

ADA Bus Stop Accessibility Study Report

Tucson, Arizona



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(First of two projects for the City of Tucson's "ADA Sidewalk Accessibility to Bus Stops Study")

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1. BACKGROUND

For the past several years, the Tucson Department of Transportation (TDOT) has been working closely with the disabled community to upgrade and expand the sidewalk network. In 1999 and again in 2004, a detailed regional study was conducted to identify key sidewalk gaps and missing ramps that are needed to achieve accessibility along Tucson's major roadway network in compliance with the Americans with Disabilities Act (ADA). Since then TDOT has invested millions of local, state, and federal dollars in the elimination of pedestrian barriers and in the construction of sidewalks, ramps, and crosswalks.

The ADA Bus Stop Accessibility Study in the Tucson metropolitan region is a continuation of the City of Tucson's effort to improve accessibility for pedestrians, especially persons with disabilities. Access to fixed route public transit service is critical to giving people more travel options and freedom of mobility. The Commission on Disability Issues (CODI), a local citizen advisory group, has been instrumental in pointing out specific access issues associated with sidewalk and bus stop accessibility in the Tucson metropolitan region. CODI continues to meet regularly with TDOT staff to discuss these issues and possible improvements.

In early 2008, the Pima Association of Governments (PAG) awarded TDOT funding to undertake a study titled *ADA Sidewalk Accessibility to Bus Stops*. This study consists of two projects. The first project, the topic of this report, consists of an inventory and evaluation of ADA accessibility at each bus stop location throughout the metropolitan region. In addition to the City of Tucson, this region includes the jurisdictions of Pima County, Town of Marana, Town of Oro Valley, Tohono O'odham San Xavier District, Pascua Yaqui Pueblo, and the City of South Tucson (see Exhibit 1). The second project, referred to as the City of Tucson Sidewalk Inventory Project, will provide an update of previous regional sidewalk inventories and recommend improvements.

A two-person team, consisting of the City of Tucson Transit Services Project Manager and a graduate student intern, from the University of Arizona Graduate Planning Degree Program, conducted the study. Additionally, a working group of City of Tucson and transit facility representatives provided additional information and support throughout the study. The group meets monthly to discuss the condition, possible relocation, and future improvements to individual bus stops.

This report highlights the purpose of the ADA Bus Stop Accessibility Study; the method used in undertaking the project, including the data collection, scoring system, database, map creation, key findings, and the mapped results. The report also includes seven appendices.

2. Purpose

The primary purpose of this project was to obtain base-line data regarding ADA accessibility of the Sun Tran fixed route bus stops in the Tucson metropolitan region (see Exhibit 1) and to identify needed improvements. The team evaluated each bus stop in the system based on four

accessibility features included in the ADA guidelines,¹ as well as five other amenities that the project team determined important to making transit more user friendly. Using a numerical scoring system, the project team reported results in terms of an overall bus stop score ranging from zero to ten.

The results of this first project will be used for the upcoming City of Tucson Sidewalk Inventory Update Study.



Exhibit 1: Map showing the metropolitan region served by Sun Tran and constituting the area of consideration for the ADA Bus Stop Accessibility Study (December 2008 map).

¹ Based on information from the U.S. Access Board Guidelines for Accessible Public Rights-of-way, and the Special Report: Accessible Public Rights of Way from the Public Rights-of-Way Access Advisory Committee (PROWAAC), <http://www.access-board.gov/> accessed online March 2008

3. METHOD

The team conducted the project using a three-part data collection process, an accessibility and amenity identification and scoring system, a customized database, and a mapping technique. Details on the project method are described below.

Data Collection

The team collected the required facility and amenity data through inventory record reviews, Geographic Information System (GIS) map checks, and field inspections. The inventory records were supplied by Sun Tran and Attention Transit Advertising (ATA), the City’s advertising contractor for the bus stop shelters. The Sun Tran Scheduling and Service Development Department provided information on each active bus stop, including stop identification, stop abbreviation, stop name, on/at street information, shelter owner (i.e. City of Tucson, ATA, or other applicable jurisdiction), and stop area jurisdictional location. ATA furnished data on the number of advertising shelters, refurbished shelters, and advertising benches.

Next, the project team evaluated each bus stop and connecting sidewalk segment using the on-line TDOT Map Center GIS maps and/or Google Maps Street View. The TDOT GIS maps include transit service layers that identify the location of bus routes and active bus stops (Exhibit 2). The bus stop layer includes photographs of each stop, which can be used to help identify ADA features and additional desired amenities. These photographs are maintained in the Sun Tran Trapeze System, which is the software used by Sun Tran for planning, reporting, and scheduling bus service.

To obtain information on sidewalk and curb conditions near the bus stops, the project team used the TDOT “virtual ride” mapping feature, which provides a series of still images to evaluate street and sidewalk conditions, as if one was driving. While the virtual ride feature provides side-by-side driver and passenger views of the right-of-way along each bus route, sometimes the area is not fully captured in the photographs or the images are too dark to see details. When the project team encountered such problems, it conducted a follow up review using Google Maps Street View, which provides a similar perspective on conditions around bus stops.

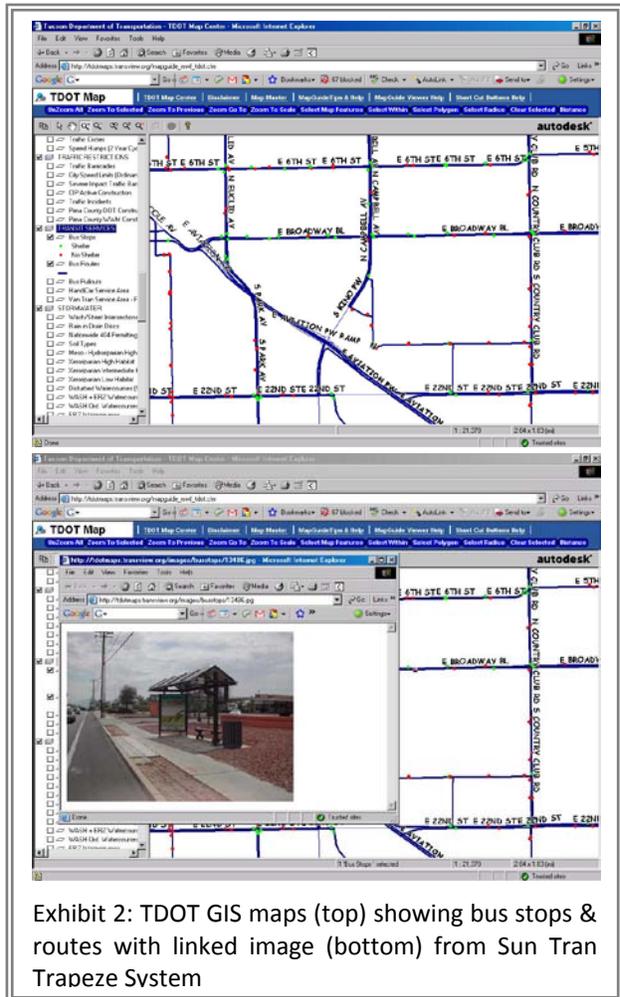


Exhibit 2: TDOT GIS maps (top) showing bus stops & routes with linked image (bottom) from Sun Tran Trapeze System

Finally, the team conducted field inspections at each transit stop to verify the data collected through the record inventory and GIS map check. Where discrepancies were found, the team took new photographs and sent them to the Sun Tran Scheduling and Service Development Department for updating of the Sun Tran Trapeze System files.

During the course of the study, the team tracked street and sidewalk work within the region that would potentially affect bus stops. This included work being undertaken by local jurisdictions served by Sun Tran, or by ATA. Where such work was identified, the team revisited and reinspected those sites to document any changes made, such as completion of ongoing road improvement projects, moving or combining of stops for better linear spacing, and general bus stop improvements.

Accessibility and Amenities Scoring

The bus stop scoring system was designed, first, to provide an overall assessment of each bus stop in relation to four ADA accessibility features and five amenities inventoried; and second, to develop a prioritized list of stops needing accessibility and amenity improvements.

The accessibility scoring scale ranged from zero (0) to five (5) with the lowest overall accessibility score a bus stop could receive being zero (0) and the highest being five (5). Details of the breakdown of the scoring for each feature are provided under “ADA Accessibility Features” below.

The five amenities were scored using zero (0) if the amenity was not present and one (1) if it was present. To determine the overall score of a bus stop, the team totaled the accessibility and amenity scores. The highest score a bus stop could receive was a ten (10), which would be a bus stop that received a five (5) for ADA accessibility and a one (1) for each of the five amenities. The lowest score was a zero (0).



Exhibit 3: Sun Tran bus stops showing the four - ADA accessibility - features scored for the project (with and without a shelter or shade).

Scoring each of the four ADA accessibility features was based on the ADA guidelines, which are detailed below.

For the *level lift area*, the team noted whether such an area existed, its dimensions, and its quality, specifically if the area was concrete and met the minimum dimensions of five feet wide (5' w) and eight feet deep (8' d) from the back of curb. If the stop lacked a 5' w x 8' d lift area, the team looked to see if there was a usable substitute within a few feet of the bus stop, such as a driveway that would be accessible to the bus and to the passenger needing boarding assistance. The score was 1 for a 5' w x 8' d lift area; 0.7 for an alternative lift area; or 0 if there was no lift area of any type.

Second, the team evaluated connecting *sidewalks* (i.e., stable, firm, and slip resistant pedestrian pathways) in the vicinity of the bus stop to determine if they were continuous from the stop to the intersections in both directions. The score was 2 if there were connecting sidewalks in both directions, 1 if there was a connecting sidewalk in one direction, and 0 if there were no sidewalks in either direction.

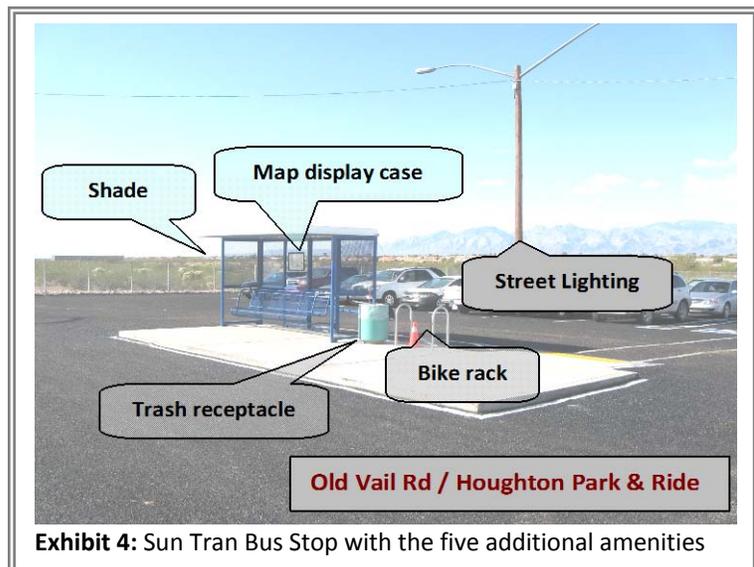
Third, the team evaluated whether there were *accessible curb (ramp) cuts* at the points at which the sidewalk(s) intersected with the closest alleys or roadways. The score for curb (ramp) cuts was 2 if there were curb (ramp) cuts in both directions, 1 if there was a curb (ramp) cut in one direction, and 0 if there were no curb (ramp) cuts.

Fourth, the team noted whether the bus stop included a *shelter*, and if it did, whether the shelter included an ADA accessible wheelchair bay. If the shelter did not have a wheelchair bay, the team deducted 0.05 from the bus stop's ADA accessibility score. If there was an ADA accessible shelter, no score was given. There are no requirements for a shelter to be present within the ADA guidelines.

The amenities inventoried included (Exhibit 4):

- street lighting
- trash receptacle
- map display case
- bike rack
- shade

Street lighting was included because it improves pedestrian access at night, as well as perceptions of personal security. The team considered a bus stop to have adequate lighting if a light pole or fixture was located within ten feet (10') of the stop. Because the field inventory was completed



during daylight hours, the team was only able to indicate whether lighting existed, but not whether it was functional or whether it illuminated sidewalks sufficiently to improve pedestrian access.

Database

The bus stop accessibility and amenity data were entered into a customized Excel spreadsheet. Bus stop information was updated as necessary throughout the study. Additionally, passenger boarding and alighting data, provided by Sun Tran, were incorporated into the database. Although some coding errors were unavoidable, every effort was made to double-check all data entries.

The first page of the database and the definition sheet explaining the breakdown of points are provided in Appendix A. The full database provides the individual and totaled scores for the accessibility features and additional amenities. A representative section of the database is shown in Exhibit 5.

Lighting	TrashCan	DsplyCas	SignPost	BikeRack	Shdetype	Shdescor
-	1	-	-	-	shelter	1.00
-	1	-	1	-	shelter	1
-	1	-	-	-	shelter	1.00
-	-	-	1	-	-	-
1	1	-	-	-	shelter	1.00
-	-	-	1	-	tree	0.75
1	-	-	-	-	-	-
1	1	1	-	-	shelter	1.00
-	-	-	1	-	-	-
1	1	-	-	-	-	-
-	1	1	-	-	shelter	1.00

AB-5Star	NonShltr	Curb-cut	ConcLift	LevelLft	Sdwk Stp	Acc Amen
3.2	-	1.2	1	-	1	5.20
4.2	-	1.5	gap	0.7	2	6.20
5	-	2.0	1	-	2	7.00
4.5	-	1.5	1	-	2	4.50
5	-	2.0	1	-	2	8.00
4	-	2.0	gap	-	2	4.75
4	-	2.0	-	-	2	5.00
3.5	-	1.5	1	-	1	7.50
3.5	-	1.5	gap	-	2	3.50
2.5	-	1.5	gap	-	1	4.50
4.95	-0.05	2.0	1	-	2	7.95

Exhibit 5: These sample sections from the database show the scoring for the amenities and ADA accessibility features. A detailed definition and scoring of each column is found in Appendix A.

4. KEY FINDINGS

The key findings presented in this section are based on inventorying all the active bus stops in the Sun Tran fixed route system. As of December 31, 2008, the number of active bus stops in the system was 2,240, excluding the City's three transit centers, which have an additional thirty-one identified bus stops. One lesson learned in the course of this study was that the number of active bus stops changes frequently. This is due to stops being combined or adjusted for quarter-mile spacing, which is the "ideal" distance between stops as proscribed by Sun Tran and TDOT. Stops are also changed or discontinued frequently due to ongoing road and sidewalk projects as well as private development construction projects.

Following are key findings from the baseline inventory data collected from March 2008 to December 2008.

- 778 (35%) of the 2,240 active bus stops have an ADA accessibility score of 5, meaning that each stop includes all of the following ADA features. First, the bus stop has a firm, stable, non-slip level-lift area. In addition, the stop has connecting sidewalks in both directions and curb (ramp) cuts at the intersections, also in both directions. Finally, if the stop has a shelter, the shelter has a minimum 30" wide x 48" deep wheelchair bay.
- 1,080 (48%) of the bus stops have a designated ADA-accessible lift area, and 157 (7%) of the bus stops have a nearby alternative lift area, such as a driveway cut.
- 1,128 (50%) of the bus stops have curb (ramp) cuts and connecting sidewalks. Of these, 967 have sidewalks in two directions and 161 have sidewalks in one direction.

It should be noted that stops without curbs and sidewalks can be fully accessible in rural type settings if a shared-use path is separated from the road traffic and created of a firm, stable, and non-slip hard surface. Good examples of such stops are those along Cloud Road between Sabino Canyon and Pantano Roads (Exhibit 6).

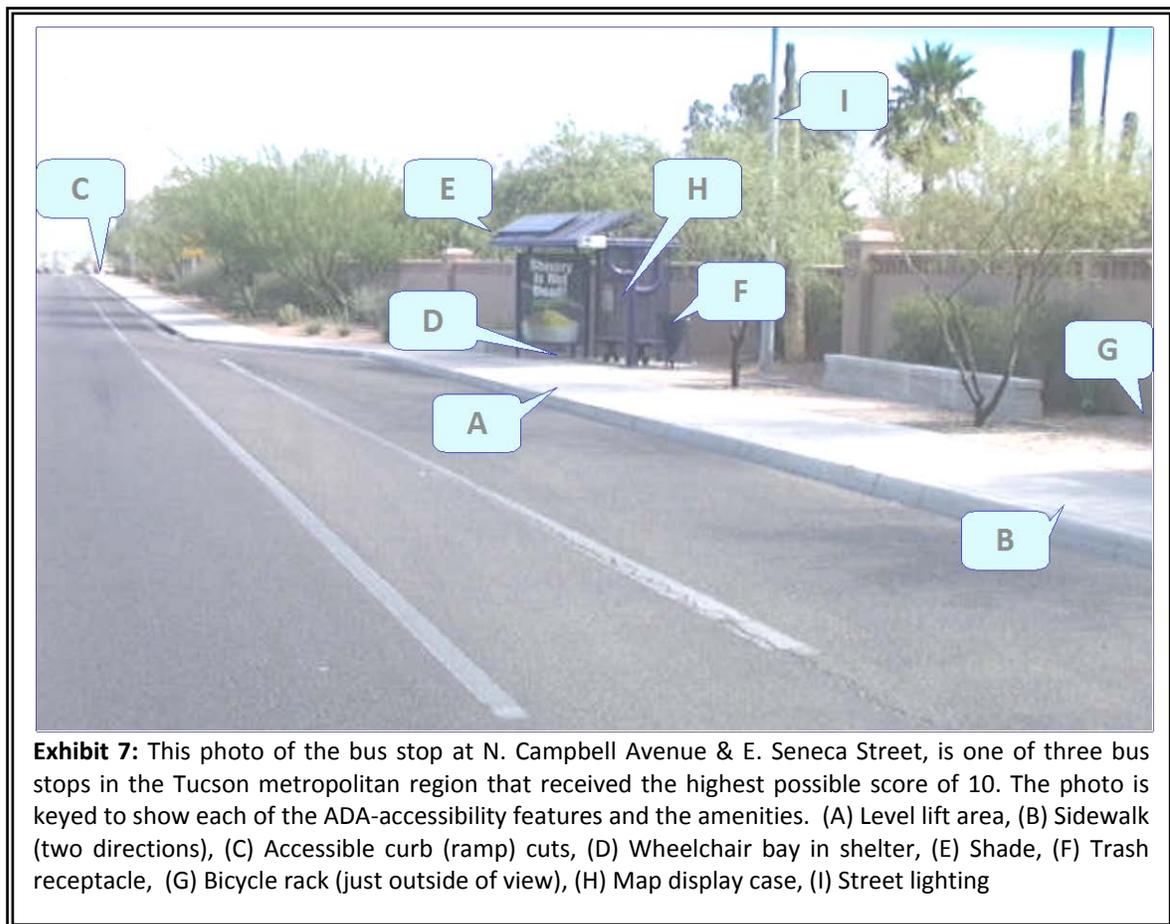
- 875 (39%) of the bus stops have shelters. Of those, 751 have ADA-accessible wheelchair bays.



Exhibit 6: Illustrated here is a bus stop along Cloud Road, which is made accessible with an asphalt shared-use path, detectable warning devices at road crossings as found at curb (ramp) cuts, and a level lift area.

Adding the scoring for the five amenities (i.e., shade, trash receptacles, bicycle racks, map display cases, and street lighting) to the ADA accessibility scoring, resulted in the following findings:

- 3 bus stops received a 10, the highest possible overall score. These included the bus stops at the southeast corner of Campbell Avenue and E. Seneca Street, the northwest corner of Park Avenue and University Avenue, and the stop on the University of Arizona Mall (Exhibit 7).
- 94 (4%) of the 2,240 bus stops had an overall score of 9.



- The inventory of bus stop amenities showed 502 (22%) bus stops have lighting; 1,024 (46%) have trash cans; 21 (1%) have bike racks; 412 (18%) of stops with shelters have a route map and display case, and 1,322 (59%) have some type of shade. Shade is an amenity that is important given Tucson’s hot desert environment. Types of shade include 875 bus shelters, 378 trees, and 69 other types, such as a high wall or building.

The number of benches and ridership counts for each stop was also included in the inventory. A total of 636 benches were counted at stops with and without shelters. ATA, the advertising contractor, and the local jurisdictions each own some of the benches that are located at the

different bus stops. As with other amenities, seating improves the quality of bus stops for waiting passengers. Even though seating was not scored, the data was collected to assist in the evaluation of possible improvements for individual bus stops.

To begin establishing improvement priorities, the team first identified bus stops with high ridership (100 or more passengers) and compared them to the bus stops identified as fully ADA accessible and also those stops that were in need of ADA accessibility improvements. More specific findings include:

- 123 (5.5%) of the 2,240 bus stops in the region have average daily boardings of 100 or more passengers. Of these stops:
 - 75 have an ADA accessibility score of 5
 - 33 have an ADA accessibility score range from 4 – 5
 - 4 have an ADA accessibility score less than 3
 - 105 have either a shelter or other shade

Based on the rankings of recommended ADA improvements, the most common are (1) level lift areas and (2) sidewalk connections to the bus stops. The bus stops requiring these two types of improvements are scattered throughout the region. However, bus stops that require the most improvements are located on roadway corridors with minimal infrastructure. This is highly evident on the 5-Star ADA Accessibility Map in Appendix B.

5. Maps

The completed database was combined with GIS vector data; five maps were created that provide a detailed overview of the study's key findings. The maps described below are included in Appendices B – F respectively.

5-Star ADA Accessibility Map (December 2008): This map depicts the bus stops scored for ADA accessibility. Those bus stops receiving 5's are considered fully accessible. Bus stops with scores lower than 5 are considered to have some type of deficiency. The deficiency in bus stops with a score of 4 is generally the lack of a level lift area. Bus stops that score less than 4 generally have deficiencies that are related to lack of sidewalks or curb (ramp) cuts. Bus stops that score a 1 or a 0 do not have any sidewalks or curb (ramp) cuts, and are generally located on the periphery of the region, although some are along more urban corridors. Conversely, bus stops with accessibility scores of 4 to 5 are mostly located in areas where major road projects with sidewalks were completed. The map uses a color ramp from dark green (5) to red (0) to identify the level of accessibility at these stops.

Shade Type Availability Map, December 2008: Having some shade is important in the region's dry desert environment, especially during the hot summer months. This map identifies stops with no shade (bright yellow) to some shade (orange), tree shade (green), or structural shade (light blue-gray). A review of the mapped results shows the need for shade at bus stops is spread throughout the region.

Shelter and Benches, December 2008: This map illustrates stops with available seating either within a bus shelter or as freestanding benches. Bus stops without seating are shown with a bright yellow dot. Additionally, the map identifies those stops with and without advertising. The City of Tucson allows advertising at bus stops to pay for maintenance services such as trash collection and graffiti removal.

Average Daily Boardings Map and Average Daily Ridership Map, December 2008: These two maps show the bus stops based on average daily boardings (on) and overall total ridership (on and off). High ridership stops are generally located at transfer points within the regional system and along major roadways. This data was compared to the data shown in the 5-Star ADA Accessibility Map to determine whether the stops with high total ridership were accessible to all bus users.

6. ACTION PLAN

The ADA Bus Stop Accessibility Study provided the first comprehensive assessment of bus stop accessibility and much needed improvements in the Tucson region. Now that maps and data are available, the City of Tucson can better identify and quantify priorities in the form of a strategic action plan in coordination with various departments and members of the disabled community. Listed below are the actions to making all stops ADA accessible over the next several years.

Short-term Actions

- Develop a list of improvement priorities and identify strategies for implementation. The study team has taken a first step by using the findings from the ADA Bus Stop Accessibility Study to compile a list of thirty-five (35) bus stops that can be made more accessible through small-scale improvements to be completed with minimal engineering design. This list was developed in close coordination with members of the Commission on Disability Issues (CODI) who regularly use the fixed route system.
- Identify funding sources. During the course of this study, the project team researched funding sources to begin implementing necessary ADA improvements. In June 2009, an existing Federal Transit Administration (FTA) grant was identified as one possible funding source, as long as a 20% local match could be secured. In October 2009, the Pima County Regional Transportation Authority (RTA) approved funds to be used for the local match, helping to launch the citywide ADA bus stop improvement program. The City of Tucson Streets Maintenance Division will begin the first set of 35 priority improvements by the end of 2009.

Ongoing Actions

- Improve communication and coordination between transit officials and key personnel (i.e. Project Managers) who area responsible for planning, design, and construction of public works projects

that affect bus stops. This includes staff in various City departments as well as other local agencies who coordinate design review and construction administration. TDOT Transit and Sun Tran staff continue to educate other officials on ADA needs at bus stops, and routinely review plans to ensure improvements are included.

- Regularly update the database to track implemented improvements. This requires TDOT and/or Sun Tran staff to identify stops that have been modified and conduct a field visit to document improvements.

Long-term Actions

- Conduct a comprehensive sidewalk inventory study along major roadways that will enhance ongoing bus stop accessibility inventories and analysis. As noted previously, this report completes the first of two projects of *the ADA Sidewalk Accessibility to Bus Stops Study*. The second project, currently underway, is the City of Tucson Sidewalk Inventory Update Study. Sidewalks will be evaluated in quarter mile increments to identify existing pedestrian infrastructure, needed ADA improvements and repairs, and gaps in the network that need to be completed. A priority list will be developed as well.
- Conduct the comprehensive ADA Bus Stop Accessibility Study, replicating this study, every three to five years. By doing this, City and Sun Tran staff will be able to measure progress over a long-term planning period.

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Appendix A – Database & Definitions

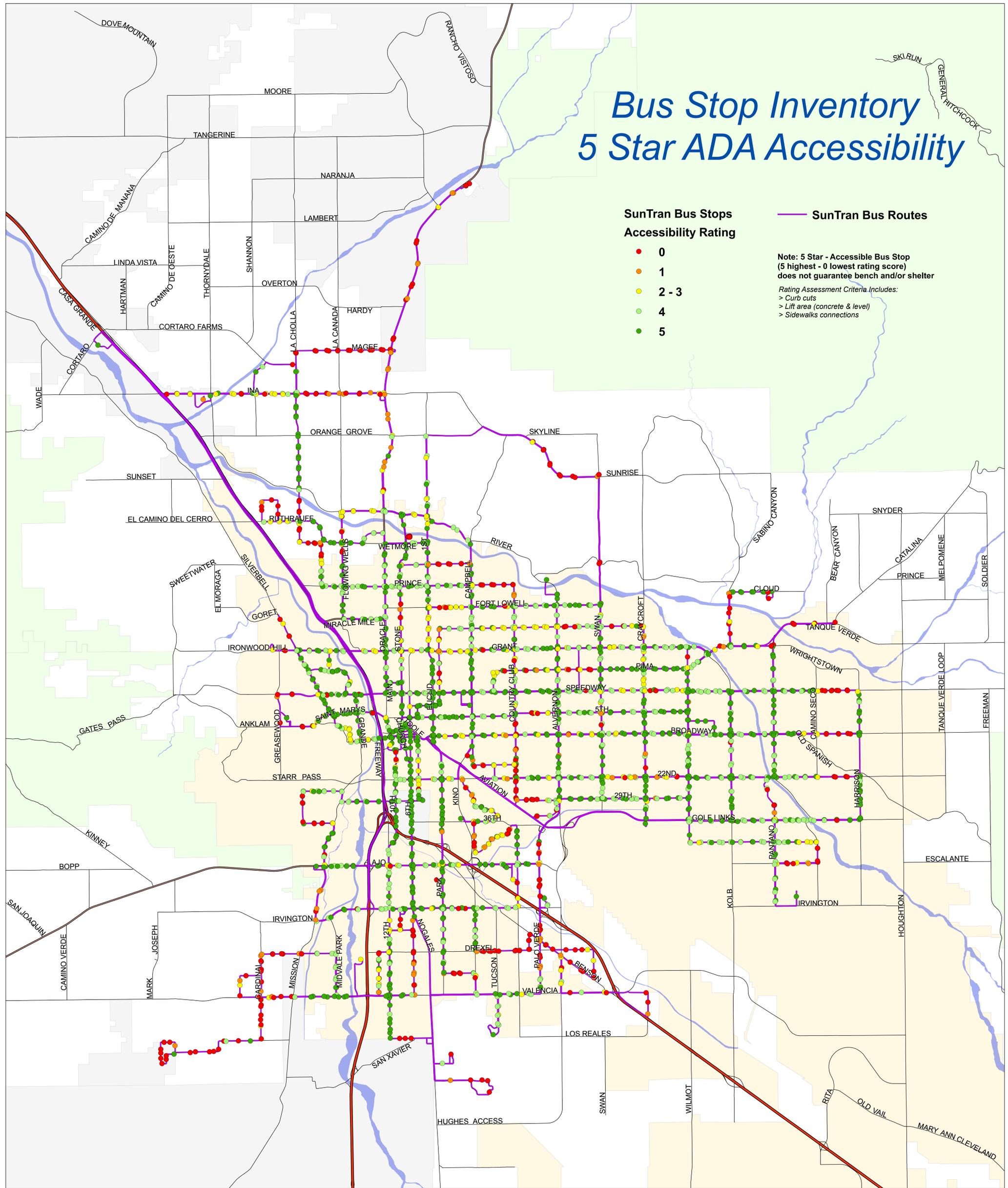
- ◇ Database Definition Sheet
- ◇ 1st Page of database, ending December 31, 2008. Complete database available upon request. Contact TDOT, Transit Services Project Manager 520-791-5883.

	stop_Id	Stop Id	From Trapeze - shelter and bench numbers and types are verified and changed as needed for inventory
	StopAbbr	Stop Abbr	
	StopName	Stop Name	
	Shelter	Shelter	
	ShltrTyp	Shelter Type	
	#shltrs	# Shelters	
	Bench	Bench	
	#benches	# Benches	
	Owner	Owner	
	At_St	At Street	
	Area	Area	
Amenity Goals	Lightng	Light (Lighting)	Does bus stop have lighting within 10 feet?
	TrashCan	Trash Can (Garbage)	Is there a trash can - ATA vendor scheduled pick-ups
	DsplyCas	Display Case	Route Map - within Case (Telephone in Trapeze Fields)
	SignPost	Sign Post	Pole in ground identifying bus-stop - not needed if shelter has bus-stop identification sign - (not scored)
	BikeRack	Bike Rack (Bicycle)	is there a bicycle rack at bus stop - ? Future amenity
	Shdetype	Shade Type (text only)	Does bus stop have shade? - What kind (ie. Shelter, shade tree, building, etc)? ... future need?
	Shdescor	Shade score	shade score: Shelter = 1. Young trees = .5 Mature trees - good shade for stop (taller than stop) = .75 Bldg or fence/wall = .5 Other (within private/public structure i.e. parking garage) = TBD
ADA - Stars	AB-5Star	Accessible Bus Stop - 5 Star (score sums non-ADA shelter, curb-cut, concrete lift area or level lift area, and sidewalks to stop)	note: 5 Star (points - Highest Rating) does not guarantee bench and/or shelter. Current ADA accessibility - determined by assessment (sum) of ADA features listed below. Point may be give for either "Concrete Lift Area" or "Level Lift Area" not both.
ADA Accessibility Areas	NonShltr	Non-ADA Shelter	- 0.05 pt (negative) - reduces accessibility score - If shelter exists at stop and does not include space for a wheel chair user
	Curb-cut	Curb-cut (ADA)	2 pts if curb-cut is to current ADA standards. 1.5 pts if driveway is used for curb-cut and accessible by wheelchair users. 1.2 pts if curb-cut is too steep for wheelchair access. 1 pt - only one curb-cut at corner .5 pt only a drive available to access sidewalk/stop
	ConcLift	Concrete Lift Area	1 pt - minimum wheelchair space - size 5' wide x 8' deep - concrete abuts curb and is usable by both rider and bus lift/ramp - space may include bus shelter area
	LevelLft	Level Lift Area (not concrete)	.7 pt - area does not have concrete - but is hard packed dirt (or other hard surface) and does not create problem for rider or bus lift/ramp.
	Sdwb_Stp	Sidewalk to Stop	2 pts if sidewalk is continuous on either side of bus-stop. 1 pt if sidewalk comes to stop from only one direction.
Other	AddComm	Additional Comments	requires field check of bus stop / or addition notes not found in Trapeze software comments field
	pull-out	Current pull-out for bus	is there currently a bus pull-out
	No_curb	No Curb	roadway does not have curbs -- stop may still be accessible
	PlnImprv	Planned Improvmt's	are improvements planned for / near this stop? - when?
	Est_Comp (Month/Year)	Estimated Completion	Month / Year Planned Improvements are Estimated to be completed
	Realtime	? Future Real-time Info Display	yes / no
	Acc_Amen	Accessible w/ Amenities	- Ultimate Bus Stop - '10' - score determined by Accessible Stop score and addition of lighting, trash can, display case, bike rack, and shade
Ridership	Rider_Ons	Rider_Ons	Information Provided by: SunTran Scheduling & Service Development Department
	Rider_Offs	Rider_Offs	
	Stp_Totl	Stp_Totl	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
1	Stop_id	StopAbr	StopName	Shelter	ShlrTyp	#shlrs	Bench	#benches	Owner	Al_St	Area	Lighting	TrashCan	DsplyCas	SignPost	BikeRack	ShldrType	ShldrScor	AB-5Star	NonShlr	Curb-cut	ConcLift	LevelLft	Sdwk_Stp	AddComm	pull-out	no_curb	PlnImprv	Est_Comp (Month/Year)	Realtime	Acc_Amen	Rider_Ons	Rider_Offs	Slp_Totl
2	12132	1019(NE)	10th Av/19th St	1	G	1	0	COT	W 19TH ST	W5	-	1	-	-	-	shelter	1.00	3.2	-	1.2	1	-	1	ck drive / ? Sidewalk end or sand on walkway?	-	-	COT - HURF	2010	-	5.20	17	5	22	
3	12267	1019(SW)	10th Av/19th St	1	Purple G	1	0	COT	W 19TH ST	W5	-	1	-	-	-	shelter	1.00	5	-	2.0	1	-	2		-	-	COT - HURF	2010	-	7.00	18	15	33	
4	14876	1020(SE)	10th Av/20th St	1	Purple G	1	0	COT	W 20TH ST	W5	-	1	-	-	-	shelter	1.00	5	-	2.0	1	-	2		yes	-	COT - HURF	2010	-	7.00	40	38	78	
5	12268	1021(NW)	10th Av/21st St	1	Purple G	1	0	COT	W 21ST ST	W5	-	1	-	-	-	shelter	1.00	4	-	2.0	1	-	1	North corner of shelter & sidewalk do not have enough space to get by	-	-	COT - HURF	2010	-	6.00	46	39	85	
6	12130	1023(NE)	10th Av/23rd St	1	STu-ad	1	0	ATA	W 23RD ST	W5	1	1	1	-	-	shelter	1.00	5	-	2.0	1	-	2		yes	-	-	-	-	9.00	35	26	61	
7	12079	1023(SW)	10th Av/23rd St	1	Stu-Refurb G	1	0	ATA	W 23RD ST	W5	-	1	-	1	-	shelter	1	5	-	2	1	-	2	new image 1/09/09	yes	-	-	-	-	7	14	53	67	
8	12129	1026(NE)	10th Av/26th St	1	Stu-Refurb G	1	0	ATA	W 26TH ST	S	1	1	-	1	-	shelter	1	5	-	2	1	-	2	new image 1/09/09	-	-	-	-	-	8	22	17	39	
9	12270	1026(SW)	10th Av/26th St	1	Stu-Refurb G	1	0	ATA	W 26TH ST	S	-	1	-	1	-	shelter	1	4.2	-	1.5	g	0.7	2	if drive-way used - new image 1/09/09	-	-	-	-	-	6.2	13	19	32	
10	156	1029(NE)	10th Av/29th St	1	STu-ad	1	0	ATA	W 29TH ST	S	-	1	-	-	-	shelter	1.00	5	-	2.0	1	-	2	new image 10/24/08	yes	-	-	-	-	7.00	65	46	111	
11	167	1029(NW)	10th Av/29th St	1	STu-ad	1	0	ATA	W 29TH ST	S	1	1	-	-	-	shelter	1.00	5	-	2.0	-	-	2	sign on Utility Pole	yes	-	-	-	-	8.00	26	39	65	
12	12271	1032(NW)	10th Av/32nd St	0		0	0	-	W 32ND ST	S	-	-	-	1	-	fence	0.25	5	-	2	1	-	2		-	-	-	-	-	5.25	11	9	20	
13	12128	1032(SE)	10th Av/32nd St	0		0	0	-	W 32ND ST	S	-	-	-	1	-	-	5	-	-	2.0	1	-	2	shelter removed after 2007 virtual ride -	-	-	-	-	-	5.00	21	14	35	
14	14872	1034(SW)	10th Av/34th St	0		0	0	-	W 34TH ST	S	-	-	-	-	-	shelter	1.00	5	-	2.0	1	-	2		-	-	-	-	-	6.00	10	4	14	
15	12127	1036(NE)	10th Av/36th St	0		0	0	-	W 36TH ST	S	-	-	-	1	-	-	4.5	-	-	1.5	1	-	2	ck photo	yes	-	-	-	-	4.50	11	5	16	
16	14871	1037(SW)	10th Av/37th St	1	G	1	0	STu	W 37h St	S	1	1	-	-	-	shelter	1.00	5	-	2.0	1	-	2	added	yes	-	-	-	-	8.00	4	18	22	
17	12125	1041(NE)	10th Av/41st St	1	STu-Ad	1	0	ATA	W 41ST ST	W5	-	1	1	-	-	shelter	1.0	5	-	2.0	1	-	2		yes	-	-	-	-	8.00	20	7	27	
18	12274	1041(SW)	10th Av/41st St	1	STu-ad	1	0	ATA	W 41ST ST	W5	-	1	1	-	-	shelter	1.00	5	-	2.0	1	-	2		-	-	-	-	-	8.00	7	6	13	
19	12124	1044(NE)	10th Av/44rd St	1	Purple G	1	0	COT	W 43RD ST	W5	-	1	1	-	-	shelter	1.00	5	-	2.0	1	-	2		yes	-	-	-	-	8.00	28	13	41	
20	12275	1044(NW)	10th Av/44th St	1	Purple G	1	0	COT	W 43RD ST	W5	-	1	-	-	-	shelter	1.00	5	-	2.0	1	-	2		yes	-	-	-	-	8.00	26	14	40	
21	331	12AJ(NE)	12h Av/Ajo	1	G	1	0	COT	W AJO WY	W5	-	1	1	-	-	shelter	1.00	5	-	2.0	1	-	2		-	-	-	-	-	8.00	93	37	130	
22	338	12AJ(SW)	12h Av/Ajo	1	Cac-ad	1	0	ATA	W AJO WAY	W1	-	1	-	-	-	shelter	1.00	5	-	2.0	1	-	2		-	-	-	-	-	9.00	61	116	177	
23	12106	12B(NE)	12h Av/Bilby	1	G	1	0	COT	W BILBY RD	W5	-	1	1	-	-	shelter	1.00	5	-	2.0	1	-	2		yes	-	-	-	-	8.00	10	2	12	
24	12107	12AL(NE)	12h Av/C Alford	0		0	0	-	W C RAMONA	W1	-	-	-	1	-	tree	0.75	5	-	2.0	1	-	2	bus sign on utility/light post	-	-	-	-	-	6.75	27	3	30	
25	14952	12AL(SW)	12h Av/C Alford	0		0	0	-	Calle Alford (across from intersection of SW at P...	W1	-	-	-	1	-	tree	0.75	4	-	2.0	gap	-	2	stop - not on list/TDOT maps - Bea corrected	-	-	-	-	-	4.75	5	11	16	
26	14833	12R(SW)	12h Av/C Rita	1	Purple G	1	0	COT	W DOCE PL	W1	1	1	-	-	-	-	4	-	-	2.0	-	-	2	sign on utility/light post	-	-	-	-	-	5.00	1	30	31	
27	12287	12CA(NW)	12h Av/Canada	1	Cac-ad	1	0	ATA	W CANADA	W1	-	1	1	-	-	shelter	1.00	5	-	2.0	1	-	2	NW 12th Ave / Canada Dr.	-	-	-	-	-	8.00	14	41	55	
28	12278	12D(NW)	12h Av/District	1	G	1	0	COT	W DISTRICT ST	W1	-	1	1	-	-	shelter	1.00	5	-	2.0	1	-	2	new image 10/17/08 - add sidewalks	-	-	-	-	-	8.00	12	15	27	
29	12108	12DR(NE)	12h Av/Drexel	1	Cac-ad	1	0	ATA	W DREXEL RD	W5	-	1	1	-	-	shelter	1.00	5	-	2.0	1	-	2	ck for maint of dirt/ sand	-	-	-	-	-	8.00	66	27	93	
30	12288	12DR(SW)	12h Av/Drexel	1	G	1	0	COT	W DREXEL RD	W1	-	1	-	-	-	shelter	1.00	5	-	2.0	1	-	2		-	-	-	-	7.00	15	26	41		
31	11936	12IN(SW)	12h Av/Inez	1	Purple G	1	0	COT	W INEZ DR	W1	-	-	1	1	-	shelter	1.00	5	-	2.0	1	-	2		-	-	-	-	7.00	1	16	17		

Appendix B – 5-Star ADA Accessibility Map

Bus Stop Inventory 5 Star ADA Accessibility



SunTran Bus Stops Accessibility Rating

- 0
- 1
- 2 - 3
- 4
- 5

SunTran Bus Routes

Note: 5 Star - Accessible Bus Stop (5 highest - 0 lowest rating score) does not guarantee bench and/or shelter

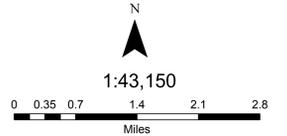
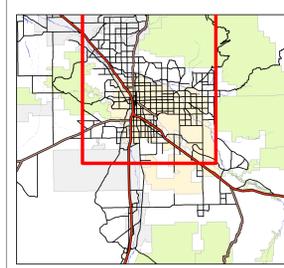
Rating Assessment Criteria Includes:
 > Curb cuts
 > Lift area (concrete & level)
 > Sidewalks connections

*Bus Stop Inventory
5 Star
ADA Accessibility
December 2008*

Street Network
Highway Type
 — Interstate Highway
 — State Highway

Major Streets
 — Major Streets
Major Washes
 ■ Major Washes

Jurisdictions
NAME
 ■ City of Tucson
 ■ Other Jurisdictions
 ■ Pima County
 ■ Parks and Wilderness Areas



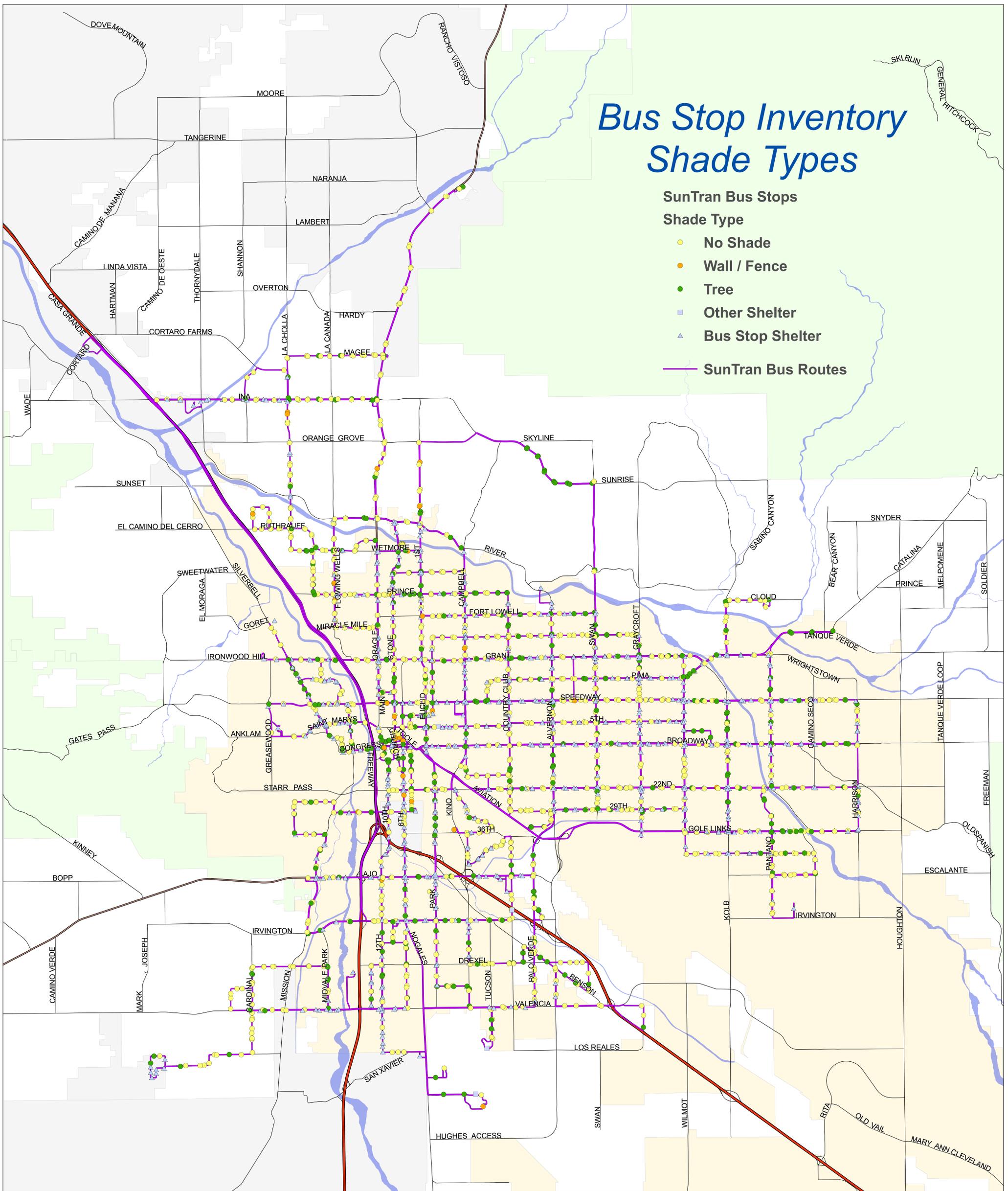
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DMuelle 1
 Y:\Bus Inventory - ArcMap Files\BSI-ADA_5_star_portrait.mxd 01/08/09

Appendix C – Shade Types Map

Bus Stop Inventory Shade Types

- SunTran Bus Stops**
- Shade Type**
- No Shade
 - Wall / Fence
 - Tree
 - Other Shelter
 - ▲ Bus Stop Shelter
- SunTran Bus Routes



*Bus Stop Inventory
Shade Types*

December 2008

Street Network

Highway Type

- Interstate Highway
- State Highway

Major Streets

— Major Streets

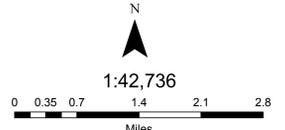
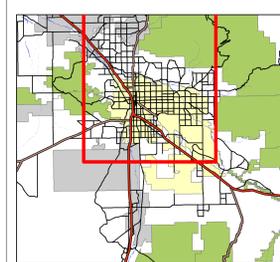
Major Washes

■ Major Washes

Jurisdictions

NAME

- City of Tucson
- Other Jurisdictions
- Pima County
- Parks and Wilderness Areas



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DMuelle1

Y:\Bus Inventory - ArcMap Files\BSI-Shade.mxd

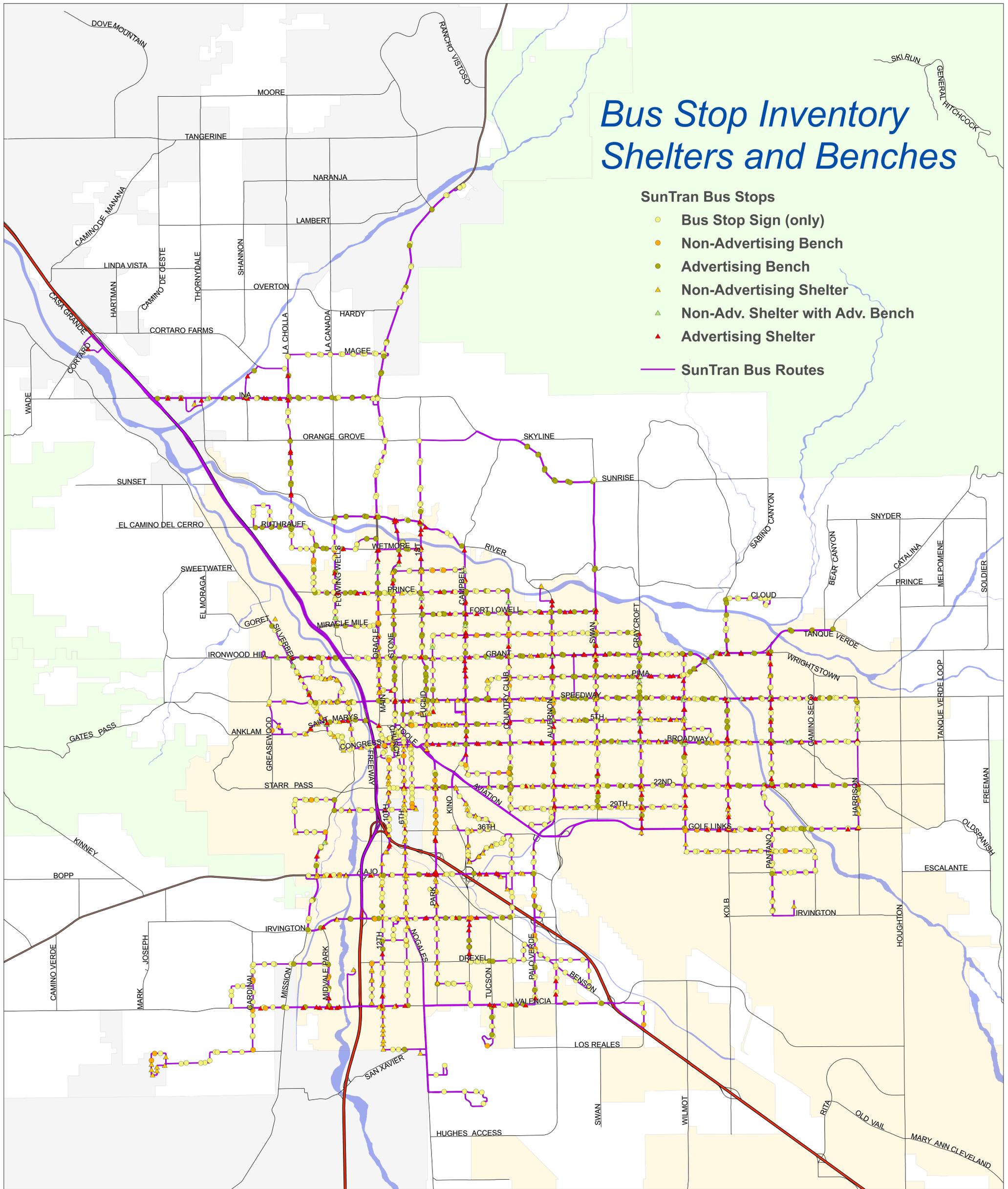
01/12/09

Appendix D – Shelters and Benches Map

Bus Stop Inventory Shelters and Benches

SunTran Bus Stops

- Bus Stop Sign (only)
- Non-Advertising Bench
- Advertising Bench
- ▲ Non-Advertising Shelter
- ▲ Non-Adv. Shelter with Adv. Bench
- ▲ Advertising Shelter
- SunTran Bus Routes



Bus Stop Inventory Shelters and Benches

December 2008

Street Network Highway Type

- Interstate Highway
- State Highway

Major Streets

- Major Streets

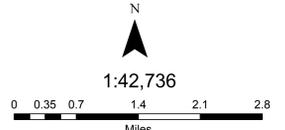
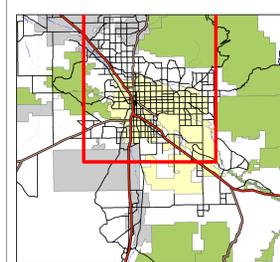
Major Washes

- Major Washes

Jurisdictions

NAME

- City of Tucson
- Other Jurisdictions
- Pima County
- Parks and Wilderness Areas



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DMuelle1

Y:\Bus Inventory - ArcMap Files\BSI-bench&shelter_portrait.mxd 01/09/09

Appendix E – Average Daily Boardings Map

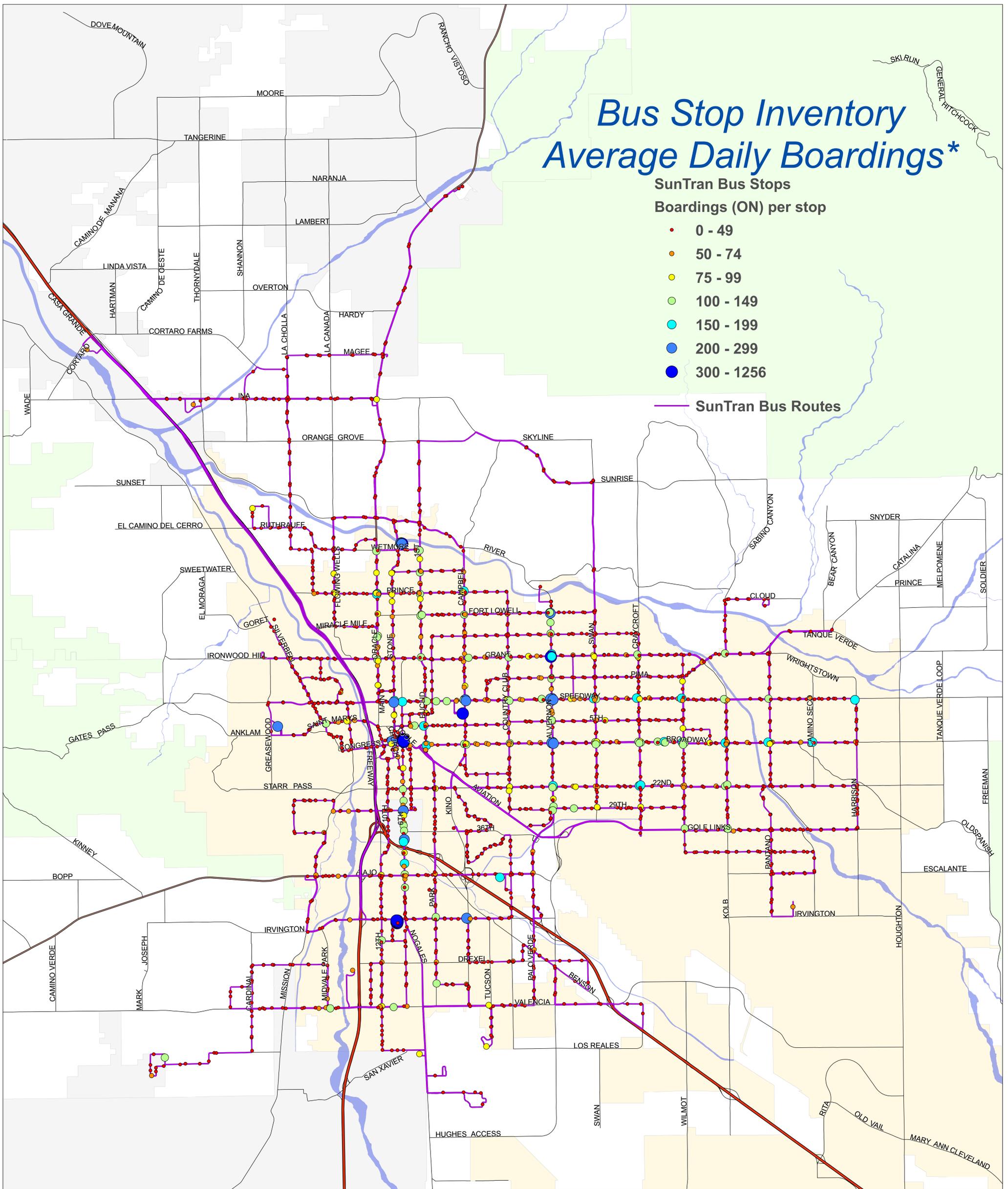
Bus Stop Inventory Average Daily Boardings*

SunTran Bus Stops

Boardings (ON) per stop

- 0 - 49
- 50 - 74
- 75 - 99
- 100 - 149
- 150 - 199
- 200 - 299
- 300 - 1256

— SunTran Bus Routes



Bus Stop Inventory
Avg Daily Boardings*

December 2008

Street Network

Highway Type

- Interstate Highway
- State Highway

Major Streets

— Major Streets

Major Washes

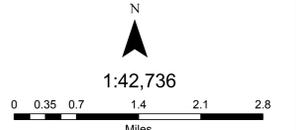
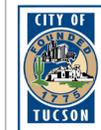
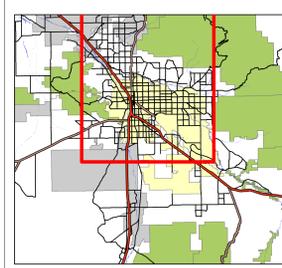
■ Major Washes

Jurisdictions

NAME

- City of Tucson
- Other Jurisdictions
- Pima County
- Parks and Wilderness Areas

* SunTran Bus Activity Report (12/01/08)



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DMuelle1
Y:\Bus Inventory - ArcMap Files\BSI_avg Boardings_12-1-08.mxd 01/09/09

Appendix F – Average Daily Ridership Map

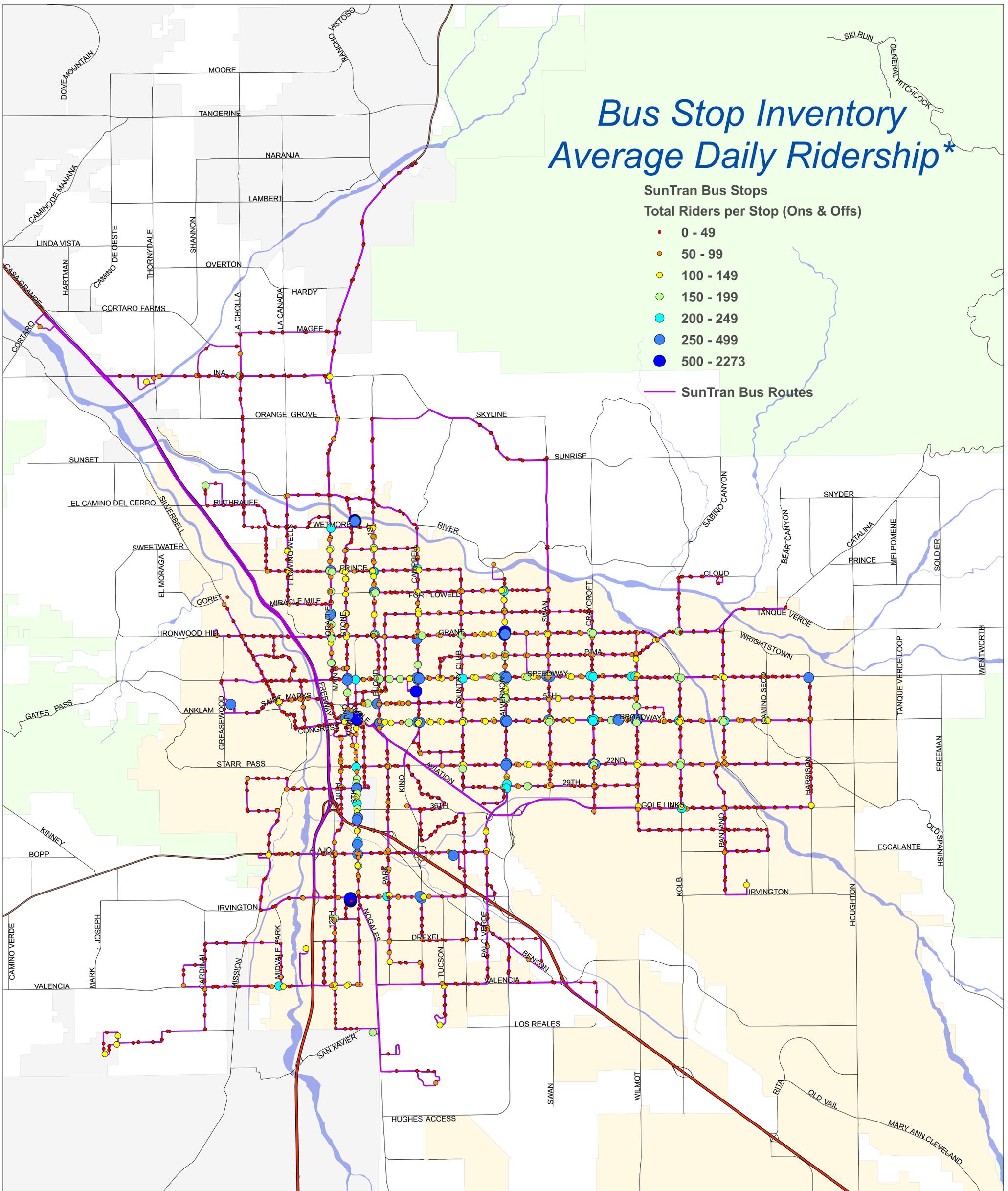
Bus Stop Inventory Average Daily Ridership*

SunTran Bus Stops

Total Riders per Stop (Ons & Offs)

- 0 - 49
- 50 - 99
- 100 - 149
- 150 - 199
- 200 - 249
- 250 - 499
- 500 - 2273

— SunTran Bus Routes



Bus Stop Inventory Avg Daily Ridership*

Total Riders per Stop
(Ons & Offs)
December 2008

Street Network Highway Type

- Interstate Highway
- State Highway

Major Streets

— Major Streets

Major Washes

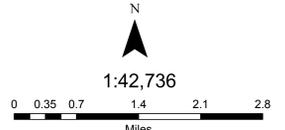
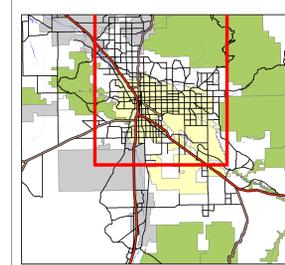
■ Major Washes

Jurisdictions

NAME

- City of Tucson
- Other Jurisdictions
- Pima County
- Parks and Wilderness Areas

* SunTran Bus Activity Report (12/01/08)



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DMuelle1
Y:\Bus Inventory - ArcMap Files\BSI_Ridership_12-1-08.mxd 01/08/09

Appendix G – FAQ Sheet

ADA¹ Bus Stop Accessibility Study

Frequently Asked Questions (FAQ's)

Focus: SunTran – Regional Fixed Route Transit System
As of: December 2008

What is the purpose of the study?

- To develop an inventory of the bus stops within the SunTran Regional Fixed Route Transit System in coordination with SunTran
- Identify the accessibility of the bus stops
- Prioritize improvements related to the ADA accessibility and connectivity
- Create an Action Plan to implement improvements needed at the bus stops

What are the *proposed* goals (What are we trying to accomplish)?

- Improve mobility independence for transit users (disabled and non-disabled)
- Remove environmental barriers for the disabled community
- Improve connectivity throughout the entire fixed route system
- Improve bus stop comfort and safety
- Improve coordination between the local jurisdictions, their internal departments (i.e.: Transportation and Development Services), and SunTran in regards to projects that may affect transit accessibility

What is the definition of an ADA-accessible bus stop?

- An accessible bus stop uses the ADA guidelines, which includes a minimum lift area of 60" wide x 96" deep. In addition, the stop should have continuous sidewalks from curb to curb and accessible curb cuts. Bus shelter accessibility was also evaluated if a shelter was present.

As part of the inventory, we qualified and quantified these areas to give a maximum score of 5 points (or 5 stars). 1 point was assessed for the concrete level lift area, 1 point for a curb cut in each direction (maximum 2 points), and 1 point for continuous sidewalk in each direction (maximum 2 points) with a total score of five

Were bus stops inventoried for any additional features?

- Yes, other features that may be desirable at a bus stop were inventoried. These additional amenities include lighting, trashcans, bike racks, and route map display cases. These amenities were also scored as part of the overall quality of the bus stop, if all the scores were added together (both accessibility and other amenities) an ideal bus stop would score 10 points.

- How many bus stops have lighting?

502

- How many bus stops have trashcans?

1024

- How many bus stops have bike racks?

21

- How many bus stops have route maps

412

How was the inventory conducted?

- Using a variety of tools:
 - TDOT (Tucson Department of Transportation) website maps, “Virtual Ride” (ARAN Van –07)
 - SunTran bus stop photos in their database
 - Google Maps – Street View
 - Field site visits after reviewing remotely

How many SunTran bus stops are there in the region?

- approximately 2271 active bus stops including the transit centers

How many bus stops are accessible from the nearest street intersection?

- from one direction only 161
- from both directions 967

Overall 50% of the bus stops are accessible from one direction, 43% from both directions

How many bus stops have an ADA-accessible lift area (wheelchair loading pad)?

- 1080
- 157 have an alternative lift area such as a driveway cut with a firm, stable, non-slip surface

Overall 55% of the bus stops have a lift area

How many bus shelters have an ADA-accessible wheelchair bay?

- 751 (83%)

How many bus shelters do not have an ADA-accessible wheelchair bay*?

- 153 (17%)

How many bus stops have shelters in the region? Where are they located?

- Total # 875
- City of Tucson 816
- Pima County (Unincorporated) 28
- South Tucson 16
- Pascua Yaqui 7
- Marana 7
- Tohono O’Odam 1
- Oro Valley 0

Who owns the shelters*?

- City of Tucson 524
- ATA – advertising shelter 343
- University of Arizona 8
- South Tucson 7
- Pascua Yaqui 7
- Pima County 5
- Pueblo Gardens NA 7
- Tohono O’Odam 2
- Private 1

* A number of stops have more than one bus shelter (904 shelters system-wide)

How many bus stops have shade?

- Shade is not an ADA requirement. However, shade is very important in the desert. Shade types were qualified and ranked based on amount of shade available for example a shelter received a higher score than a young tree.
 - Shelters: 875
 - Trees: 378
 - Other: 69
 - Total: 1322

Approximately 59% of the bus stops have some type of shade

How many bus stop benches are there in the region?

- 636

Some benches are provided through a private advertising contractor and others are owned by the local jurisdictions

Of the bus stops that have the highest number of boardings (riders-on), how many are ADA-accessible?

- | | |
|-----------------------------------|-----------------------------------|
| ▪ 200 + <u>22 of 26 (85%)</u> | ▪ 50 – 74 <u>88 of 153 (58%)</u> |
| ▪ 100 – 199 <u>53 of 97 (55%)</u> | ▪ 25 – 49 <u>138 of 320 (43%)</u> |
| ▪ 75 – 99 <u>40 of 66 (61%)</u> | |

What is the plan of action?

- Identify bus stop accessibility needs and priorities based on the analysis of the inventory using ADA recommended guidelines.
- Identify bus stop amenity needs (i.e. shelters, shade, benches, lighting, etc.)
- Secure funding sources to improve bus stops
- Coordinate improvements with SunTran, TDOT Engineering, ATA, other jurisdictions, and RTA

**For more information Contact:
TDOT Transit Administration
520-791-5883**

¹ADA stands for the American Disabilities Act, a law prohibiting discrimination against persons with disabilities in the areas of employment, public accommodations, and public services such as transportation. The ADA considers regular city bus service (SunTran) to be “the primary mode of public transportation for everyone.” For these reason cities with regular bus service must make that service ‘accessible’ to (usable by) individuals with disabilities