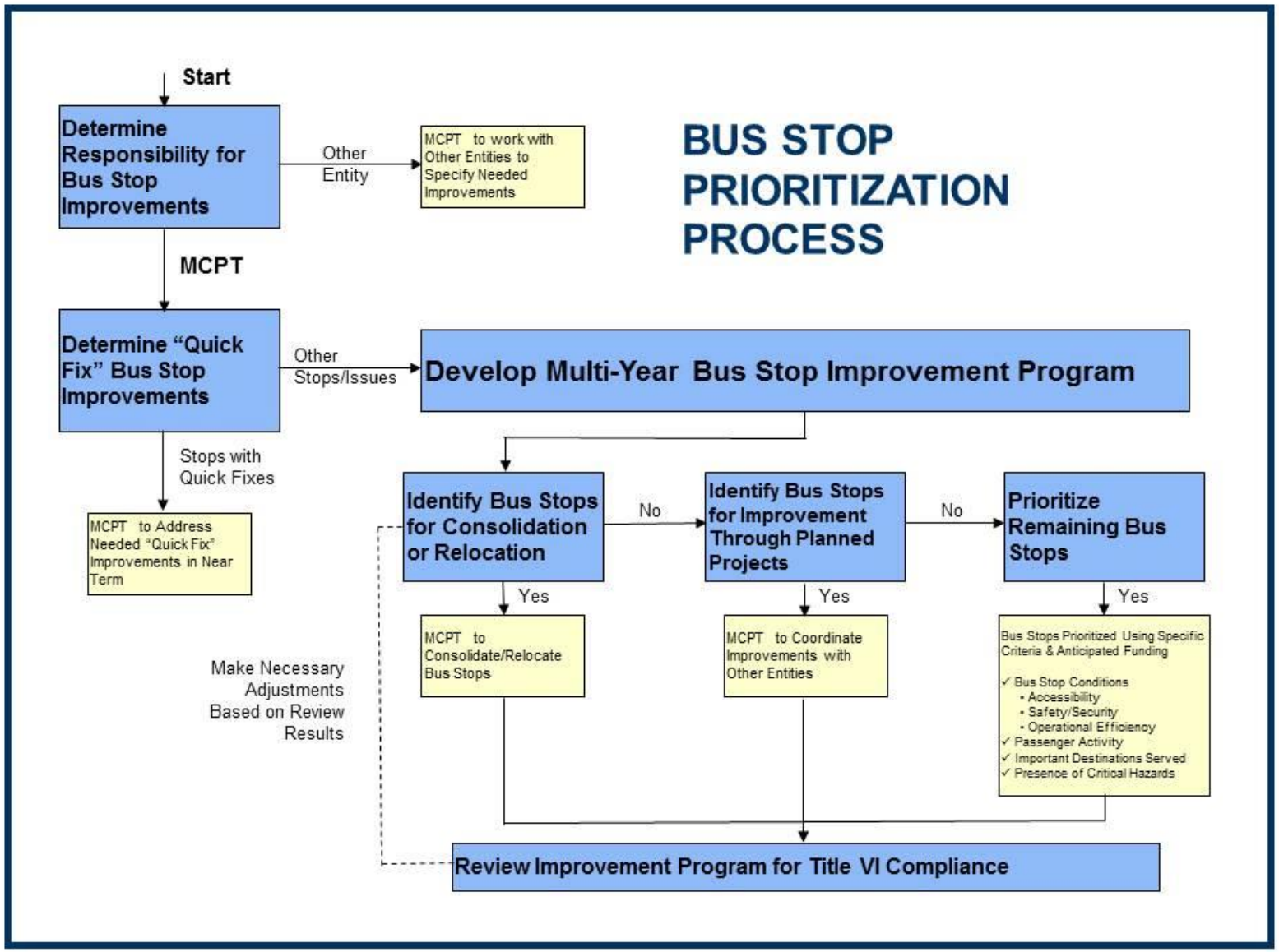


Figure 4-1 Prioritization Process Flow Chart

Table 4-1 Responsible Entity for Bus Stop Improvements

Description	Responsible Entity
Replace Sign at Stop	MCPT
Refurbish Shelter	MCPT
Install Lighting for Shelter	MCPT
Install Other Lighting Sources	Entity or Jurisdiction Bus Stop is Located In
New Boarding and Alighting Area	MCPT
Resurface Boarding and Alighting Area	MCPT
New Connecting Path	MCPT
New Sidewalk	Entity or Jurisdiction Bus Stop is Located In
Resurface Sidewalk	Entity or Jurisdiction Bus Stop is Located In
New Curb Ramp	Entity or Jurisdiction Bus Stop is Located In
Resurface Curb Ramp	Entity or Jurisdiction Bus Stop is Located In
Relocate Bus Stop	MCPT

As seen in Table 4-1, MCPT is not responsible for a number of infrastructure items that are primarily implemented and maintained by other jurisdictions. MCPT is responsible for only the infrastructure pertaining to its bus stop directly, such as bus stop signs, shelters, and boarding and alighting areas. Sidewalks and curb ramps are maintained by other jurisdictional entities. Although sidewalks are maintained by the jurisdictional entity where the bus stop is located, MCPT is responsible for the installation of a connecting path from the boarding and alighting area to the sidewalk if one is present. In some cases, where a sidewalk would be expected and the shoulder of the roadway cannot be used as the accessible path, MCPT will be responsible for the installation of a sidewalk from the boarding and alighting area to the nearest intersection.

Step 2: Identify Consolidated/Relocated Bus Stops

The second step in developing the phased implementation plan was to determine which MCPT bus stops have been identified for consolidation or elimination. With approximately 50 bus stops, it is possible that MCPT's system has some stops that can be consolidated (i.e., the grouping of two or more stops into a single stop) or eliminated altogether. The decision to consolidate or eliminate stops can be based on such factors as the existing level of passenger activity, the spacing between bus stops, the placement/location of the bus stop, and/or the severity of needed improvements. For this effort, the possibility of consolidating stops considered three specific criteria:

- *Distance* – A minimum bus stop spacing distance of one-eighth mile was considered for urban bus stops and one-quarter mile for suburban and rural bus stops. Stops that are spaced more closely than this were reviewed to determine whether consolidation may be feasible without negatively impacting passenger walk access to MCPT service.
- *Ridership* – The number of passengers boarding and alighting at each stop was evaluated.
- *Nearby Trip Generators* – The number of nearby trip generators were used to determine whether consolidation is recommended for each bus stop.
- *Bus Stop Conditions Priority Scoring* – The stage of the prioritization process that considered bus stop conditions (i.e., accessibility, safety/security, operational efficiency) was used to help determine the timing of the bus stops being proposed for consolidation (i.e., immediate, near term, long term).

Based on this analysis, as shown in the table below, four bus stops were recommended for initial consolidation.

Table 4-2 Bus Stops Recommended for Consolidation

#	Bus Stop ID	On Street	Cross Street
1	5	WARFIELD	TRAIL DR - RINES MARKET
2	8	MLK BLVD	LINCOLN
3	35	US 1	MONTEREY - WIN DIXIE
4	36	US 1	REGENCY SQUARE

Other bus stops met some of the above mentioned criteria for stop consolidation. However, relocating the bus stop, as described below, either away from another nearby stop or closer to an obvious trip generator was instead recommended.

It should be noted that this effort also included identifying bus stops that MCPT may want to consider relocating, based on safety/security or operational efficiency issues identified during the inventory process. Scenarios warranting possible relocation include the following:

- Bus stop is located just over the crest of a hill;
- Bus stop is located just after the curve in the street;
- Bus stop is located near a railroad crossing or track;
- Waiting passengers are hidden from view of oncoming traffic;
- A stopped bus straddles the crosswalk or obstructs a curb ramp;
- Bus stop discharges passengers onto driveway apron;
- Bus stop discharges passengers onto roadway;
- Bus stops are spaced close together; and
- Bus stop is located away from trip generators.

A total of 25 bus stops were identified as having safety/security or operational efficiency issues that warranted possible relocation, a list of which is presented in Table 4-3.

Table 4-3 Bus Stops Recommended for Relocation

#	Bus Stop ID	On Street	Cross Street	Location
1	1	COUNTY HEALTH DEPARTMENT	WIC	100' East
2	3	ST LUCIE MOBILE HOME PARK	SR 76	130' South
3	6	US POST OFFICE	SW ADAMS	70' North
4	9	FLORIDA COMMUNITY HEALTH CENTER	WARFIELD BLVD	30' East
5	12	US 1	INDIAN - PUBLIX	930' Northeast
6	14	EAST OCEAN MALL	FRESH MARKET	770' Northwest
7	15	MONTEREY	OCEAN - COUNTY BUILDING	640' North
8	19	MARTIN MEMORIAL HOSPITAL NORTH	MARTIN MEMORIAL HOSPITAL NORTH	6' West Or 250' South
9	21	PALM BEACH	10TH	250' North
10	22	PALM BEACH	10TH	150' North
11	25	OCEAN BLVD	MONTEREY - SMITHFIELD PLAZA	30' West
12	26	US 1	MONTEREY - STUART CENTER	400' Southwest
13	27	ELLANDALE ST	LAMAR HOWARD PARK	90' East
14	28	WILLOUGHBY BLVD	HEALTH DEPARTMENT	20' Southwest
15	29	TREASURE COAST MALL	US 1	10' South
16	32	US 1	BRITT - TARGET	230' North
17	34	US 1	KANNER - PUBLIX	880' East
18	39	US 1	SALERNO - WINN DIXIE	630' West
19	40	US 1	JOHNSON	50' South
20	41	KIWANIS PNR	DOWNTOWN	60' Southwest
21	42	US 1	BAKER - PUBLIX	300' West
22	43	US 1	BRITT - PINEAPPLE COMMONS	480' West
23	47	US 1	COVE - SEACOAST BANK	400' South
24	48	US 1	COVE - WALGREENS	110' North
25	101	MLK BLVD	SALVATION ARMY	1100' East

Step 3: Prioritization of MCPT's Improvement Responsibilities

The third step in developing the phased implementation plan was to prioritize MCPT's bus stop improvement responsibilities. This was accomplished using additional process steps. First, "quick fix" bus stop improvements were ascertained by defining identified issues that could be quickly and easily addressed by at relatively low cost. Second, bus stops were identified that could possibly be improved in conjunction with planned transportation projects. Lastly, a five-year phased implementation plan was created to help guide MCPT in addressing the more significant improvements at the remaining bus stops.

4.1 IDENTIFY QUICK FIX IMPROVEMENTS

The first step in prioritizing MCPT's improvement responsibilities was to determine which improvements are "quick fixes" and can be made in the near-term. This includes stops with comparatively minor issues that can be addressed with minimal effort and/or cost. These types of issues would represent an opportunity for a "quick fix" that falls under the responsibility of MCPT and that can be addressed right away without a significant budgetary impact.

For purposes of this analysis, a quick fix improvement consists of the following:

- The addition, replacement, or modification of the bus stop sign is required, or
- The cost estimate is less than or equal to $1,000 per stop, or
- Other minor or partial improvements, such as an obstruction or accessibility issue caused by an official or 3rd party bench or trash can.

Keep in mind that the modification or removal of 3rd party amenities is not MCPT's responsibility. However, having non-compliant amenities/infrastructure associated with MCPT's bus stops could cause issues, and as such it is recommended that they be remediated. Also, as previously mentioned, bus stops that serve more than one route are required to display, on the bus stop sign, the bus routes that serve that particular stop. While this particular attribute was not assessed for all bus stops, in locations where bus route identification signs are missing, they should be (re)mounted.

A list of those bus stops that have improvements considered to be quick fixes is presented in Table 4-4. It should be noted that this list was generated for those bus stops meeting the quick fix criteria needing the quick fix improvement listed above, regardless of whether other (non-quick fix) improvements also are needed at the bus stop. It should also be noted that "quick fix" does not mean full compliance when the work is complete; it is just addressing an immediate issue or deficiency.

Table 4-4 Bus Stops Recommended for Quick Fixes

#	Bus Stop ID	On Street	Cross Street	Item(s)
1	5	WARFIELD	TRAIL DR - RINES MARKET	Low Cost
2	6	US POST OFFICE	SW ADAMS	New Sign
3	8	MLK BLVD	LINCOLN	Relocate Trash Can
4	12	US 1	INDIAN - PUBLIX	Low Cost
5	14	EAST OCEAN MALL	FRESH MARKET	Low Cost
6	18	US 1	14TH	New Sign
7	30	WALMART PSL	US 1	New Sign
8	34	US 1	KANNER - PUBLIX	Low Cost
9	37	MARTIN MEMORIAL HOSPITAL SOUTH	IRSC	New Sign
10	38	MARTIN MEMORIAL HOSPITAL NORTH	IRSC	New Sign
11	39	US 1	SALERNO - WINN DIXIE	Low Cost, New Sign
12	41	KIWANIS PNR	DOWNTOWN	New Sign, Relocate Bench, Relocate Trash Can
13	42	US 1	BAKER - PUBLIX	New Sign
14	58	MLK BLVD	LINCOLN	New Sign
15	74	WARFIELD	TRAIL DR - RINES MARKET	New Sign
16	101	MLK BLVD	SALVATION ARMY	New Sign, Relocate Bench

4.2 IDENTIFY FUND LEVERAGING OPPORTUNITIES

The second step in addressing the MCPT's improvement responsibilities was to determine which bus stop improvements can be completed in conjunction with various types of planned transportation projects, including roadway widening, and transportation enhancements being implemented by FDOT, Martin County, and/or various municipalities. It should be noted that if a road is being altered, which would include repaving, than all ADA issues associated with the bus stops, sidewalks, curb ramps, pedestrian signals, and pedestrian crossings adjoining the improved roadway must be rectified by the agency completing the roadway improvements.

It was found that in the FDOT's 5 year work program, dated 02/08/2015, no projects occur on sections of road that currently contains bus stops. However, it is possible that at a later date FDOT or another entity will occur on these sections of road and the necessary bus stop improvements may be able to be "piggy backed" with those transportation projects.

While it is believed that some cost efficiencies would result, it is not known at this time the amount that the MCPT could potentially save in the future by completing the bus stop improvements concurrent with planned transportation projects. Therefore, no attempt has been made in this study to estimate the amount that may be saved.

4.3 PRIORITIZATION PROCESS FOR PHASED IMPLEMENTATION PLAN

MCPT's limited financial and staff resources prevent all of the required bus stop improvements from being implemented at one time. Therefore, a prioritization process was created with the intention to rate the conditions at each stop and assess needs to determine which improvements should be implemented first. This third and final step in addressing MCPT's improvement responsibilities involved ranking the remaining bus stop improvements with a two-step process:

- Step 1: Rate the accessibility, safety/security, and operational efficiency conditions of each bus stop.
- Step 2: Assess the potential benefit to be derived by the improvements by reviewing bus stop activity and trip generator activity factors (i.e., community facilities).

Step 1: Rate Conditions at the Bus Stops

The initial assessment of the remaining bus stop improvement needs focused on issues with the bus stops related to three major characteristics: accessibility, safety/security, and operational efficiency. To conduct this analysis, three steps were followed to guide the prioritization of bus stops related to these three major characteristics. As part of the inventory process, information on multiple data elements was collected to support the evaluation of the accessibility, safety/security, and operational efficiency of each bus stop. This information was utilized to determine a score for each bus stop, as summarized in Appendix E, and whether the overall condition assessment of each characteristic falls into one of three rating ranges: high, medium, or low. These ratings account for the fact that there are two factors that could drive the scores: the relative number of deficiencies present at the stop and the relative nature of those deficiencies (i.e., how critical they are compared to the deficiencies in other elements). Given these two factors, the meaning of each ratings range is as follows:

- High – Either the stop has no deficiencies or very few less-critical deficiencies.
- Medium – Either the stop has very few critical deficiencies or a greater number of less-critical deficiencies.
- Low – Either the stop has many critical deficiencies, a combination of critical and less-critical deficiencies, or all of its elements are deficient to some degree.

Accessibility

This category addresses how accessible and available the bus stop is to the passenger. It determines how easy or difficult the bus stop is to navigate by assessing obstructions within the accessible path or sidewalks, presence of infrastructure such as curb ramps or bus stop signs, and the compliance of that infrastructure. An overall accessibility score was developed for each bus stop using the following elements related to accessibility:

- bus stop location;
- presence of a controlled pedestrian crossing;
- presence of a curb and compliant curb ramp;
- ability to maneuver a wheelchair through shelter;
- bench obstruction;
- presence and compliance of a sidewalk;
- presence and compliance of landing area; and
- presence and compliance of the bus stop sign.

Each of the above elements were assessed for their level of accessibility. An element was given a positive score if it was accessible and a zero or negative score based upon its level non-compliance. As noted previously, this information was utilized to determine whether the accessibility score calculated for each MCPT bus stop falls into one of three ratings ranges: high, medium, and low. Table 4-5 presents the distribution of the accessibility scores developed for MCPT's bus stops. Table 4-6 presents a list of the 10 bus stops with the highest accessibility scores. While Table 4-7 presents a list of the 10 bus stops with the lowest accessibility scores, signifying those stops with the greatest preponderance of accessibility issues. Note that the top and bottom ten stops listed below is just a sample. In some cases, the score was tied with other stops.

Table 4-5 Distribution of Accessibility Scores

Ratings Range	# of Bus Stops	Distribution
Very Low (<=0)	17	38%
Low (>0 & <=5)	15	33%
Medium (>5 & <=10)	10	22%
High (>10 & <=15)	3	7%
Very High (>15)	0	0%
Total	45	100%

Table 4-6 Bus Stops with Highest Accessibility Score

#	Bus Stop ID	Intersection	Accessibility Score	Rank
1	14	EAST OCEAN MALL & FRESH MARKET	14	3
2	5	WARFIELD & TRAIL DR - RINES MARKET	12	1
3	9	FLORIDA COMMUNITY HEALTH CENTER & WARFIELD BLVD	12	27
4	12	US 1 & INDIAN - PUBLIX	10	4
5	34	US 1 & KANNER - PUBLIX	10	5
6	35	US 1 & MONTEREY - WIN DIXIE	10	19
7	39	US 1 & SALERNO - WINN DIXIE	8	2
8	7	FAMILY LEARNING CENTER & FAMILY LEARNING CENTER	8	7
9	20	OCEAN & ST LUCIE - NORTH SIDE	8	22
10	11	WALMART & US 1	6	9

Table 4-7 Top 10 Bus Stops with Lowest Accessibility Score

#	Bus Stop ID	Intersection	Accessibility Score	Rank
1	100	US 1 & MONTEREY RD - CVS	-5	21
2	6	US POST OFFICE & SW ADAMS	-4	40
3	27	ELLANDALE ST & LAMAR HOWARD PARK	-4	38
4	101	MLK BLVD & SALVATION ARMY	-4	37
5	3	ST LUCIE MOBILE HOME PARK & SR 76	-4	17
6	18	US 1 & 14TH	-3	45
7	37	MARTIN MEMORIAL HOSPITAL SOUTH & IRSC	-3	34
8	26	US 1 & MONTEREY - STUART CENTER	-2	44
9	4	ADAMS & 150TH	-1	42
10	8	MLK BLVD & LINCOLN	-1	20

Safety/Security

Similar to the accessibility score, an overall safety/security score was developed for each bus stop using seven elements related to safety/security. This category rates how safe or secure the passenger is when accessing the stop or standing at the stop while waiting for the bus. This involves such issues as location of the bus stop and whether the passengers/pedestrians would be visible to oncoming traffic or potential hazards at the bus stop such as steep swales or guide wires. The following elements were used to develop the safety/security score:

- bus stop location;
- presence of a controlled pedestrian crossing;
- presence of detectible warnings on the curb ramp;
- presence of marked crosswalk(s);
- landing area in a safe location;
- presence of lighting; and
- presence of other potential safety or security hazards.

Each of the above elements were assessed for their level of safety and security. An element was given a positive score if it was safe/secure and a zero or negative score based upon its lack of safety/security. This information was utilized to determine whether the safety/security score calculated for each MCPT bus stop falls into one of three ratings ranges: high, medium, and low. Table 4-8 presents the distribution of the safety/security scores developed for MCPT's bus stops. Table 4-9 presents a list of the 10 bus stops with the highest safety/security scores, while Table 4-10 presents a list of the 10 bus stops with the lowest safety/security scores, signifying those stops with the greatest preponderance of Safety/security issues. Note that the top and bottom ten stops listed below is just a sample. In some cases, the score was tied with other stops.

Table 4-8 Distribution of Safety/Security Scores

Ratings Range	# of Bus Stops	Distribution
Very Low (<=2)	7	16%
Low (>2 & <=4)	10	22%
Medium (>4 & <=6)	11	24%
High (>6 & <=8)	7	16%
Very High (>8)	10	22%
Total	45	100%

Table 4-9 Top 10 Bus Stops with Highest Safety/Security Score

#	Bus Stop ID	Intersection	Safety Score	Rank
1	39	US 1 & SALERNO - WINN DIXIE	9	2
2	11	WALMART & US 1	9	9
3	40	US 1 & JOHNSON	9	15
4	32	US 1 & BRITT - TARGET	9	16
5	31	US 1 & EUGENIA	9	18
6	22	PALM BEACH & 10TH	9	26
7	9	FLORIDA COMMUNITY HEALTH CENTER & WARFIELD BLVD	9	27
8	25	OCEAN BLVD & MONTEREY - SMITHFIELD PLAZA	9	29
9	21	PALM BEACH & 10TH	9	30
10	58	MLK BLVD & LINCOLN	9	36

Table 4-10 Bottom 10 Bus Stops with Lowest Safety/Security Score

#	Bus Stop ID	Intersection	Safety Score	Rank
1	26	US 1 & MONTEREY - STUART CENTER	-3	44
2	3	ST LUCIE MOBILE HOME PARK & SR 76	-1	17
3	6	US POST OFFICE & SW ADAMS	0	40
4	27	ELLANDALE ST & LAMAR HOWARD PARK	0	38
5	101	MLK BLVD & SALVATION ARMY	0	37
6	100	US 1 & MONTEREY RD - CVS	0	21
7	18	US 1 & 14TH	2	45
8	4	ADAMS & 150TH	3	42
9	1	COUNTY HEALTH DEPARTMENT & WIC	3	35
10	5	WARFIELD & TRAIL DR - RINES MARKET	3	1

Operational Efficiency

An overall operational efficiency score was developed for each bus stop. This category rates each bus stop by its effectiveness to facilitate timely and efficient operation of the transit system. The following five elements related to operational efficiency were used to develop the score:

- Bus location when stopped (e.g., right-turn lane, curb lane, parking lane, etc.);
- bus stop relation to nearest intersection (e.g., near side, far side mid-block, etc.)
- presence of controlled pedestrian crossing;
- potential hazards; and
- presence and compliance of a sign at the bus stop.

Each of the above elements were assessed for their level of operational efficiency. An element was given a positive score if it was determined to be operationally efficient accessible and a zero or negative score based upon its level non-operational efficiency. This information was utilized to determine whether the operational efficiency score calculated for each MCPT bus stop falls into one of three ratings ranges: high, medium, and low. Table 4-11 presents the distribution of the operational efficiency scores developed for MCPT's bus stops. Table 4-12 presents a list of the 10 bus stops with the highest operational efficiency scores, while Table 4-13 presents a list of the 10 bus stops with the lowest operational efficiency scores, signifying those stops with the greatest preponderance of operational efficiency issues. Note that the top and bottom ten stops listed below is just a sample. In some cases, the score was tied with other stops.

Table 4-11 Distribution of Operational Efficiency Scores

Ratings Range	# of Bus Stops	Distribution
Very Low (<=1)	19	42%
Low (>1 & <=2)	12	27%
Medium (>2 & <=3)	9	20%
High (>3 & <=4)	0	0%
Very High (>4)	5	11%
Total	45	100%

Table 4-12 Top 10 Bus Stops with Highest Operational Efficiency Score

#	Bus Stop ID	Intersection	Operation Score	Rank
1	33	US 1 & EUGENIA ST	5	14
2	32	US 1 & BRITT - TARGET	5	16
3	31	US 1 & EUGENIA	5	18
4	25	OCEAN BLVD & MONTEREY - SMITHFIELD PLAZA	5	29
5	21	PALM BEACH & 10TH	5	30
6	16	OCEAN & ST LUCIE - SOUTH SIDE	3	13
7	8	MLK BLVD & LINCOLN	3	20
8	9	FLORIDA COMMUNITY HEALTH CENTER & WARFIELD BLVD	3	27
9	10	ADAMS & WARFIELD - LIBRARY	3	43
10	18	US 1 & 14TH	3	45

Table 4-13 Bottom 10 Bus Stops with Lowest Operational Efficiency Score

#	Bus Stop ID	Intersection	Operation Score	Rank
1	101	MLK BLVD & SALVATION ARMY	-1	37
2	41	KIWANIS PNR & DOWNTOWN	-1	33
3	42	US 1 & BAKER - PUBLIX	-1	24
4	100	US 1 & MONTEREY RD - CVS	-1	21
5	30	WALMART PSL & US 1	-1	11
6	26	US 1 & MONTEREY - STUART CENTER	0	44
7	27	ELLANDALE ST & LAMAR HOWARD PARK	0	38
8	1	COUNTY HEALTH DEPARTMENT & WIC	0	35
9	74	WARFIELD & TRAIL DR - RINES MARKET	0	10
10	39	US 1 & SALERNO - WINN DIXIE	0	2

Step 2: Assess Factors Related to the Need for Improvements

The second step in the process was assessing factors that relate to the need for the improvement – where would the most benefits be derived. Passenger boarding and alighting at the stop in conjunction with the adjacent destinations are used to make this determination.

Bus Stop Activity

Bus stop activity was assessed for the majority of the stops using a partial manual ridecheck. Bus stop activity is typically defined as the total number of passengers boarding and alighting at a single stop over the course of an average weekday. However, since the ridecheck for each route did not always encompass an entire day's worth of data, the ridership data was normalized.

Bus stop activity data criterion is important in helping establish the relative "necessity" of each stop because of the level of patron use. The higher the usage of the stop, the more pertinent are the deficiencies. Table 4-14 presents the distribution of the ridership at MCPT's bus stops. Table 4-15 presents a list of the 10 bus stops with the highest ridership, while Table 4-16 presents a list of the 10 bus stops with the lowest ridership.

The average normalized ridership was calculated based on multiple manual ridership data counts. Although, in some cases, the average daily ridership reported is zero, throughout the year riders may have boarded and alighted at that particular stop, just not when the manual counts were performed. Also note that the top and bottom ten stops listed below are just a sample. In some cases, the ridership values were tied with other stops.

Table 4-14 Distribution of Bus Stop Activity Scores

Ridership Range	# of Bus Stops	Distribution
Very Low (<=50)	18	40%
Low (>50 & <=100)	13	29%
Medium (>100 & <=200)	7	16%
High (>200 & <=500)	3	7%
Very High (>500)	4	9%
Total	45	100%

Table 4-15 Top 10 Bus Stops with Highest Ridership

#	Bus Stop ID	Intersection	Ridership	Rank
1	3	ST LUCIE MOBILE HOME PARK & SR 76	769	17
2	30	WALMART PSL & US 1	656	11
3	5	WARFIELD & TRAIL DR - RINES MARKET	560	1
4	74	WARFIELD & TRAIL DR - RINES MARKET	560	10
5	100	US 1 & MONTEREY RD - CVS	310	21
6	39	US 1 & SALERNO - WINN DIXIE	256	2
7	29	TREASURE COAST MALL & US 1	203	8
8	11	WALMART & US 1	199	9
9	8	MLK BLVD & LINCOLN	180	20
10	37	MARTIN MEMORIAL HOSPITAL SOUTH & IRSC	163	34

Table 4-16 Bottom 10 Bus Stops with Lowest Ridership

#	Bus Stop ID	Intersection	Ridership	Rank
1	18	US 1 & 14TH	0	45
2	46	INDIANTOWN GAS COMPANY & WARFIELD BLVD	0	39
3	58	MLK BLVD & LINCOLN	0	36
4	22	PALM BEACH & 10TH	0	26
5	21	PALM BEACH & 10TH	1	30
6	4	ADAMS & 150TH	9	42
7	15	MONTEREY & OCEAN - COUNTY BUILDING	11	23
8	25	OCEAN BLVD & MONTEREY - SMITHFIELD PLAZA	17	29
9	19	MARTIN MEMORIAL HOSPITAL NORTH & MARTIN MEMORIAL HOSPITAL NORTH	20	41
10	41	KIWANIS PNR & DOWNTOWN	21	33

Nearby Trip Generators

During the inventory process to collect MCPT bus stop information, the surveyors also assessed and recorded information on various key trip generators (e.g., schools, offices, shopping centers, social service agencies, etc.) that were located near each bus stop. This information was taken into consideration when analyzing the stops, since some of these generators are typically more closely related to transit use. This criterion is also important in establishing the relative "necessity" of a particular stop. Stops that serve nearby transit generators are critical despite the level of ridership because the trips are critical. The more trip generators around the stop, the more pertinent the deficiencies. Table 4-17 lists a selection of bus stops that serve important trip generators that were noted during the inventory process.

Table 4-17 Stops Serving Major Trip Generators

Bus Stop ID	Intersection	Trip Generator
3	ST LUCIE MOBILE HOME PARK & SR 76	Residential
7	FAMILY LEARNING CENTER & FAMILY LEARNING CENTER	School/Day Care
10	ADAMS & WARFIELD - LIBRARY	Library
16	OCEAN & ST LUCIE - SOUTH SIDE	Residential
18	US 1 & 14TH	Medical/Rehab, Office/Commercial, Residential, Retail
19	MARTIN MEMORIAL HOSPITAL NORTH & MARTIN MEMORIAL HOSPITAL NORTH	Church, Medical/Rehab, Office/Commercial, Residential
21	PALM BEACH & 10TH	School/Day Care
22	PALM BEACH & 10TH	Residential, School/Day Care
25	OCEAN BLVD & MONTEREY - SMITHFIELD PLAZA	Medical/Rehab, Office/Commercial, Residential, Retail
27	ELLANDALE ST & LAMAR HOWARD PARK	School/Day Care
28	WILLOUGHBY BLVD & HEALTH DEPARTMENT	Government, Medical/Rehab
37	MARTIN MEMORIAL HOSPITAL SOUTH & IRSC	Medical/Rehab, School/Day Care
38	MARTIN MEMORIAL HOSPITAL NORTH & IRSC	Medical/Rehab, School/Day Care
41	KIWANIS PNR & DOWNTOWN	Park And Ride
47	US 1 & COVE - SEACOAST BANK	Office/Commercial

All of the previous factors were reviewed and an implementation program was prepared to prioritize the improvements. This implementation program was then reviewed to determine compliance with Title VI of the Civil Rights Act of 1964. As a federally funded transit system, MCPT must ensure that the services and programs are in compliance with Title VI requirements, as described below:

> "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participating in, or denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The grantee must ensure that federally supported transit services and related benefits are distributed in an equitable manner." (Source: FTA Triennial Review Workbook, FY 2008)

To review Title VI compliance, a GIS-based analysis of MCPT's service area was completed to assess the comparative nature and distribution of the proposed bus stop improvements, consolidations, and deletions with regard to both minority and non-minority portions of the service area.

Title VI Assessment Methodology

The 2000-2011 American Community Survey estimates were used to identify the average low-income and minority populations within MCPT's service area. The service area average was then used to evaluate all block groups within the county. Then the block groups below the industry standard of $25,000 for poverty level income and the above average minority population were selected. Figure 4-2 and Figure 4-3 illustrates the GIS analysis conducted and resulting Title VI areas within Martin County.

Title VI Assessment Results

An analysis, using ArcGIS, was conducted to determine the Title VI block groups in MCPT's service area. Based on this analysis, 80 percent of the total bus stops are located in Title VI low income areas and 54 percent of the total bus stops are located in Title VI minority areas. Overall, 85 percent of the bus stops are located within a Title VI area. The implementation plan calls for improvements to be made to 100 percent all bus stops. Based on this review, it was concluded that the implementation program is in compliance with Title VI requirements.

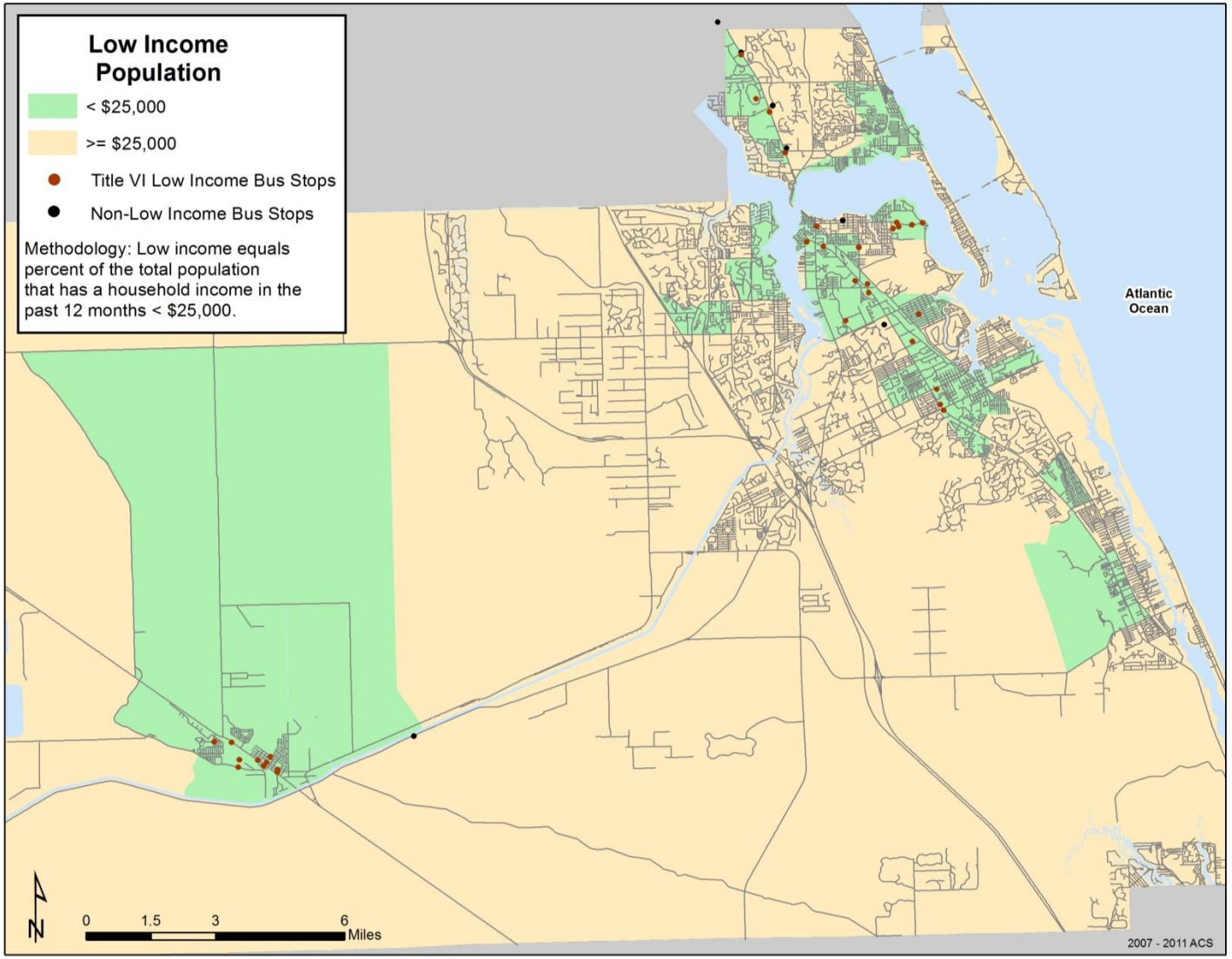


Figure 4-2 Martin County Low Income Title VI Areas

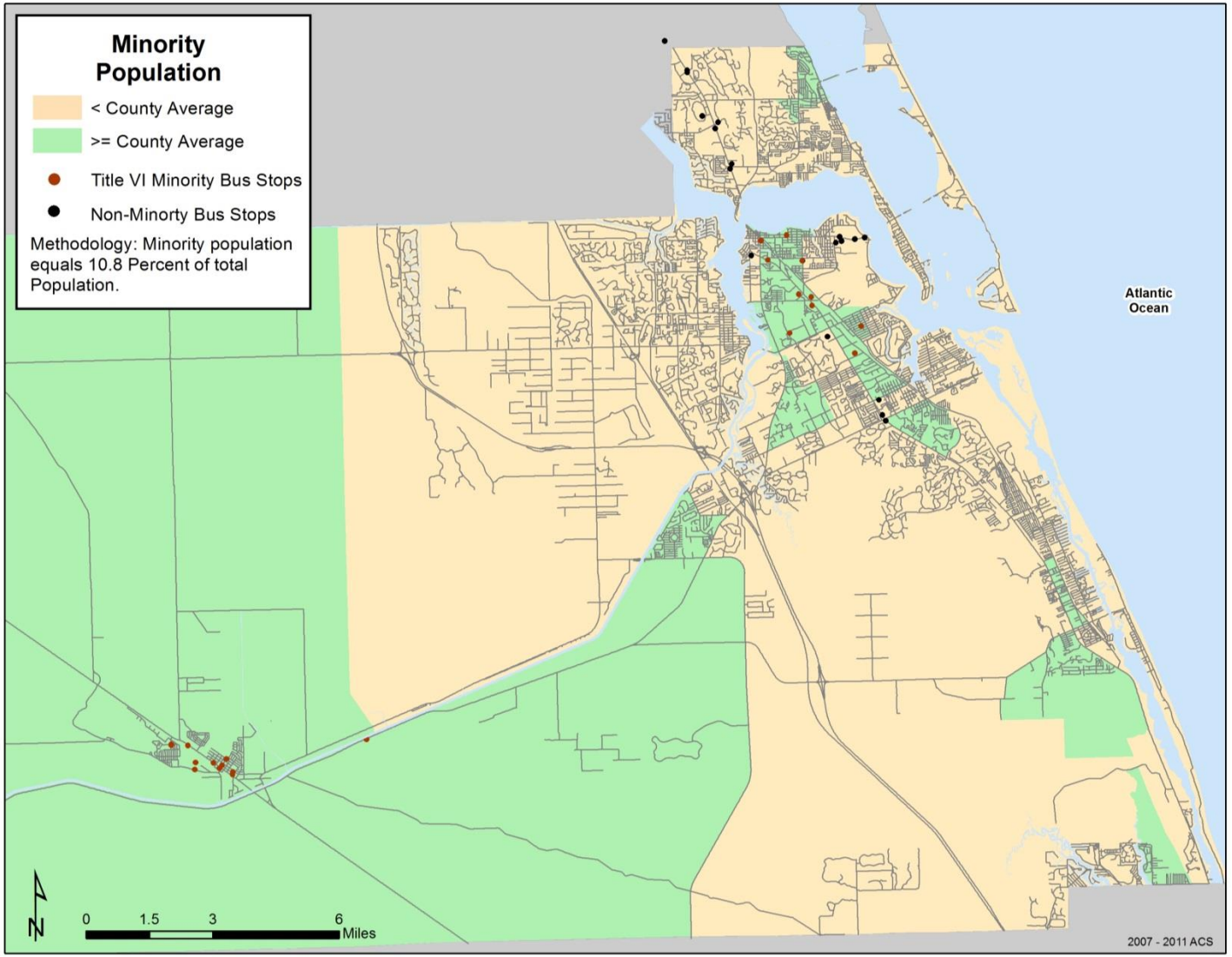
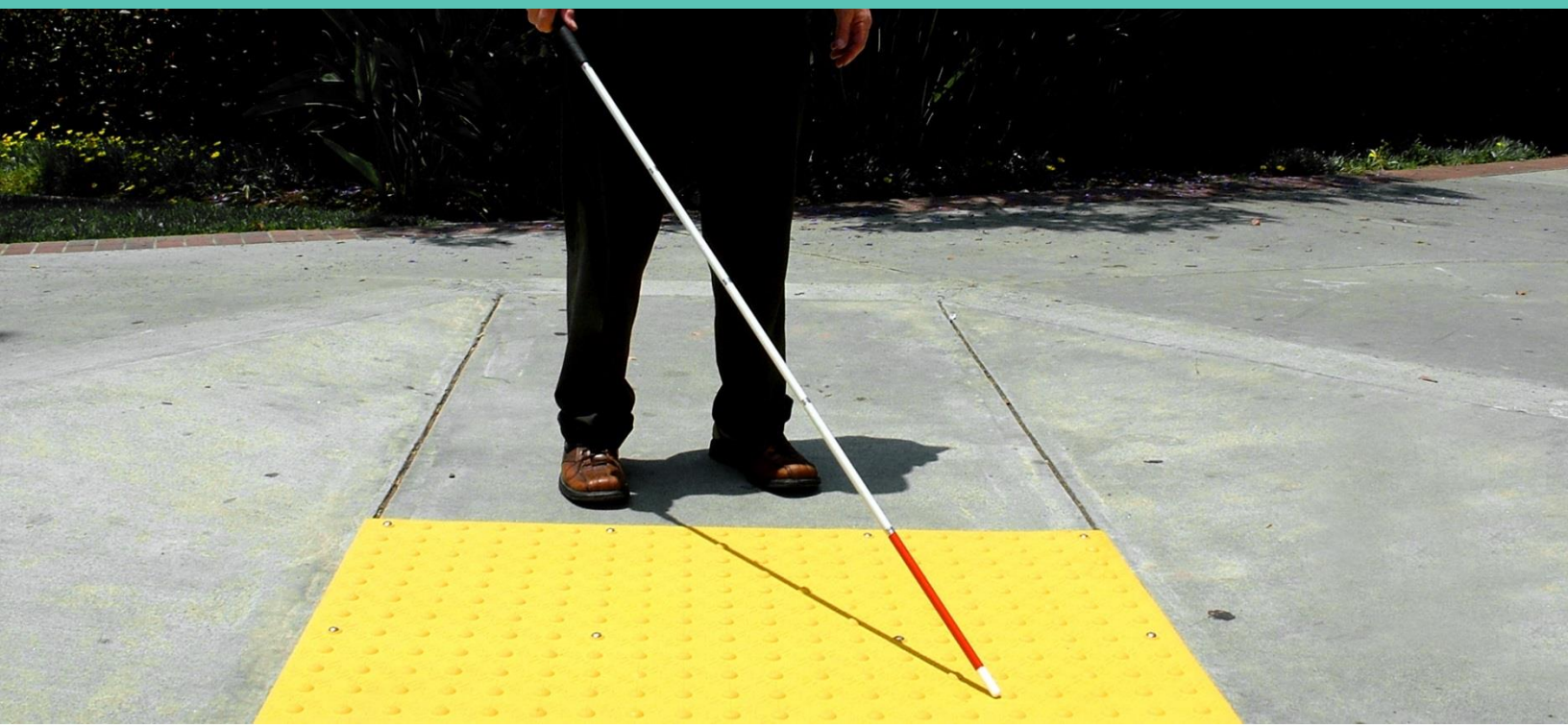


Figure 4-3 Martin County Minority Population Title VI Areas

CHAPTER 5

IMPLEMENTATION AND FINANCIAL PLAN



5.0 IMPLEMENTATION AND FINANCIAL PLAN

In the previous sections, the improvements that are required to improve accessibility conditions at bus stops and facilities were identified, and the entities responsible for undertaking the improvements were listed. The next step in the process is the development of an Implementation and Financial Plan for MCPT's required improvements. This was undertaken through the following efforts:

- preparing cost estimates for the required improvements;
- identifying funding that is available for the improvements; and
- reviewing the specific improvements in more detail and categorizing them into two separate groups. These include:
  - quick fix improvements; and
  - improvements that require more time, effort, and/or funding.

5.1 DEVELOPMENT OF IMPROVEMENT COSTS

In order to develop the Implementation and Financial Plan, unit costs for each type of improvement were developed. These unit costs were based on recent experiences with other transit agencies and, when available, standard industry costs when local data was not available. **It is important to note that the unit costs include across-the-board assumptions that will need to be reviewed prior to the actual improvement being completed**.

Table 5-1 includes the unit costs for each type of improvement that were used to estimate the improvement costs. In addition, this table includes the total number of bus stops needing each type of improvement, as well as the total cost by improvement type.

Note that the costs included in the table below are planning level estimates, once the projects progress through design, the actual construction opinions of cost will become more refined. While the overall project costs for mobilization, maintenance of traffic, signed and sealed plans, and clearing and grubbing may seem high, MCPT does not have the funding to go out and make all of these improvements at one time, which would offer the most economy of scale. Therefore, cost estimates are reflective of multiple smaller phases that will be more conducive to the funding available.

Table 5-1 Cost Estimate

Improvement	Cost		Number of Instances	Approximate Amount Recommended (sq/lf)	Approximate Cost
Relocate Bus Stop[1]	$450	each	29		$13,100
New Boarding & Alighting Area[2]	$1,200	each @ 40 sf	25	1,000	$30,000
Partial Boarding & Alighting Area[2]	$30	per sf	13	155	$4,700
New Sidewalk/Connecting Path[2]	$22	linear ft @ 5’ wide	13	186	$1,100
Add/Replace/Move Bus Sign At Stop	$450	each	39		$17,600
Add Detectable Warnings[3]	$275	each	12		$3,300
Resurface B&A[2]	$11	per sf	20	585	$6,400
Resurface Curb Ramp[2]	various		7		$1,800
Raised Curb[2]	$100	each @ 5' long	17	90	$1,700
Remove Cement	$15	per sf	8	320	$4,800
Add a curb ramp	$450	each	6		$2,700
Minor Crosswalk Striping	$3	linear foot	6	216	$600
Crosswalk Infrastructure	various		1		$1,200
Other Improvements[4]					$5,500
Mobilization	$500	each	44		$22,000
Maintenance of Traffic	$1,500	each	1		$1,500
Signed & Sealed Plans	$1,500	each	1		$1,500
Clearing & Grubbing	$1,500	each	49		$ 73,500
Total Order of Magnitude Cost Estimates[5]					**$193,000**

(1) While the total estimated cost for the majority of the bus stop improvements listed in the appendix contains mobilization, maintenance of traffic, signed and sealed plans, and clearing and grubbing costs, those costs are listed separately in this table.
(2) The dimensions for all new pavement, such as boarding and alighting areas and connecting paths, were measured. As such, the "Amount Recommended" column is the sum of these dimensions.
(3) At some intersections, more than one detectable warning is needed to be added or replaced. As such, the number of instances does not represent the total number of bus stops.
(4) The "Other" category includes miscellaneous estimated costs that do not occur with much frequency.
(5) The costs included are planning level estimates, once the projects progress through design, the actual construction cost will become more refined. In addition, right-of-way costs were not included in these estimates.

Again, it should be noted that the estimates are intended to reflect the order-of-magnitude costs for MCPT's overall bus stop improvement needs over the timeframe of the plan; for specific projects nearing implementation, it will be necessary for MCPT to conduct a more detailed cost assessment.

Four bus stops were recommended for consolidation and 25 bus stops were found to have potential safety/security or operational efficiency issues, such as the stops being located in front of a driveway, over the crest of a hill, where the passengers are not in view of oncoming traffic, etc. Relocation of the identified bus stops would provide many benefits, including correcting the potential safety hazards to passengers and/or increasing the overall operational efficiency of the bus stop.

The effort to determine which stops should be changed (e.g., removed, consolidated, or relocated) will require a focused effort by MCPT staff. MCPT staff will need to review each of the bus stops recommended for both consolidation and/or relocation in more detail following completion of this study to determine if it is appropriate to consolidate or relocate the bus stop, or instead make improvements to the stop at its current location. Any combination of consolidation, relocating, and improving the stops identified for consolidation and/or relocation will result in adjustments to the cost estimates, depending on whether the cost of needed improvements is less than or greater than the cost of relocating the bus stop.

5.2 DEVELOPMENT OF THE IMPLEMENTATION AND FINANCIAL PLAN

Individual Bus Stops

Following the development of the Improvement Plan in Section Four, the Implementation and Financial Plan was developed to identify when the improvements should occur, based on the relative priority of the improvements and anticipated level of funding that would be available for MCPT to address the improvements. The Implementation and Financial Plan includes all improvements that are MCPT's responsibility as well as some improvements that may end up being the responsibility of other entities.

Due to the nature of the quick fix improvements, it is assumed that the majority of the quick fix improvements identified in the previous table will be completed within the confines of the five-year plan, listed in the following section.

As previously mentioned in Section Four, it would be ideal if MCPT could take advantage of "piggy backing" needed bus stop improvements with planned roadway projects. Under ideal circumstances, this would permit MCPT to benefit either because the project directly addresses some or all of the needed stop improvements, or the project allows MCPT to reduce its improvement costs due to the concurrent construction activities. It is not known at this time the amount of implementation costs that could potentially be saved by completing the bus stop improvements concurrent with planned transportation projects. Therefore, potential cost savings through fund leveraging are not included in the Implementation and Financial Plan at this time. In the future, should the desire and ability to estimate the amount of costs that could be reduced through fund leveraging, the cost of the improvements for those impacted stops may be adjusted.

To develop the plan, the prioritized list of bus stop improvements determined to be MCPT's responsibility were incorporated into the Implementation and Financial Plan based on the amount of anticipated funding available each year for the improvements.

It should be stressed that the Implementation and Financial Plan will serve as a general guide for the planning of bus stop and facility improvements and that several factors will influence the timing for implementation of specific improvements and the overall cost of the program, including:

- Opportunities for partnering with other jurisdictions or organizations on implementing improvements.
- Specific site conditions at individual stops, including landscaping, utilities, drainage, which can have a significant impact on the type of improvements required and the associated cost.
- Contracting opportunities, including awarding a unit-price contract for the implementation of improvements at multiple locations.
- Additional opportunities to relocate or consolidate individual bus stops.

On an annual basis, the list of needed improvements will be reviewed against the funding that is available that year to develop a specific work program. As previously mentioned, this will involve development of more detailed cost estimates based on a review of site conditions at individual stops.

5.3 FUNDING PLAN FOR NEEDED IMPROVEMENTS

Improvements to MCPT's bus stops and shelters are financed through several funding sources, which may include:

- FTA,
- FHWA,
- FDOT,
- and local funding

A total of $9,720 is currently projected to be available annually from all sources over the next five-year period. It should be stressed that this figure is an estimate of future revenues that **could be** available for this program. Many factors will affect the actual revenues received by MCPT, including future reauthorization of the federal transportation funding program, collections by local taxing authorities for the impact fees from developers, and future allocations of the competitive funding from other agencies. It should be noted that it is MCPT's goal to complete the necessary improvements within three to five years, and therefore inquiries are being made about additional revenue streams.

To prepare a funding plan, costs for all the various improvements were calculated and then compared to the amount of funding projected to be available over the next five years. This comparison is shown below:

Program Expenses:

Total program[1]	$193,000
Anticipated Annual Revenue:	$9,720

(1) Note that the costs are planning level estimates, once the projects progress through design, the actual construction cost will become more refined.

Table 5-2 presents the recommended phased implementation plan for the first five years of study improvements. It should be noted that the costs are estimates of probable cost, with the ultimate costs dependent upon how the work is undertaken, site conditions at individual stops, material and labor prices in future years, and potential right-of-way costs. The number of stops that are consolidated or relocated will also be an important variable, as well as amount of work that will be the responsibility of other entities.

It should be noted that other ongoing efforts will accelerate the implementation of the improvements, including:

- Road improvement projects undertaken by local jurisdictions and FDOT.
- Projects undertaken by developers through land use and concurrency agreements in the County and various cities.

Due to the anticipated level of funding currently available for bus stop improvements and due to the quick-fix improvement list, the stops recommended for improvement each year of the program are not necessarily the highest ranking stops on the priority list. However, as the improvement program progresses, high ranking stops that were not initially improved as part of this grant are included in future years. Note that the implementation plan shown below does not take into account the partial quick-fix improvements or the potential piggy-back projects.

Table 5-2 Phased Implementation Plan for Bus Stop Improvements

ID	Rank	Total Cost	Year	Item
5	1	$900	2015	Misc Improvements
39	2	$900	2015	Sign not compliant
14	3	$900	2015	Misc Improvements
12	4	$900	2015	Misc Improvements
34	5	$900	2015	Misc Improvements
28	6	$1,200	2015	Boarding and alighting area not compliant
7	7	$1,200	2015	Misc Improvements
29	8	$2,200	2015	Boarding and alighting area not compliant
Estimated Cost[1]:		**$9,100**		

ID	Rank	Total Cost	Year	Item
11	9	$3,200	2016	Boarding and alighting area not compliant, Detectable Warnings
16	13	$3,000	2016	Boarding and alighting area not compliant
43	12	$3,400	2016	Boarding and alighting area not compliant
Estimated Cost[1]:		**$9,600**		

ID	Rank	Total Cost	Year	Item
74	10	$4,600	2017	Boarding and alighting area not compliant, Sign not compliant, Detectable Warnings, No Raised Curb
30	11	$4,800	2017	Boarding and alighting area not compliant, Sign not compliant, No Raised Curb
Estimated Cost[1]:		**$9,400**		

ID	Rank	Total Cost	Year	Item
40	15	$4,200	2018	Boarding and alighting area not compliant
3	17	$5,200	2018	Boarding and alighting area not compliant, Detectable Warnings, No Raised Curb
Estimated Cost[1]:		**$9,400**		

ID	Rank	Total Cost	Year	Item
33	14	$3,100	2019	Boarding and alighting area not compliant, Detectable Warnings
31	18	$3,100	2019	Boarding and alighting area not compliant
35	19	$3,200	2019	Misc Improvements
Estimated Cost[1]:		**$9,400**		

(1) Note that the costs are planning level estimates, once the projects progress through design, the actual construction cost will become more refined. Right-of-way costs are not included.

It should be noted that the phased implementation plan is just a guide. The number of bus stops improved each year and the specific locations chosen for improvement may vary due to such factors as the actual costs of the improvement or potential right-of-way issues. As such, the improvements will need to be reviewed and a work program developed specifying the improvements that will be undertaken on an annual basis. The improvements would be undertaken through task orders. It is envisioned that the effort could focus on implementation of improvements along specific corridors, which would enable improvements to be implemented more quickly.

The phased implementation plan, in coordination with the bus stop assessment database, identifies the type of improvements proposed to be undertaken for each of the first five years of the plan. The phased implementation plan and assessment database should be used to in developing a specific action program for implementing the improvements on an annual basis.

It should be stressed that this plan is presented as an overall guide to the implementation of improvements. MCPT staff will need to review the needed improvements and the available funding on an annual basis to develop the annual improvement program.

CHAPTER 6
NEXT STEPS

6.0 NEXT STEPS

The following is a summary of next steps for MCPT to consider to ensure that the major goals of the Bus Stop and Facility Accessibility Study are achieved and maintained over time.

Bus Stop and Facilities Standards

- MCPT shall use the *Accessing Transit Design Handbook for Florida Bus Passenger Facilities, Version III, 2013* concerning the concepts of accessibility, safety/security, and operational efficiency to guide the design of new bus stops and facilities, as well as improvements to existing bus stops and facilities.

Funding for Improvements

- MCPT shall seek additional funding for bus stop improvements.

Analysis to Determine Jurisdictional Responsibility

- MCPT shall conduct an analysis to determine the specific improvements that fall within the responsibility of each respective jurisdiction (County, Cities, and FDOT).
- Based on the results of the analysis, MCPT shall formally advise each jurisdiction of the specific improvement needs that are within their responsibility.

Advise Entities Responsible for Improvement Needs

- MCPT shall advise each entity of the list of needed improvements that fall within their responsibility.
- MCPT shall review and update standards as necessary (as ADAAG/FAC requirements change, etc.).
- MCPT shall continue to coordinate with FDOT and local jurisdictions on the development and implementation of strategies to implement accessibility improvements.

Bus Stop Consolidation/Relocation

- MCPT shall review the initial list of bus stops recommended for consolidation and confirm the final list of stops to be removed.
- MCPT shall provide the list of consolidated bus stops to MCPT maintenance staff to flag each bus stop identified for consolidation, which shall provide notice to the riders utilizing the stop(s) identified for consolidation.
- MCPT shall determine additional public outreach efforts, as appropriate, based on the number and scale of the bus stops recommended for consolidation.
- MCPT shall conduct bus stop consolidation reviews to correspond with the service change route mark-ups that occur multiple times throughout the year.
- MCPT shall conduct a comprehensive review of additional stops that can be eliminated, relocated, or consolidated, using the spacing standards as well as ridership and bus stop inventory data.
- MCPT staff shall continue to identify consolidation opportunities as part of roadway improvement reviews requested by other agencies, including FDOT, Martin County, and various cities.

- MCPT staff shall review the list of bus stops identified for relocation and determine whether the bus stops should be relocated or improvements made to correct any accessibility, safety/security, or operational efficiency issues, if feasible.

MCPT Training

- MCPT shall review and discuss the standards for bus stops and facilities on an ongoing basis to ensure that staff has an understanding of accessibility issues, requirements, and procedures.
- MCPT shall review and discuss the procedures and responsibilities for implementing new stops and updating the inventory on an ongoing basis.

Database Maintenance Procedures

- MCPT shall finalize the procedures and staff responsibilities for keeping the inventory up-to-date and ensuring that all new bus stops implemented are in compliance with MCPT's adopted standards.
- MCPT shall, in the future, utilize the updated inventory to enable Customer Service, Service Planning, and Scheduling staff to access information on each stop, including photographs, list of available amenities, conditions at bus stop, and list of planned improvements.

Implementation Schedule for Quick Fix Improvements

- It is recommended that MCPT develop a schedule for their Maintenance staff to complete the "quick fix" improvements.

Review Implementation and Financial Plan

- MCPT staff shall be provided the specific phasing plan for use in updating the Implementation and Financial Plan on an annual basis, including developing a specific action program for implementing the improvements.
- MCPT shall pursue mechanisms for increasing the efficiency with which improvements identified in the Implementation and Financial Plan are completed (i.e., pursuing unit price contracts, etc.).
- MCPT shall conduct high-level coordination between the TPO, FDOT, and local jurisdictions to ensure that necessary improvements are addressed.

Update Inventory Database Regularly

- MCPT shall update the inventory on a regular basis to reflect any revisions to routes and bus stops undertaken since completion of the initial inventory, including any stops that are removed or relocated to address bus stop consolidation and/or relocation issues.

Annual Review of Progress

- MCPT shall review the progress of addressing improvements identified in the Implementation and Financial Plan on an annual basis.
- MCPT shall coordinate with local jurisdictions, FDOT, and stakeholder groups on strategies for implementing improvements.

- MCPT shall update the following year's work program to reflect the new list of needed improvements.

Regularly Report Progress of Implementation

- MCPT shall regularly report the progress of implementing improvements to MCPT's ADA Coordinator.
- MCPT shall continue to coordinate with local jurisdictions, the development community, and stakeholder groups to advise them of the established standards and discuss strategies for implementing improvements.

Regularly Update GIS Analysis

- MCPT shall provide updated GIS information and the results of GIS analyses conducted for MCPT bus stops to local jurisdictions and FDOT.

Explore Future Applications for Inventory Information

- MCPT shall explore future applications for making information from the inventory available to the public, including a list of amenities, conditions, and photographs for each bus stop, potentially tied to a system map and/or individual route maps and available via the Internet.
- MCPT shall explore the feasibility of providing inventory information to the public via Google Transit.