

COLLIER AREA TRANSIT BUS STOP ADA ASSESSMENT FINAL REPORT

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Prepared For:

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Table of Contents

1.0	INTRODUCTION	1
2.0	INVENTORY PROCESS	2
2.1	Field Data Collection	2
2.2	Bus Stops	2
2.3	Transit Facilities	4
2.4	Quality Control and Compilation of Master Database	4
3.0	ADA REQUIREMENTS AND DATA COLLECTION	5
3.1	General ADA Requirements	5
3.2	Bus Stop Requirements	7
3.3	Boarding and Alighting Areas	7
	Standards.....	7
	Data Analysis and Results	8
3.4	Bus Stop Signs	9
	Standards.....	10
	Data Analysis and Results	11
3.5	Accessible Routes and Sidewalks	11
	Standards.....	11
	Data Analysis and Results	12
3.6	Curb Ramps.....	13
	Standards.....	13
	Data Analysis and Results	14
3.7	Obstructions.....	15
3.8	Transfer Facilities.....	16
	Overview	16
	Data Analysis and Results	19
	Collier County Government Center, Stop ID #1	20
	Description	20
	Deficiencies:.....	20
	Recommendations:	20
	Collier Area Transit Ops, Stop ID#161	22
	Description	22
	Deficiencies:.....	22
	Recommendations:	22



4.0	DEVELOPMENT OF IMPROVEMENT PROGRAM	25
	Step 1: Identify Responsible Entity	25
	Step 2: Identify Consolidated/RELOCATED Bus Stops	28
	Step 3: Prioritization of CAT’s Improvement Responsibilities.....	30
	Identify Fund Leveraging Opportunities	30
	Prioritization Process for Phased Implementation Plan	32
	Accessibility	33
	Safety/Security	35
	Operational Efficiency	37
	Bus Stop Activity	39
	Nearby Trip Generators.....	41
	Implementation Plan	42
5.0	IMPLEMENTATION AND FINANCIAL PLAN.....	45
	Development of Improvement Costs	45
	Development of the Implementation and Financial Plan.....	48
	Individual Bus Stops.....	48
	Transfer Facilities	50
	Funding Plan for Needed Improvements.....	50
6.0	NEXT STEPS	56
	Bus Stop and Facilities Standards.....	56
	Funding for Improvements	56
	GIS Analysis to Determine Jurisdictional Responsibility	56
	Advise Entities Responsible for Improvement Needs	56
	Bus Stop Consolidation/Relocation	56
	CAT Training.....	57
	Database Maintenance Procedures	57
	Review Implementation and Financial Plan	57
	Update Inventory Database Regularly.....	57
	Annual Review of Progress	58
	Regularly Report Progress of Implementation	58
	Regularly Update GIS Analysis	58
	Explore Future Applications for Inventory Information	58



Figures

Figure 2-1 Data Collection Tools	3
Figure 3-1 General Bus Stop Accessibility Standards Diagram	6
Figure 3-2 Landing Area Standards Diagram	8
Figure 3-3 Accessible Route Standards Diagram	12
Figure 3-4 Curb Ramp Accessibility Standards Diagram	14
Figure 3-5 Collier County Government Center Transfer Station Location	20
Figure 3-6 Collier Area Transit Operations Transfer Station Location	22
Figure 3-7 Proposed Collier Area Transit Operations Transfer Station Improvements ...	24
Figure 4-1 Prioritization Process Flow Chart	26
Figure 4-2 Collier County Low Income Title VI Areas	43
Figure 4-3 Collier County Minority Population Title VI Areas	44

Tables

Table 3-1 Total Deficiencies for Boarding and Alighting Areas	9
Table 3-2 Visual Character Height Standards.....	10
Table 3-3 Total Deficiencies for Bus Stop Sign Placement and Visibility	11
Table 3-4 Total Deficiencies for Accessible Routes and Sidewalks	13
Table 3-5 Total Deficiencies for Curb Ramps	15
Table 3-6 Total Obstruction Deficiencies	16
Table 4-1 Responsible Entity for Bus Stop Improvements	27
Table 4-2 Bus Stops Recommended for Consolidation	29
Table 4-3 Bus Stops Recommended for Relocation	29
Table 4-4 Potential Piggy-Backed Bus Stops	31
Table 4-5 Distribution of Accessibility Scores	34
Table 4-6 Bus Stops with Highest Accessibility Score	34
Table 4-7 Top 10 Bus Stops with Lowest Accessibility Score	34
Table 4-8 Distribution of Safety/Security Scores.....	36
Table 4-9 Top 10 Bus Stops with Highest Safety/Security Score.....	36
Table 4-10 Bottom 10 Bus Stops with Lowest Safety/Security Score	36
Table 4-11 Distribution of Operational Efficiency Scores	38
Table 4-12 Top 10 Bus Stops with Highest Operational Efficiency Score	38
Table 4-13 Bottom 10 Bus Stops with Lowest Operational Efficiency Score	38
Table 4-14 Distribution of Operational Efficiency Scores	40
Table 4-15 Top 10 Bus Stops with Highest Ridership	40
Table 4-16 Bottom 10 Bus Stops with Lowest Ridership	40
Table 4-17 Stops Serving Major Trip Generators	41
Table 5-1 Order of Magnitude Cost Estimate	46
Table 5-2 Transfer Facilities Cost Estimate	50
Table 5-3 Phased Implementation Plan for Bus Stop Improvements	52



Appendices

Appendix A – Survey Questionnaire

Appendix B – Training Manual

Appendix C – Database Definitions

Appendix D – Bus Stop Assessment Database

Appendix E – Bus Stop Assessment Matrix

Appendix F – Bus Stop Assessment Summary Tables



1.0 INTRODUCTION

The Collier MPO, Collier Area Transit (CAT), and FDOT are interested in improving the access to and from, the security at, and the operations at CAT's 527 stand-alone bus stops and 2 transfer centers.

This study includes a comprehensive inventory of the conditions at CAT'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 CAT'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, CAT 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 CAT's bus stops are compliant, safe, secure, and operationally efficient, all of CAT'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.



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 CAT and other entities to identify infrastructure improvement needs.

2.1 FIELD DATA COLLECTION

TOA staff and an engineering student from Florida Gulf Coast University 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 in June and July 2013.

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, Apple iPads, 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 three surveyors and two days of field training, where the surveyors practiced accessing actual bus stops.

Bus Stop Inventory – The inventory data collection was conducted by a two-person team, consisting of an engineer from Tindale-Oliver and an engineering student from Florida Gulf Coast University, on 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 TRANSIT FACILITIES

Accessibility assessments of CAT's two Transit Centers were conducted by members of the project team. Detailed field assessments of all accessibility features provided at each of the facilities were conducted and inventory data comparable to the data collected during the bus stop survey effort were collected.

It is important to recognize that the transit centers present features that are not common to regular bus stops, such as buildings, restrooms, ticketing facilities, tactile transit signage, and parking facilities. Hence, the established database used for the bus stop inventory and deficiency reporting process did not lend itself to accommodating the captured data from the facilities assessments. Therefore, it was prudent to develop the stand-alone report document for these facilities.

2.4 QUALITY CONTROL AND COMPILATION OF MASTER DATABASE

The initial data collection process was conducted over a period of two 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 CAT.

It should be noted that CAT 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 CAT's bus stops collected during the inventory, including any applicable comments noted by the surveyors.

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.



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.
- 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.

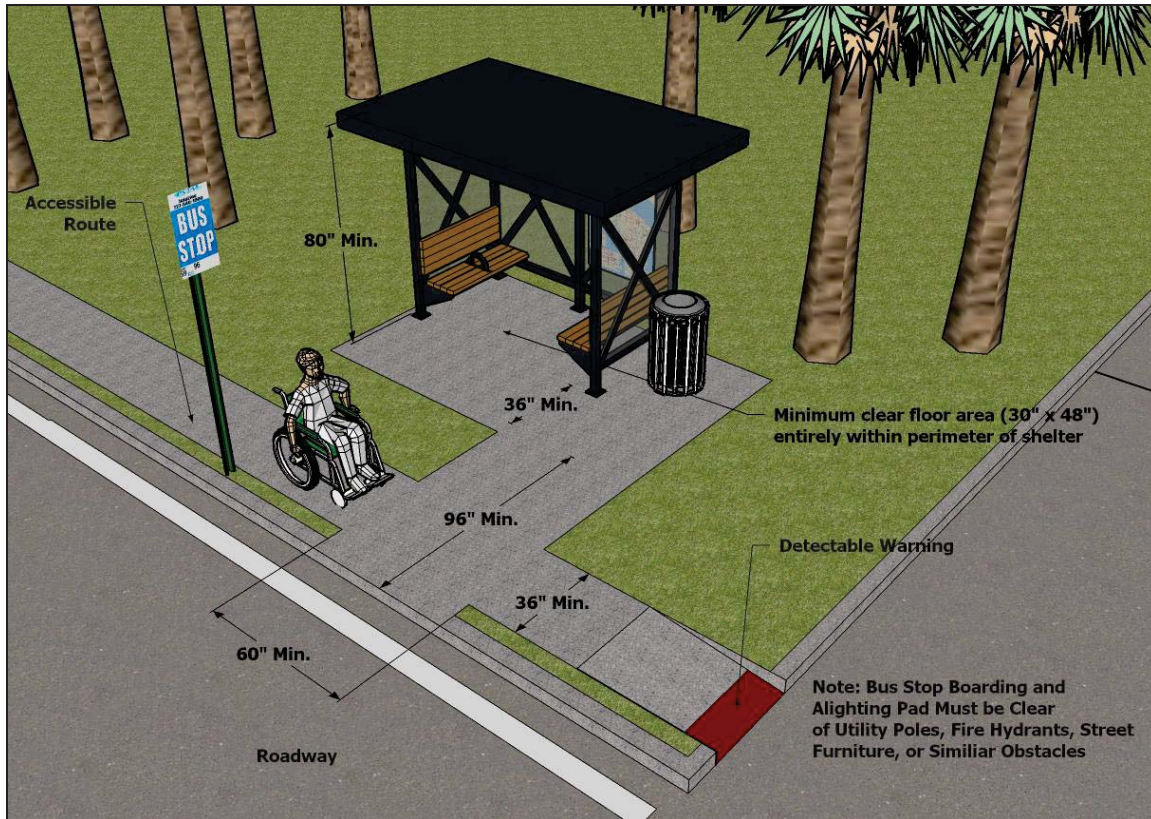


Figure 3-1 General Bus Stop Accessibility Standards Diagram

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 CAT'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 CAT will not be required to implement much infrastructure, such as sidewalks and curbs. In these cases, CAT 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 CAT'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	125
Defect in boarding and alighting pad	440
Cross slope is greater than 2%	248
Running slope does not match the road	4
Running slope is greater than 5% ⁽²⁾	5
Elevation changes greater than 1/4"	47
No raised curb	225
Total stops with problematic boarding and alighting areas⁽³⁾	492

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, 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, approximately 24% or 125 bus stops have no boarding and alighting area either, designated or undesignated, 83% or 440 bus stops have a defect in the boarding and alighting area, 47% or 252 bus stops have a cross slope greater than 2%, 9% or 48 bus stops have a change in elevation of greater than 1/4", and 43% or 225 bus stops do not have a raised curb. Therefore, 492 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, and especially for bus stops that serve more than one route, the bus stop sign should 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



Data Analysis and Results

To determine the compliance of CAT'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 CAT 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	15
Sign not properly mounted	5
CAT sign not compliant	20

In general, the typical sign design for CAT meets the requirements of the ADAAG/FAC. There are 15 stops without a CAT bus stop sign and 5 CAT bus stops that have a bus stop sign that is not properly mounted. Therefore, 20 bus stops have a CAT bus stop sign deficiency or no CAT bus stop sign present at the bus stop.

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 3-3 illustrates these accessible route standards.

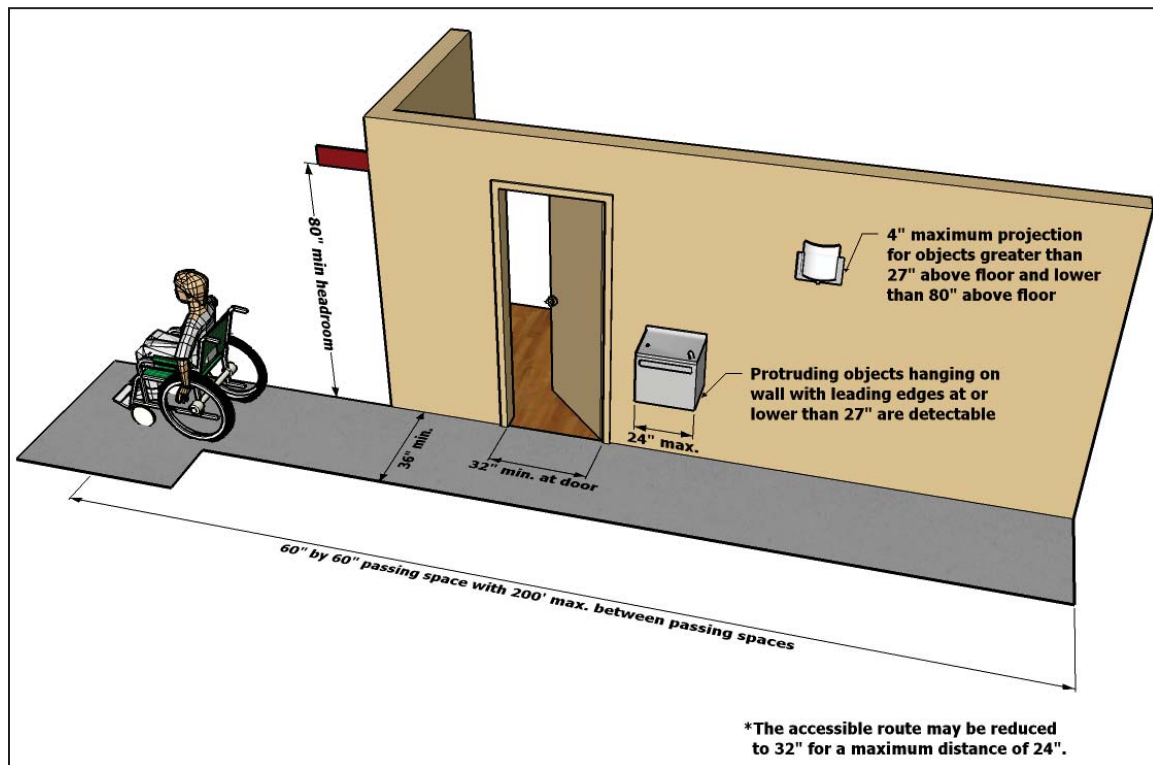


Figure 3-3 Accessible Route Standards Diagram

Data Analysis and Results

To determine the compliance of accessible routes and paths at CAT 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 CAT 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)	34
No sidewalk present (shoulder of roadway acts as accessible path)	66
Sidewalk less than 4 feet wide	0
Running slope is greater than 5%	5
Sidewalk not compliant/not present	105

As shown in Table 3-4, there are 100 stops that have no sidewalk present. In addition, there are 5 bus stops where the running slope of the sidewalk is greater than 5%. It should be noted that in 66 of the locations that do not currently have a sidewalk, there is no reasonable expectation of a sidewalk and the shoulder of the roadway acts as the accessible path. In these cases, it is not necessary to construct a sidewalk.

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 3-4 illustrates a number of these standards.

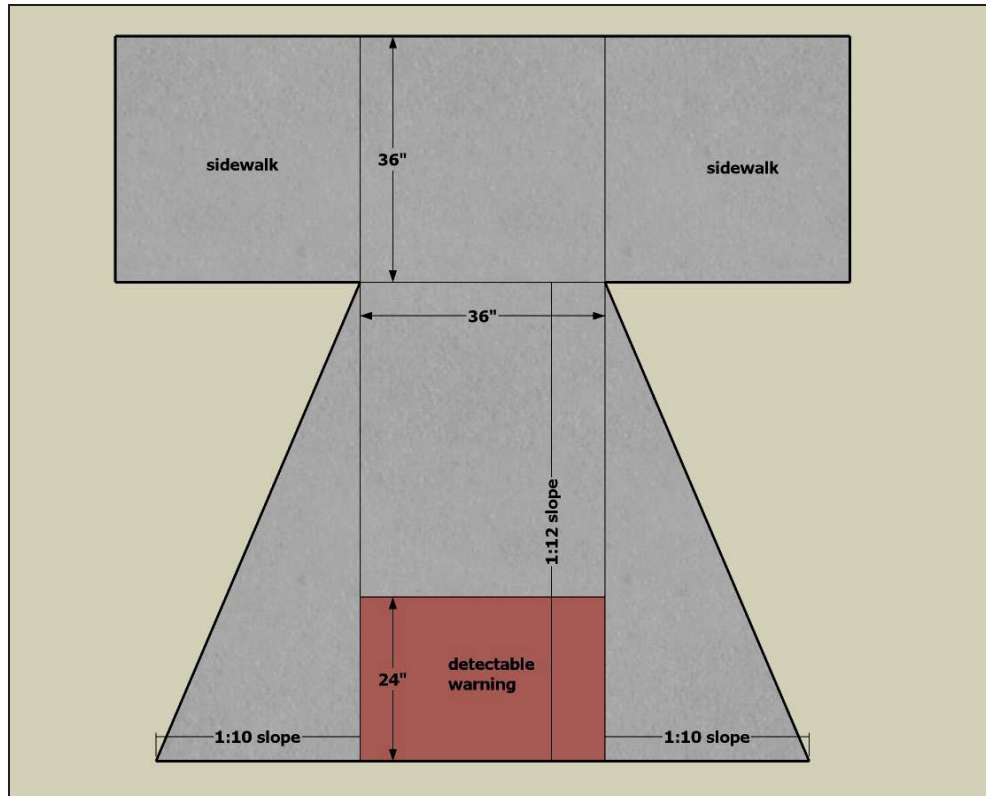


Figure 3-4 Curb Ramp Accessibility Standards Diagram

Data Analysis and Results

The compliance of curb ramps near CAT 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	10
Without detectable warning strips	209
Detectable warning strips in poor condition	26
Detectable warning does not extend the full width of the sidewalk	42
Detectable warning not 24"	20
Without smooth transitions	14
Slope greater than 8.3%	87
Unstable surface	1
Total stops with non-compliant curb ramps⁽¹⁾	220

Note: Many of these deficiencies are the responsibility of other agencies and not CAT. However, CAT 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 CAT'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 CAT system. There are 10 bus stops without curb ramps where a sidewalk is present and 209 curb ramps with no detectable warning strips present. There are a total of 220 bus stops in the CAT system have a deficient curb ramp or a sidewalk with no curb ramps.

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 CAT'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 CAT's bus stops are listed below.



Table 3-6 Total Obstruction Deficiencies

Deficiency	Total Stops
Bench is inaccessible	17
Bench is an obstruction	7
Trash Can inaccessible	6
Trash Can is an obstruction	5
Newspaper rack is an obstruction	0
Newspaper rack is inaccessible	1
Bike rack is an obstruction	4
Payphone is inaccessible	1
Total Stops obstructions/inaccessible amenities⁽¹⁾	32

- (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 are 17 stops that have inaccessible benches, 7 stops where the bench is an obstruction, 6 stops where the trash can is inaccessible, and 5 stops where the trash can is an obstruction. There are a total of 32 stops that have an amenity that is either inaccessible or an obstruction. It should also be noted that CAT does not condone the placement of 3rd party amenities and, in some cases, there removal is recommended.

3.8 TRANSFER FACILITIES

As previously mentioned, assessments of CAT's transfer facilities were performed separate from the process employed to inventory and assess the bus stops. Use of the Federal Transit Administration's Transportation Facilities Checklist, which was revised to conform to the revised ADAAG standards adopted by the U.S. Department of Transportation on November 29, 2006, was used as a tool during the assessment of CAT's two bus transfer facilities.

Overview

The ADA mandates equal access to mass transit for all passengers, thereby requiring every new bus, bus stop, and facility to be fully accessible to the maximum extent practicable. The elements of a bus stop, bus facility, and the public right-of-way are important aspects of providing an accessible environment and are mandated by the ADA.

CAT provides two transfer and transit centers that are strategically placed to provide CAT passengers with efficient transfer opportunities to maximize the ease of transferring between the various bus routes.

The two CAT facilities were assessed for compliance with the ADAAG and FAC during this project. The information below details the assessment of each facility, the findings



from the assessment, photos of the facility and specific deficiencies, recommendations for remediation of deficiencies, and a cost estimate for corrective actions. The standards of data capture and elements of concern for the bus stop survey have also been applied to the bus stops located within these facilities.

The assessment of the elements at the facilities included the following general categories:

- pedestrian access;
- passenger amenities;
- safety and security features;
- information/communication features;
- operational features; and
- parking facilities.

These broad categories include the following accessibility parameters as applied to the facilities assessments.

- **Accessible Routes**
 - 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 (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.
- **Surfaces and Sidewalks**
 - 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.
- **Protruding Objects**
 - Objects at 27" to 80" above grade must not be more than a 4" protrusion.
 - Post-mounted objects must not be more than a 12" protrusion.
 - Overhead clearance must be equal to or greater than 80" above the surface.
- **Ramps and Curb Ramps**
 - The maximum ramp segment slope permitted is 1:12 (8.3%).
 - The maximum cross slope permitted is 1:48 (2%).
 - Level landings must be provided at each 30' (1:12) or 40' (1:16) horizontal projection.



- Landings must be no less than 60” long and full width of ramp segment.
- Handrails must be provided on both sides of ramp (handrails not required on curb ramps).
- Edge protection must be provided on ramp drop-offs.
- Change in direction on ramps must be equal to or greater than 60” X 60”.
- 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.
- Curb ramps must have detectable warning in truncated domes with pattern and characteristics defined by regulations, including contrasting color.
- Detectable warning also required at landings and flush transitions at street crossings.

- **Bus Stops/Boarding and Alighting Areas**
 - Must be on or connect to an accessible route.
 - Must have an accessible approach to the boarding and alighting area and all provided amenities.
 - 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.
 - Cross slope of boarding and alighting area (perpendicular to the curb) 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.
 - The bus stop site must be chosen to provide the greatest degree of accessibility practicable.
 - Bus stop amenities must be connected to accessible route and 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 shelter.
 - If a bench is included within a shelter, it must allow minimum space of 30” X 48” resting/transfer space at one end of bench.

- **Bus Stop Signs**
 - Proper signs at bus stops are an important element of good transit service. Signs serve as a source of information to patrons and operators regarding the location of the bus stop and are excellent marketing tools to promote transit use. For example, letter styles, sign appearance, and color choice should be unique to the transit system so that passengers can readily identify bus stops.



Double-sided signs that provide for visibility from both directions and reflectorized signs for night-time visibility are preferred.

- Bus stop signs should be placed at the location where people board the front door of the bus. The bus stop sign shows the area where passengers should stand while waiting for the bus. It also serves as a guide for the bus operator in positioning the vehicle at the stop. The bottom of the sign should be at least 7 feet above ground level and should not be located closer than 2 feet from the curb face.
- **Other Signage**
 - Signs providing route designations, bus numbers, destinations, and access information must be designed for use by transit riders with vision impairments. In some cases, two sets of signs may be needed to ensure visibility for most users and to assist users with sight limitations. Route maps or timetables are not required at the stop, though such information would be valuable to all passengers.
 - Specific guidelines are given for these signs in Section 703 of the ADAAG and must be followed to ensure compliance.
- **Other Parameters**
 - Transit route information can be displayed on shelters, in business lobbies, along developed walkways, and in other appropriate areas to provide accurate route and schedule information to the public. CAT bus stop installations could include a route schedule sign display mounted to the bus stop sign post or on the shelter wall when provided.
 - Landscape features at transit waiting areas can increase passenger comfort and make the area more attractive. Earth berming, trees, and other plantings can be used to provide shade, act as windbreaks, and offer an aesthetically appealing environment to transit users. However, passenger security, as well as the visibility of passengers waiting for the bus at the facility, must be considered when designing these features.

Data Analysis and Results

The table below details the findings of the facilities assessments and includes the recommended course of corrective action and the estimated cost for the recommended repair.



Collier County Government Center, Stop ID #1

3299 Tamiami Trail East, Naples, FL 34112

Description

Located near the corner of Tamiami Trail and Airport Pulling Road, as shown in Figure 3-5, this transfer station provides service to the Red, Orange, Purple, Green, Blue, and Brown routes (1, 2, 3, 4, 5, and 9). A large covered bus loading island, connecting to six bus pull-in slips, provides accessible access to boarding and alighting of the buses. The transfer station is lighted by fluorescent and pole lighting fixtures. Amenities for the boarding and alighting locations include benches, signage displays, and waste receptacles. Public parking is provided at the facility by the adjacent parking garage, which includes accessible parking.

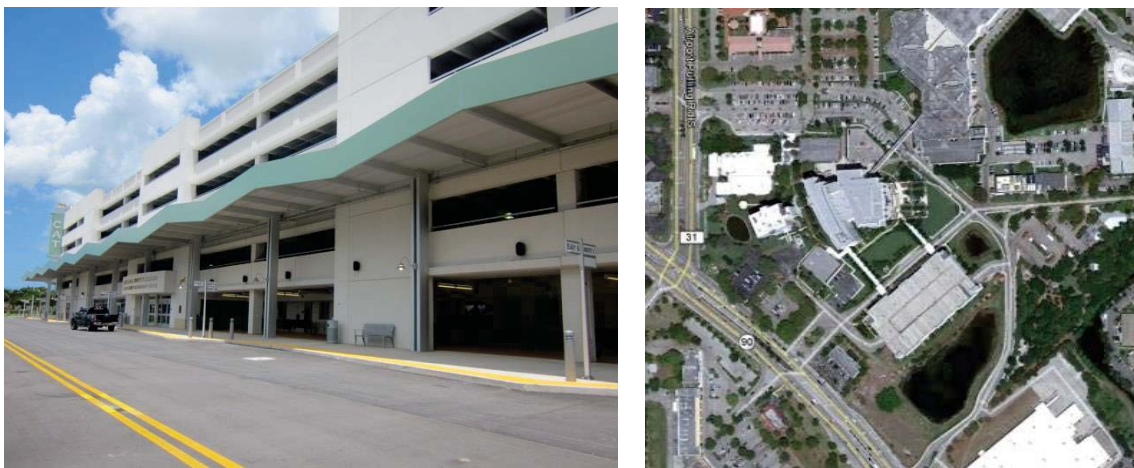


Figure 3-5 Collier County Government Center Transfer Station Location

Access to the raised concrete bus loading island containing the transfer station and its amenities is unrestricted and routes to the bus boarding and alighting areas are fully accessible. Additionally, the connecting pathways from the bus boarding and alighting areas to the adjoining parking garage are also compliant with minimum ADAAG and FAC regulations.

Deficiencies:

1. One of the emergency assistance boxes extends beyond 4" from the lateral edge of the wall and is therefore a protruding object.
2. This facility was assessed while construction was still taking place. At the time of the visit, visual and tactile exit signs are needed at the facility's egress.

Recommendations:

1. For the emergency assistance call box, located on the southern end of the facility, a curb, similar to the one built on the northern end of the facility, or a column should be built. This curb should extend the width of the box and be between the same depth of the box or up to 4" shallower.
2. If not already done, visual and tactile exit signs are needed at the facility's egress. Since this is primarily an open air facility, these exit signs should lead



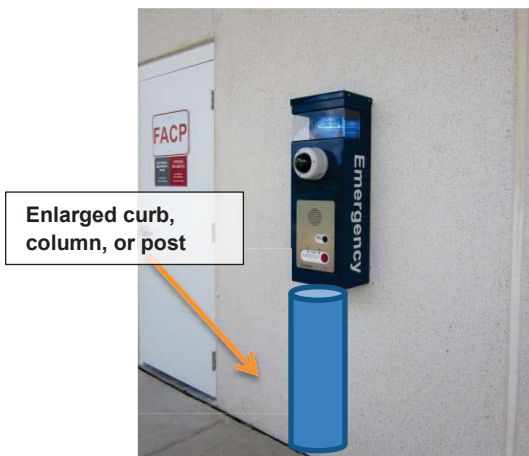
to a safe location away from the transfer facility, such as the sidewalks heading towards the Government Center.



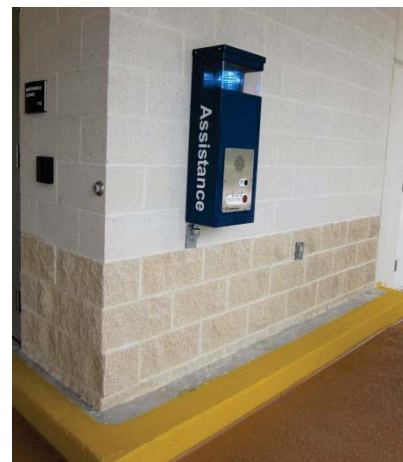
Looking North at the bus loading island



Looking North along the waiting area



This emergency assistance box is a protruding object



This emergency assistance box is not a protruding object due to the curb built below it object



Collier Area Transit Ops, Stop ID#161

8300 Radio Road, Naples, FL 34104

Description

A customer service center and waiting room is located the Collier Area Transit Ops transfer facility, located at 8300 Radio Road, as shown below in Figure 3-6. The facility includes four at-grade loading bus bays and 66 parking spaces, including 3 accessible parking spaces.

Transfers between Purple, Green, Blue, and Yellow lines (3, 4, 5, and 6) are provided at the stop. This bus stop presents several accessibility deficiencies, as described below.



Figure 3-6 Collier Area Transit Operations Transfer Station Location

Deficiencies:

1. The bus loading bays are not adjacent to a raised boarding and alighting area.
2. The ramp to access the facility has no handrail and a slope of 6%.
3. There is no entry sign at the entrance to the facility.
4. The electronic schedule located in the front of the facility is a protruding object
5. The television above the main exit is too high for the displayed font height.
6. The service desk is raised too high.

Recommendations:

1. A 5' X 8' section of concrete with a raised 6" curb should be installed adjacent to each of the bus loading bays to function as a boarding and alighting area. A ramp should also be provided to allow people to enter and exit the boarding and alighting area. A raised boarding and alighting area will insure that the slope of the wheelchair ramp extending from the bus will not exceed the ADA's specifications of 8.3%.
2. The ramp used to access the facility needs to either be resurfaced to have a slope $\leq 5\%$ or have a handrail on both sides of the ramp.
3. An ISA sign should be placed adjacent to the entrance of the facility.



4. The electronic schedule protrudes beyond 4" from the surface of the wall. To prevent a person from inadvertently bumping into the protruding object, the lower portion of the column should be built out so that the schedule extends ≤ 4 " from the leading edge.
5. The characters on the television should comply with the visual character heights as specified in the ADA and in Table 3-2 of this report. This would either entail lowering the television or increasing the height of the characters on the television.
6. The main service desk inside the facility is 54.5" high. This is greater than the reach limits as specified by the ADA. However, after speaking with a CAT representative, it was found that if needed, the representative will assist the customer at a lower table, located in the lobby of the facility.



Bus Stop Bays



Incompliant entrance ramp slope



Sign is a protruding object



Incompliant character heights



Incompliant desk height



Lower desk used by customer service

It should be noted that engineering plans have already been drafted that appear to include mitigation of the ADA issues listed for the exterior of the facility, as shown below. Therefore, in the preceding cost estimation section, it is assumed that all exterior ADA issues have already addressed.

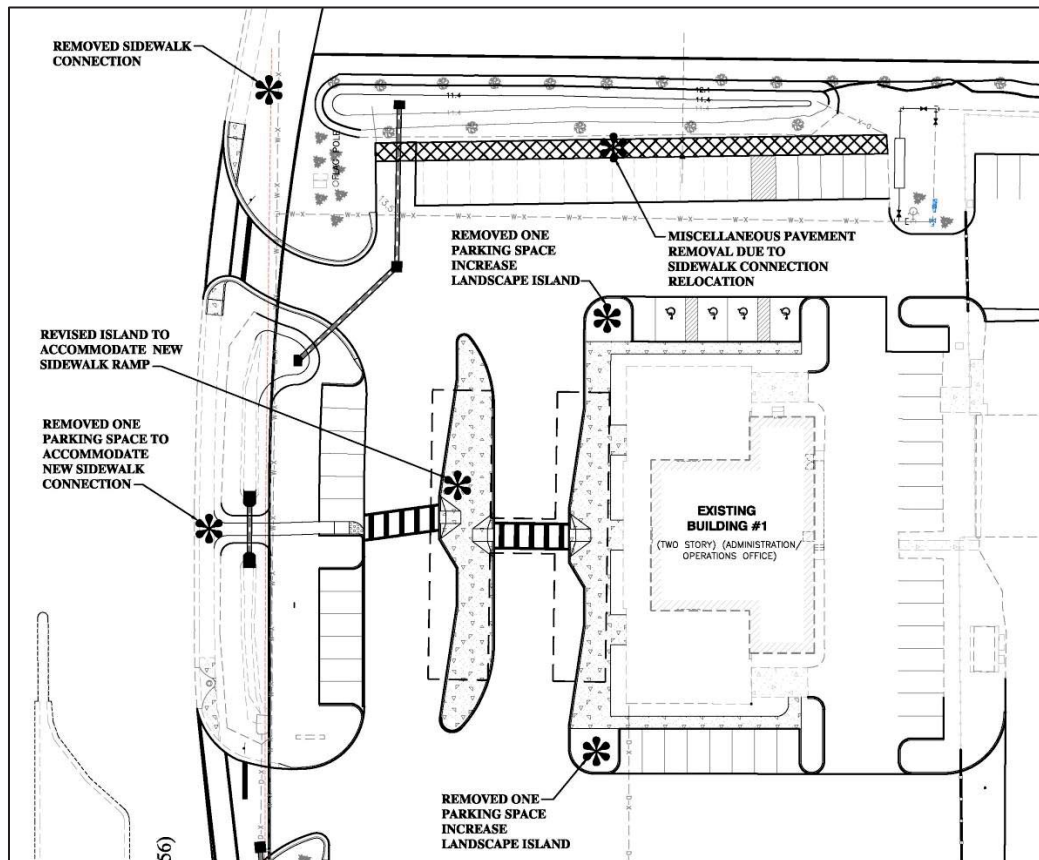


Figure 3-7 Proposed Collier Area Transit Operations Transfer Station Improvements



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 (CAT or other).
- Step 2: Determine whether stops can be removed, consolidated, or relocated.
- Step 3: Prioritize improvements that are CAT's responsibility through:
 - Determining improvements that should be addressed immediately,
 - 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 CAT 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 CAT, it also is the case that a number of the recommended improvements may fall under the responsibility of other entities such as FDOT, Collier County, City Naples, Marco Island, and/or a private entity. 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 CAT are removed from the list of improvements that are to be included in the phased implementation plan. These improvements will be considered separately, as CAT 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.

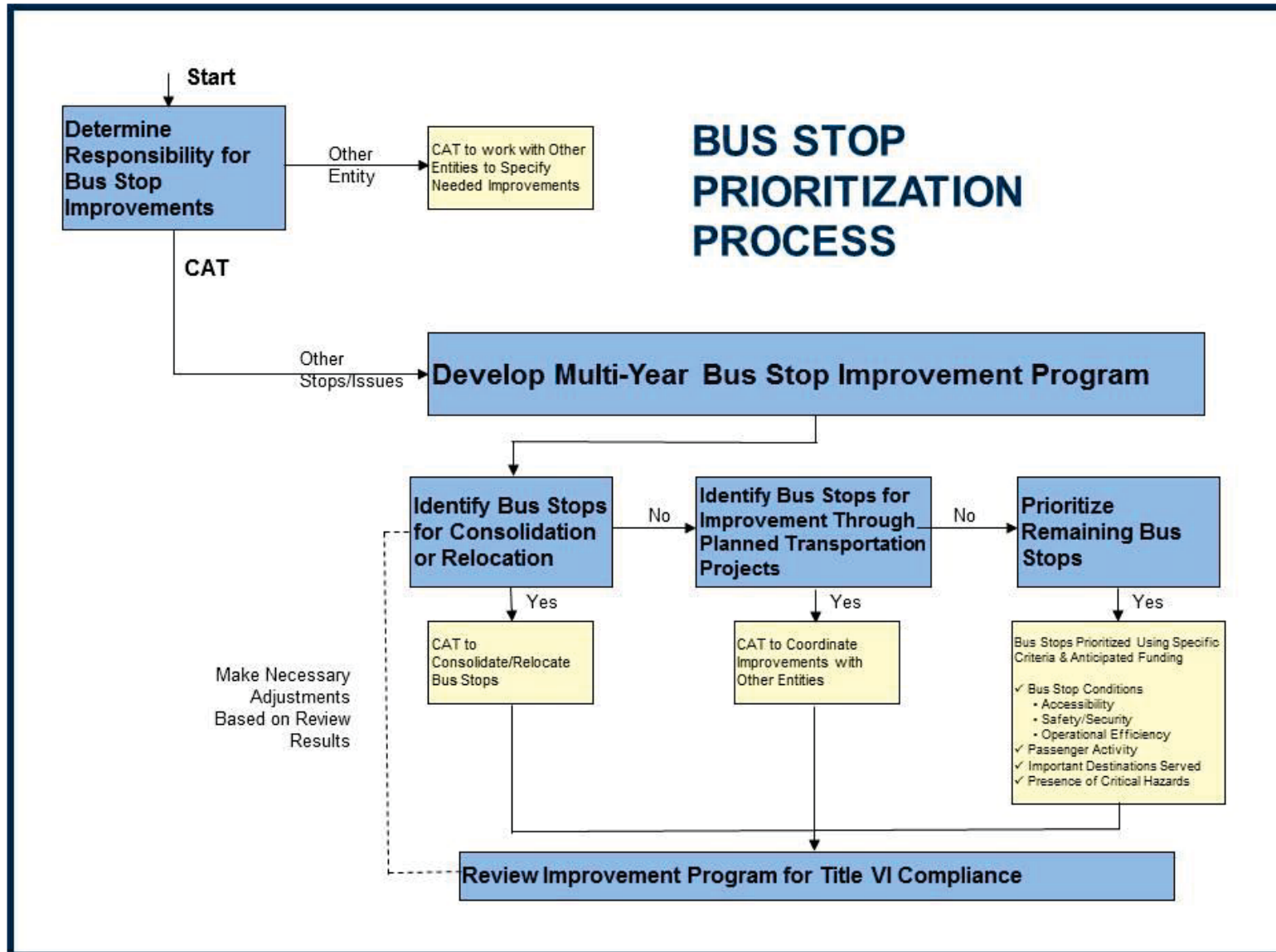


Figure 4-1 Prioritization Process Flow Chart



Table 4-1 Responsible Entity for Bus Stop Improvements

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

As seen in Table 4-1, CAT is not responsible for a number of infrastructure items that are primarily implemented and maintained by other jurisdictions. CAT 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, CAT 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, CAT 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 CAT bus stops have been identified for consolidation or elimination. With approximately 550 bus stops, it is possible that CAT'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 CAT 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, 1 bus stop is recommended for initial consolidation, which is presented in Table 4-2.

It should be noted that this effort also included identifying bus stops that CAT 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; and
- Bus stop discharges passengers onto roadway;

A total of 30 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 4-2 Bus Stops Recommended for Consolidation

#	Bus Stop ID	On Street	Cross Street	Notes
1	358	S 5th St	W Delaware Ave	Combine with 357

Table 4-3 Bus Stops Recommended for Relocation

#	Bus Stop ID	On Street	Cross Street	Approximate Relocation
1	4	Tamiami Trl	Commercial Dr	430' North
2	6	Tamiami Trl	Davis Blvd	550' South
3	48	Golden Gate Pkwy	Naples High School	100' East
4	69	Airport Pulling Rd	Davis Blvd	120' South
5	99	Airport Pulling Rd	Vanderbilt Beach Rd	200' South
6	112	Airport Pulling Rd	Horseshoe Dr	450' South
7	115	Airport Pulling Rd	North Rd (DMV)	500' South
8	116	Airport Pulling Rd	Estey Ave	170' North
9	117	Airport Pulling Rd	Connecticut Ave	330' North
10	137	Tamiami Trl	Lakewood Blvd	170' North
11	195	Green Blvd	Laurel Ridge Apartments	390' West
12	249	Tamiami Trl	Treviso Bay Blvd	800' North
13	257	Tamiami Trl	Habitat Rd	350' Southeast
14	276	Collier Blvd	17th Ave SW	750' North
15	277	Golden Gate Blvd	Weber Blvd	450' East
16	279	Wilson Blvd	Golden Gate Blvd	360' West
17	284	Immokalee Rd	39th Ave NE	200' North
18	290	Wilson Blvd	Golden Gate Blvd	60' West
19	293	Collier Blvd	13th Ave SW	1300' North
20	313	Golden Gate Pkwy	47th St SW	110' East
21	315	Golden Gate Pkwy	41st sty SW	400' East
22	347	Lake Trafford Rd	Ringo Ln	600' East
23	353	Roberts Ave	N 9th St	400' East
24	372	Roberts Ave	N 9th St	250' East
25	428	San Marco Rd	Sand Hill St	950' West
26	431	Bald Eagle Dr	W Elkcam Cir	200' North
27	469	Goodlette-Frank Rd	Solana Rd	430' South
28	500	Pine Ridge Rd	Napa Blvd	150' West
29	511	Collier Blvd	Shell Island Rd	500' North
30	538	Collier Blvd	Mainsail Dr	400' North



Step 3: Prioritization of CAT's Improvement Responsibilities

The third step in developing the phased implementation plan was to prioritize CAT's bus stop improvement responsibilities. This was accomplished using additional process steps. First, 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 CAT in addressing the more significant improvements at the remaining bus stops.

Identify Fund Leveraging Opportunities

The second step in addressing the CAT'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, Collier 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 11/27/2013, projects 425840-1, 433189-1, 429120-1, 433173-1, 195416-4, and 430873-1 occurs on sections of road that currently contains bus stops. Table 4-5 presents a list of the bus stops whose 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 CAT could potentially save 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. For those bus stop improvements that may be completed in conjunction with projects in Florida Department of Transportation's (FDOT) Five Year Work Program for FY 2014-2019, the bus stops are noted in the phased implementation plan as possibly tying into the projects. The phasing takes into account the year the majority of project funding will be made available. Therefore, CAT's bus stop improvement cost for each of the potentially leveraged stops in the phased implementation plan is tied to the year that the transportation improvement is planned to occur over the next five years.



Table 4-4 Potential Piggy-Backed Bus Stops

#	FDOT Project #	Bus Stop ID	On Street	Cross Street	Year
1	195416-4	522	Davis Blvd	Radio Rd	2014
2	195416-4	483	Davis Blvd	Cedar Hammock Blvd	2014
3	195416-4	300	Davis Blvd	Wildwood Lakes Blvd	2014
4	195416-4	274	Davis Blvd	Firano Dr	2014
5	425840-1	294	Collier Blvd	Green Blvd	2014/2015
6	425840-1	276	Collier Blvd	17th Ave SW	2014/2015
7	425840-1	295	Collier Blvd	20th PI SW	2014/2015
8	425840-1	296	Collier Blvd	Golden Gate Pkwy	2014/2015
9	429120-1	303	Davis Blvd	Ospreys Landing	2015
10	429120-1	304	Davis Blvd	Kings Way	2015
11	429120-1	305	Davis Blvd	Kings Lake Square	2015
12	429120-1	306	Davis Blvd	Lakewood Blvd	2015
13	429120-1	307	Davis Blvd	Pine Acre	2015
14	429120-1	271	Davis Blvd	E Crowne Pointe Blvd	2015
15	429120-1	270	Davis Blvd	Kings Lake Square	2015
16	429120-1	269	Davis Blvd	Lakewood Blvd	2015
17	429120-1	268	Davis Blvd	Airport Rd	2015
18	430873-1	37	Tamiami Trl	Vanderbilt Beach Rd	2015
19	430873-1	38	Tamiami Trl	Pelican Bay Blvd N	2015
20	430873-1	25	Tamiami Trl	Pelican Bay Blvd N	2015
21	433173-1	301	Davis Blvd	Santa Barbara Blvd	2016
22	433173-1	273	Davis Blvd	Unity Way	2016
23	433189-1	433	Collier Blvd	N Barfield Dr	2016
24	433189-1	411	Collier Blvd	N Barfield Dr	2016
25	433189-1	432	Collier Blvd	E Elkcam Cir	2016



Prioritization Process for Phased Implementation Plan

CAT'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 CAT'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 were collected to support the evaluation of the accessibility, safety/security, and operational efficiency of each bus stop. This information was utilized to determine 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.

As noted previously, this information is utilized to determine whether the accessibility score calculated for each CAT 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 CAT'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
Low (≤ 0)	201	38%
Medium (> 0 & < 1)	297	57%
High (≥ 1)	26	5%
Total ¹	524	100%

(1) At the time of the analysis, CAT had 527 standalone bus stops in their system. However, three were not assessed due to their temporary removal caused by roadway construction.

Table 4-6 Bus Stops with Highest Accessibility Score

#	Bus Stop ID	Intersection	Accessibility Score	Rank
1	206	GOLDEN GATE PARKWAY & 50TH ST SW	1.3	86
2	27	TAMIAMI TRL & 93RD AVE N	1.3	248
3	153	GOODLETTE-FRANK RD & POST OFFICE	1.3	263
4	36	TAMIAMI TRL & 93RD AVE N	1.2	23
5	136	TAMIAMI TRL & RATTLESNAKE HAMMOCK RD	1.2	70
6	80	AIRPORT PULLING RD & ARDISIA LN	1.2	88
7	175	RADIO RD & MANOR BLVD	1.2	318
8	64	AIRPORT PULLING RD & GLADES BLVD	1.1	2
9	54	TAMIAMI TRL & 7TH AVE N	1.1	23
10	241	BROWARD ST & TAMIAMI TRL	1.1	67

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

#	Bus Stop ID	Intersection	Accessibility Score	Rank
1	377	WINN DIXIE & LAKE TRAFFORD	-0.7	116
2	337	TAYLOR TERRACE & BASS RD	-0.7	481
3	280	WILSON BLVD & 24TH AVE NE	-0.6	396
4	318	MARKET ST & DAVIS BLVD	-0.6	476
5	358	S 5TH ST & W DELAWARE AVE	-0.5	5
6	243	FLORIDIAN AVE & HOLLAND ST	-0.5	127
7	134	THOMASSON DR & LOMBARDY LN	-0.5	237
8	22	TAMIAMI TRL & CENTER ST	-0.5	238
9	285	S 1ST ST & EUSTIS AVE E	-0.5	244
10	356	S 6TH ST & COLORADO AVE	-0.5	350



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.

This information is utilized to determine whether the safety/security score calculated for each CAT 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 CAT'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
Low (≤ 0)	8	2%
Medium (> 0 & < 1)	228	44%
High (≥ 1)	288	55%
Total ¹	524	100%

(1) At the time of the analysis, CAT had 527 standalone bus stops in their system. However, three were not assessed due to their temporary removal caused by roadway construction.

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

#	Bus Stop ID	Intersection	Safety Score	Rank
1	235	WALMART & COLLIER BLVD @ PASEDO DR	1.4	1
2	421	COLLIER BLVD & MARRIOTT	1.4	7
3	236	FREEDOM SQUARE PLAZA & TRIANGLE BLVD	1.4	9
4	66	IMMOKALEE RD & CREEKSIDE WAY	1.4	10
5	541	RATTLESNAKE HAMMOCK RD & MANDALAY CIR	1.4	12
6	281	IMMOKALEE RD & RANDALL BLVD	1.4	17
7	58	TAMIAMI TRL & 10TH ST N	1.4	21
8	54	TAMIAMI TRL & 7TH AVE N	1.4	23
9	89	IMMOKALEE RD & MEDICAL BLVD	1.4	27
10	57	TAMIAMI TRL & 3RD AVE S	1.4	28

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

#	Bus Stop ID	Intersection	Safety Score	Rank
1	358	S 5TH ST & W DELAWARE AVE	-0.6	5
2	511	COLLIER BLVD & SHELL ISLAND RD	-0.6	524
3	409	COLLIER BLVD & HENDERSON CREEK RD	-0.1	512
4	321	FARM WORKER WAY & AGRICULTURAL WAY	0	54
5	259	COLLIER BLVD & VERONA WALK BLVD	0	367
6	336	LAKE TRAFFORD RD & CHRISTIAN TERRACE	0	487
7	242	FLORIDIAN AVE & HARDEE ST	0	488
8	301	DAVIS BLVD & SANTA BARBARA BLVD	0	508
9	252	FLORIDIAN AVE & HARDEE ST	0.1	93
10	377	WINN DIXIE & LAKE TRAFFORD	0.1	116



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.

This information is utilized to determine whether the operational efficiency score calculated for each CAT 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 CAT'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
Low (≤ 0)	109	21%
Medium (> 0 & < 1)	262	50%
High (≥ 1)	153	29%
Total ¹	524	100%

(1) At the time of the analysis, CAT had 527 standalone bus stops in their system. However, three were not assessed due to their temporary removal caused by roadway construction.

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

#	Bus Stop ID	Intersection	Operation Score	Rank
1	64	AIRPORT PULLING RD & GLADES BLVD	1.3	2
2	170	RADIO RD & SAN MARCOS BLVD	1.3	3
3	43	TAMIAMI TRL & PARK SHORE SHOPPING CENTER	1.3	8
4	119	AIRPORT PULLING RD & J AND C BLVD	1.3	11
5	20	TAMIAMI TRL & GRANADA BLVD	1.3	16
6	118	AIRPORT PULLING RD & GLADES BLVD	1.3	18
7	58	TAMIAMI TRL & 10TH ST N	1.3	21
8	50	FLEISCHMANN BLVD & COASTLAND MALL/FLEISCHMANN PARK	1.3	34
9	11	TAMIAMI TRL & 5TH AVE N	1.3	35
10	149	BAYSHORE DR & COCO AVE	1.3	36

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

#	Bus Stop ID	Intersection	Operation Score	Rank
1	409	COLLIER BLVD & HENDERSON CREEK RD	-1	512
2	187	GOLDEN GATE PKWY & TROPICANA BLVD	-0.5	78
3	259	COLLIER BLVD & VERONA WALK BLVD	-0.5	367
4	78	AIRPORT PULLING RD & PINE RIDGE RD	-0.3	99
5	189	SUNSHINE BLVD & GOLDEN GATE PKWY	-0.3	102
6	179	GOLDEN GATE PKWY & ESTUARY BLVD	-0.3	206
7	107	AIRPORT PULLING RD & PINE WOOD CIR	-0.3	214
8	5	TAMIAMI TRL & DAVIS BLVD	-0.3	214
9	156	GOODLETTE-FRANK RD & CENTRAL AVE	-0.3	221
10	106	AIRPORT PULLING RD & CLUBHOUSE DR	-0.3	335



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 is typically assessed for each stop using Automatic Passenger Counter (APC) data. Bus stop activity is defined as the total number of passengers boarding and alighting at a single stop over the course of an average weekday. This particular 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 CAT’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 daily ridership was calculated based on eight months of ridership data, collected from January 1, 2013 to August 15, 2013. Please note that although the average daily ridership reported is zero in some cases, throughout the year, riders may have boarded and alighted at that particular stop, just not enough to have the average daily value be larger than zero. 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 Operational Efficiency Scores

Ratings Range	# of Bus Stops	Distribution
Low (<=10)	387	73%
Medium (>10 & <20)	72	14%
High (>=20)	57	11%
Not Reported	13	2%
Total ¹	529	100%

(1) At the time of the analysis, CAT had 527 standalone bus stops in their system plus two transfer centers. The ridership data reported here takes into account all 529 bus stops.

Table 4-15 Top 10 Bus Stops with Highest Ridership

#	Bus Stop ID	Intersection	Avg Daily Ridership
1	1	GOVERNMENT CENTER	1125
2	235	WALMART & COLLIER BLVD @ PASEDO DR	188
3	66	IMMOKALEE RD & CREEKSIDE WAY	177
4	161	CAT OPERATION TRANSIT CENTER	165
5	68	AIRPORT PULLING RD & GOVERNMENT CENTER	125
6	398	IMMOKALEE HEALTH DEPARTMENT & LIBRARY	120
7	163	FLEISCHMANN BLVD & COASTLAND MALL	92
8	219	TAMIAMI TRL & COURT HOUSE SHADOWS	67
9	187	GOLDEN GATE PKWY & TROPICANA BLVD	60
10	118	AIRPORT PULLING RD & GLADES BLVD	60

Table 4-16 Bottom 10 Bus Stops with Lowest Ridership

#	Bus Stop ID	Intersection	Avg Daily Ridership
1	448	COLLIER BLVD & CARIBBEAN CT	0
2	521	COLLIER BLVD & CAPRI BLVD	0
3	481	GOLDEN GATE PKWY & 66TH ST SW	0
4	301	DAVIS BLVD & SANTA BARBARA BLVD	0
5	180	GOLDEN GATE PKWY & FREEDOM PARK	0
6	479	GOLDEN GATE PKWY & NAPLES GRANDE	0
7	324	E MAIN ST & COUNTY RD 846	0
8	505	GOLDEN GATE PKWY & 66TH ST SW	0
9	417	SEAGRAPE DR & AMBER DR	0
10	439	TAMIAMI TRL & IMPERIAL WILDERNESS BLVD	0



Nearby Trip Generators

During the inventory process to collect CAT 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 list 25 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
2	TAMIAMI TRL & ANDREW DR	Office/Commercial, Residential, Retail
64	AIRPORT PULLING RD & GLADES BLVD	Residential, Retail
66	IMMOKALEE RD & CREEKSIDE WAY	Office/Commercial, Retail
68	AIRPORT PULLING RD & GOVERNMENT CENTER	Church, Government, Office/Commercial, Retail
105	AIRPORT PULLING RD & PINE RIDGE RD	Retail
116	AIRPORT PULLING RD & ESTEY AVE	Retail
118	AIRPORT PULLING RD & GLADES BLVD	Residential, Retail
119	AIRPORT PULLING RD & J AND C BLVD	Office/Commercial, Retail
139	TAMIAMI TRL & WALMART	Office/Commercial, Residential, Retail
162	FLEISCHMANN BLVD & 10TH ST N	Government, Retail
163	FLEISCHMANN BLVD & COASTLAND MALL	Government, Retail
170	RADIO RD & SAN MARCOS BLVD	Residential, Retail
189	SUNSHINE BLVD & GOLDEN GATE PARKWAY	Residential, School/Day Care
219	TAMIAMI TRL & COURT HOUSE SHADOWS	Office/Commercial, Residential, Retail
235	WALMART & COLLIER BLVD @ PASEDO DR	Retail
241	BROWARD ST & TAMIAMI TRL	Residential, Retail
252	FLORIDIAN AVE & HARDEE ST	Residential
253	FLORIDIAN AVE & BROWARD ST	Residential, Retail
276	COLLIER BLVD & 17TH AVE SW	Residential, Retail
285	S 1ST ST & EUSTIS AVE E	Casino
321	FARM WORKER WAY & AGRICULTURAL WAY	Residential
364	IMMOKALEE GOV CENTER & MAIN ST	Government, Office/Commercial, Retail
377	WINN DIXIE & LAKE TRAFFORD	Retail
398	IMMOKALEE HEALTH DEPT & LIBRARY	Government, Medical/Rehab
508	RADIO RD & DAVIS BLVD	Residential, Retail



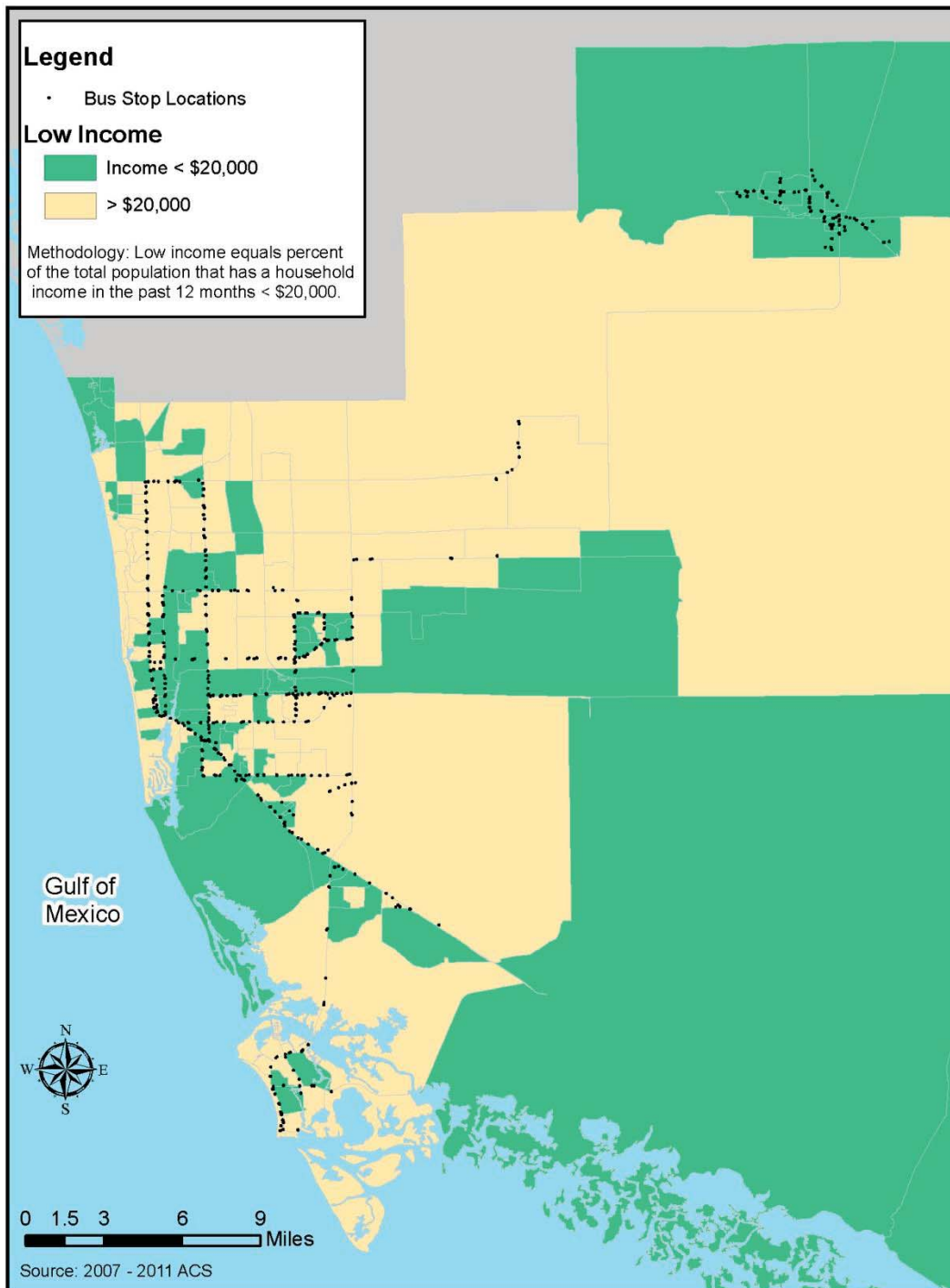
Implementation Plan

All of the previous factors were reviewed and a 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, CAT 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)

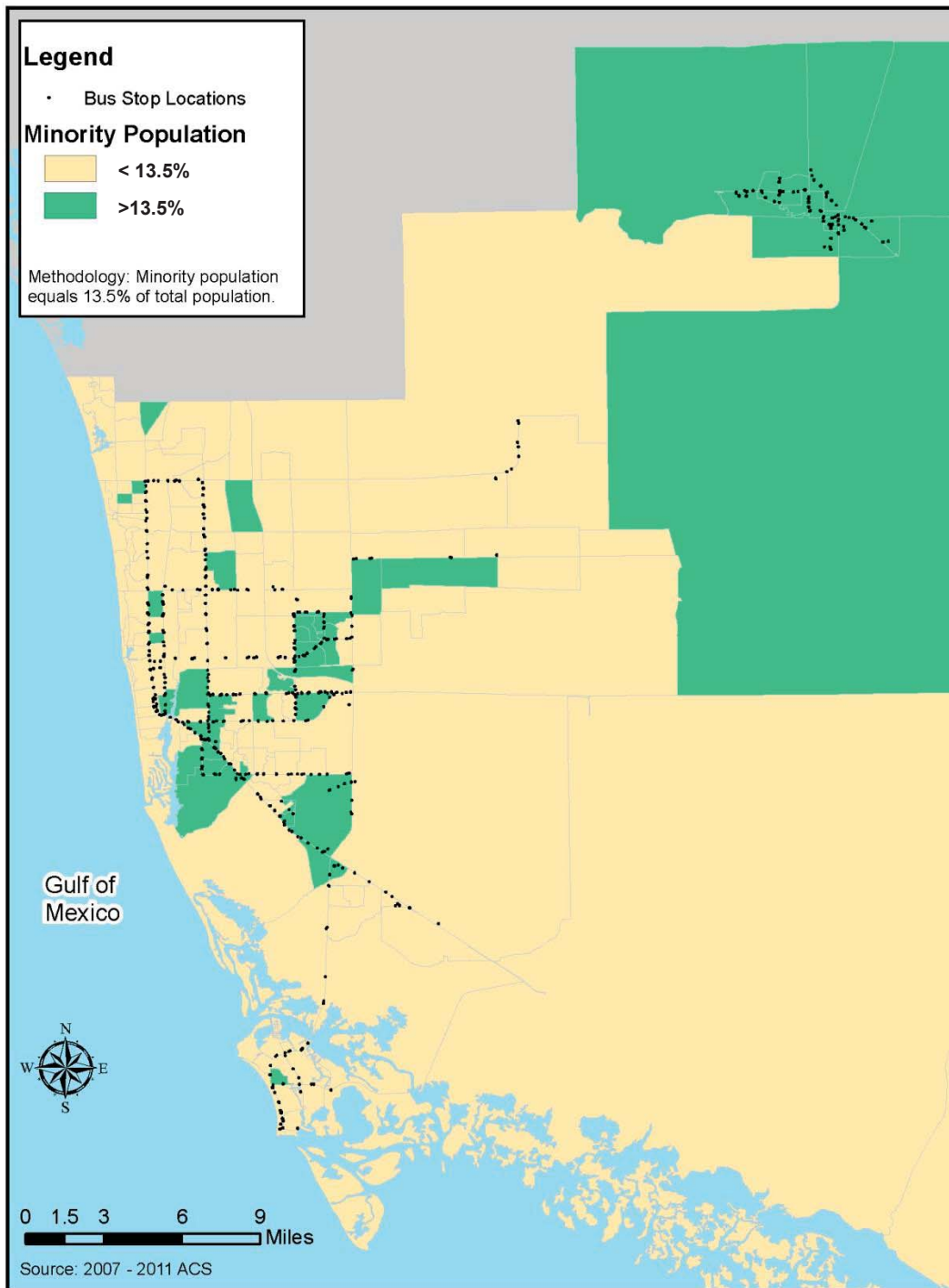
To review Title VI compliance, a GIS-based analysis of CAT’s service area was completed to assess the comparative nature and distribution of the proposed bus stop improvements, consolidations, and deletions with regard to both minority and non-minority portions of the service area.

Figure 4-2 and Figure 4-3 illustrates the GIS analysis conducted and resulting Title VI areas in the CAT service area. Based on this analysis, 65 percent of the total bus stops are located in Title VI areas and 64 percent those bus stops identified as needing improvements are located in Title VI areas. Based on this review, it was concluded that the implementation program is in compliance with Title VI requirements.



Note: \$20,000 is an industry standard for poverty level income for three person households, as reported by the US Department of Health and Human Services.

Figure 4-2 Collier County Low Income Title VI Areas



Note: 13.5% is obtained from the sum of Collier's minority population divided by Collier's total population.

Figure 4-3 Collier County Minority Population Title VI Areas



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 CAT'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.

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 order-of-magnitude 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, CAT 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 Order of Magnitude Cost Estimate

Improvement	Cost	Number of Instances	Amount Recommended (sf/lf)	Total Cost
Remove Bus Stop ¹	\$400 each	1		\$ 400
Relocate Bus Stop ¹	\$400 each	30		\$ 12,000
New Boarding & Alighting Area ²	\$1,200 each @ 40 sf	257	10,280 sf	\$ 308,400
Partial Boarding & Alighting Area ²	\$30 per sf	212	3,140 sf	\$ 94,200
New Sidewalk/Connecting Path ²	\$6 lf @ 5' wide	115	4,660 lf	\$ 26,500
Add/Replace/Move Bus Sign At Stop	\$175 each	88		\$ 15,400
Resurface ²	\$11 per sf	340	7,990 sf	\$ 87,900
Detectable Warning ³	\$275 each	629		\$ 173,000
Remove Detectable Warnings at B&A	\$140 each	61		\$ 8,500
Raised Curb ²	\$100 each @ 5' long	217	1,090 lf	\$ 21,700
Remove Cement	\$15 per sf	57	2,012 sf	\$ 30,200
Add Curb Ramp	\$450 each	64		\$ 28,800
Crosswalk Striping	\$3 per lf	27	1,558 lf	\$ 4,700
Crosswalk Infrastructure	various	29		\$ 97,200
Other Improvements ⁴	various			\$ 71,800
Mobilization	\$500 each	524		\$ 262,000
Maintenance of Traffic	\$1,500 each	523		\$ 784,500
Signed & Sealed Plans	\$1,500 each	523		\$ 784,500
Clearing & Grubbing	\$1,500 each	474		\$ 711,000
Total Order of Magnitude Cost Estimates⁵				\$ 3,522,700



- (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.



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

A total of 1 bus stop is recommended for consolidation and 30 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. The total number of bus stops recommended for consolidation or relocation is 31. 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 CAT staff. CAT 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.

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 CAT to address the improvements. The Implementation and Financial Plan includes all improvements that are CAT's responsibility as well as some improvements that may end up being the responsibility of other entities.



As previously mentioned in Section Four, it would be ideal if CAT could take advantage of “piggy backing” needed bus stop improvements with planned roadway projects. Under ideal circumstances, this would permit CAT to benefit either because the project directly addresses some or all of the needed stop improvements, or the project allows CAT 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 CAT’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.



Transfer Facilities

As previously mentioned, a separate assessment was conducted at CAT's two transit facilities. The assessment conducted at CAT's facilities includes cost estimates for needed improvements totaling approximately \$4,000, as described below.

Table 5-2 Transfer Facilities Cost Estimate

Bus Stop ID	Facility	Deficiencies	Cost
1	Collier County Government Center	Protruding object, No visual and tactile exit signs	\$3,500 ¹
161	Collier Area Transit Ops	Character height, Service desk height	\$12,000 ¹

(1) Note that these estimated costs contain \$500 for mobilization and \$1500 for signed and sealed plans.

FUNDING PLAN FOR NEEDED IMPROVEMENTS

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

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

Currently, \$297,398 is available for improvements to bus stops located on the state highway system. This funding is part of a one-time grant that must be used in full by the end of the year.

A total of \$25,000 is 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 CAT, 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.

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:

Study Improvement Needs ¹	\$3,522,700
Transfer facilities ¹	\$15,500
Total program ¹	\$3,538,200

Current Funding for State Highway: \$297,398

Anticipated Annual Revenue: \$25,000

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

The relocation of bus stops assumes that all 30 stops will be relocated and the removal of bus stops assumes that the one stop will be removed. However, keep in mind that the Study Improvement Needs represents the total estimate of probable cost, some of which will be the responsibility of other entities.

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 order-of-magnitude estimates, with the ultimate costs dependent upon how the work is undertaken, site conditions at individual stops, and material and labor prices in future years. The number of stops that are consolidated or relocated will also be an important variable.

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 Naples, Marco Island, and Collier County.

Due to the grant currently available for bus stop improvements along state highways, which will expire this year, the stops recommended for improvement during the first 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.



Table 5-3 Phased Implementation Plan for Bus Stop Improvements

ID	Rank	Total Cost	Year	Item
43	8	\$ 3,800	2014	Boarding and alighting area not compliant, Detectable Warning at B&A
231	14	\$ 3,700	2014	Boarding and alighting area not compliant
20	16	\$ 3,800	2014	Boarding and alighting area not compliant, Detectable Warning at B&A
58	21	\$ 4,600	2014	Misc ADA Issue
36	23	\$ 4,200	2014	Detectable Warning at B&A
54	23	\$ 4,200	2014	Detectable Warning at B&A
57	28	\$ 5,000	2014	Boarding and alighting area not compliant
11	35	\$ 4,300	2014	Boarding and alighting area not compliant
219	39	\$ 7,600	2014	No raised curb, Detectable Warning at B&A
10	41	\$ 4,500	2014	Boarding and alighting area not compliant
2	42	\$ 6,100	2014	Boarding and alighting area not compliant
56	46	\$ 4,200	2014	Boarding and alighting area not compliant
364	47	\$ 6,300	2014	Boarding and alighting area not compliant
508	59	\$ 6,800	2014	No raised curb
295	63	\$ 4,100	2014	Boarding and alighting area not compliant
3	64	\$ 5,900	2014	Boarding and alighting area not compliant
136	70	\$ 7,600	2014	No raised curb, Detectable Warning at B&A
139	71	\$ 7,700	2014	Boarding and alighting area not compliant, No raised curb, Detectable Warning at B&A
240	72	\$ 6,800	2014	Boarding and alighting area not compliant, No raised curb
33	73	\$ 5,200	2014	Boarding and alighting area not compliant, Detectable Warning at B&A
121	74	\$ 5,300	2014	Boarding and alighting area not compliant
63	88	\$ 6,000	2014	Boarding and alighting area not compliant
42	93	\$ 6,300	2014	Boarding and alighting area not compliant
55	98	\$ 6,000	2014	Boarding and alighting area not compliant
59	99	\$ 5,900	2014	Boarding and alighting area not compliant
61	100	\$ 6,000	2014	Boarding and alighting area not compliant
120	100	\$ 6,000	2014	Boarding and alighting area not compliant
9	108	\$ 6,000	2014	Boarding and alighting area not compliant
26	110	\$ 5,900	2014	Boarding and alighting area not compliant
13	111	\$ 5,900	2014	Boarding and alighting area not compliant
160	112	\$ 6,000	2014	Boarding and alighting area not compliant
272	127	\$ 5,500	2014	Boarding and alighting area not compliant
545	147	\$ 6,600	2014	Boarding and alighting area not compliant, No raised curb
122	169	\$ 6,000	2014	Boarding and alighting area not compliant
60	185	\$ 6,000	2014	Boarding and alighting area not compliant



ID	Rank	Total Cost	Year	Item
325	192	\$ 5,500	2014	Boarding and alighting area not compliant
52	209	\$ 7,700	2014	Misc ADA Issue
300	209	\$ 5,900	2014	Boarding and alighting area not compliant
5	213	\$ 6,000	2014	Boarding and alighting area not compliant, Sign not compliant
12	223	\$ 6,500	2014	Boarding and alighting area not compliant
6	227	\$ 6,400	2014	Boarding and alighting area not compliant
146	255	\$ 7,000	2014	Boarding and alighting area not compliant, No raised curb
239	258	\$ 6,600	2014	Boarding and alighting area not compliant, No raised curb
248	265	\$ 7,600	2014	No raised curb, Detectable Warning at B&A
16	273	\$ 6,300	2014	Boarding and alighting area not compliant
45	274	\$ 6,500	2014	Boarding and alighting area not compliant
18	276	\$ 6,800	2014	Boarding and alighting area not compliant
44	277	\$ 7,000	2014	Boarding and alighting area not compliant
15	283	\$ 6,200	2014	Boarding and alighting area not compliant
247	291	\$ 7,900	2014	No raised curb, Detectable Warning at B&A

Estimated Cost¹: \$ 295,700

ID	Rank	Total Cost	Year	Item
235	1	\$ 3,800	2015	No raised curb
64	2	\$ 4,500	2015	Detectable Warning at B&A
170	3	\$ 4,400	2015	Bike rack obstruction , Boarding and alighting area not compliant, Detectable Warning at B&A
174	4	\$ 5,000	2015	Bike rack obstruction , Boarding and alighting area not compliant, Detectable Warning at B&A
358	5	\$ 900	2015	Boarding and alighting area not compliant, No raised curb
119	11	\$ 6,000	2015	Boarding and alighting area not compliant

Estimated Cost¹: \$ 24,600



ID	Rank	Total Cost	Year	Item
348	6	\$ 4,200	2016	Sign not compliant
236	9	\$ 4,000	2016	Misc ADA Issue
66	10	\$ 5,600	2016	Boarding and alighting area not compliant
541	12	\$ 3,500	2016	None
281	17	\$ 3,700	2016	Schedule not accessible
89	27	\$ 4,000	2016	Misc ADA Issue

Estimated Cost¹: \$ 25,000

ID	Rank	Total Cost	Year	Item
148	13	\$ 4,500	2017	Boarding and alighting area not compliant, Detectable Warning at B&A
118	18	\$ 6,300	2017	Boarding and alighting area not compliant
95	19	\$ 4,300	2017	Boarding and alighting area not compliant
471	20	\$ 6,100	2017	Boarding and alighting area not compliant
167	30	\$ 3,800	2017	Boarding and alighting area not compliant

Estimated Cost¹: \$ 25,000

ID	Rank	Total Cost	Year	Item
457	22	\$ 5,000	2018	Boarding and alighting area not compliant
105	25	\$ 6,100	2018	Bench obstruction, Boarding and alighting area not compliant, Detectable Warning at B&A
169	31	\$ 3,800	2018	Boarding and alighting area not compliant
263	31	\$ 3,800	2018	Boarding and alighting area not compliant
321	54	\$ 6,300	2018	Boarding and alighting area not compliant, No raised curb

Estimated Cost¹: \$ 25,000

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



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. CAT staff will need to review the needed improvements and the available funding on an annual basis to develop the annual improvement program.



6.0 NEXT STEPS

The following is a summary of next steps for CAT 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

- CAT 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

- CAT shall seek additional funding for bus stop improvements.

GIS Analysis to Determine Jurisdictional Responsibility

- CAT shall conduct a GIS analysis to determine the specific improvements that fall within the responsibility of each respective jurisdiction (Naples, Marco Island, Collier County, and FDOT).
- CAT shall formally advise each jurisdiction of the specific improvement needs that are within their responsibility, based on the results of the GIS analysis.

Advise Entities Responsible for Improvement Needs

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

Bus Stop Consolidation/Relocation

- CAT shall review the initial list of bus stops recommended for consolidation and confirm the final list of stops to be removed.
- CAT shall provide the list of consolidated bus stops to CAT maintenance staff to flag each bus stop identified for consolidation, which shall provide notice to the riders utilizing the stop(s) identified for consolidation.



- CAT shall determine additional public outreach efforts, as appropriate, based on the number and scale of the bus stops recommended for consolidation.
- CAT shall conduct bus stop consolidation reviews to correspond with the service change route mark-ups that occur multiple times throughout the year.
- CAT 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.
- CAT staff shall continue to identify consolidation opportunities as part of roadway improvement reviews requested by other agencies, including FDOT, Collier County, Naples, and Marco Island.
- CAT 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.

CAT Training

- CAT 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.
- CAT shall review and discuss the procedures and responsibilities for implementing new stops and updating the inventory on an ongoing basis.

Database Maintenance Procedures

- CAT 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 CAT's adopted standards.
- CAT 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.

Review Implementation and Financial Plan

- CAT 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.
- CAT 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.).
- CAT shall conduct high-level coordination between the MPO, FDOT, and local jurisdictions to ensure that necessary improvements are addressed.

Update Inventory Database Regularly

- CAT 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

- CAT shall review the progress of addressing improvements identified in the Implementation and Financial Plan on an annual basis.
- CAT shall coordinate with local jurisdictions, FDOT, and stakeholder groups on strategies for implementing improvements.
- CAT shall update the following year's work program to reflect the new list of needed improvements.

Regularly Report Progress of Implementation

- CAT shall regularly report the progress of implementing improvements to:
 - BCC
 - PTAC, and
 - CAT's ADA Coordinator.
- CAT 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

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

Explore Future Applications for Inventory Information

- CAT 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.
- CAT shall explore the feasibility of providing inventory information to the public via Google Transit.