# COLLIER AREA TRANSIT
# BUS STOP ADA ASSESSMENT
# DRAFT REPORT

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**Prepared For:**
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# 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 with the purpose of improving CAT's staff's understanding of accessibility issues pertaining to Americans with Disabilities Act (ADA) requirements, as they relate 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. CAT recognizes, however, that it is important to strike a balance between the potential need to eliminate stops and the community's need for convenient access to 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 more detailed discussion and 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 all surveyors and two days of field training where the surveyors went out in smaller groups to practice at 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. 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 E 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.

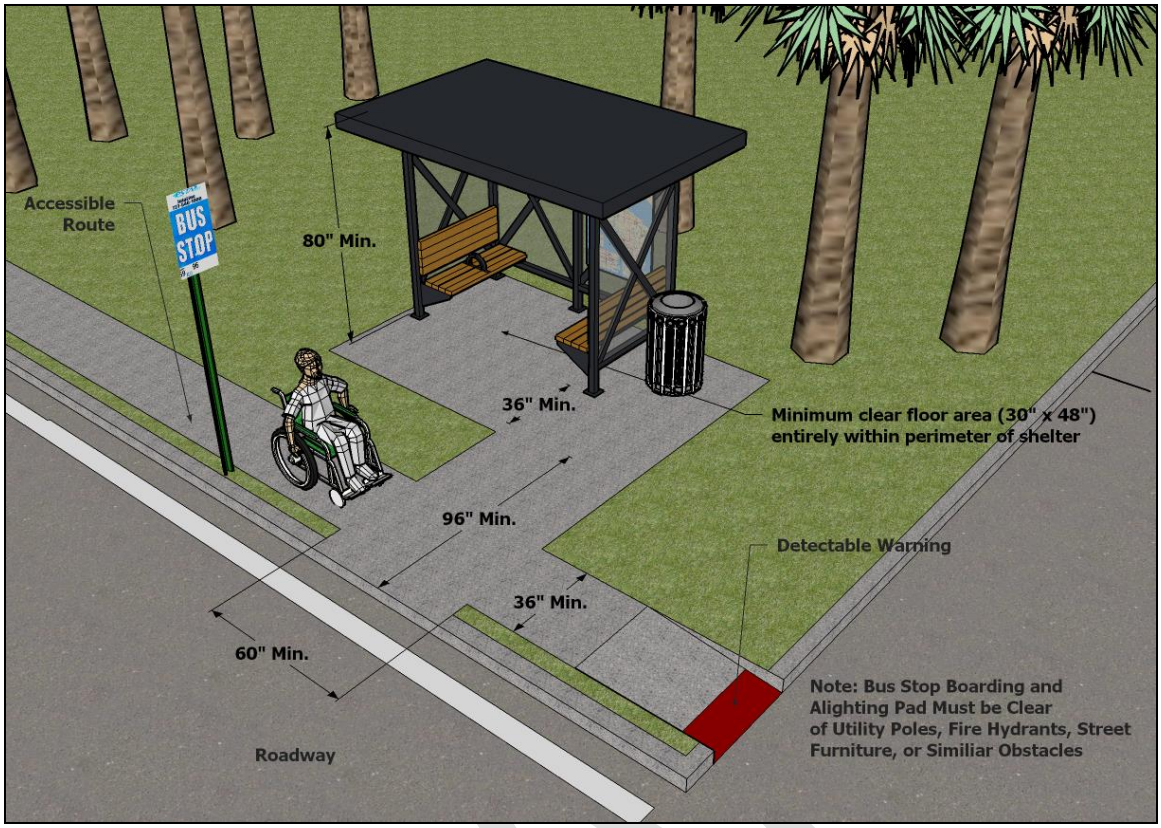



**Figure 3-1 General Bus Stop Accessibility Standards Diagram**

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 PADS

Boarding and alighting pads (previously referred to as "landing" pads or areas) 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.

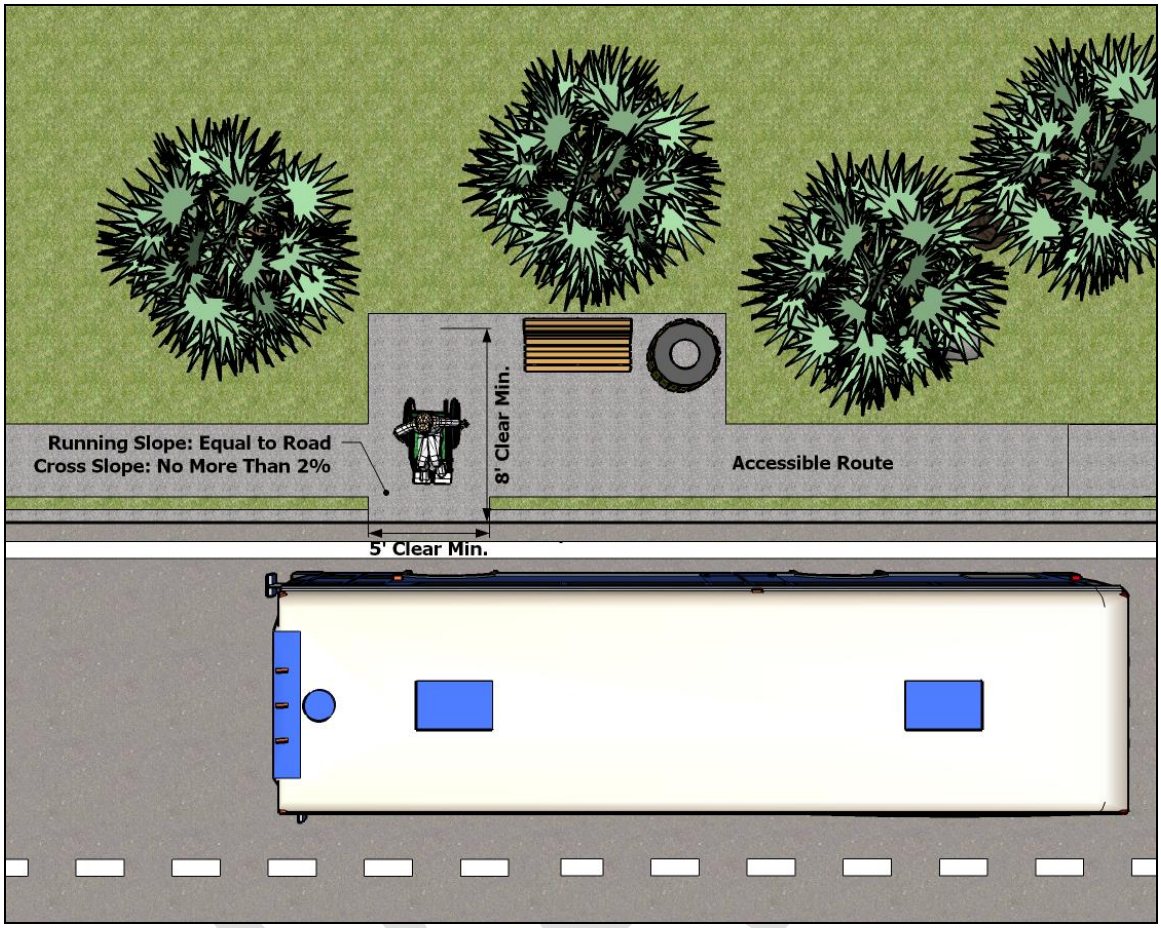



**Figure 3-2 Landing Area Standards Diagram**

## *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 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** |

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.

(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.

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 ¼", 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 about 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(1)** | **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.

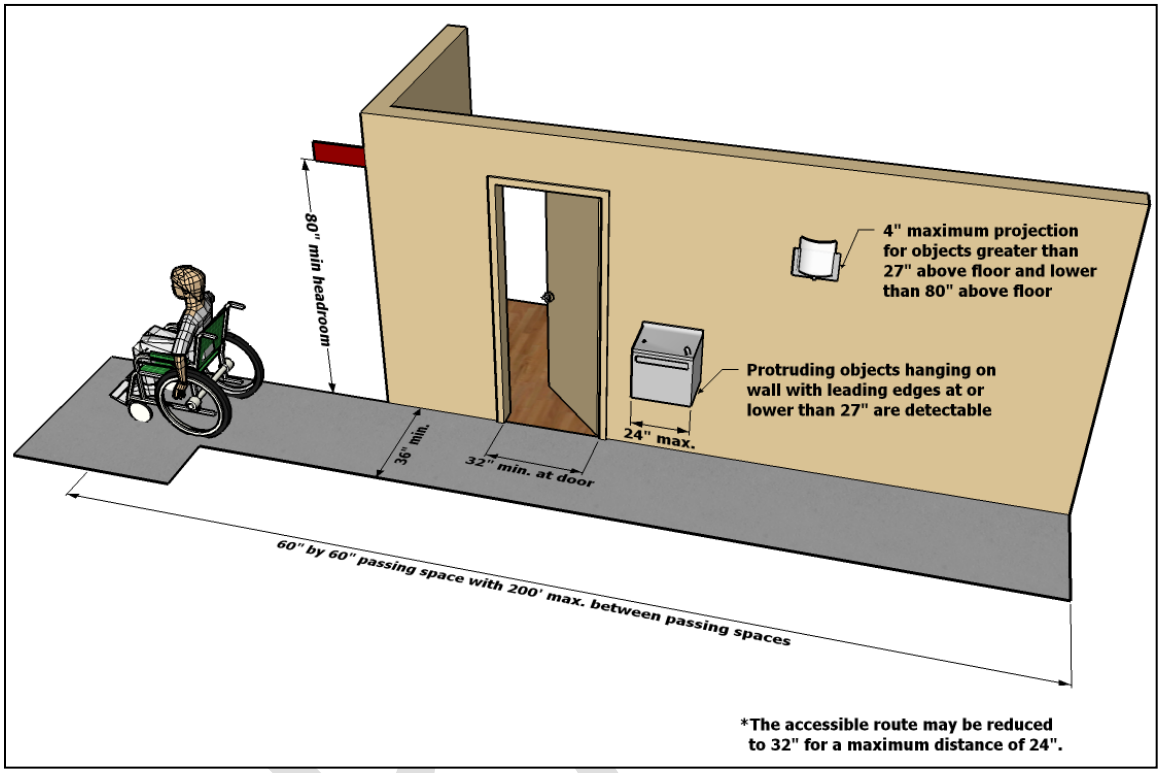



**Figure 3-3 Accessible Route Standards Diagram**

## *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 road may act as accessible path) | 66 |
| Sidewalk less than 3 feet wide | 0 |
| Running slope is greater than 5% | 5 |
| **Sidewalk not compliant** | 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.

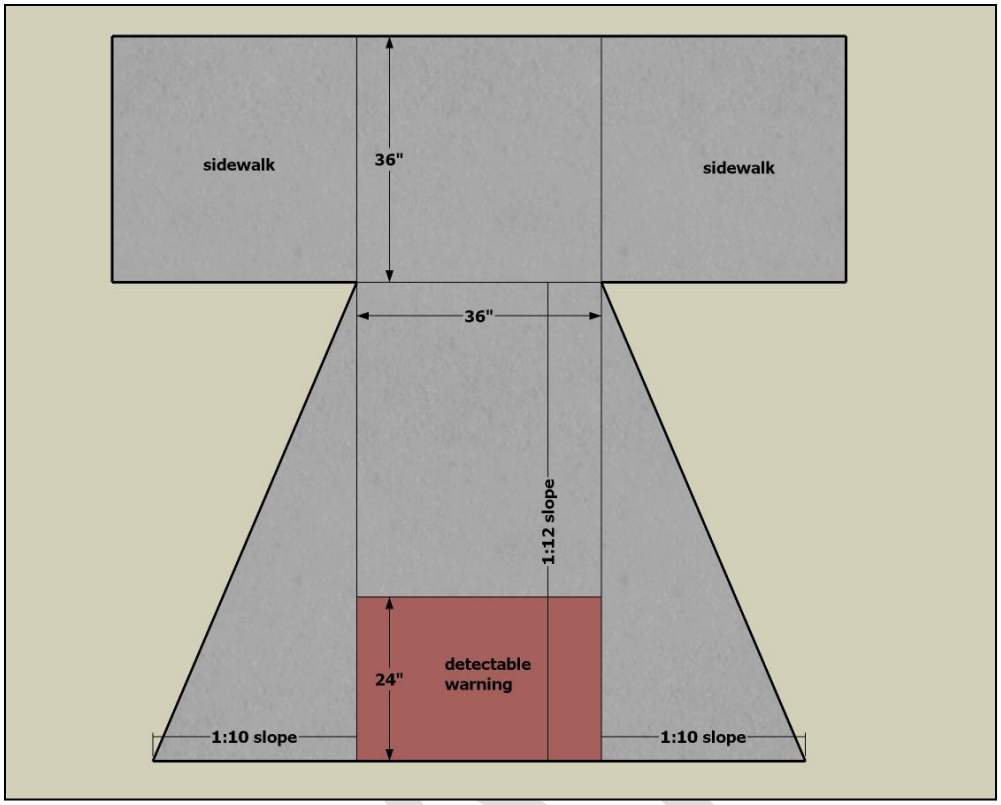



**Figure 3-4 Curb Ramp Accessibility Standards Diagram**

### *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 jurisdictions and not CAT.

(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.

## 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, 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:*

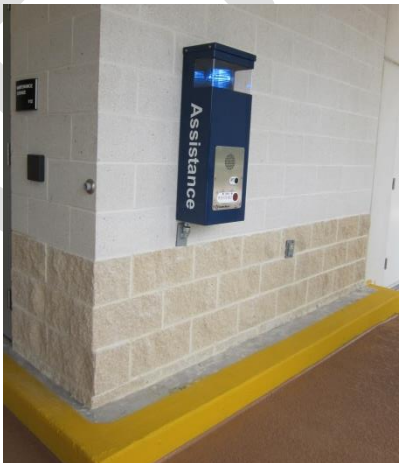
1. For the emergency assistance call box, located on the southern end of the facility, a curb, similar to the one built on the northern end of the facility, or a column should be built. This curb should extend the width of the box and be between the same depth of the box or up to 4” shallower.

2. If not already done, visual and tactile exit signs are needed at the facility's egress.


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 <=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.

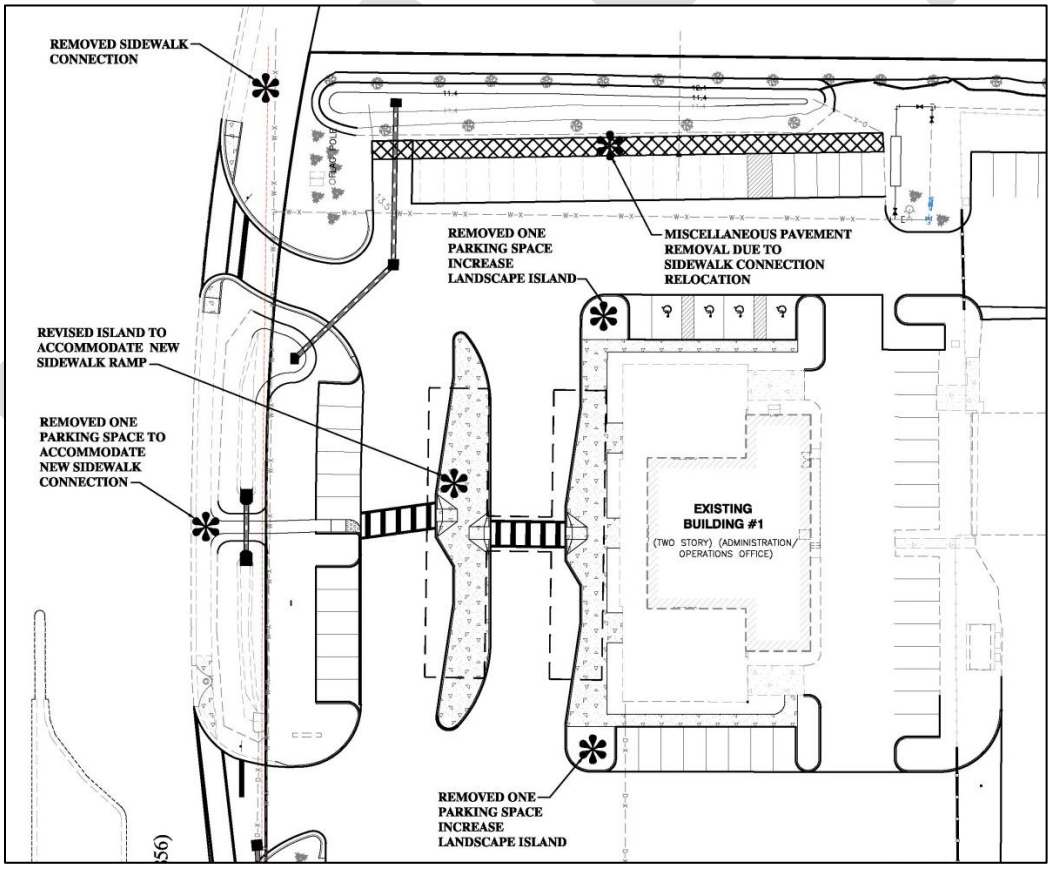



**Figure 3-7 Proposed Collier Area Transit Operations Transfer Station Improvements**

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

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

**STEP 1: IDENTIFY RESPONSIBLE ENTITY**

The first step in developing the phased implementation plan was to determine which improvements are the responsibility of 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.

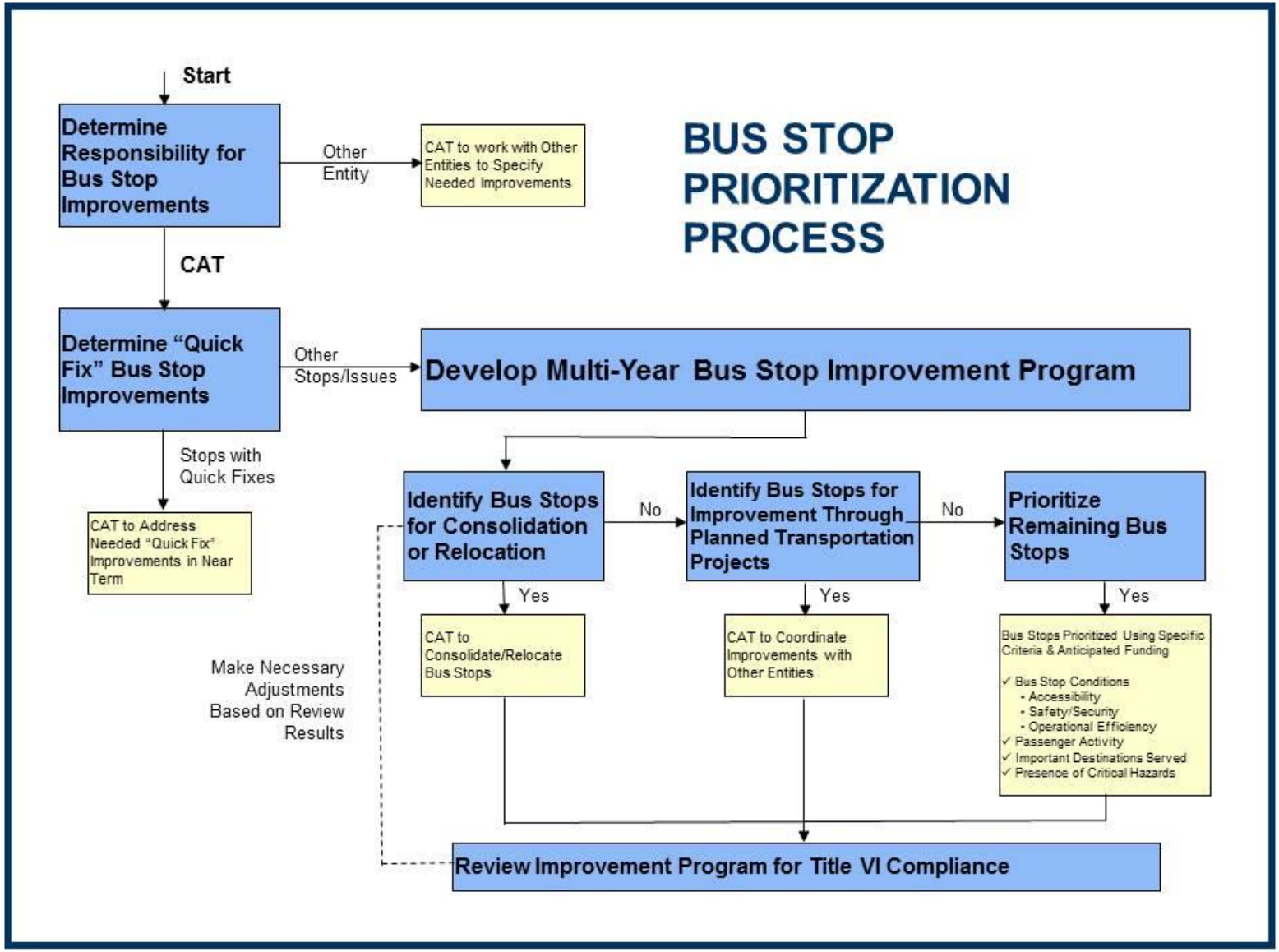



**Figure 4-1 Prioritization Process Flow Chart**

**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 can not 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 | Location |
|---|---|---|---|---|
| 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, "quick fix" bus stop improvements were ascertained by defining identified issues that could be quickly and easily addressed by CAT staff at relatively low cost. Second, bus stops were identified that could possibly be improved in conjunction with planned transportation projects. Third, a five-year phased implementation plan was created to help guide CAT in addressing the more significant improvements at the remaining bus stops.

### Identify Quick Fix Improvements

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

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

- The replacement or modification of the bus stop sign is required, or
- The removal of detectable warnings at the B&A area, or
- The order-of-magnitude cost estimate is less than or equal to $4000 per stop

Other improvements, such as an obstruction or accessibility issue caused by a 3rd party bench or trash can, could be fixed rather easily; however, these improvements are not the responsibility of CAT and are, therefore, not included in the list of quick fixes. It should also be noted that CAT does not condone the placement of such 3rd party amenities

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

**Table 4-4 Bus Stops Recommended for Quick Fixes**

| # | Bus Stop ID | On Street | Cross Street | Rank |
|---|---|---|---|---|
| 1 | 235 | Walmart | Collier Blvd @ Pasedo Dr | 1 |
| 2 | 64 | Airport Pulling Rd | Glades Blvd | 2 |
| 3 | 358 | S 5th St | W Delaware Ave | 5 |
| 4 | 348 | Lake Trafford Rd | N 15th St | 6 |
| 5 | 43 | Tamiami Trl | Park Shore Shopping Center | 8 |
| 6 | 236 | Freedom Square Plaza | Triangle Blvd | 9 |
| 7 | 541 | Rattlesnake Hammock Rd | Mandalay Cir | 12 |
| 8 | 231 | Physician Regional Medical | Collier Blvd | 14 |
| 9 | 20 | Tamiami Trl | Granada Blvd | 16 |
| 10 | 281 | Immokalee Rd | Randall Blvd | 17 |
| 11 | 36 | Tamiami Trl | 93rd Ave N | 23 |
| 12 | 54 | Tamiami Trl | 7th Ave N | 23 |
| 13 | 105 | Airport Pulling Rd | Pine Ridge Rd | 25 |
| 14 | 89 | Immokalee Rd | Medical Blvd | 27 |
| 15 | 518 | Collier Blvd | Winterberry Dr | 28 |
| 16 | 167 | Radio Rd | Industrial Blvd | 30 |
| 17 | 169 | Radio Rd | Livingston Rd | 31 |
| 18 | 263 | Rattlesnake Hammock Rd | Huntington Woods Dr | 31 |
| 19 | 286 | Immokalee Rd | 39th Ave NE | 33 |
| 20 | 50 | Fleischmann Blvd | Coastland Mall/Fleischmann Pk | 34 |
| 21 | 68 | Airport Pulling Rd | Government Center | 38 |
| 22 | 2 | Tamiami Trl | Andrew Dr | 42 |
| 23 | 282 | Immokalee Rd | Orange Tree Blvd | 52 |
| 24 | 162 | Fleischmann Blvd | 10th St N | 62 |
| 25 | 3 | Tamiami Trl | Bayshore Dr | 64 |
| 26 | 241 | Broward St | Tamiami Trl | 67 |
| 27 | 139 | Tamiami Trl | Walmart | 71 |
| 28 | 33 | Tamiami Trl | 110th Ave N | 73 |
| 29 | 177 | Radio Rd | Santa Clara Dr | 77 |
| 30 | 187 | Golden Gate Pkwy | Tropicana Blvd | 78 |
| 31 | 206 | Golden Gate Pkwy | 50th St SW | 86 |
| 32 | 80 | Airport Pulling Rd | Ardisia Ln | 88 |
| 33 | 252 | Floridian Ave | Hardee St | 93 |
| 34 | 253 | Floridian Ave | Broward St | 94 |
| 35 | 104 | Airport Pulling Rd | Naples Blvd | 95 |
| 36 | 55 | Tamiami Trl | 4th Ave N | 98 |
| 37 | 189 | Sunshine Blvd | Golden Gate Pkwy | 102 |
| 38 | 377 | Winn Dixie | Lake Trafford | 116 |

**Table 4-5, Continued Bus Stops Recommended for Quick Fixes**

| # | Bus Stop ID | On Street | Cross Street | Rank |
|---|---|---|---|---|
| 39 | 147 | Tamiami Trl | Lakewood Blvd | 117 |
| 40 | 243 | Floridian Ave | Holland St | 127 |
| 41 | 208 | Sunshine Blvd | Golden Gate Pkwy | 152 |
| 42 | 221 | Rattlesnake Hammock Rd | Doral Cir | 156 |
| 43 | 5 | Tamiami Trl | Davis Blvd | 214 |
| 44 | 244 | Floridian Ave | Johns St | 245 |
| 45 | 27 | Tamiami Trl | 93rd Ave N | 248 |
| 46 | 153 | Goodlette-Frank Rd | Post Office | 263 |
| 47 | 137 | Tamiami Trl | Lakewood Blvd | 264 |
| 48 | 84 | Airport Pulling Rd | Olde Groves Rd | 265 |
| 49 | 248 | Tamiami Trl | Thomasson Dr | 266 |
| 50 | 400 | N 1st St | 2nd Ave N | 271 |
| 51 | 145 | Thomasson Ln | Tamiami Trl E | 282 |
| 52 | 133 | Thomasson Dr | Alladin Ln. | 295 |
| 53 | 374 | N 15th St | Goodwill | 316 |
| 54 | 451 | Bayshore Dr | Windstar Blvd | 316 |
| 55 | 175 | Radio Rd | Manor Blvd | 318 |
| 56 | 294 | Collier Blvd | Green Blvd | 330 |
| 57 | 103 | Airport Pulling Rd | J and C Blvd | 345 |
| 58 | 100 | Airport Pulling Rd | Vanderbilt Beach Rd | 348 |
| 59 | 132 | Thomasson Dr | Bayshore Dr | 355 |
| 60 | 349 | N 15th St | 8th Ave | 357 |
| 61 | 444 | Collier Ct | Caxambas Park | 359 |
| 62 | 351 | N 15th St | Immokalee Dr | 365 |
| 63 | 230 | Lely Cultural Pkwy | Edison College | 366 |
| 64 | 317 | Napa Blvd | Pine Ridge Rd | 379 |
| 65 | 441 | Abiaka Way | Chickee Dr | 380 |
| 66 | 465 | 8th St N | 4th Ave N | 381 |
| 67 | 453 | 8th St N | 4th Ave N | 387 |
| 68 | 193 | Green Blvd | Whistlers Green Cir | 389 |
| 69 | 197 | Santa Barbara Blvd | Hunter Blvd | 393 |
| 70 | 376 | N 15th St | Palm Ave | 403 |
| 71 | 350 | N 15th St | 5th Ave | 404 |
| 72 | 392 | Collier Health Services | SR 29 | 405 |
| 73 | 41 | Tamiami Trl | Pine Ridge Rd | 413 |
| 74 | 333 | Westclox Rd | Carson Rd | 415 |
| 75 | 143 | Thomasson Dr | Lombardy Ln | 422 |
| 76 | 419 | Collier Blvd | Sandpiper Condominium | 424 |

**Table 4-6, Continued Bus Stops Recommended for Quick Fixes**

| # | Bus Stop ID | On Street | Cross Street | Rank |
|---|---|---|---|---|
| 77 | 289 | Wilson Blvd | 24th Ave NE | 452 |
| 78 | 427 | San Marco Rd | S Barfield Dr | 453 |
| 79 | 394 | New Market Rd | Nassau St | 463 |
| 80 | 324 | E Main St | County Rd 846 | 478 |
| 81 | 337 | Taylor Terrace | Bass Rd | 481 |
| 82 | 242 | Floridian Ave | Hardee St | 488 |
| 83 | 35 | Tamiami Trl | 99th Ave N | 489 |
| 84 | 140 | Tamiami Trl | Seminole Ave | 494 |
| 85 | 525 | Carolina Ave | Warren St | 498 |
| 86 | 409 | Collier Blvd | Henderson Creek Rd | 512 |

### 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, projects 425840-1, 433189-1, 429120-1, 433173-1, 195416-4, 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 4-7 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 Pl 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 4-6 presents the distribution of the accessibility scores developed for CAT's bus stops. Table 4-7 presents a list of the 10 bus stops with the highest accessibility scores. While Table 4-8 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 4-8 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 4-9 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 4-10 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 4-9 presents the distribution of the safety/security scores developed for CAT's bus stops. Table 4-10 presents a list of the 10 bus stops with the highest safety/security scores, while Table 4-11 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 4-11 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 4-12 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 4-13 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 4-12 presents the distribution of the operational efficiency scores developed for CAT's bus stops. Table 4-13 presents a list of the 10 bus stops with the highest operational efficiency scores, while Table 4-14 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 4-14 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 4-15 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 4-16 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 4-15 presents the distribution of the ridership at CAT's bus stops (excluding the two transfer centers). Table 4-16 presents a list of the 10 bus stops with the highest ridership, while Table 4-17 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 4-17 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 4-18 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 4-19 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 4-18 list 25 bus stops that serve important trip generators that were noted during the inventory process.

**Table 4-20 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 GOVERNMENT CENTER & MAIN ST | Government, Office/Commercial, Retail |
| 377 | WINN DIXIE & LAKE TRAFFORD | Retail |
| 398 | IMMOKALEE HEALTH DEPARTMENT & LIBRARY | Government, Medical/Rehab |
| 508 | RADIO RD & DAVIS BLVD | Residential, Retail |

## DRAFT IMPLEMENTATION PLAN

All of the previous factors were reviewed and a draft implementation program was prepared to prioritize the improvements. This draft 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 draft implementation program is in compliance with Title VI requirements.

**Figure 4-2**

**Collier County Low Income Title VI Areas**

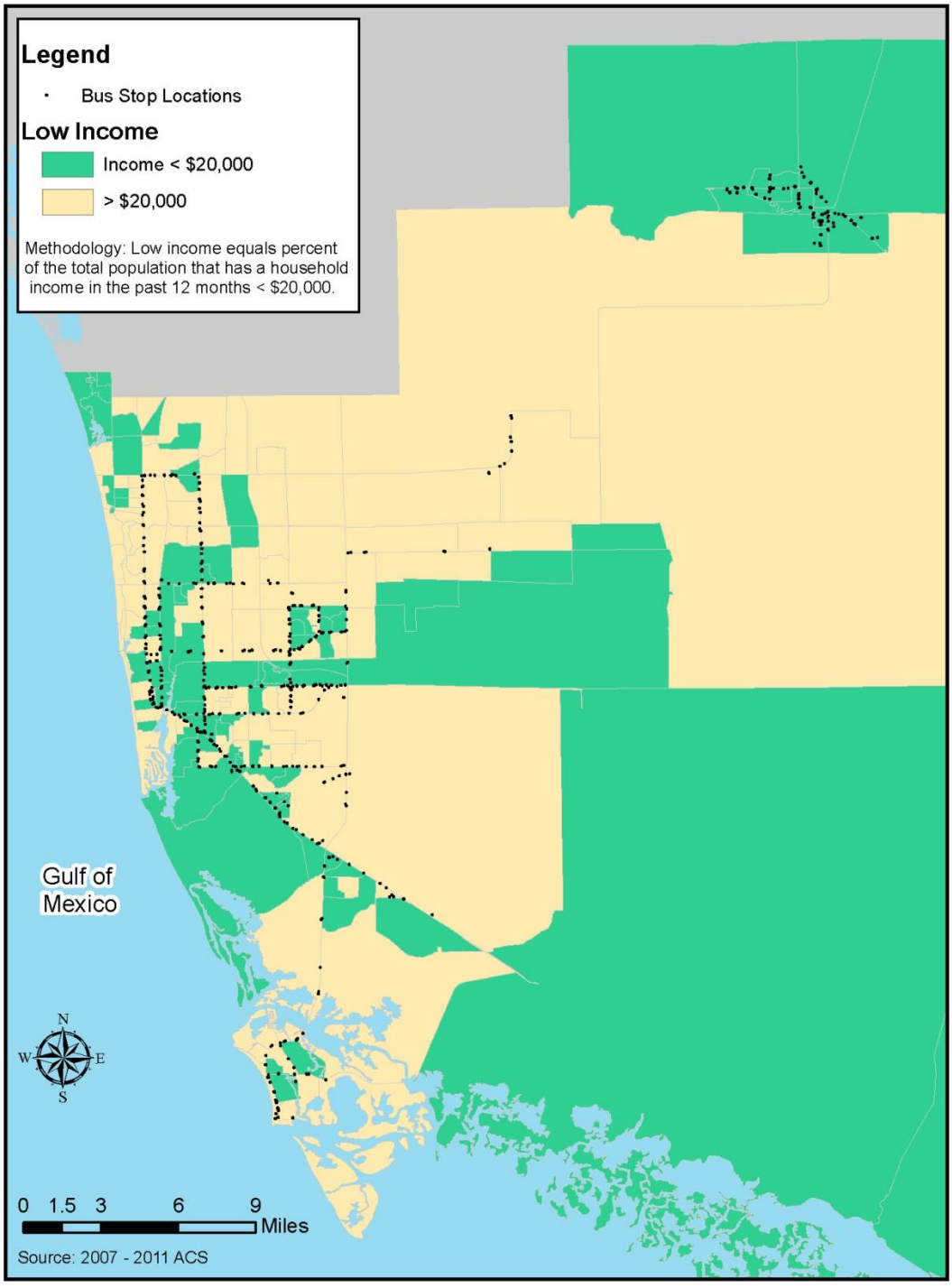
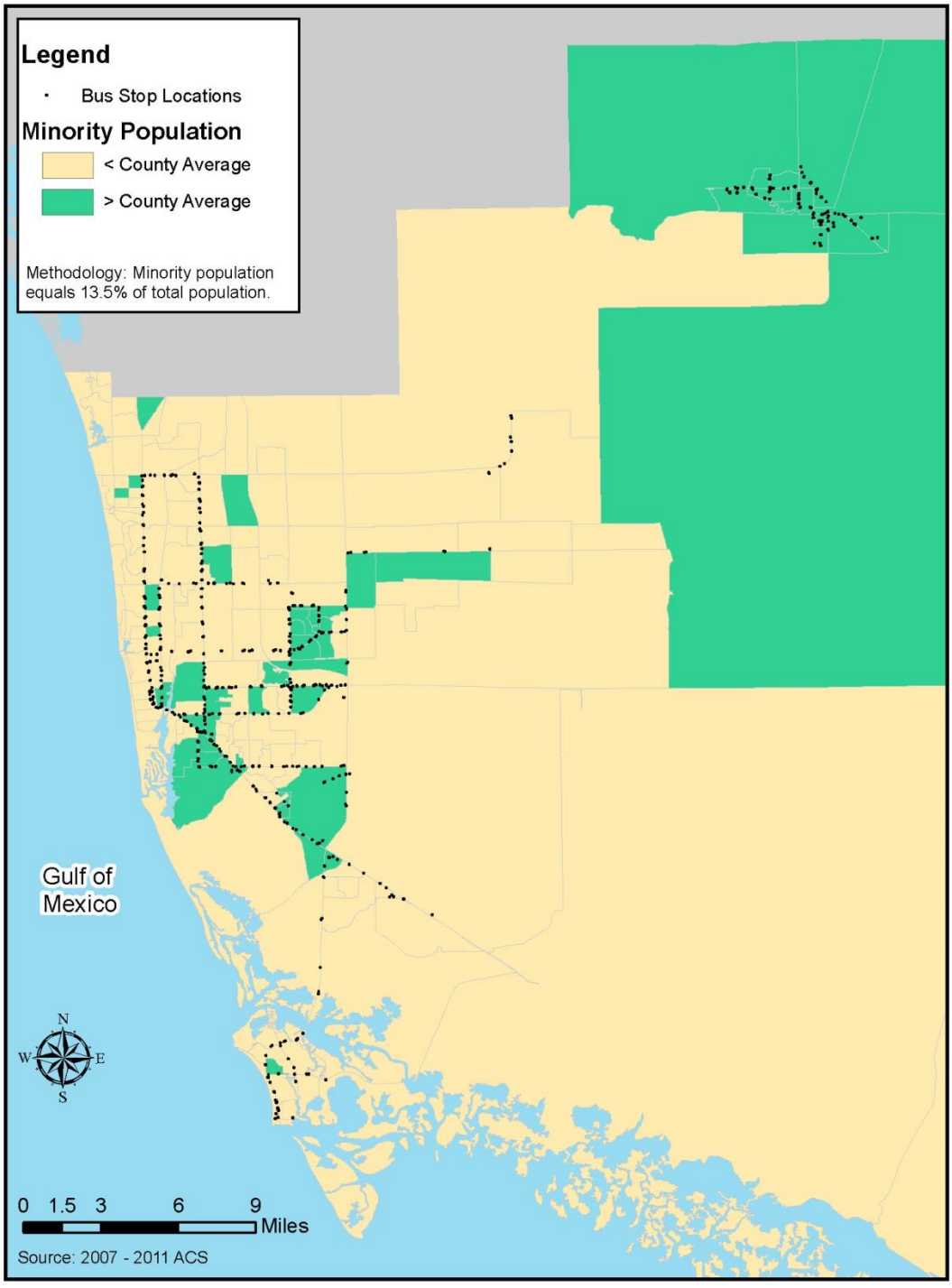


**Figure 4-3**

**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 and categorizing them into two separate groups. These include:
    - quick fix improvements; and
    - improvements that require more time, effort, and/or funding.

## 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.

**Table 5-1**

**Order of Magnitude Cost Estimates**

| 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 | $ 94,215 |
| New Connecting Path[2] | $6 | lf @ 5' wide | 115 | 4,660 lf | $ 26,527 |
| Add/Replace/Move Bus Sign At Stop | $175 | each | 88 | | $ 15,400 |
| Resurface[2] | $11 | per sf | 340 | 7,990 sf | $ 87,890 |
| Detectable Warning[3] | $275 | each | 629 | | $ 172,975 |
| Raised Curb[2] | $100 | each @ 5' long | 217 | 1,090 lf | $ 21,700 |
| Other Improvements | | | | | $ 238,918 |
| 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 Estimates** | | | | | **$ 3,520,200** |

*(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 bus stops, 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.*

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 stops are 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.

Due to the nature of the quick fix improvements, it is assumed that all of the quick fix improvements identified in Table 4-4 will be completed this fiscal year (FY 2014-2015). Therefore, the funding plan that was developed reflects this assumption of the quick fix improvements being implemented over a 24-month period.

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 5-1 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:

**[CAT - Please Insert Funding Sources]**

Projections of the amount of revenue that could be obtained from these sources are:

**[CAT – Please Insert Amount of Revenue]**

A total of $xxx,xxx is projected to be available 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 | $3,298,400 |
| Relocation of bus stops | $224,100 |
| Removal of bus stops | $900 |
| Transfer facilities | $15,500 |
| Total program | $3,538,900 |
| **Anticipated Revenues:** | $xxx,xxx |
| **Estimated Shortfall:** | $xxx,xxx (five-year total) |

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 funding and expenditure program for the study improvements as well as shelter and bus stop 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.

**Table 5-2**

**CAT Phased Implementation Plan for Bus Stop Improvements**

**[After we receive the estimated revenue per year, we can develop the Phased Implementation Plan]**

Annually, the improvements will be need to be reviewed and a work program developed specifying the improvements that will be undertaken. The improvements would be undertaken through task orders. It is envisioned that the effort would focus on implementation of improvements along specific corridors, which would enable improvements to be implemented more quickly.

The phased implementation plan, which identifies the number of improvements by type of improvement to be undertaken each year of the plan, is presented in Table 5-3. A detailed plan showing the specific improvements by bus stop for each year of the plan has been provided to CAT staff for use in updating the Implementation and Financial Plan on an annual basis, including developing a specific action program for implementing the improvements.

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.

**Table 5-3**
**Phased Implementation Plan - Identification of Improvements by Year**

**[After we receive the estimated revenue per year, we can develop the Identification of Improvements by Year table]**

# 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 integrate the inventory database into their scheduling software.
- 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.

## IMPLEMENTATION SCHEDULE FOR QUICK FIX IMPROVEMENTS

- CAT shall develop a schedule for CAT Maintenance staff to complete the "quick fix" improvements.

## REVIEW IMPLEMENTATION AND FINANCIAL PLAN

- CAT Growth Management Department 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 CAT, 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:
  - CAT Board
  - 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.