

# DESIGNING TRANSIT ACCESSIBLE COMMUNITIES STUDY



## DRAFT WORKING PAPER #1 SUMMARY OF EXISTING CONDITIONS

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## 1.0 INTRODUCTION

Currently in the Maricopa Association of Governments (MAG) region, approximately 97 percent of all transit users approach the transit system by walking, biking, carpooling, or via kiss-and-ride; the remaining three percent drive alone and park in designated lots. Of all transit users, about 90 percent of them approach the system strictly by walking or biking. Regardless of the initial approach to transit, all connecting trips at the destination are made at the pedestrian level. Therefore, while there should be efforts to balance accessibility for all users, pedestrian connectivity should be addressed for all modes. Accessibility, for this study, is not defined as the ability to access transit service generally, but rather eliminating barriers transit patrons face as they access transit stops.

Typically, the average transit user is willing to walk one-quarter (¼) mile to a station or stop, although external factors can affect this distance. There are both soft and hard factors that affect the experience of the pedestrian transit user. Hard factors include the street design, land use, and frequency of transit service. Soft factors include weather protection, landscaping, social experience, and personal safety. MAG and its partners have conducted various previous studies related to transit user needs and transit facilities. Key studies include the Sustainable Transportation and Land Use Integration Study, The Regional Transit Framework Study, Regional Public Transit Authority (RPTA) Bus Stop Handbook (1993), Complete Streets Guide (2011), and the MAG Pedestrian Policies and Design Guidelines. The Designing Transit Accessible Communities (DTAC) Study is intended to augment findings and recommendations of these previous studies to provide guidelines that can be utilized by agencies in the MAG region to improve the safety, comfort, and experience of pedestrians and bicyclists accessing transit.

### 1.1 Purpose of Study

Transit stops are the gateways to public transportation. Each one welcomes riders into the system and provides a transition point for entry into the community. The *Valley Metro Fact Sheet* (Issue 6, July 2009 – June 2010) indicates there are over 7,000 bus stops serving over 55.5 million bus boardings annually. It is important, therefore, that the bus stops provide a consistent, safe, and accessible environment. Currently, bus stops in the MAG region give riders mixed messages, depending on accessibility and how safe each stop feels. MAG and its partners understand that safe and accessible transit stops are an integral part of the public transit system. As such, MAG has initiated this study to furnish member agencies with additional tools and guidelines to promote and sustain better planning associated with improving existing deficiencies and deploying future stops that are more accessible and supportive of adjacent neighborhood needs. Despite how transit patrons primarily arrive at a stop, in the end all are pedestrians. Thus, this study will focus on challenges faced by pedestrians and bicyclists as they access transit at the stop level. Goals of the study include:

- Identify challenges faced by users getting to transit
- Recommend improvement concepts, policies, and guidelines to enhance transit accessibility
- Provide a toolkit of measures and strategies for local governments to create transit accessible and livable neighborhoods
- Identify options and provide a regional framework for applying for federal grants

The project ultimately will provide a set of documents that will serve as an enhanced pathway for MAG member agencies to build more livable and multi-modal neighborhoods.

### 1.2 Organization of Report

As one of the initial efforts associated with the study, this Working Paper has been prepared to (1) document existing transit services and facilities in the MAG region, (2) report the type and availability of data to support various analyses, and (3) set the foundation for pursuing categorization of bus stops and specific case studies for each stop category. As the Designing Transit Accessible Communities (DTAC) Study Team's knowledge base increases throughout the study, the reference library and available data schedule will be updated and reflected in the associated work products and the final report.



## 2.0 PUBLIC TRANSIT SERVICES AND FACILITIES

In 1985, the Arizona Legislature passed a law enabling the citizens of Maricopa County to vote on a sales tax increase to fund regional transportation improvements. The law also provided for creation of the Regional Public Transportation Authority (RPTA), now known as Valley Metro/RPTA. Elected officials from local governments comprise the RPTA Board of Directors. Public transportation in the Valley now includes several different modes of travel and services provided under the Valley Metro brand.

The Valley Metro system offers a hierarchy of services with different levels of speed and convenience geared to accommodate a variety of travel and mobility needs. Light Rail Transit (LRT) and the complementary LINK service offer high reliability, speed, and comfort for commuters. RAPID and Express Bus offer commuters a service and experience similar to LRT and LINK. Traditional, regularly scheduled, fixed-route bus service covers most of the Valley and Circulators serve several communities. In support of these services, strategically located transit centers and a system of park-and-ride (P&R) lots permit commuters to easily access the system. In addition, there are Dial-a-Ride (D&R) services throughout Maricopa County to support mobility requirements of persons with special needs.

The recent economic recession has impacted transit services offered in the Valley. Many cuts in service have been implemented due to funding shortfalls, and additional cuts, as well as new services, are likely as adjustments continue to be made. Due to the fluidity of the situation, the description of transit services presented herein represents routes and services currently operated. Expansion of the system should be anticipated as economic recovery occurs and Valley Metro funding levels increase. This section provides an overview of existing transit services and facilities within the MAG region as of January 2012 (unless otherwise indicated). Additional detail respecting transit services is presented in Appendix A.

### 2.1 Light Rail Transit Service

#### 2.1.1. METRO Light Rail

Light rail transit (LRT) service, referred to as "METRO Light Rail," currently consists of a 20-mile operating system with its northern terminus at Montebello Avenue and 19<sup>th</sup> Avenue in central Phoenix and its eastern terminus at Sycamore and Main Street in west Mesa (Figure 2.1) METRO Light Rail serves 18 stations as it passes through Phoenix via Central Avenue and Washington Street, offering access to Phoenix Uptown, Phoenix Downtown, Arizona State University (ASU) Downtown Campus, and Phoenix Sky Harbor International Airport via an automated Sky Train (under construction). The route serves nine stations through Downtown Tempe and the ASU Tempe Campus before proceeding to its easternmost station in west Mesa. LRT service began public operation on December 27, 2008, and ridership has surpassed initial forecasts of approximately 26,000 daily boardings; daily boardings (weekday) in January, 2012, were reported by Valley Metro to be 44,087.

#### 2.1.2. Valley Metro LINK

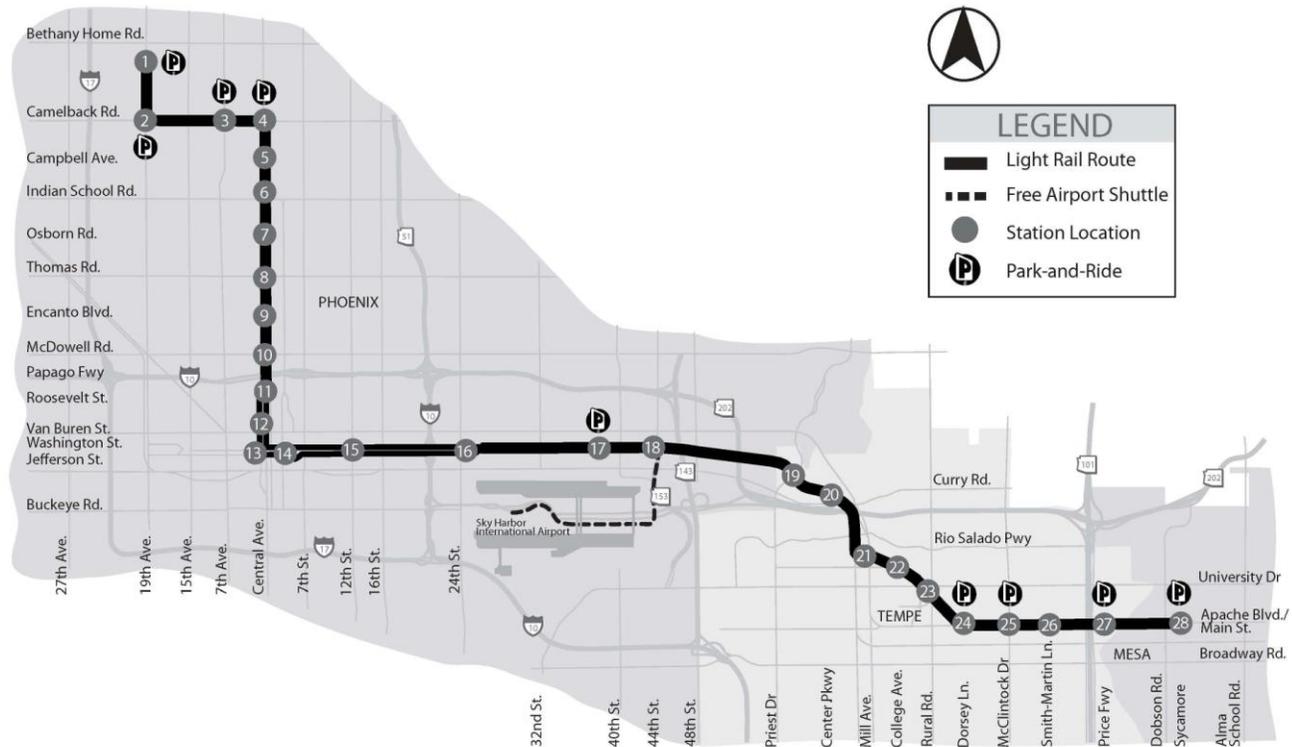
An important component of the METRO Light Rail service is Valley Metro LINK bus service. Valley Metro LINK offers riders state-of-the-art bus service with rail-like comfort, speed, and reliability. Two routes operate in the Mesa, Chandler, and Gilbert communities, directly "linking" transit users to the METRO Light Rail Sycamore/Main Street Station and other transit services at the adjacent Sycamore Transit Center:

- Arizona Avenue/Country Club Drive, serves western Chandler, western Gilbert, and central Mesa; and
- Main Street, serves western and central Mesa.

Connections to fixed-route, regional bus service are possible at the transit center and community ends of routes.



Figure 2.1  
METRO LIGHT RAIL ROUTE



Source: Planning Your Trip, METRO Light Rail at [http://routes.valleymetro.org/timetables/785/transit\\_route?type=1](http://routes.valleymetro.org/timetables/785/transit_route?type=1).

## 2.2 Bus Service

Bus service is comprised of Valley Metro LINK service (noted above), RAPID service, Express Bus routes, regularly scheduled local route service, local limited-stop service, neighborhood circulators, and rural connectors. A summary description of bus services provided in the MAG region is presented in the following subsections.

### 2.2.1. Express Commuter Services

Valley Metro operates express commuter services that accommodate morning and afternoon/evening commutes. The focus of this service is to enhance the speed and convenience of commuting with few intervening stops between boarding and alighting points. There are two types of express service: RAPID and Express Bus.

#### RAPID Service

The City of Phoenix operates the RAPID bus service, which compared to the Express Bus service, provides fewer stops and higher speeds, as buses generally stay on the freeways subsequent to departing from the origination point (P&R lots in the morning and Phoenix downtown in the evening). Currently, there are four routes oriented to the freeway system that connect outer areas of the City to the downtown area:

- I-10 East RAPID serves Ahwatukee Foothills and east Phoenix
- I-10 West RAPID serves west Phoenix



- I-17 RAPID serves northwest Phoenix

(Note: A RAPID-to-Rail connecting service is provided by diverting two buses each during the AM and PM peak periods from I-17 through the Montebello Ave/19<sup>th</sup> Ave METRO Rail Station.)

- SR-51 RAPID serves north Phoenix.

### **Express Bus Service**

Scheduled Express Bus service operates on a fixed route during the AM and PM peak periods with the primary destination being Downtown Phoenix, although two routes have an orientation to the Scottsdale Air Park employment center. Express Bus service provides higher speeds and fewer stops than found on traditional fixed-route bus services operating on urban roadways and forming the bulk of the bus system. Pick-ups are made at widely spaced stops in the route's origination area, and the bus does not stop to pick up or discharge passengers until it reaches specific scheduled locations, such as transit centers and P&R lots. Once in the Downtown or Air Park areas, local service is provided, although stops are more widely spaced than local bus service – a service referred to as “limited stop.” Some segments of Express Bus routes are operated on Valley freeways, utilizing high-occupancy vehicle (HOV) lanes, as may be available, to attain higher operating speeds between the origination and destination areas. Currently, there are 19 operating Express Bus routes serving the MAG region.

Special, “Limited Stop” service – the Grand Avenue Limited – is provided during the AM and PM peak periods along US-60/Grand Avenue from El Mirage to Downtown Phoenix. The route terminates at the Central Avenue/Camelback Transit Center after providing limited-stop service along Central Avenue. Also, a rural AM/PM commuter route – the Phoenix/Gila Bend Regional Connector – operates between Ajo and west Phoenix – with stops in Gila Bend, Buckeye, Goodyear, and Avondale. A similar Connector Route, linking Wickenburg to the Arrowhead Mall Transit Center in north Glendale/east Peoria, has been discontinued. It is possible that this service will be reactivated in the future as Valley Metro funding improves and development continues.

### **2.2.2. Existing Scheduled, Fixed-Route Local Bus Service**

Regularly scheduled, fixed-route local bus service provided through Valley Metro is comprised of local bus routes and circulators.

### **Local Bus Routes**

Local bus routes operate on almost every arterial roadway in the Phoenix metropolitan area during the morning (AM) and afternoon (PM) peak travel periods. Substantial cuts have been made to bus services in recent months due to the current global economic downturn, which has forced significant budget cuts at all governmental levels. At the end of June, 2009, regularly scheduled local bus routes numbered 64; at this time, there are 57 routes serving the MAG region. It is highly likely that service levels of June, 2009, will be reestablished over time and even increased as funding levels improve.

### **Circulators**

Free circulator bus service uses smaller buses to connect residential areas to local destinations such as other neighborhoods, major bus routes, medical centers, schools, shopping, recreational areas, senior centers, and multi-generational centers. Seven distinct circulator services in six Valley communities operate over 22 separate routes.

## **2.3 Transit Service Access Facilities**

Travelers can access public transit services in three different ways: Transit Centers, P&R Lots, and transit stops. Transit stops include stations on the METRO Light Rail route as well as bus stops.

### **2.3.1. Transit Centers**

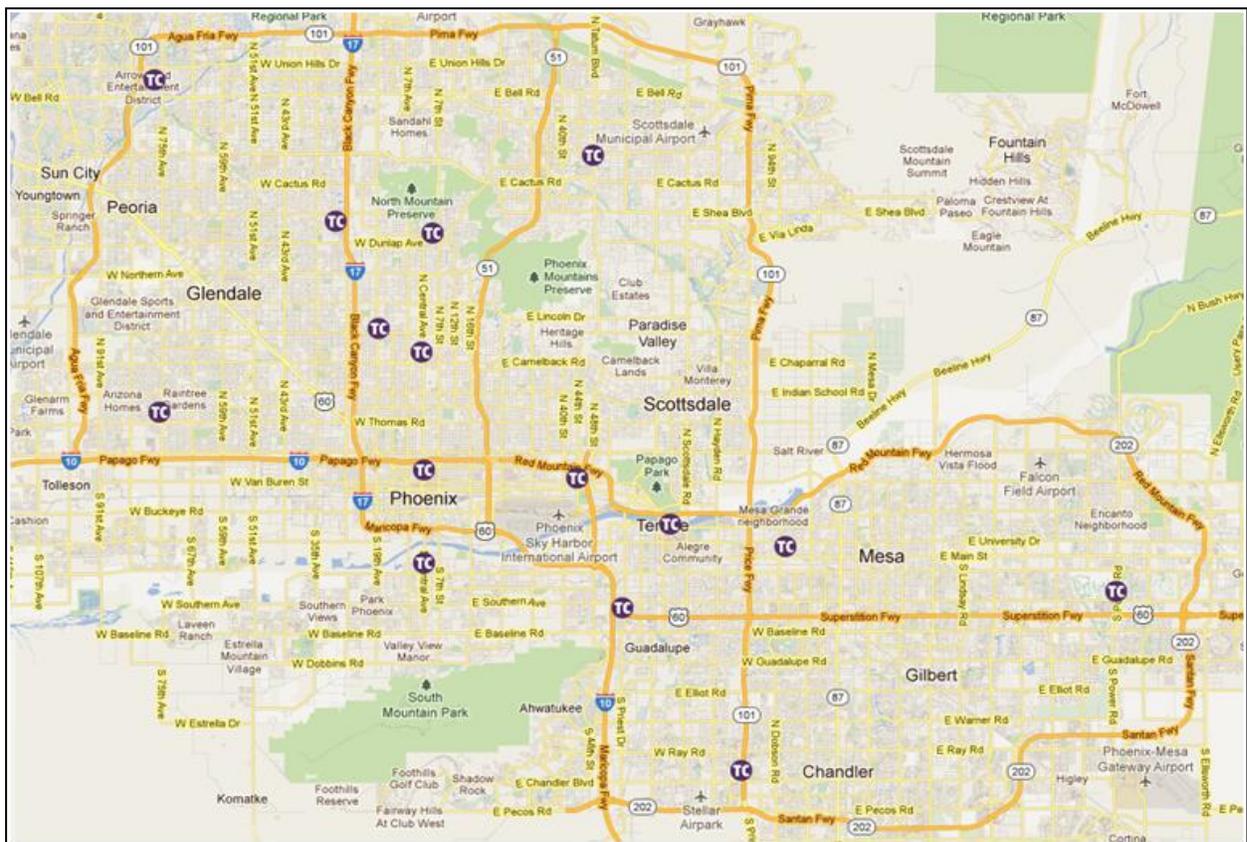
Transit centers are specifically designed to serve multiple transit modes, including: METRO Light Rail, RAPID, Express Bus, fixed-route scheduled local bus routes, and circulators. Thus, they are facilities where transit routes



converge, enabling passengers to transfer among various routes and services, as may be required to complete their travel. Transit centers generally are located off the street, although some services may occur on the street adjacent the center. These facilities provide transit patrons with a range of services and amenities, which may include: shade structures, shade trees, play areas, public restrooms, drinking fountains, fare sales, transit information, evaporative cooling, bike and day lockers, and telephones. Transit Centers also may include adjacent P&R facilities. In addition, Valley Metro passes for the many services offered are sold at many transit centers.

As shown in Figure 2.2, there are 16 transit centers in the Valley at this time. Services through the Loloma Station in Scottsdale have been temporarily suspended for budgetary reasons; however, some transit routes still operate through the facility. Still, this is five more than were operational in the summer of 2011. Nine of the 15 operational transit centers are located in Phoenix; five of the 15 have adjacent P&R lots. Outside of Phoenix, the only other transit center with an adjacent P&R lot is the Sycamore and Main Street Transit Center in Mesa with 802 spaces, which is the current eastern extent of METRO Light Rail. By comparison, the Montebello/19<sup>th</sup> Avenue Transit Center at the northern extent of METRO Light Rail has a P&R lot with 794 spaces.

Figure 2.2  
VALLEY TRANSIT CENTERS



Source: Transit Centers, Valley Metro Bus at [http://www.valleymetro.org/bus/transit\\_centers/](http://www.valleymetro.org/bus/transit_centers/).

### 2.3.2. Park-and-Ride Lots

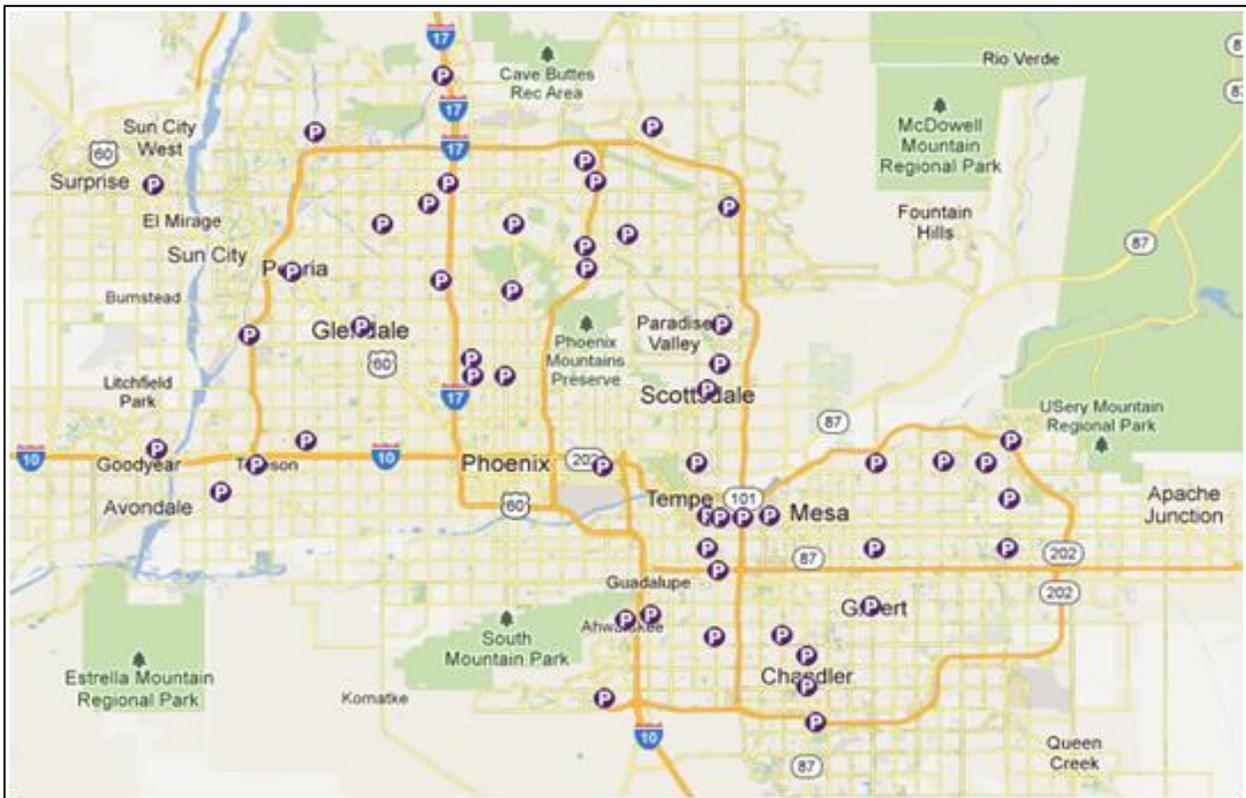
Public transit services in the Valley are supported by an extensive system of P&R lots. This critical transit component of the Valley transit system supports direct automobile access to almost all services. P&R lots allow individuals to drive their automobile to a transit service, park in an adjacent lot, and board the train or bus; they return later to retrieve their automobile and proceed home or to another destination. P&R lots are particularly



important for patrons of METRO Light Rail, RAPID, Express Bus, as demonstrated with the large lots at the Sycamore and Main Street Transit Center in Mesa and Montebello/19<sup>th</sup> Avenue Transit Center in Phoenix.

Overall, there are 54 P&R lots distributed throughout the study area, as shown in Figure 2.3. The majority of the P&R lots are situated in close proximity to a major highway or thoroughfare. Those at freeway locations are particularly situated to support the RAPID and Express Bus services. Nine P&R facilities have been developed

Figure 2.3  
VALLEY PARK-AND-RIDE LOTS



Source: Park-and-Ride Locations, Valley Metro Web Site, February, 2012 at [http://www.valleymetro.org/park\\_and\\_rides/bus/](http://www.valleymetro.org/park_and_rides/bus/).

specifically to serve the METRO Light Rail service. These lots are located adjacent to the LRT line and offer a total of 3,636 parking spaces. All P&R lots are available to travelers free of charge, and all are monitored by security cameras, security officers, and municipal police officers.

### 2.3.3. Valley Metro Transit Stops

There are thousands of transit stops accommodating access to the fixed-route, scheduled transit services described in the previous sections. A small number of these stops are associated with the specialized services of Valley Metro oriented to commuter travel. Although not a committed commuter mode, METRO Light Rail has only 28 stops or stations (five of the stations actually translate into ten stops, as they are situated on parallel streets, i.e., Washington and Jefferson). The limited number of stations and semi-exclusive guideway operation allows the LRT service to offer expedited travel. The two LINK routes, tying into the eastern end of the METRO Light Rail system, have a combined 29 stops, most of them spaced at one-mile intervals. The one-mile intervals expedite this special connector service, making it comparable to METRO Light Rail service. Valley Metro's Express Bus service and the



RAPID service of Phoenix are similar in that there are few stops, and the routes include long non-stop operating segments.

The vast majority of transit stops serving the MAG region are bus stops that provide access to the regional fixed-route bus network and circulators. A regional bus stop database has been developed to provide information about all of these stops. However, Valley Metro is a consortium of several communities, and maintenance of this database by the individual jurisdictions purchasing or providing service is inconsistent. Valley Metro is pursuing efforts to bring greater coordination to this data gathering/reporting process, as the accuracy and reliability of the database affects the automated trip planning system. The bus stops offer a range of amenities for transit system users, as depicted by the photos below:



## 2.4 Commuting Alternatives

When commuting to work or another location (e.g., school) on a regular basis, people generally look for a reliable and dependable mode of travel. The private automobile and regularly scheduled transit services can accommodate this need. However, there are other forms of commuting that offer realistic alternatives to the private automobile and transit services. Carpool and vanpool programs generally focus on commute-to-work trips, although carpooling is a practice that lends itself to any activity, e.g., attending a sporting event. These two alternate modes of travel are considered major players in the effort to reduce congestion and pollution by removing vehicles from the road, especially during the morning and afternoon/evening peak periods. Commuting alternatives also include bicycle travel and walking to/from a desired destination.

### Bike/Walk

All public fixed-route, scheduled transit vehicles (METRO Light Rail and Valley Metro buses) have bicycle racks to accommodate bicyclists. Larger station/stops, such as transit centers, have bike stands for securing bicycles, and some have bike lockers to permit transition to the transit mode. Most arterial roadways in the Valley have pedestrian-friendly sidewalks, and efforts are going forward to improve the safety and ambiance of the walk environment through wider sidewalks and buffers between sidewalks and traffic. Improved bus routes and bus schedules, including a centralized number to call for bus arrival times at every stop through a system called NextRide, makes walking at least a portion of any trip easier to coordinate with public transit services. The NextRide electronic service provides quick access to arrival information of the next bus or train at each stop. Transit patrons can enter the station/stop number or location by phone or Internet access to learn of the estimated time for the next transit vehicle.

### Carpool

Carpools involve two or more persons sharing a motor vehicle to save time and money. In the Valley, carpoolers (and motorcycles) are able to use available HOV lanes, which are focused on reducing commute times and permits carpoolers to avoid congestion experienced in the general travel lanes. Carpoolers benefit by saving money for fuel, reducing vehicle wear and tear, and relieving some of the stress of daily commutes. Information about carpooling opportunities is readily available at <http://www.valleymetro.org/carpool/>, where one can sign up to join a carpool. The site also provides an email contact and phone number – 602.262.RIDE.



Accessibility to the Valley Metro system is enhanced by a ShareTheRide Web site and phone number for people to query potential partnerships with others to carpool. ShareTheRide is a state-of-the-art ride matching system that allows commuters to quickly and securely find a carpool partner. The system matches commuters, based on proximity, destination, and travel route, as well as schedules and preferences. The Web site helps prospective carpoolers by providing information about potential benefits, tips for engaging in a successful carpool, and a checklist for organizing driving responsibilities, expenses, and personal preferences.

## Vanpool

Vanpools are comprised of commuters sharing the monthly rental fee and gasoline cost associated with the use of a clearly marked, multi-passenger (6 to 15 persons) Valley Metro van. Fuel, insurance, and vehicle maintenance costs are covered through a monthly fee paid to the primary driver. Some employers may offer company-owned vans as an alternative mode incentive to employees. Like the carpool program, Valley Metro maintains a Web site with information about vanpooling opportunities: <http://www.valleymetro.org/vanpool>.

Routes traveled by vanpool vehicles generally are oriented to collecting employees with a common destination, such as an economic activity center (e.g., downtown Scottsdale) or the same corporation (e.g., the Intel Chandler and Ocotillo campuses). Vanpool members also are eligible for special commuter tax benefits. According to the Valley Metro Vanpool Web site, “the Federal Government has enacted tax laws that benefit commuters who travel to work in government-owned vanpools. Employees are eligible for employer subsidies or they may set aside up to \$115 a month of their pre-tax income towards commuting costs. Employers who subsidize their employees’ commute may receive equivalent deductions free of additional payroll and federal income taxes.”

## 2.5 Specialized Transportation Services

Within the MAG region, there are other transportation and mobility opportunities that have been devised to accommodate the segment of the traveling public with special needs. Dial-a-Ride systems provide special access/mobility options for those without vehicles or who are significantly disadvantaged and unable to provide for their own transportation.

### 2.5.1. Dial-A-Ride

Dial-a-Ride is a shared-ride service provided by a number of different agencies throughout the Valley, depending on the city or town where the service exists. For instance, there can be Dial-a-Ride service for seniors, persons with disabilities, or the general public. The vehicles are not route oriented, and drivers may pick-up or drop-off people at multiple, predetermined locations during the course of the trip, although advance reservations may be required. In most cases, travel on the Dial-a-Ride system can be accomplished without transferring to another vehicle, unless a person’s trip extends beyond the service area of the system. Valley Metro facilitates transfers between Dial-a-Ride systems and between the Dial-a-Ride systems and regularly scheduled fixed-route bus service. Dial-a-Ride services are provided by Phoenix, Peoria, Glendale, Scottsdale, Tempe, Chandler, Mesa, Paradise Valley, and Tolleson.

### 2.5.2. Coupons for Cabs

Chandler, Gilbert, Mesa and Tempe residents may receive for nominal co-pay a coupon book valued at \$10. Coupons can be applied toward the fare and tip of participating taxi companies. Scottsdale residents may receive up to sixteen vouchers per month per user through Cab Connection. Vouchers are subsidized by the City of Scottsdale at a rate of 80% up to a maximum of \$10.

## 2.6 Operations and Maintenance Facilities

A number of operations and maintenance (O&M) facilities are required to support the delivery of transit services in the Valley. These facilities serve multiple purposes including: vehicle service and fueling, employee training, system administration, and operational management. Some O&M facilities are designed to meet specialized needs of the services supported. Capital development funds available through Federal Transit Administration (FTA) formula and discretionary grant programs support a significant portion of the costs associated with constructing transit



O&M facilities. There are five regional publicly-owned facilities supporting fixed-route and demand-responsive (e.g., Dial-a-Ride) and one METRO Light Rail O&M facility.

## 2.7 Ridership

The latest *Transit Performance Report* published by Valley Metro was issued December, 2010 (Revised May 12, 2011). This report provides a summary of key statistics regarding system operations and service provided. Table 2.1, extracted from this report reveals that overall farebox recovery from ridership amounted to 23.3 percent of operating costs. Fixed-route bus services performed slightly better than this average with a 24.1 percent farebox recovery, and METRO Light Rail performed even better at 28.0 percent. Clearly, the METRO Light Rail service was the most expensive to operate at \$12.43 per revenue mile. Vanpooling proved to be the most efficient with a cost of only \$0.47 per revenue mile. However, vanpooling is the second most expensive to access at \$2.17 for an average fare, compared to \$0.84 for fixed-route bus service and \$0.76 for METRO Rail riders.

There were 69.6 million total boardings in FY 2010, defined as July 1, 2009 – June 30, 2010. Fixed-route bus services accounted for close to 80 percent of all boardings in the system. The METRO Light Rail service accounted for over 17 percent of system ridership, attracting 4.57 boardings per revenue mile. METRO Light Rail boardings per revenue mile operated clearly outstripped the other services, which would be expected for the high-capacity LRT service. Approximately 10 percent of all boardings were served by routes supported with Proposition 400 funding, which attracted 1.12 boardings per revenue mile.

Table 2.1  
VALLEY METRO SYSTEM SUMMARY REPORT

Performance Indicator	Proposition 400 Fixed-Route Level	Valley Metro System Operations				System Total
		Fixed-Route	Paratransit	Vanpool	Light Rail	
Farebox Recovery	19.7%	24.1%	6.3%	92.9%	28%	23.3%
Operating Cost Per Boarding	\$5.22	\$3.50	\$36.99	\$2.34	\$2.72	\$3.72
Subsidy Per Boarding	\$4.19	\$2.66	\$34.69	\$0.17	\$1.96	\$2.85
Operating Cost Per Revenue Mile	\$5.86	\$5.90	\$4.38	\$0.47	\$12.43	\$5.41
Average Fare	\$1.03	\$0.84	\$2.30	\$2.17	\$0.76	\$0.87
Total Boardings	7,008,830	55,571,959	777,525	1,135,783	12,112,738	69,601,005
Percent of Total Boardings	10.07%	79.852%	1.12%	1.63%	17.40%	100.00%
Boardings Per Revenue Mile	1.12	1.69	0.12	0.20	4.57	1.46

Source: Extracted from *Transit Performance Report, FY 2010* (July 1, 2009 – June 30, 2010), Valley Metro, December 2010, Revised 5.12.11.

The *Annual Ridership Report* for FY 2010 – 2011 produced by Valley Metro (Table 2.2) shows that total boardings were down slightly from the year before: 67.6 million (FY 2011) compared to 69.6 million (FY 2010). However, the system, as a whole, was more productive, achieving 2.1 boardings per revenue mile in FY 2011 compared to 1.46 in FY 2010. The table indicates ridership in Phoenix accounted for 65 percent of total ridership, attracting 2.5 boardings per revenue mile. Tempe was the only other city to achieve a ridership rate per revenue mile (2.2) that exceeded the overall system average.

METRO Light Rail attracted 12.8 million riders, accounting for 18.9 percent of total ridership, which is an increase of two percentage points over the previous year. Combined, the three cities participating/supporting METRO Rail (Phoenix, Tempe, and Mesa), which serves the core area of the MAG region and the Valley Metro transit system, accounted for 90.7 percent of total system ridership.

In FY 2010 – 2011, 1.5 million persons accessed transit with bicycles, accounting for 2.23 percent of total ridership. The share of bike riders using transit in most cities was greater than the city's share of total boardings, with the prominent exception of Phoenix and Tempe. Cities with a notably higher share of bicycle access relative to the



total share of all transit boardings are: Avondale, Chandler, Gilbert, Glendale, Mesa, Scottsdale, and Sun City. However, bike riders accounted for 0.05 percent or less of total ridership in eight cities.

Wheelchair users accounted for less than one percent of total system ridership. Like bike riders, the share of wheelchair users by city generally is greater than the city's share of total ridership with the prominent exception of Tempe. However, wheelchair users accounted for 0.05 percent or less of total ridership in six cities.

Table 2.2  
VALLEY METRO ANNUAL RIDERSHIP, FY 2010-2011: SUMMARY BY CITY

Jurisdiction	Boardings	Percent	Revenue		Boardings			W/C	Percent
			Miles	Percent	Per Mile	Bikes	Percent		
Avondale	120,943	0.18%	188,071	0.59%	0.6	5,026	0.33%	435	0.16%
Chandler	874,178	1.29%	937,621	2.96%	0.9	50,015	3.32%	4,044	1.49%
El Mirage	3,238	0.00%	6,309	0.02%	0.5	169	0.01%	54	0.02%
Fountain Hills	2,517	0.00%	4,719	0.01%	0.5	60	0.00%	1	0.00%
Gila River Indian Comr	4,583	0.01%	5,707	0.02%	0.8	199	0.01%	46	0.02%
Gilbert	165,766	0.25%	433,402	1.37%	0.4	12,297	0.82%	957	0.35%
Glendale	2,395,053	3.54%	1,559,304	4.92%	1.5	72,263	4.80%	14,736	5.44%
Goodyear	34,062	0.05%	31,139	0.10%	1.1	216	0.01%	35	0.01%
Guadalupe	41,882	0.06%	56,580	0.18%	0.7	1,146	0.08%	195	0.07%
Litchfield Park	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mesa*	5,702,483	8.43%	2,870,510	9.06%	2.0	194,859	12.94%	28,459	10.51%
Paradise Valley	11,900	0.02%	68,958	0.22%	0.2	501	0.03%	32	0.01%
Peoria	92,725	0.14%	49,038	0.15%	1.9	2,573	0.17%	516	0.19%
Phoenix*	43,955,347	65.02%	17,664,306	55.74%	2.5	848,925	56.39%	180,978	66.83%
Scottsdale	2,440,512	3.61%	2,195,209	6.93%	1.1	87,743	5.83%	10,043	3.71%
Sun City	32,929	0.05%	44,127	0.14%	0.7	2,235	0.15%	259	0.10%
Surprise	20,825	0.03%	19,548	0.06%	1.1	550	0.04%	103	0.04%
Tempe*	11,663,939	17.25%	5,251,317	16.57%	2.2	225,158	14.96%	29,619	10.94%
Tolleson	23,258	0.03%	31,819	0.10%	0.7	750	0.05%	52	0.02%
Rural Connector Svcs	21,390	0.03%	271,034	0.86%	0.1	791	0.05%	223	0.08%
<b>Total</b>	<b>67,607,530</b>		<b>31,688,717</b>		<b>2.1</b>	<b>1,505,476</b>		<b>270,787</b>	
<i>*Metro Rail ridership portion included above was:</i>			<i>*Metro Rail mileage portion included above was:</i>						
Mesa - 1,216,730			Mesa - 117,614						
Phoenix - 7,885,771			Phoenix - 1,613,369						
Tempe - 3,691,028			Tempe - 674,162						

Source: Extracted from Annual Ridership Report FY 2010-2011, Valley Metro.

The 2011 Rider Satisfaction Survey – Total Market conducted for Valley Metro, provides the following conclusions regarding the transit system use and acceptance:

- Light rail ridership continues to grow and expand the base of transit users in the Valley.
- Overall satisfaction with the transit system among all riders increased this year to the highest level since 2005.
- In a shift from last year, there was a notable increase in the percentage of transit users indicating they are likely to continue using transit next year.
- It appears that the rider angst about the increase in fares that occurred in the spring of 2010 was short lived.
- After increasing last year, the percent of riders indicating they primarily use the Transit Book for transit information decreased.



### 3.0 PERTINENT REFERENCE DOCUMENTS

Several studies, guides, and design standards have been completed that address various components of the transit system and its function in the MAG region. Some are in process, others have been completed in recent years, and still others are foundational from several years back. These resources have served to guide transit accessibility planning and decision making to this point. Discussions, findings, and conclusions reported from these resources have relevance to this study in that they can provide direction and context for proceeding with formulation of regional transit accessible policies and tools. Thus, an important aspect of this study will be integration of relevant information from each of these resources, as appropriate.

#### 3.1 Relevant Recent Studies and Other Resources

In preparation for this study, several resources of potentially relevant information were identified. These resources are in the form of study results in published reports, policy and planning documents, and design guides of various agencies and jurisdictions. These references offer a platform of potentially pertinent and valuable information on which to build a regional framework of transit accessible policies and tools.

Basic information relating to these relevant recent studies and other resources has been summarized in Table 3.1. Table 3.1 identifies each resource reviewed and indicates its applicability to the MAG Designing Transit Accessible Communities (DTAC) Study relative to ten topics of applicability: Safety, Comfort, Policy, Funding, Wayfinding, Toolkits, Standards, Paths & Sidewalks, Bicycle, and Design Standards. Where the reference document is relevant to the DTAC study, the appropriate topic is marked. A more detailed abstract for each of these resources is presented in Appendix B.

##### 3.1.1. Regional and Local Transit Studies

In addition to the resources introduced in the previous section, several regional and local transit planning studies have been identified that may have some helpful data:

###### *Valley Metro/Regional Public Transportation Authority (RPTA)*

- Central Phoenix/East Valley Light Rail Transit Environmental Impact Statement (CP/EV LRT)
- Comprehensive Arterial Bus Rapid Transit Planning Study, September, 2009
- 2008 Ridership Satisfaction Survey-Phoenix Market
- 2009 Ridership Satisfaction Survey-Phoenix Market
- Origin and Destination Study
- Papago Intermodal Transfer Station Feasibility Study
- Passenger and Operating Facility Characteristics
- Short-Range Transit Plan
- Ridership Reports.

###### *City of Phoenix*

- 2008 Ridership Satisfaction Survey-Phoenix Market (RPTA)
- 2009 Ridership Satisfaction Survey-Phoenix Market (RPTA)
- 2010 Origin and Destination Study (RPTA)



Table 3.1  
SUMMARY OF REFERENCE RESOURCES

Ref. No.	Document Name	Year	Sponsoring Agency	Author	Applicability to Designing Transit Accessible Communities Study										
					Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards	
1	Bicycle Access and Egress to Transit	2011	CALTRANS, USDOT	Mineta Transportation Institute	●	●		●						●	
2	Community Characteristics Promoting Transit and Walking	2007	Sierra Club	DR. John Holtzclaw		●									●
3	Dangerous by Design	2011	Transportation for America	Michelle Ernst	●			●					●		
4	MAG Complete Streets Guide	2011	Maricopa Association of Governments	PLAN*et	●	●	●				●	●	●	●	
5	MAG Regional Bikeway Master Plan	2007	Maricopa Association of Governments	Sprinkle Consulting	●	●	●	●				●	●		
6	MAG Pedestrian Polices and Design Guidelines	2005	Maricopa Association of Governments	Maricopa Association of Governments	●	●	●	●	●	●	●	●			●
7	MAG Pedestrian Plan	1999	Maricopa Association of Governments	The Planning Center	●	●	●	●			●				●
8	MAG Regional Transit Framework	2010	Maricopa Association of Governments	Maricopa Association of Governments, Valley Metro			●	●							
9	Retrofit of Urban Corridors: Land Use Policies and Retrofit of Urban Corridors: Land Use Policies and Transit-Friendly Environments Design Guidelines for Transit-Friendly Environments	1993	University of California Transportation Center	Anastasia Loukaitou-Sideris UCLA	●	●	●				●				●
11	TCRP Document 44: Literature Review for Providing Access to Public Transportation Stations	2009	Transportation Research Board	Kittelson & Associates	●	●	●	●	●	●	●	●	●	●	●
12	Tempe Development Standards - Part 4 (Way-Finding)	2010	City of Tempe	City of Tempe	●	●	●		●		●	●	●	●	●
13	City of Phoenix Interim Transit-Oriented Zoning Overlay District One	2004	City of Phoenix	City of Phoenix			●				●	●	●	●	
14	Toolkit for the Assessment of Bus Stop Accessibility & Safety	2005	Easter Seals Project Action	Nelson/Nygaard	●	●	●	●	●	●					



Table 3.1 (continued)  
**SUMMARY OF REFERENCE RESOURCES**

Ref. No.	Document Name	Year	Sponsoring Agency	Author	Applicability to Designing Transit Accessible Communities Study									
					Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
15	Guide for Transit Oriented Development	2006	Metropolitan Council	Metropolitan Council			●			●				●
16	Transit Oriented Development in Phoenix		Valley Metro RPTA	City of Phoenix			●				●			●
17	Ten Principles for Successful Development Around Transit	2003	Urban Land Institute	Urban Land Institute		●	●			●				
18	RTD Transit Access Guidelines	2009	Regional Transportation District (Denver)	Regional Transportation District Transit Access Committee	●	●	●				●	●	●	●
19	Universal Design & Accessible Transit Systems: Facts to Consider When Updating or Expanding Your Transit System	2009	Easter Seals Project Action	Rehabilitation research Center on Accessible Public Transportation	●	●			●		●			●
20	Vision for an Ideal Accessible Community	2007	Transport Canada / Transportation Research Board	International Centre for Accessible Transportation (ICAT)							●	●	●	
21	STLUIS Working Paper One: Regional Transportation Framework and Issues	2011	Maricopa Association of Governments	Sustainable Transportation & Land Use Integration Study			●	●	●					
22	STLUIS Working Paper Two: Moving Toward Sustainable Transportation	2011	Maricopa Association of Governments	Sustainable Transportation & Land Use Integration Study			●		●	●	●			
23	Promoting Bicycle Commuter Safety	2012	USDOT, Caltrans	Asbjorn Osland - Mineta Transportation Institute	●	●	●			●	●		●	
24	Multimodal Level of Service Analysis for Urban Streets: Users Guide	2009	AASHTO, Federal Highway Administration	National Cooperative Highway Research Program								●	●	●
25	Accessing Transit: Design Handbook for Florida Passenger Facilities	2008	Accessing Transit: Design Handbook For Florida Passenger Facilities	Florida Planning and Development Lab, Department of Urban and Regional Planning, Florida State University	●	●	●		●	●	●	●	●	●
26	Transit Facilities Guidelines	2006	State of Florida Department of Transportation	State of Florida Department of Transportation										●



Table 3.1 (continued)  
SUMMARY OF REFERENCE RESOURCES

Ref. No.	Document Name	Year	Sponsoring Agency	Author	Applicability to Designing Transit Accessible Communities Study									
					Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
27	American With Disabilities Act Accessibility Guidelines For Buildings And Facilities	2002	U.S. Architectural and Transportation Barriers Compliance Board (Access Board)	U.S. Architectural and Transportation Barriers Compliance Board (Access Board)			●				●	●		
28	State Wide Transit Facilities Standards, Criteria, Guidelines: A Quick Reference	2011	Florida Department of Transportation – Public Transit Office	Florida Department of Transportation – Public Transit Office			●	●			●	●	●	●
29	Transit Facility Practitioner’s Handbook	2008	Florida department of Transportation Districts One and Seven	Gannett Fleming, Inc., Tindale-Oliver & Associates, Inc., USF Center for Urban Transportation Research	●	●	●		●	●	●	●	●	●
30	Transit Facility Handbook	2007	Florida department of Transportation Districts One and Seven	Gannett Fleming, Inc., Tindale-Oliver & Associates, Inc., USF Center for Urban Transportation Research	●	●	●		●	●	●	●	●	●
31	Urban Bikeway Design Guide	2011	National Association Of City Transportation Officials	National Association Of City Transportation Officials	●	●							●	●
32	RPTA Bus Stop Programs and Standards:Design Guidelines	2007	Valley Metro RPTA	Parsons Brinckerhoff (PB)							●	●	●	●
33	RPTA Bus Stop Programs and Standards: Findings and Recommendations	2008	Valley Metro RPTA	Parsons Brinckerhoff (PB)	●	●		●			●	●	●	
34	Signalized Intersection Enhancements that Benefit Pedestrians	2012	America Walks	Fehr & Peers	●	●				●	●	●		●



- High Capacity Transit Corridor Study (City of Phoenix)
- Efficiency and Effectiveness Report (RTPA)
- Freeway BRT Operational Plan (RPTA)
- Origin and Destination Study (RPTA)
- Park-and-Ride Re-Prioritization Study (RPTA)
- Phoenix Bus Bay Priority Study Update
- Regional Paratransit Study (RPTA)
- Ridership Reports (RPTA).

### 3.1.2. Applicable Studies

Several studies compiled in the reference library of relevant resources (refer to Table 3.1) are directly applicable to and have resources that can directly apply to the MAG DTAC Study. Table 3.2 shows how each applicable study is linked to the DTAC study by task. As the study progresses through the remaining work program, the Consultant Team will incorporate the findings and recommendations of these studies into scheduled work products. This table will assist the Consultant Team in ensuring these applicable studies are referenced and utilized in the appropriate work task(s). As noted earlier, detailed summaries of these and other reference documents are provided in Appendix B.

## 3.2 Peer Transit Agency Outreach

The Consultant Team reached out to peer transit agencies in other communities to determine whether any have specific accessibility guidelines that would be pertinent to the DTAC Study. The following agencies were contacted:

- San Diego, California - San Diego Association of Governments
- San Francisco, California - Metropolitan Transportation Commission
- Seattle, Washington - Puget Sound Transit
- Denver, Colorado - Regional Transportation District
- Salt Lake City, Utah - Utah Transit Authority
- Kansas City, Missouri - Kansas City Area Transit Authority
- Las Vegas, Nevada – Regional Transportation Commission
- Houston, Texas – Metropolitan Transit Authority.

Each agency was asked if they had specific guidelines or policies directed to transit accessibility. Three of the agencies contacted did share some specific guidelines. Most of the agencies indicated that they did not have specific guidelines or policies, but many had studies incorporating elements of accessibility, such as studies relating to Complete Streets or Transit Oriented Development (TOD) along fixed routes. The Houston MTA responded that it is in the process of selecting a consultant to develop accessibility guidelines and anticipates that the study will kick off in June 2012. The information shared by responding agencies is highlighted in the following subsections.

### 3.2.1. Denver RTD

Denver Regional Transportation District (RTD) is Denver Colorado's Transit Authority. Denver RTD has the most specific guidelines regarding transit accessibility, which were developed in 2009. These guidelines were included in this study's core reference library as discussed previously in Section 3.1. Denver's guidelines recognize that when safety, convenience, and attractiveness are maximized, transit will be both easier to use and more likely to



Table 3.2  
APPLICABLE STUDIES AND GUIDES

Document	Year	Sponsoring Agency	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects
Transit Cooperative Research Program (TRCP) Document 44: Literature Review for Providing Access to Public Transportation Stations	2009	Transportation Research Board (TRB)	●		●	●	●	●			
RTD Transit Access Guidelines	2009	Denver Regional Transportation District (RTD)	●	●		●		●			
Accessing Transit: Design Handbook for Florida Passenger Facilities	2008	Florida Department of Transportation (FDOT)	●	●	●	●					
RPTA Bus Stop Programs and Standards: Findings and Recommendations	2008	Valley Metro RPTA	●		●	●	●	●	●	●	●
Transit Facility Handbook	2007	FDOT	●		●	●					
Pedestrian Policies and Design Guidelines	2005	Maricopa Association of Governments (MAG)				●	●	●			
Toolkit for the Assessment of Bus Stop Accessibility and Safety	2005	Easter Seals Project Action				●		●			



be used. The RTD guidelines establish an accessibility hierarchy, encouraging an optimal balance of modes accessing the transit system. Pedestrians are given the highest priority, as each transit trip begins and ends with a pedestrian trip. The guidelines accomplish this by creating standards for pedestrians, bus transfer, bicycle, and auto access with the goal to achieve an optimal balance between them. Because each city and location is unique, the guidelines are meant to be flexible.

### 3.2.2. SANDAG

The San Diego Association of Governments (SANDAG) is the regional transportation planning agency and the metropolitan planning organization for the 18 jurisdiction region of San Diego County. In its role as the primary transportation planning agency, SANDAG has implemented over the years several funding programs that incentivize planning and designing for pedestrian and bicycle travel especially in conjunction with transit. The following sections describe some of the key SANDAG programs that support bicycle and pedestrian travel and could inform the DTAC study.

#### TransNet

In 1988, San Diego County voters approved a 0.5 cent sales tax increase to support transportation systems planning and implementation. San Diego voters extended this tax in 2004. SANDAG has since implemented two funding programs with sales tax receipts to support bicycle and pedestrian planning, design, and implementation:

- *TransNet* Bicycle, Pedestrian, and Neighborhood Safety Program (\$280 million)
- *TransNet* Smart Growth Incentive Program (SGIP) and Active Transportation Grant Program (\$285 million)

The *TransNet* SGIP funds support transportation and transportation-related infrastructure improvements and planning efforts that complement smart growth development initiatives. SGIP awards two percent of the annual *TransNet* revenues (approximately \$4.8 million in FY 2009) for the next 40 years to local governments through a competitive grant program to support projects that will help better coordinate transportation and land use in the San Diego region.

The goal of *TransNet* SGIP is to fund public infrastructure projects and planning activities that will facilitate compact, mixed-use development focused around public transit that will increase housing and transportation choices. Funded projects will serve as models for how modest investments in infrastructure and planning can make smart growth an asset to communities around the region. These investments should help attract private developers initiate developments that, with the support of the *TransNet*-funded projects, create great places in the San Diego region.

To support efficient use of these *TransNet* funds by local jurisdictions in the region, SANDAG prepared a series of guidelines. These guidelines are described below.

#### **Parking Strategies for Smart Growth**

**Background:** Smart Growth development sites feature relatively dense development, mixes of compatible land use with pedestrian amenities, bicycle facilities, and optimal access to public transportation. These features favor access by transit, walking, and bicycling. The diversity of uses within close proximity encourages visitors to make journeys within the site by foot, even if they arrive by car. Furthermore, research has shown that vehicle ownership for Smart Growth residents is lower than for residents of suburban development. All of these factors suggest that parking demand in smart growth areas is lower than elsewhere in the region and that parking supplies should reflect this fact.

The United States Environmental Protection Agency (EPA) has published key guidance on parking provisions for smart growth. Recognizing connections between mixed-use development, driving, and parking, the EPA, in a publication on parking in smart growth developments, has stated:



*[T]ypical parking regulations and codes simply require a set amount of parking for a given square footage or number of units, assuming all trips will be by private automobile and ignoring the neighborhood's particular mix of uses, access to transit and walking, and context within the metropolitan region. Such inflexible parking requirements can force businesses to provide unneeded parking that wastes space and money.... [I]nflexible minimum parking requirements are the norm – but they represent a barrier to better development (EPA, 2006).*

It is important to note that lower parking rates can reinforce higher vehicle trip generation rates, a fundamental goal of Smart Growth. Donald Shoup, Professor of Urban Planning at the University of California, Los Angeles, an articulate critic of minimum parking requirements, contends that making parking more scarce and costly will make people more likely to travel by transit, by bike, or on foot. As the cost to park increases in terms of out-of-pocket cost or the time-cost associated with searching for scarce parking, drivers will re-evaluate their mode choice, and some will change travel behavior to and from destinations. Thus, cities that reduce parking requirements for Smart Growth also can expect reduced levels of driving.

**Study Findings:** This study found that a number of cities in the San Diego region provide accommodations for Smart Growth development in their parking requirements, but typical parking requirements may provide an excess supply of parking relative to demand documented in nationwide studies. Additional measures to provide parking appropriate to Smart Growth developments potentially could be implemented. Parking strategies identified did not include the collection of empirical parking demand data in the San Diego region. Therefore, further study in the region, at a neighborhood level, is warranted to: (1) examine whether parking demand in San Diego Smart Growth areas deviates significantly from demand observed in nationwide studies; and (2) determine appropriate strategies for particular locations. Additionally, the study does not address parking requirements for public transit stations and downtown San Diego.

Demand documented in studies conducted in other regions provides a starting point for analyzing potential parking strategies that may be appropriate in Smart Growth environments. This conclusion is based on real-world experiences at existing Smart Growth developments that have employed these strategies. Further research of parking demand at Smart Growth sites in the region is called for at the neighborhood level, in order to capture each area's unique characteristics with respect to parking demand. This study is available as a resource for local jurisdictions within the SANDAG region, if they choose to use it. Local jurisdictions are under no obligation to use this study in their development approval processes. The study results do not include region-wide recommendations and recognize that parking management should be analyzed and implemented on a community basis.

### **Trip Generation for Smart Growth**

**Background:** Smart Growth developments generally are perceived to generate fewer vehicle trips and less demand for parking compared to conventional suburban developments, due to an increased number of trips via transit, walking, or bicycling. However, there has been a lack of empirical data to demonstrate this in the San Diego region. Current trip generation and parking supply guidelines are based on conventional suburban development, perhaps imposing a burden on developers and jurisdictions to provide more roadway and parking capacity than is necessary in Smart Growth environments. Application of identified trip generation and parking demand rates appropriate for Smart Growth development could result in cost savings for jurisdictions, developers, homebuyers, and renters.

SANDAG'S *Regional Comprehensive Plan (RCP)*, adopted in 2004, offers a vision for change in the San Diego region that strongly emphasizes sustainability and Smart Growth concepts. *Trip Generation for Smart Growth: Planning Tools for the San Diego Region* is a strategic initiative called for in the RCP to be a component of the SANDAG Smart Growth Toolbox; it is intended to be a resource for local agencies as they implement Smart Growth development.

The results of this study are intended to provide a richer, more accurate accounting of vehicle trip reduction associated with mixed-use and TOD in Smart Growth environments, compared to current local and national methods of calculating trip generation. This information is intended to supplement data in the *San Diego Traffic Generators Manual*, published by SANDAG in 2000, and the accompanying *Not-so-Brief-Guide to Trip Generation*, published by SANDAG in 2002. Whereas the *Not-so-Brief-Guide* suggests application of generic vehicle trip



reductions of five percent for locations within one-quarter mile of transit and 10 percent for mixed-use developments, the method outlined in this study accounts for the uniqueness of each Smart Growth development site and proposes reductions based on the specific context in which each site is situated.

**Study Findings:** The *Trip Generation for Smart Growth* study presents an overview of a mixed-use development trip generation method (Mixed-Use Method) recently developed by a team led by Fehr & Peers to improve vehicle trip generation forecasts for mixed-use developments. This method was applied to a series of Smart Growth sites in the San Diego area.

This study is accompanied by a spreadsheet tool designed for estimation of trip generation in Smart Growth settings. The spreadsheet tool applies the Mixed-Use Method described within this study. The spreadsheet tool, as well as the study, is available as a resource for local jurisdictions, if they choose to use it. Local jurisdictions within the SANDAG region are under no obligation to use the tool or the study in their development approval processes.

This study found that, at both the site level and at the Smart Growth Opportunity Area (SGOA) level, reductions in vehicle trips were observed for Smart Growth development, relative to the number of trips that would be expected to occur in typical suburban developments. These findings suggest trip generation generally will be overestimated at Smart Growth developments, if appropriate trip reductions are not included in the calculations.

The study also identified and validated a method to account for the amounts of trip reduction attributable to different Smart Growth development forms. The Mixed-Use Method, initially developed for the EPA and the Institute of Transportation Engineers (ITE), accounts for the degree to which mixed-use sites internally capture travel and the extent to which Smart Growth site design and context results in walking, biking, and transit use. The study validated the Mixed-Use Method for use within the San Diego region by comparing the method's trip generation estimates to actual travel data from twenty of the region's SGOAs and six smaller mixed-use/TOD sites.

The Mixed-Use Method represents a dramatic improvement over current methods of estimating trip generation for Smart Growth developments. The method produces reliable, though still somewhat conservative, estimates of trip generation that are highly sensitive to the context of any given development. Specifically, it accounts for the degree to which a development can be considered "Smart Growth," by measuring discrete characteristics of the site, such as nearby transit frequency and level of service, walkability, development density, and mix of uses. In contrast, the *San Diego Traffic Generators Manual* currently recommends generic, across-the-board trip reduction percentages of five percent for locations within one-quarter mile of transit and 10 percent for mixed-use – regardless of the frequency or level of service of the nearby transit, density, and walkability of the site in question.

### **Designing for Smart Growth, Creating Great Places in the San Diego Region**

The quality of a community's design can make the difference between a sense of overcrowding and a feeling of vibrancy. This particularly is true where smart growth development principles result in more intense development and a greater mix of uses. *Designing for Smart Growth, Creating Great Places in the San Diego Region* is a resource for policymakers, local agency planning and engineering staff, developers, and interested citizens that shows how good design can contribute to the quality of life in the San Diego region. Guidelines in this publication address the importance of design in maintaining and enhancing community character and in creating great public places. It serves as both a primer and a technical reference. Among the subjects covered are such community defining topics as site design, street design, and parking to support mixed-use developments and a variety of transportation options.

### **3.2.3. The San Francisco Bay Area Metropolitan Transportation Commission (MTC)**

The San Francisco Bay Area MTC has adopted various policies related to encouraging TOD. The following sections describe these policies and this Metropolitan Planning Organization's (MPO) focus on encouraging community connection to transit stations.



### **MTC's TOD Policy**

To promote cost-effective transit service, ease regional housing shortages, create vibrant communities, and preserve open space, MTC adopted a TOD Policy in 2005 that applies to transit extension projects in the Bay Area. Research shows that residents living within one-half mile of transit service are much more likely to use it, and large job centers within one-quarter mile of transit service draw more workers on transit.

MTC's TOD Policy includes three key elements. The first is corridor-based performance measures to quantify minimum levels of development around transit stations. Minimum thresholds are based on the transit mode – there is a higher threshold for capital-intensive modes, such as the Bay Area Rapid Transit (BART) system. Second, MTC will help to fund station area plans for jobs and housing, station access, design standards, parking, and other amenities, based on unique circumstances and community character. The third element of the TOD Policy is creation of Corridor Working Groups that bring together local government staff, transit agencies, county congestion management agencies (CMAs), and other key stakeholders along the corridor to help develop station area plans to meet MTC's corridor-wide, land-use thresholds.

Augmenting development of the TOD Policy, MTC undertook a TOD Study, an extensive analytical and outreach process that assessed the opportunities, benefits, and barriers for increased levels of TOD in the San Francisco Bay Area. MTC surveyed over 900 households to examine what attracts San Francisco Bay Area home-seekers to TOD neighborhoods and how to improve these neighborhoods to better attract home-seekers. The goal was to help elected officials, public agency professionals, community stakeholders, and developers understand how to develop high-quality TODs so they successfully create great neighborhoods and attract new residents. This work is applicable to town centers, downtowns, transit villages, urban neighborhoods, and suburban centers.

### **TOD Financial Incentives**

The Bay Area MTC has designated a series of Priority Development Areas (PDAs) near transit where land development should be focused. Similar to SANDAG's Smart Growth Opportunity Areas, MTC provides funding incentives for pedestrian and bicycle infrastructure and, generally, to support planning and design in these designated areas. Local jurisdictions with designated PDAs and goals closely aligned with MTC program objectives can secure financial assistance for planning and project implementation. Funding opportunities for local governments with PDAs include: streetscape improvements, station area planning, transportation demand management, and density incentives.

### **MTC Safe Routes to School Program**

The Bay Area MTC has a newly established Safe Routes to School (SR2S) Program for the region, which provides funding to the counties, further augmenting the federal and state SR2S programs (administered by Caltrans) and local programs. A total of \$17 million will be distributed to the counties proportionately, according to their share of total school enrollment in the region. Initially, county CMAs are responsible for convening a collaborative county process in order to decide which investments make sense, given that each county faces unique SR2S implementation challenges and determination must be made regarding which agency will implement the program.

### **MTC Safe Routes to Transit Program**

The Safe Routes to Transit (SR2T) Program awards \$20 million in grants to facilitate walking and bicycling to access regional transit service. Bicycling and walking are cost-effective and sustainable ways to reach regional transit stations; yet many commuters cite safety as the main reason they drive instead. This program is funded by Regional Measure 2 and is administered by TransForm and the East Bay Bicycle Coalition. Safe Routes to Transit (SR2T) promotes bicycling and walking to transit stations by funding projects and plans that make non-motorized feeder trips easier, faster, and safer. By improving the safety and convenience of biking and walking to regional transit service, SR2T gives commuters the opportunity to leave their cars at home and reduce congestion on Bay Area bridges. Improvements in the safety and convenience of bicycling and walking to regional transit give commuters the opportunity to leave their cars at home. To date, approximately \$16 million has been awarded to over 40 capital and planning projects. SR2T funds may be used for:



- Secure bicycle storage facilities at transit stations/stops/pods
- Safety enhancements for pedestrian/bike station access to transit stations/stops/pods
- Removal of pedestrian/bike barriers near transit stations.



## 4.0 STAKEHOLDER OUTREACH

Engaging a wide range of stakeholders is important on all MAG transportation studies. MAG is dedicated to taking a proactive approach to establishing effective communication with the community and securing input early and often in the planning process. This approach will aid MAG in building community-based, informed consent for the project outcome. MAG will utilize two means to provide opportunities for identifying, educating, informing, and engaging stakeholders throughout the process, as well as ensuring coordination with study project partners: Stakeholder Workshops and a Technical Working Group (TWG).

Stakeholder workshops will provide an appropriate venue where a variety of stakeholders may come and participate in the planning process, engaging the DTAC Study Team to share their ideas, concerns, and solutions relating to transit accessibility. The TWG will be a small committee of professional staff from member agency with transit specific interests.

### 4.1 Outline of Responsibilities

**MAG Staff** – Alice Chen, Project Manager, will be the main point of contact for the project for stakeholder outreach. Alice may designate a representative from time to time to represent the project at specific meetings or during MAG committee meetings.

**Consultant Team** – The Consultant Team will have two components:

Executive Team (Alice Chen, Dan Marum, Trent Thatcher, Jim Townsend); and

DTAC Study Team (Alice Chen and all consultants).

**Technical Work Group (TWG)** – The TWG will meet at crucial milestones as the study progresses. It will be responsible for technical review of information and documents developed by the DTAC Study Team, providing critical comments/input. All findings and recommendations will be presented to the TWG prior to finalizing milestone deliverables. Table 4.1 provides a list of TWG members.

Table 4.1  
**TECHNICAL WORKING GROUP MEMBERS**

Name	Agency	MAG Committee Represented
Wahid Alam	City of Mesa	Population Technical Advisory Committee (POPTAC)
Katherine Coles	City of Phoenix	Bike and Pedestrian
Eric Iwerson	City of Tempe	Bike and Pedestrian
Deron Lorenzo	Valley Metro	Transit
Ben Limmer	Valley Metro	Transit
Ken Maruyama	Town of Gilbert	Elderly and Persons with Disabilities
Joseph Perez	City of Phoenix	Bike and Pedestrian
Karen Savage	City of Surprise	Bike and Pedestrian
Gardner Tabon	Valley Metro	Safety

### 4.2 Summary of Workshop #1

**Stakeholders** – MAG has identified several stakeholders to participate in the study. The initial group of stakeholders was placed into four groups (shown below in Tables 4.2 – 4.5) to better engage each member.



Table 4.2  
**FACILITIES STAKEHOLDER GROUP**

Name	Title	Organization
Antonio Barraza	Foreman II, Public Transit	City of Phoenix
Katherine Coles	Planner	City of Phoenix
Maureen Decindis	Bike and Pedestrian Coordinator	MAG
Jim Fox	Public Works Director	Town of Youngtown
EJ Hynick	Street Maintenance Foreman	City of Phoenix
David Kohlbeck	Assistant Public Works Director	City of Surprise
Vincent Lopez		Maricopa County Department of Public Health
Amy Moran*	Transportation Planner	Wilson & Company
Shannon Scutari	Chair	Sustainable Cities Coalition
Bernard Venegas		City of Phoenix Public Transit Department
Scott Wisner	Customer Service Manager	Valley Metro RPTA

\* Group Facilitator

Table 4.3  
**HUMAN SERVICES STAKEHOLDER GROUP**

Name	Title	Organization
Jane Bruzzese	Senior Director of Programs	Benevilla
Jody Burbank	Paratransit Program Coordinator	Valley Metro RPTA
Loretta Crimi	North West Valley's Transportation Stakeholders Committee	
Michelle	President/CEO	Benevilla
Jayne Hubbard	Mobility Manager	Foothills Caring Corps
Betty S. Lynch	Chair, West Valley Human Services Alliance	Southwest Valley Family YMCA Board of Management
Dan Marum*	Transportation Planner	Wilson & Company
Emily Patricia	Program Coordinator- SCP Maricopa County	Civic Service Institute @ NAU
Jim Townsend	Transportation Planner	Wilson & Company
Curt Upton	Planner	City of Phoenix

\* Group Facilitator



Table 4.4  
**SPECIAL NEEDS STAKEHOLDER GROUP**

Name	Title	Organization
Larry Clausen	Executive Director	Arizona Developmental Disabilities Planning Council
Debra Figueroa	Job Developer	Salvation Army
DeDe Gaisthea*	Transportation Planner	Maricopa Association of Governments (MAG)
Bob Gooltz	Chairman of Transportation Service	Sun City West Foundation
Debbie Kattelman	Accounts Receivable	Scottsdale Training and Rehabilitation Services
Reed Kempton	Transportation Planner	City of Scottsdale
Frances Nutty	Social Worker	DaVita Inc.
Brandon Ramsey	Community Relations Manager	Mosaic- Phoenix, AZ
Lena Rivera	Case Manager	NOVA Safe Haven
Trent Thatcher	Traffic Engineer	Wilson & Company
Reginald Ragland	Equal Opportunity Specialist (EOS)	City of Phoenix

\* Group Facilitator

Table 4.5  
**TRANSPORTATION STAKEHOLDER GROUP**

Name	Title	Organization
Stuart Boggs	Transportation Planning Manager	Valley Metro RPTA
Carol Ketcherside	Planning Director	Valley Metro RPTA
Julie Howard	Transit Coordinator	City of Mesa
Jorge Luna*	Transit Planner	MAG
Mark Melnychenko	Principal Planner	City of Phoenix Public Transit Department
Herb Muñoz, Jr.	Project Manager	City of Phoenix Public Transit Department
Evelyn Ng	Senior Transportation Planner	City of Scottsdale
Delores Nolan	Transportation Education Supervisor	Valley Metro RPTA
Mark Peterson	Transportation Planner	Fehr & Peers Associates
Janet Strauss	Transportation Planner	Valley Metro RPTA

\* Group Facilitator



The entire group met together to go over the purpose of the proceedings and gain a familiarity with project goals and objectives. A copy of the presentation is presented in Appendix C.

Following the general session, each stakeholder group reconvened in a separate room with a designated Group Facilitator and a DTAC Study Team member to discuss various transit accessibility issues. Group participants were encouraged to provide input to the study at this time. To help foster discussion among the group members, a list of questions was provided to focus their comments. However, each Group Facilitator was free to explore other pertinent issues as they arose. The breakout session questions are presented in Table 4.6.

Project Goal	Question
1. Identify the challenges faced by users getting to transit.	<ol style="list-style-type: none"> <li>1. What are transit user challenges in accessing transit?</li> <li>2. How can these challenges be addressed?</li> </ol>
2. Recommend improvements, policies and guidelines to enhance transit accessibility.	<ol style="list-style-type: none"> <li>1. What type of bicycle and pedestrian facilities should be provided near transit stops in the MAG region?</li> <li>2. What does ADA not address when considering bus/transit stops?</li> </ol>
3. <i>Provide measures and strategies helpful in creating transit accessible neighborhoods.</i>	<ol style="list-style-type: none"> <li>1. What obstacles do communities face in planning and implementing transit accessible improvements?</li> <li>2. What ideas do you have to help communities better plan and implement improvements for transit accessibility?</li> </ol>
4. <i>Provide a cost analysis and framework for funding options and prioritization of improvements.</i>	<ol style="list-style-type: none"> <li>1. If the region were to invest in transit accessibility improvements, what would you list as the most important criteria in prioritizing improvements and why?</li> <li>2. What are the challenges in funding accessibility improvements and how can we overcome them?</li> </ol>

Each group provided a series of comments, issues, and concerns that were recorded by the Group Facilitator. These responses are summarized in Table 4.7 below.

In addition to the responses summarized in Table 4.7, each stakeholder was provided with a comment sheet to provide additional comments, if needed, to the DTAC Study Team. At the time of publication of this Working Paper, no comment forms have been returned to MAG. A copy of the comment form is presented in Appendix D.



Table 4.7  
SUMMARY OF WORKSHOP #1 BREAKOUT SESSIONS

Issue	Facilities	Human Services	Special Needs	Transportation
Americans with Disabilities Act (ADA)	<ul style="list-style-type: none"> <li>• Accessible path of travel – someone with disabilities</li> <li>• Provide ample areas for those maneuvering onto the bus with wheelchairs or mobility devices.</li> <li>• Provide a pad for convenient waiting.</li> <li>• Improve “Stop” network, minimize specialized ADA transport.</li> <li>• Recent stops are of higher standard, need to retrofit and agree on one uniform standard.</li> </ul>	<ul style="list-style-type: none"> <li>• No safe place to accommodate a transfer of paratransit users to fixed-route bus (Hospital and Sun City Route 106)</li> <li>• ¼ mile is the limit those with disability can traverse, when there are no other fixed routes in the area.</li> <li>• The larger metro areas around the light rail transit (LRT) get better transit amenities than those outside the area.</li> <li>• Mobility Center is good, lessens anxiety for those accessing transit with special needs.</li> </ul>	<ul style="list-style-type: none"> <li>• Those with special needs take longer to access transit. It seems a long distance to travel.</li> <li>• Dial-A-Ride is not reliable to arrive on time.</li> <li>• Not all stops are ADA compliant.</li> <li>• Have volunteers help those with disabilities access transit.</li> <li>• If Federal Government classifies someone as disabled, they should qualify for transit assistance and not just rely on the Mobility Center for training.</li> <li>• Increase ADA compliance in areas near large older populations.</li> </ul>	<ul style="list-style-type: none"> <li>• Dial-A-Ride provides a safety net.</li> <li>• Access for wheel chairs</li> <li>• Gated Communities have green belts to access bus stops more easily; however, these are not always ADA accessible.</li> </ul>
Bike	<ul style="list-style-type: none"> <li>• Have bike lanes linked to bus stops -collector/arterial</li> <li>• Local streets are bikeable.</li> <li>• Need racks installed at stops in case bus rack is full and bike must be secured.</li> </ul>	<ul style="list-style-type: none"> <li>• Racks on busses are desirable and fill up fast.</li> <li>• Lack of paths near bus stops and transit in general</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• LRT is crowded with bikes.</li> <li>• Bike racks on transit vehicles often are full.</li> <li>• Bike to transit is an issue especially for transit dependent; design to increase bike storage capacity.</li> <li>• Bike sharing program</li> <li>• Bike lockers</li> <li>• More frequent service can reduce crowding and capacity issues.</li> </ul>
Sidewalk/Walkability	<ul style="list-style-type: none"> <li>• Improve safety of sidewalks (8th most dangerous for pedestrians in USA).</li> <li>• Too spread out and too many traffic lanes (not walkable)</li> <li>• Streetscape Scottsdale has high standards, calling for 10-foot sidewalks; five-foot categories give a pleasant and safe feel.</li> <li>• Provide wider and smoother sidewalks.</li> <li>• Avoid rough spots (i.e. decorative or excessively winding).</li> </ul>	<ul style="list-style-type: none"> <li>• Continuous sidewalk is missing in many areas.</li> <li>• Distance too long between stops.</li> <li>• Lack of trails near bus stops</li> <li>• Improve transitions from areas without sidewalk to sidewalks with smooth surfaces.</li> </ul>	<ul style="list-style-type: none"> <li>• Stray animals make pedestrians and those with disabilities feel uncomfortable walking to transit.</li> <li>• Differences in the terrain surrounding the area, gravel, grass, incomplete sidewalks.</li> </ul>	<ul style="list-style-type: none"> <li>• More density increases need for pedestrian access.</li> <li>• Lack of accessible sidewalks</li> <li>• Master-planned communities lack Interconnectivity.</li> <li>• Historical areas want to remain rural (bridal paths, no sidewalk improvements etc), but they are in the heart of the city.</li> <li>• Difficult to cross streets (especially seniors &amp; disabled).</li> <li>• Short signal phases</li> <li>• Wide, car-focused streets</li> <li>• Road construction detours pedestrians.</li> <li>• Obstacles in public right-of-way</li> </ul>



Table 4.7 (continued)  
SUMMARY OF WORKSHOP #1 BREAKOUT SESSIONS

Issue	Facilities	Human Services	Special Needs	Transportation
Street Crossing	<ul style="list-style-type: none"> <li>High intensity Activated crossWalk (HAWK) signaling system is safer than mid-block crossings.</li> <li>Too many lanes to cross at wide arterials and collectors</li> <li>Too few mid-block crossings</li> </ul>	<ul style="list-style-type: none"> <li>Few mid-block stops have crosswalks or have safer crossing areas nearby, particular along arterials and wider streets.</li> <li>Utilize HAWK signaling system at mid-block crossings to create higher awareness.</li> <li>Crossing time at traffic signals not long enough for seniors.</li> </ul>	<ul style="list-style-type: none"> <li>Mid-block stops tend not to be close to a signal or safe crossing.</li> <li>Pedestrians are forced to cross wide, multi-lane arterials, particularly at mid-block crossing, where traffic signals do not exist.</li> <li>Transfer times are too short when crossing wide arterials.</li> <li>Motorists are inattentive to transit patrons crossing unsignalized crosswalks.</li> <li>Wide streets are a barrier to pedestrians and those with disabilities.</li> </ul>	<ul style="list-style-type: none"> <li>Signal timing for pedestrians</li> <li>Engineers must be more aware of pedestrians.</li> <li>Traffic calming to reduce vehicle speeds</li> <li>Hawk – rethink need to move pedestrian crossings</li> </ul>
Funding	<ul style="list-style-type: none"> <li>Mesa prepared a “Bus Stop Improvement Plan,” but Congestion Management and Air Quality (CMAQ) Improvement Program will not fund ADA only plans.</li> <li>Bus stop improvements have a point system or warrant for Phoenix area. Does a project meet the warrant (criteria)? Is it worthwhile to try for federal grants for highest priority projects or wait for major street or land use projects?</li> </ul>	<ul style="list-style-type: none"> <li>Funding tends to go to the population centers and leaves the outskirts without sufficient improvement funding.</li> </ul>	<ul style="list-style-type: none"> <li>Funding for stops</li> <li>Operational cost to maintain is high, especially if trash containers, water fountains were added</li> </ul>	<ul style="list-style-type: none"> <li>Adopt-A-Bus Program</li> <li>Gasoline money/use of Highway-User Revenue Fund (HURF) money</li> <li>Next Prop 400 bus improvements</li> <li>Need for flexible funding programs</li> <li>Current tough economic times</li> <li>Address: Better shelter design, pedestrian-focused design guidelines, education of users and officials, change people’s perspective (buses aren’t just a social service)</li> <li>Consider stop location early on, collaboration between all parties.</li> <li>Funding has been traditionally auto-focused - distribute more money to transit.</li> </ul>
Policy	<ul style="list-style-type: none"> <li>Baby strollers can’t use ADA ramp.</li> <li>Stop shading</li> <li>No region-wide standard</li> <li>Need to prioritize: safety, communication, shade, lighting, benches, distance between stops, land use design and transit stop locations, smooth continuous sidewalk</li> </ul>	<ul style="list-style-type: none"> <li>Unincorporated areas may be lower priority for stop improvements.</li> </ul>	<ul style="list-style-type: none"> <li>Encourage policy makers to talk with and take into account the needs of transit users.</li> <li>Develop regional level policy for stop design and placement.</li> <li>Need standardized regional policy for stop placement.</li> <li>Include mobility issues in conversation</li> </ul>	<ul style="list-style-type: none"> <li>Promote implementation of the “Complete Streets” concept to benefit all users.</li> <li>Bike racks on transit vehicles</li> </ul>
Environment	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Weather protection is needed at stops.</li> <li>Shelters and shading are important to those using medication with sun exposure and heat exposure side effects.</li> </ul>	<ul style="list-style-type: none"> <li>Have volunteers provide water at stops frequented by those with special needs or seniors.</li> <li>Better shade needed around stops.</li> <li>Extreme temperatures can be fatal for persons with a disability.</li> </ul>	<ul style="list-style-type: none"> <li>Misters to deal with the heat</li> <li>Shade needed</li> </ul>



Table 4.7 (continued)  
SUMMARY OF WORKSHOP #1 BREAKOUT SESSIONS

Issue	Facilities	Human Services	Special Needs	Transportation
Information System	<ul style="list-style-type: none"> <li>Develop a master database of bus stops that are ADA accessible.</li> <li>Stop locator needs to include interactive Web-based map to look at each site not just list the stop.</li> <li>Phoenix owns Bus Stop Management System.</li> <li>The system needs to add attributes of the stops.</li> <li>Each city needs to maintain its own database.</li> <li>Transit accessible (TA) communities should be identified, (not all communities can be TA).</li> <li>NEXT STOP is good, give real time arrival of next bus.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Have drivers and others assist those with special needs or disabilities in understanding how to use the bus.</li> </ul>	<ul style="list-style-type: none"> <li>Remove mystery; make transit service information more accessible.</li> </ul>
Transit System	<ul style="list-style-type: none"> <li>Get feedback from users.</li> </ul>	<ul style="list-style-type: none"> <li>Too far between stops. Consider making more mid-block stops to shorten distance to nearest stop.</li> </ul>	<ul style="list-style-type: none"> <li>Not enough transit connectivity to outlying unserved communities.</li> <li>No transit service to Sun City.</li> <li>Not enough options for transit in the Northwest Valley and the outlying areas of the region.</li> <li>Coordinate route timetables with adjoining cities – some neighboring cities have differing headways on same street making transfers more difficult.</li> <li>Consider placement of transfers points, both ADA and non-ADA, across jurisdictional boundaries.</li> <li>Explore “same as” models.</li> </ul>	<ul style="list-style-type: none"> <li>More density increases need for enhanced pedestrian access.</li> <li>More frequent service reduces crowding and capacity issues.</li> <li>Way-finding challenges</li> <li>Infrequent service</li> <li>Car-focused transportation system</li> <li>Need for “complete” streets, transit friendly</li> <li>“Road diet” to reduce street size and lower speeds in neighborhoods to increase safety</li> </ul>



Table 4.7 (continued)  
SUMMARY OF WORKSHOP #1 BREAKOUT SESSIONS

Issue	Facilities	Human Services	Special Needs	Transportation
Stops	<ul style="list-style-type: none"> <li>• Shade stops only every mile or transfer point.</li> <li>• Standardize color of stops, tan structures, blue signs. Some stops don't look like stops.</li> <li>• Encourage cities to improve stops during general plan updates.</li> <li>• Local communities should upgrade stops.</li> <li>• Encourage private partnerships to build stops.</li> <li>• Every area has different stop designs which make it difficult to look unified.</li> <li>• When upgrading stops consider; location wait time, number of boardings, if it is a transfer stop, and maintenance costs.</li> <li>• If art shelters are built they should be mobile so that they can be relocated if the stop becomes obsolete.</li> </ul>	<ul style="list-style-type: none"> <li>• Need covered seating to get out of sun or inclement weather.</li> <li>• Lighting should be provided at stops.</li> <li>• Too far between stops. Consider making more mid-block stops to shorten distance to nearest stop.</li> </ul>	<ul style="list-style-type: none"> <li>• Poor shelter design does not block the sun.</li> <li>• Make sure all stops are ADA accessible (improved or otherwise).</li> <li>• Place stops closer to entrances to medical facilities to shorten walking distance for those with special needs.</li> <li>• Optimize the distance between stops to increase travel time and improve efficiency.</li> <li>• Place stops at large activity centers.</li> <li>• Inventory all stops to document what amenities they have, and the usage.</li> <li>• Seating is important to the elderly and those with special needs.</li> <li>• Revisit usage of stops – demographic change.</li> <li>• Standardize stops to assist with maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>• Material/composition can be uncomfortable; metal heats up.</li> <li>• Braille at bus stops</li> <li>• Provide misters to deal with the heat.</li> <li>• Orient amenities to provide shelter and shade.</li> <li>• Some locations don't have the space in the ROW for a bus stop.</li> <li>• Somewhere to sit is important</li> </ul>



## 5.0 ASSESSMENT OF DATA

Secondary data in electronic formats will be essential to the analyses proposed to be accomplished for the DTAC Study, especially for Task 4 – Categorize Transit Stops and Case Studies. In Task 4, the Consultant Team proposes creating a typology of transit stops by grouping stop areas that have characteristics or traits in common. The groupings then would be the basis for developing prototypical pedestrian and bicycle improvements under Task 5 – Develop Prototype Concepts. The typology would be based on socioeconomic and built environment factors that have been shown to influence transit, bicycle, and pedestrian demands, as well as the quality of transit service. Other data, reflecting micro-scale characteristics of the built environment, such as curb ramps, street trees, presence of sidewalk, and street lights, will be helpful in developing the typology and defining conceptual responses to accessibility issues. This section describes the general data types necessary to support this key aspect of the DTAC Study. It also documents the Consultant Team’s effort to obtain this data and the results of the data collection effort to date.

### 5.1 Data Needs Requests

Because there is no one place or source from which transit data may be obtained regarding regional transit operations, it was decided that the MAG Project Manager would serve as the main point of contact for all data requests and responses to those requests. To assist in tracking the data requests, the Consultant Team developed a Data Request Sheet, which was given to the MAG Project Manager in January, 2012. The Data Request Sheet represents a list that is evolving as data requests are added, needs are determined, and additional data is identified. The MAG Project Manager distributed the Data Request Sheets to necessary individuals at a variety of agencies across the county. Examples of socioeconomic and macro-scale data requested include:

- 2010 Census Data
- Employment and Employment Centers
- MAG Region Land Uses
- MAG Regional Roadway Network.

Examples of transit-related data requested include:

- Valley Metro RPTA Monthly Boardings Report
- Existing Transit Routes
- Georeferenced Bus Stop Locations.

A copy of the full list of requested data is provided in Appendix E.

### 5.2 Data Limitations

Initially, the Consultant Team requested 27 different types of data through the MAG Project Manager. The MAG Project Manager has received approximately nine of the data files requested, including all current census data, housing and land use data, and transportation system data. The disparity between information identified on the Data Request Sheet and data received is due to two factors: (1) the requested data does not exist within one agency’s control; and (2) the data is unavailable.

A good example of where data are not readily available from one source is transit stop amenities. Each MAG member agency is responsible for bus stop design and installation of stop amenities, such as benches, trash cans, and shelters. If a stop warrants amenities, the local municipality funds, installs, and maintains the improved stop. If geographic information system (GIS) data or other stop data are available, it would be up to each municipality to collect and maintain this data.

An example of data not available is transit boardings/alightings (on/off) by stop. Valley Metro does not have the technology fully deployed in its fleet to account for boardings and deboardings by stop. Only a few buses have this



technology. Valley Metro can detect boarding passengers by fare collection, but this data is dependent upon the driver to collect and, as a result, data collection is inconsistent.

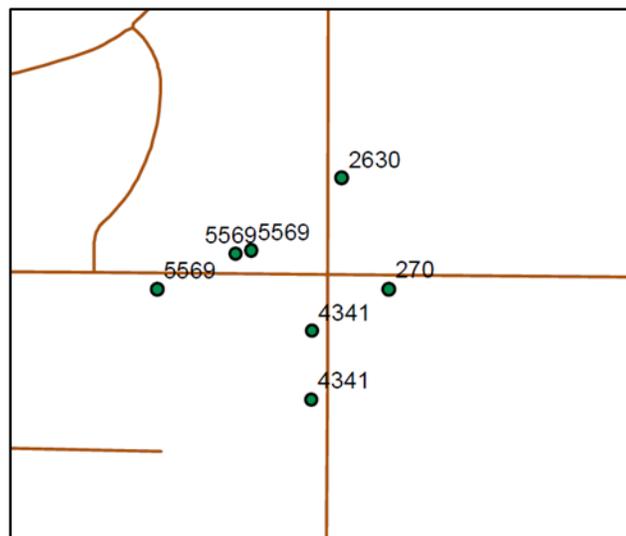
### 5.3 Data Assessment

The key data required to perform Task 4 has been obtained. Other key data that will be required for Task 5, such as curb ramps, street trees, and street lighting for specific stop locations, has not yet been obtained. Obtaining this data will require contact with the appropriate jurisdictions in Maricopa County.

Geocoded bus stops are an important data type for this study, in that the data gathered can support the preliminary analyses of bus stop areas. Valley Metro provided the Consultant Team with a bus-stop-point shapefile. Upon review of this data, it was noted that multiple points were assigned the same identification number. Initially, the Consultant Team assumed the data structure reflected nearside and farside transit stops. Upon further inquiry with Valley Metro, it was determined that there was an error in the data collection methodology, whereby the geographic positioning system (GPS) data capture had resulted in collecting multiple points for a single bus stop site.

Figure 5.1 graphically displays the issues associated with the geocoded bus-stop-point shapefile. The figure depicts an intersection in the region served by the regional transit system. At this intersection, there are three points reflecting the bus stop with an identification number of STOP5569 and two points reflecting STOP4341. Thus, the shapefile could be interpreted as accounting for more than two stops. This problem was fairly easily resolved by performing a feature dissolve in GIS, using the bus stop ID field.

Figure 5.1  
EXAMPLE OF MULTIPLE BUS STOPS FOR SINGLE LOCATION



A more difficult issue was discovered in relation to summing the number of routes by bus stop, which is a “quality of transit service” indicator desired for further assessment under Task 4. The screenshot, shown in Figure 5.2, shows four bus-stop-points with the same bus stop, specifically the number 42 under the column labeled BSM\_STOPID. The challenge with this issue was to calculate the total number of bus routes serving each bus stop, regardless of the number of points associated with the bus stop, or the number of fields in which the bus route information was contained. To accomplish this task, the Consultant Team programmed a routine that facilitated the concatenation, i.e., linking together, of bus route information into a single field. The Consultant Team then was able to perform a count of the multiple routes serving each bus stop area. The routine performed well, and the Consultant Team was able to generate a field of data showing the number of bus routes serving each bus stop. In this case, the bus-stop-point is served by four routes: 7, 8, 16, and 77.



Figure 5.2  
SCREENSHOT INDICATING A MULTIPLE GEOCODED BUS STOP

LONDECIDEG	LATDECIDEG	HEADING	DIRECTION	ON_ROUTE_A	ON_ROUTE_B	ON_ROUTE_C	ON_ROUTE_D	ON_ROUTE_E	ON_ROUTE_F	ON_ROUTE_G	ON_ROUTE_H	JURIS	CITYNUM	BSM_STOPID	BSM_SHTSTP	BSM_DS
-111696076	33412762	310.2543							45			MESA	ME	39	EB E ARBOR AV NB S RECKER RD S PHN	ME
-111590066	33377684	89.7302	77									PHOENX	PH	41	EB E BASELINE RD FS S 44TH ST S 4ET	PH
-112064742	33377159	232.3499			B							PHOENX	PH	42	EB E BASELINE RD FS S 7TH ST S 9TH	PH
-112064730	33377200	100.962	7									PHOENX	PH	42	EB E BASELINE RD FS S 7TH ST S 9TH	PH
-112064717	33377176	220.2013				16						PHOENX	PH	42	EB E BASELINE RD FS S 7TH ST S 9TH	PH
-112064302	33377656	101.5959										PHOENX	PH	42	EB E BASELINE RD FS S 7TH ST S 9TH	PH
-111917343	33378187	89.6551	77									TEMPE	TE	43	EB E BASELINE RD FS S DORSEY LA S M	TE
-111504674	33378117	61.4708	77									TEMPE	TE	44	EB E BASELINE RD FS S MA 791 TYP I A G	TE

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(4 out of 9127 Selected)



## 6.0 NEXT STEPS

The next phase of the project will involve utilization of collected data collected to move forward toward categorizing the transit stops and studying each category in detail. Then, the DTAC Study Team will develop prototypical improvements for each category and recommend ways to fund and implement the improvements. Additional Working Papers will be developed to document the DTAC Study Team's progress, culminating in a final report that will include a DTAC Toolkit. The study is scheduled for completion during the latter part of 2012.



## **APPENDICES**



## Appendix A

### Existing Transit System Inventory



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# Public Transit Services and Facilities Overview

## 1.0 Light Rail Transit Service

### 1.1 METRO light rail

Light rail transit (LRT) service, referred to as "METRO light rail," currently consists of a 20-mile operating system with its northern terminus at 19th Avenue and Montebello Avenue in central Phoenix and its eastern terminus at Sycamore and Main Street in west Mesa (Figure 1). LRT service began public operation on December 27, 2008, and ridership has surpassed the initially forecasts of approximately 26,000 boardings a day. The LRT route serves 18 stations as it passes through Phoenix via Central Avenue and Washington Street, offering access to Phoenix Uptown, Phoenix Downtown, Arizona State University (ASU) Downtown Campus, and Phoenix Sky Harbor International Airport via an automated Sky Train (under construction). The route serves an additional ten stations through Downtown Tempe and the ASU Tempe Campus before proceeding to its easternmost station in west Mesa. Figure 1 provides a listing of LRT stations, the names of which reflect their locations, and identifies the interconnecting bus routes at 24 of the 28 stations.

### 1.2 Valley Metro LINK

An important component of the METRO Rail service is Valley Metro LINK bus service. Valley Metro LINK offers riders state-of-the-art bus service with rail-like comfort, speed and reliability. Two routes operate in the Mesa, Chandler, and Gilbert communities directly "linking" transit users to METRO Rail Sycamore/Main Street Station and other transit services at the Sycamore Transit Center:

- **Arizona Avenue/Country Club Drive** - Central Chandler, western Gilbert and downtown Mesa;
- **Main Street** – Eastern and southeastern Mesa, northeast Gilbert, central Mesa, and downtown Mesa.

Connections to fixed-route, local bus service also are possible at the transit center and community ends of the routes. Figure 2 shows the routings of Valley Metro LINK bus service and identifies stop locations.

## 2.0 Bus Service

Bus service is comprised of regularly scheduled, local, fixed-route service, express routes, local limited-stop service, RAPID service, neighborhood circulators, and rural connectors.

### 2.1 Express Commuter Services

Valley Metro operates express commuter services that accommodate morning and afternoon/evening commutes. There are two types of express service, as shown in Figure 3: RAPID and Express Bus.

#### 2.1.1. RAPID Service

RAPID bus service offered through the City of Phoenix includes few stops and high speeds and, generally, stays to the Valley freeway systems. Currently, there are four RAPID routes that connect outer areas of the City to the downtown area:

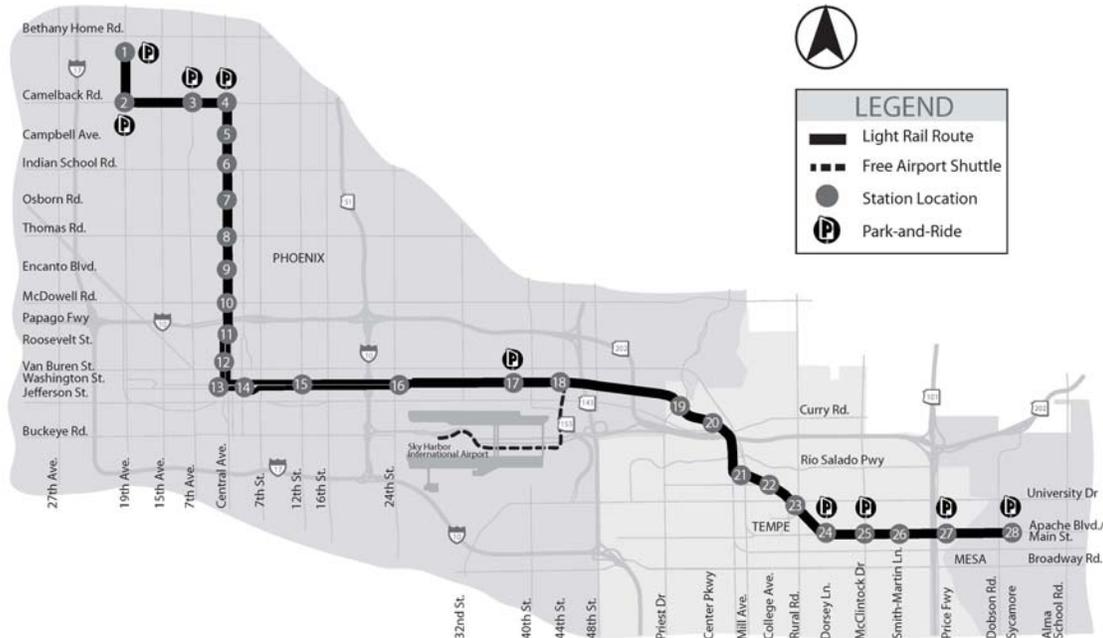
- I-10 East RAPID – serves Ahwatukee Foothills neighborhood of Phoenix
- I-10 West RAPID – serves west Phoenix and Glendale, Avondale, Tolleson communities
- I-17 RAPID – serves north Phoenix
- SR-51 RAPID – serves northeast Phoenix.

Figure 4 provides additional detail on routing of the RAPID service and identifies the location and character of established stops.



Figure 1  
METRO LIGHT RAIL ROUTE AND STATION LOCATIONS

# METRO Light Rail



## LEGEND: Light Rail Stations with Connecting Bus Routes\*

- |  |  |  |  |
|--|--|--|--|
| <p><b>1. Montebello / 19th Avenue</b><br/>Bus Routes: 15, 19, 60, RAPID to Rail</p> <p><b>2. 19th Avenue / Camelback</b><br/>Bus Routes: 19, 50</p> <p><b>3. 7th Avenue / Camelback</b><br/>Bus Routes: 8, 50</p> <p><b>4. Central Avenue / Camelback</b><br/>Bus Routes: 0, 39, 50, GL, 512</p> <p><b>5. Campbell / Central Avenue</b><br/>Bus Routes: 0, GL, 512</p> <p><b>6. Indian School / Central Avenue</b><br/>Bus Routes: 0, 41, GL, 512</p> <p><b>7. Osborn / Central Avenue</b><br/>Bus Routes: 0, GL, 512</p> <p><b>8. Thomas / Central Avenue</b><br/>Bus Routes: 0, 29, GL, 512</p> <p><b>9. Encanto / Central Avenue</b><br/>Bus Routes: 0, GL, 512</p> | <p><b>10. McDowell / Central Avenue</b><br/>Bus Routes: 0, 17, GL, 512</p> <p><b>11. Roosevelt / Central Avenue</b><br/>Bus Routes: 0, 10, GL, 512</p> <p><b>12. Van Buren / Central Avenue</b><br/><b>Van Buren / 1st Avenue</b><br/>Bus Routes: 0, 1, 3, 7, 8, 10, 12, 15, DASH, GL, 510, 512, 520, 521, 531, 532, 533, 535, 540, 541, 542, 560, 562, 571, 573, 575, RAPID: 1-10, East, 1-10 West, 1-17, SR51</p> <p><b>13. Washington / Central Avenue</b><br/><b>Jefferson / 1st Avenue</b><br/>Bus Routes: 0, 1, 8, 10, 15, DASH, GL, 510, 512, 520, 521, 531, 532, 533, 535, 540, 541, 542, 560, 562, 571, 573, 575, RAPID: 1-10 East, 1-10 West, 1-17, SR51</p> <p><b>14. 3rd Street / Washington</b><br/><b>3rd Street / Jefferson</b></p> | <p><b>15. 12th Street / Washington</b><br/><b>12th Street / Jefferson</b><br/>Bus Routes: 1, RAPID: SR51</p> <p><b>16. 24th Street / Washington</b><br/><b>24th Street / Jefferson</b><br/>Bus Routes: 1, 70</p> <p><b>17. 38th Street / Washington</b><br/>Bus Route: 1</p> <p><b>18. 44th Street / Washington</b><br/>Bus Routes: 1, 3, 13, 44, Free Airport Shuttle</p> <p><b>19. Priest Drive / Washington</b><br/>Bus Routes: 1, 56</p> <p><b>20. Center Parkway / Washington</b></p> <p><b>21. Mill Avenue / Third Street</b><br/>Bus Routes: Orbit: Earth</p> <p><b>22. Veterans Way / College Avenue</b><br/>Bus Routes: 48, 62, 65, 66, 72, Orbit: Earth, Jupiter, Mars, Mercury, Venus</p> | <p><b>23. University Drive / Rural</b><br/>Bus Routes: 72, Orbit: Mars, Mercury</p> <p><b>24. Dorsey / Apache Boulevard</b></p> <p><b>25. McClintock / Apache Boulevard</b><br/>Bus Route: 81</p> <p><b>26. Smith-Martin / Apache Boulevard</b></p> <p><b>27. Price-101 Freeway / Apache Boulevard</b><br/>Bus Route: 511</p> <p><b>28. Sycamore / Main Street</b><br/>Bus Routes: 30, 40, 45, 96, 104, LINK Service</p> |
|--|--|--|--|

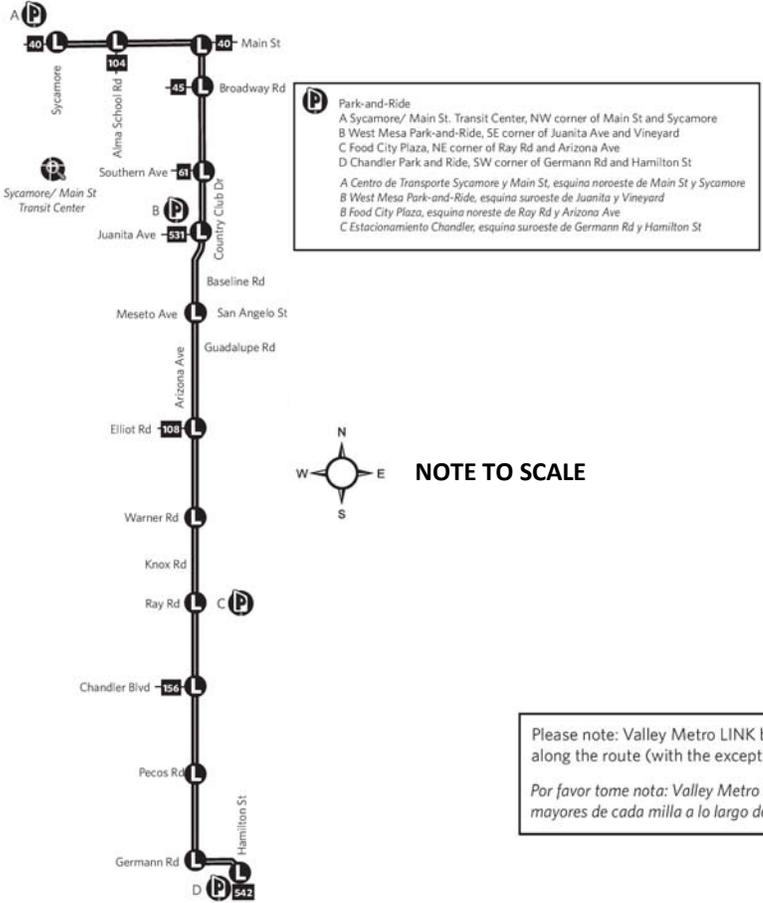
\*Bus route information is subject to change.

Information shown:  
Effective July 25, 2011.



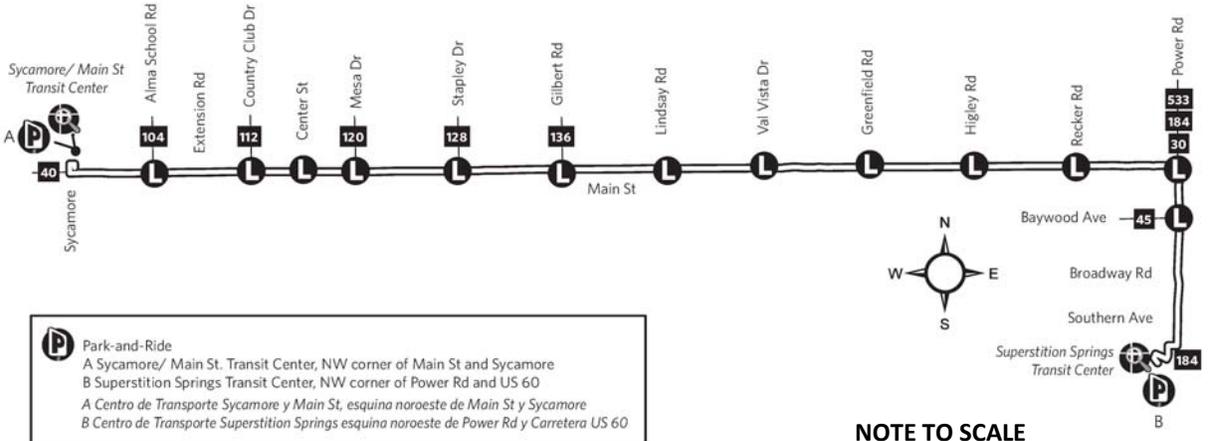
Figure 2  
VALLEY METRO LINK ROUTES AND STOP LOCATIONS

Valley Metro LINK — Arizona Ave/Country Club Dr



Please note: Valley Metro LINK bus service only stops at major mile intersections along the route (with the exception of Center St.).  
 Por favor tome nota: Valley Metro LINK parará únicamente en las intersecciones mayores de cada milla a lo largo de la ruta (con excepción de Center St.).

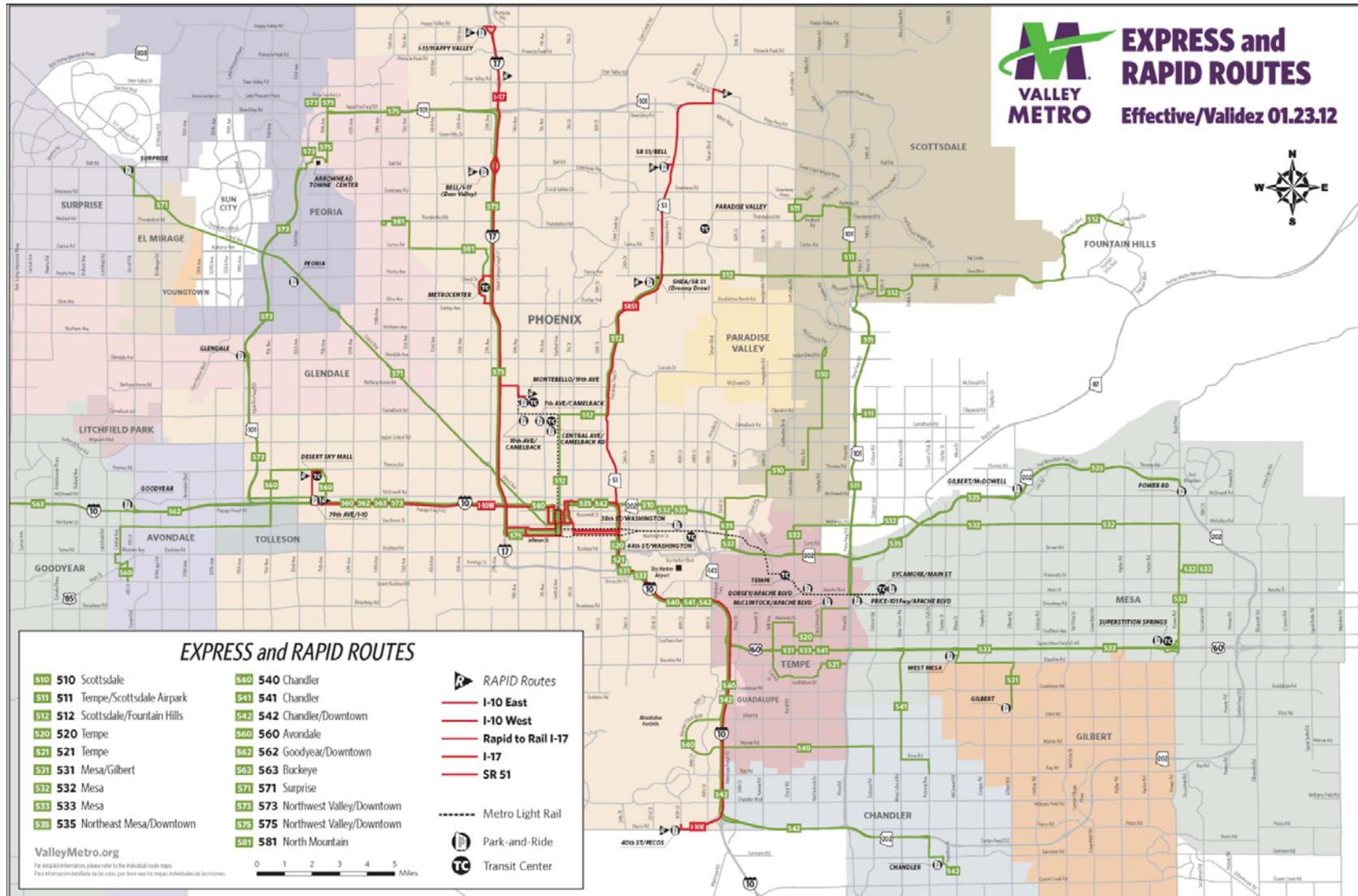
Valley Metro LINK — Main St



Source: Planning Your Trip, Valley Metro LINK Bus Service at [http://routes.valleymetro.org/timetables/8/route\\_list](http://routes.valleymetro.org/timetables/8/route_list).



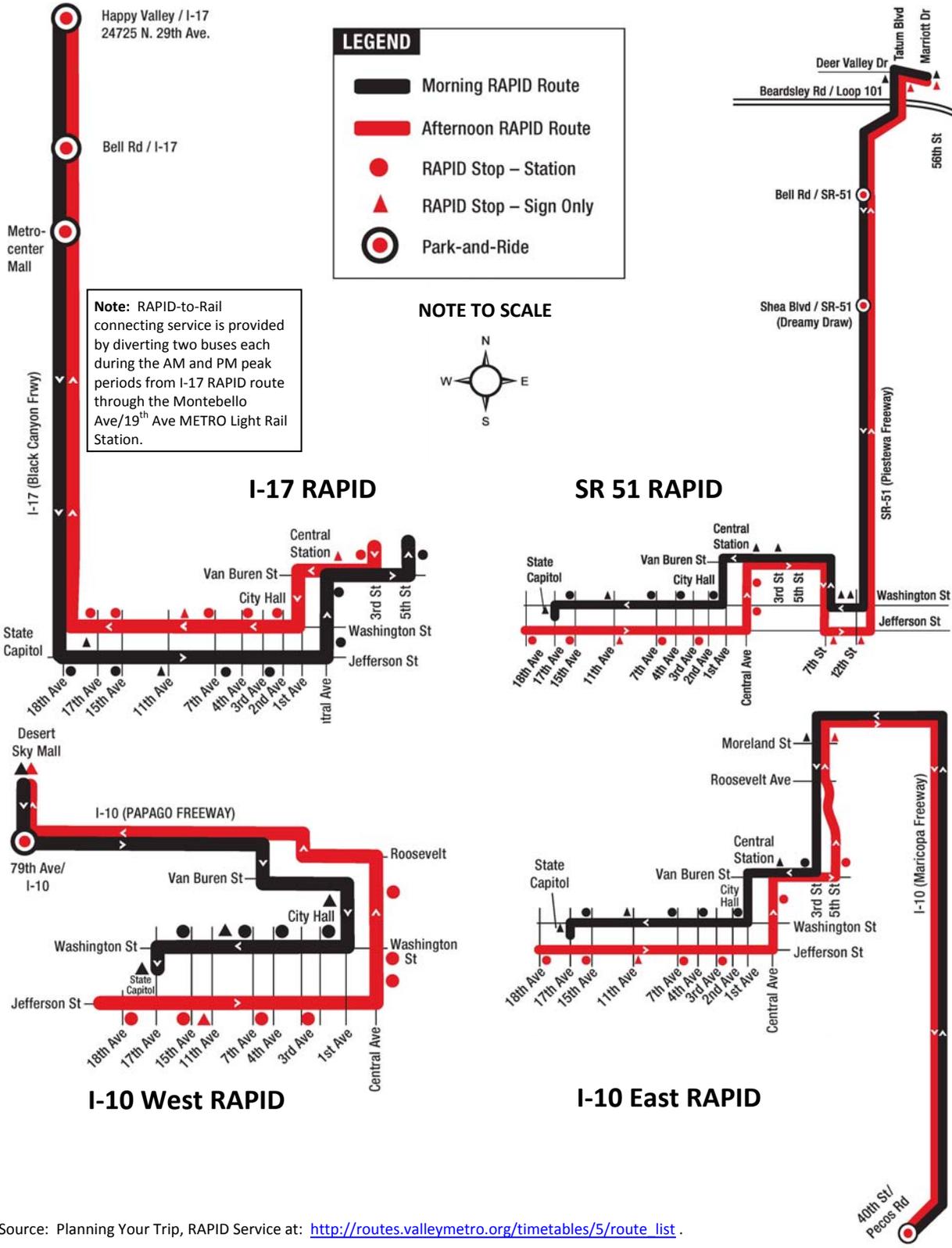
Figure 3  
**MAP OF EXPRESS AND RAPID ROUTES**



Source: Planning Your Trip, Express and RAPID Routes, Valley METRO Web site at: [http://www.valleymetro.org/planning\\_your\\_trip/express\\_rapid/](http://www.valleymetro.org/planning_your_trip/express_rapid/).



Figure 4  
CITY OF PHOENIX RAPID ROUTES AND STOP LOCATIONS



Source: Planning Your Trip, RAPID Service at: [http://routes.valleymetro.org/timetables/5/route\\_list](http://routes.valleymetro.org/timetables/5/route_list).



### 2.1.2. Express Bus Service

Currently, there are 19 operating Express Bus routes, as listed in Table 1. Refer to Figure 3, above, for the location and routing of these services.

Table 1  
EXISTING VALLEY METRO EXPRESS BUS SERVICES

Route #	Route Name	Route #	Route Name
510	Scottsdale Express	541	Chandler Express
511	Tempe/Scottsdale Airpark	542	Chandler Express
512	Scottsdale Express	560	Avondale Express
520	Tempe Express	562	Goodyear-Downtown Express
521	Tempe Express	563	Buckeye Express
531	Mesa/Gilbert Express	571	Surprise Express
532	Mesa Express	573	Northwest Valley-Downtown Express
533	Mesa Express	575	Northwest Valley-Downtown Express
535	Red Mountain-Downtown Express	581	North Mountain Express
540	Chandler Express		

Source: Schedules & Maps, Express Service, Effective July 26, 2010; Valley Metro Web site at: [http://routes.valleymetro.org/timetables/4/route\\_list](http://routes.valleymetro.org/timetables/4/route_list).

Three other express-like commuter services are offered:

- Grand Avenue Limited – Special, “Limited Stop” service during the AM and PM peak periods along US-60/Grand Avenue from El Mirage to Downtown Phoenix;
- Route 685 – Phoenix/Gila Bend Regional Connector Route; and
- Wickenburg Regional Connector – Wickenburg to Arrowhead Mall Transit Center in north Glendale/east Peoria.

The Wickenburg Regional Connector has been discontinued but likely will be reactivated in the future as Valley Metro funding improves.

## 2.2 Existing Scheduled Fixed-Route Bus Service

Regularly scheduled, fixed-route bus service is provided by Valley Metro to participating communities. This regional transit service is the most extensive geographically and in term of the amount of equipment and personnel devoted to it. More localized, community-based transit service is provided through the operation of circulators that facilitate travel between neighborhoods and local destinations (e.g., downtown areas, government complexes, educational facilities).

### 2.2.1. Local Bus Routes

Most major arterials in the MAG region have some local fixed-route bus service during the peak periods of travel. Service between the peaks is cut back to match travel demand and save operating costs. Substantial cuts have been made to bus services in recent months due to the current global economic downturn, which has forced significant budget cuts at all governmental levels. At the end of June, 2009, regularly scheduled local bus routes numbered 64 and 18 Shuttles/Circulators. It is highly likely the service levels of June, 2009, will be reestablished over time and even increased. In fact, the regularly scheduled local bus route service ultimately is being configured into a “Super Grid” system that will offer consistent, high-level services in association with the region’s arterial street system. Table 2 presents a listing of the 57 current regularly scheduled local bus routes.



Table 2  
EXISTING VALLEY METRO LOCAL BUS ROUTES

Route #	Identifier	Route #	Identifier
0	Central	60	Bethany Home
1	Washington	61	Southern
3	Van Buren	62	Hardy/Guadalupe
7	7th Street	65	Mill/Kyrene
8	7th Avenue	66	Mill/Kyrene
10	Roosevelt/Grant	67	67th Avenue
12	12th Street	70	Glendale/24th Street
13	Buckeye	72	Scottsdale/Rural
15	15th Avenue	77	Baseline
16	16th Street	80	Northern
17	McDowell	81	Hayden/McClintock
17A	McDowell - Avondale	90	Dunlap/Cave Creek
19	19th Avenue	96	Dobson
27	27th Avenue	104	Alma School
29	Thomas Road	106	Peoria/Shea
30	University	108	Elliot
35	35th Avenue	112	Country Club/Arizona Ave
39	40th Street	120	Mesa Drive
40	Main St	122	Cactus
41	Indian School	128	Stapley
43	43rd Avenue	136	Gilbert Road
44	44th Street/Tatum	138	Thunderbird
45	Broadway	154	Greenway
48	48th Street	156	Chandler Blvd/Williams Field Rd
50	Camelback	170	Bell
51	51st Avenue	184	Power Road
52	Roeser	186	Union Hills
56	Priest	251	51st Avenue
59	59th Avenue		

Prepared by Wilson & Company, February, 2012.

Source: Schedules & Maps, Local Bus Routes, Effective January 23, 2012; Valley Metro Web site at:  
[http://routes.valleymetro.org/timetables/2/route\\_list](http://routes.valleymetro.org/timetables/2/route_list).

### 2.2.2. Circulators

Circulator service generally includes connections with facilities, such as transit centers, and stops along regional routes, where access is gained to the larger, more extensive regional bus network. Thus, free Circulator bus service uses smaller buses to connect neighborhoods and residential areas to local destinations such as other neighborhoods, major bus routes, medical centers, schools, shopping, recreational areas, senior centers, and multi-generational centers. Many of the Circulators are oriented to providing access to downtown or core commercial areas of the communities operating them.

Six communities operate seven independent circulator services that offer 22 distinct routes (Table 3). Most of the routes operate seven days a week and; at a minimum, they provide service through the work week. The three circulator routes associated with the Tempe FLASH system specifically are oriented to supporting



March, 2012

weekday travel to/from the Arizona State University (ASU) campus. The Hospitality Trolley, operated by Scottsdale, provides service primarily in support of winter visitors (December 26 through March 31).

Table 3  
EXISTING CIRCULATOR ROUTES

City	Route	Operations
Avondale	ZOOM	Weekdays
Glendale	Glendale Urban Shuttle - 1	7 days a week
	Glendale Urban Shuttle – 2	Weekdays
	Glendale Urban Shuttle - 3	Weekdays
Mesa	Downtown BUZZ	Weekdays and Saturday
Phoenix	ALEX (Ahwatukee Local Explorer)	7 days a week
	DASH (Downtown Area Shuttle)	Weekdays
	Phoenix Fee Airport Shuttle	7 days a week
	MARY (Maryvale Area Rider for You)	7 days a week
	SMART (Sunnyslope Multi-Access Area Residential Transit)	7 days a week
Scottsdale	Miller Road Free Trolley	7 days a week
	Downtown Trolley	7 days a week
	Hospitality Trolley (Dec 26 – Mar 31)	7 days a week
	Neighborhood Trolley	7 days a week
Tempe	FLASH	
	Back	Weekdays
	Forward	Weekdays
Tempe	McAllister	Weekdays
	Orbit	
	Earth	7 days a week
	Jupiter	7 days a week
	Mars	7 days a week
	Mercury	7 days a week
Venus	7 days a week	

Source: Neighborhood Circulators, Valley Metro at: [http://routes.valleymetro.org/timetables/6/route\\_list](http://routes.valleymetro.org/timetables/6/route_list).

### 2.3 Transit Service Access Facilities

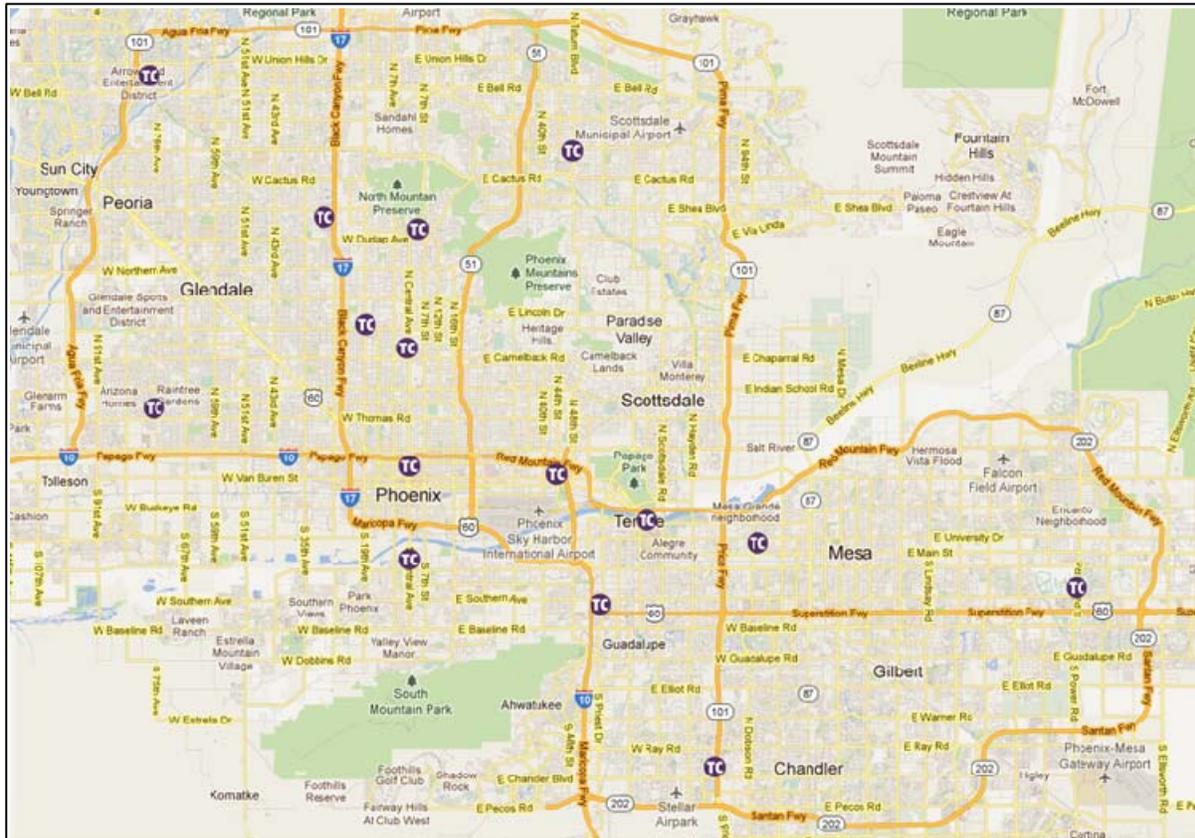
Public facilities, such as transit centers and METRO light rail stations, and locations along bus routes are provided to facilitate access (boarding and deboarding) to transit services. These transit stops are instrumental to system operations. Each facility or location acts as the gateway to service and provides varying levels of, comfort, direction, amenities, and security to assist travelers and enhance their experience with the system. Travelers can access public transit services in three different ways: Transit Centers, park-and-ride (P&R) lots, and route stops. At each facility or location, ultimately, access to the transit vehicle occurs by walking, with the exception of those in wheelchairs. While all vehicles and facilities are wheelchair accessible to permit the transition to/from the vehicles, many of the route stops are not easily negotiated by wheelchairs. An inventory of access facilities has been prepared to provide a focal point for accessibility evaluations and enhancement of the access experience.



### 2.3.1. Transit Centers

As shown in Figure 5 and listed in Table 4, there are 16 transit centers in the Valley at this time. Although Loloma Station operations in Scottsdale have been temporarily suspended for budgetary reasons, this is five more transit center than were operational in the summer of 2011. Nine of the 15 operational transit centers

Figure 5  
VALLEY METRO TRANSIT CENTER LOCATIONS



Source: Transit Centers, Valley METRO Bus at: [http://www.valleymetro.org/bus/transit\\_centers/](http://www.valleymetro.org/bus/transit_centers/).

are located in Phoenix, and five have adjacent P&R lots. The only other transit center with an adjacent P&R lot is the Sycamore and Main Street Transit Center in Mesa with 802 spaces. The Montebello/19th Avenue Transit Center at the northern extent of METRO light rail has a comparable number of spaces (794).

Transit Centers provide a range of amenities for the transit patron, which differs from facility to facility. Potentially included among the amenities are:

- Fare vending machines or an outlet (i.e., window) for purchase of bus passes and information;
- Shade-covered areas with seating;
- Drinking fountains;
- Bicycle racks; and
- Public restrooms.



Table 4  
**VALLEY METRO TRANSIT CENTERS**

Facility	Location	Routes Served	Amenities	Park-and-Ride
44 <sup>th</sup> St./Washington St. Transit Center	Washington St. and 44 <sup>th</sup> St. Phoenix	1, 3, 13, 44, METRO Rail	Fare vending machines; Shade-covered waiting areas with seating; Drinking fountains	No
Arizona Mills Mall	5000 Arizona Mills Circle Tempe	48, 56, 77	None	No
Arrowhead Town Center	7700 w. Arrowhead Town Center Glendale	67, 170, 186, 573, 575	None	No
Central Ave./Camelback Rd. Transit Center	Central Ave. and Camelback Rd. Phoenix	0, 39, 50, Grand Ave. Limited, METRO Rail	Fare vending machines; Shade-covered waiting areas with seating; Drinking fountains	Yes 135 spaces
Central Station	302 N. Central Ave. Phoenix	0, 3, 7, 8, 10, 12, 15, Red Line, Blue Line, Grand Ave. Limited, 560 Express, RAPID	Fare outlet; Shade-covered waiting areas with seating; Bike racks; Public restrooms; Drinking fountains	No
Chandler Fashion Center	3111 W. Chandler Blvd. Chandler	72, 81, 156	None	No
Desert Sky Mall Transit Center	7611 W. Thomas Rd. Phoenix	17, 17A, 29, 41, 560, 685, I-10 West RAPID, MARY	Reduced Fare ID photo site located inside mall at customer service desk (only cash is accepted); Shade-covered waiting areas; Bike racks	No
Ed Pastor Transit Center at South Mountain Village	10 W. Broadway Rd. Phoenix	0, 7, 8, 45, 52	Fare outlet; Shade-covered waiting areas with seating; Drinking fountains	No
Loloma Station	7084 E. 2nd St. Scottsdale	Operation temporarily suspend	Fare outlet; Shade-covered waiting areas with seating; Bike racks; Drinking fountains	No
Metrocenter Transit Center	9415 N. Metro Pkwy. Phoenix	15, 27, 35, 90, 106, 122, 581, I-17 RAPID, I-17 RAPID to Rail	Fare outlet; Shade-covered waiting areas with seating; Bike racks; Drinking fountains	Yes 215 spaces
Montebello/19 <sup>th</sup> Ave. Transit Center	19 <sup>th</sup> Ave. and Montebello Rd. Phoenix	15, 19, 60, I-17 RAPID to Rail, METRO Rail	Fare vending machines; Shade-covered waiting areas with seating; Drinking fountains	Yes 794 spaces
Paradise Valley Mall Transit Center	4623 E. Paradise Village Pkwy. N. Phoenix	39, 44, 106, 138, SR-51 RAPID	Shade-covered waiting areas with seating; Bike racks; Drinking fountains	Yes 100 spaces
Sunnyslope Transit Center	8927 N. 3rd St. Phoenix	0, 8, 12, 16, 80, 90, 106, SMART	Fare outlet; Shade-covered waiting areas with seating; Bike racks; Drinking fountains	Yes 45 spaces
Superstition Springs Transit Center	6555 E. Southern Ave. Mesa	40, 45, 61, 108, 184, 533, Main St. LINK	Shade-covered waiting areas with seating; Bike racks; Drinking fountains	No
Sycamore/Main St. Transit Center	Sycamore and Main St. Mesa	30, 40, 45, 96, 104, Arizona Ave./Country Dr. LINK, Main Street LINK, METRO Rail	Fare vending machines; Shade-covered waiting areas with seating; Public restrooms; Drinking fountains	Yes 802 spaces
Tempe Transportation Center	200 E. Fifth St. Tempe	48, 62, 65, 66, 72, Orbit (All Routes), METRO Rail, Maricopa Express	Fare outlet; Shade-covered waiting areas with seating; Public restrooms; Drinking fountains; Bicycle Cellar (with bike repair and accessories)	No

Prepared by Wilson & Company, February, 2012.

Source: Transit Centers, Valley Metro Bus at: [http://www.valleymetro.org/bus/transit\\_centers/](http://www.valleymetro.org/bus/transit_centers/).



### 2.3.2. Park-and-Ride Lots

Public transit services in the Valley are supported by a system of park-and-ride (P&R) lots. This critical transit system component of the Valley transit system supports direct automobile access to all almost services. P&R lots allow individuals to access a transit service via private automobile, park, and board the train or bus, returning later to retrieve their automobile and proceed to another destination. P&R lots particularly are important for the METRO light rail, RAPID, Express Bus services. This is demonstrated by the large lots at the Sycamore and Main Street Transit Center in Mesa and Montebello/19<sup>th</sup> Avenue Transit Center in Phoenix serving METRO light rail and expansive lots next to Valley freeways, accessed by RAPID and Express Buses.

Overall, there are 54 P&R lots distributed throughout the study area, as shown in Figure 6 and listed in Table 5. The majority of the P&R lots are situated in close proximity to a major highway or thoroughfare. Those at freeway locations are particularly situated to support the RAPID and Express Bus services. Nine P&R facilities have been developed specifically to serve the METRO Rail service. These lots are located adjacent to the LRT line and offer a total of 3,636 parking spaces. All P&R lots are available to travelers free of charge, and all are monitored by security cameras, security officers, and municipal police officers.

### 2.3.3. Valley Metro Transit Stops

There are thousands of transit stops accommodating access to the fixed-route scheduled transit services, including: METRO light rail, LINK, RAPID, Express Bus, regional bus, and circulators. Stops associated with METRO light rail, LINK, RAPID, and Express Bus services have been addressed above. By far the most prevalent transit stops are locations along the arterial and local street network served by the regional local bus system. The bus stops offer a range of amenities for transit system users, as depicted by the photos below:

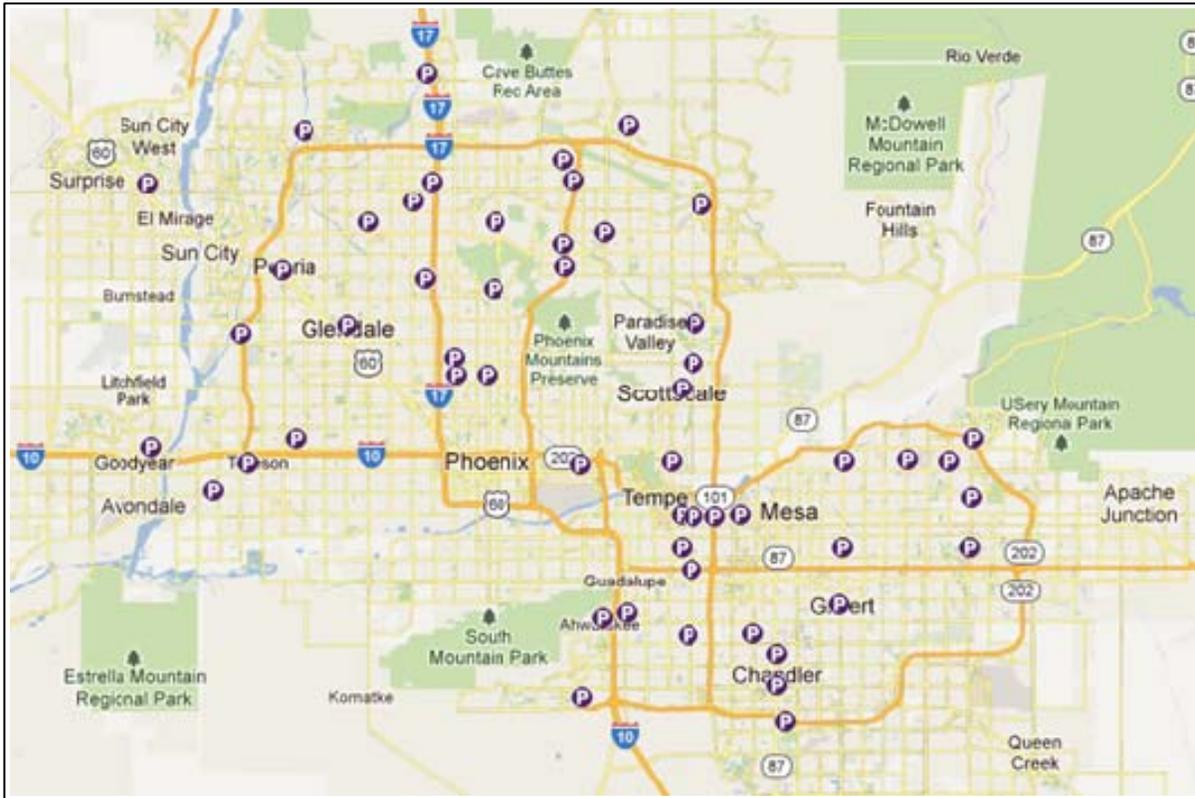


Valley Metro has an existing regional bus stop database that includes vital information about each stop. However, Valley Metro is a consortium of several communities, and maintenance of this database by the individual jurisdictions purchasing or providing service is inconsistent. Valley Metro is pursuing efforts to bring greater coordination to this data gathering/reporting process, as the accuracy and reliability of the data base affects the automated trip planning system provided on the Web site. A second issue associated with the database, is the lack of information regarding P&R lots (some of which are established on private property under agreements with property owners). The P&R lots are particularly important to the LINK, RAPID, and Express Bus services, but currently are not considered by the trip planning system.

Valley Metro recently initiated a phone-based NextRide system permitting potential riders to check bus or train arrival times. Each Valley Metro bus and train vehicle is equipped with Geographic Positioning System (GPS) technology, allowing operating information to be accessed to gain real-time scheduled arrival times. Each transit stop (bus and LRT) around the Valley is labeled with a unique “STOP#.” Potential riders need only enter the STOP# in a text message or call a telephone number that responds to speaking the STOP#.



Figure 6  
VALLEY METRO PARK-AND-RIDE LOTS



Source: Park-and-Ride Locations, Valley METRO Web Site, February, 2012 at: [http://www.valleymetro.org/park\\_and\\_rides/bus/](http://www.valleymetro.org/park_and_rides/bus/).



Table 5  
VALLEY METRO PARK-AND-RIDE FACILITIES

City	Facility/Lot	Location	Routes Served
Avondale	Donnie Hale Park	Fourth St. and 109th Ave.	Not Specified
Chandler	Carl's Jr.	Warner Rd. and Alma School Rd.	104, 541
	Chandler Park-and-Ride (P&R)	Germann Rd. and Hamilton St.	Arizona Ave. LINK, 541, 542
	Food City Plaza	Arizona Ave. and Ray Rd.	Arizona Ave. LINK, 112, 541
	Parking lot	Chicago St. and Arizona Ave.	104, 112, 541
El Mirage	Walmart	129th Ave. and Thunderbird Rd.	Grand Ave. Limited
Gilbert	Gilbert P&R	Oak St. and Page Ave.	136, 531
Glendale	City Lot	59 <sup>th</sup> Ave. and Myrtle Ave.	59, Grand Ave. Limited, Glendale Urban Shuttle (GUS) 1 & 2
	Community Church of Joy	75 <sup>th</sup> Ave. and Rose Garden Ln.	573, 575
	Glendale P&R (388)	99 <sup>th</sup> Ave. and Glendale Ave.	70, 573
	Shopping Center	Thunderbird Rd. and 51 <sup>st</sup> Ave.	51, 138, 581
Goodyear	Goodyear P&R (400)	13183 W. Cornerstone Blvd.	562
Mesa	Albertson's (temporary)	Power Rd. and McDowell Rd.	535
	Confederate Air Force	Greenfield Rd. and McKellips Rd.	532
	East Mesa Service Center	Decatur St. and Power Rd.	184, 532, 533
	Fry's Marketplace	Recker Rd. and McKellips Rd.	532
	Power Road P&R	Power Rd. and Preston St.	184, 535
	South Center Shopping Plaza	Gilbert Rd. & Southern Ave.	61, 136, 531
	Sycamore/Main St. Transit Ctr (802)	Main St. and Sycamore	30, 40, 45, 96, 104, Arizona Ave. LINK, Main St. LINK, METRO Rail
	Superstition Springs Transit Center	US-60 and Power Rd.	40, 45, 61, 108, 184, 533, Main St LINK
Peoria	Peoria P&R East	Jefferson St. and 84 <sup>th</sup> Ave.	Grand Ave. Limited
Phoenix	7 <sup>th</sup> Ave./Camelback P&R (123)	7 <sup>th</sup> Ave./Camelback Rd.	
	19 <sup>th</sup> Ave./Camelback P&R (410)	19 <sup>th</sup> Ave. and Camelback Rd.	19, 50, METRO Rail
	38 <sup>th</sup> St./Washington P&R (189)	Washington St. and 38 <sup>th</sup> St.	1, 32, METRO Rail
	40 <sup>th</sup> St. & Pecos P&R (562)	Pecos Rd. & 40 <sup>th</sup> St.	RAPID I-10 East, ALEX
	79 <sup>th</sup> Ave. & I-10 P&R (607)	I-10 and 79 <sup>th</sup> Ave.	17, 17A, 560, RAPID I-10 West
	Bell/I-17 Park-and-Ride (350)	I-17 and Bell Rd.	27, 170, RAPID I-17
	Bell/SR-51 P&R (377)	SR-51 and Bell Rd.	170, RAPID SR-51
	Cactus Square Shopping Ctr	32 <sup>nd</sup> St. and Cactus Rd.	16, 106, 138
	Central Ave./Camelback Transit Ctr (135)	Camelback Rd. and Central Ave.	0, 39, 50, 512, Grand Ave. Limited, METRO Rail
	CityNorth Shopping Ctr	53 <sup>rd</sup> St. and Park Place North	RAPID SR-51
	Greenway Village Square	35 <sup>th</sup> Ave. and Greenway Rd.	35, 154
	Happy Valley P&R	24725 N. 29th Ave.	35, RAPID I-17
	Metrocenter Transit Ctr (215)	West of 29 <sup>th</sup> Ave. on Metro Pkwy. West	15, 27, 35, 90, 106, 122, 581, RAPID I-17
	Montebello/19 <sup>th</sup> Ave. Transit Ctr (794)	Montebello Ave. and 19 <sup>th</sup> Ave.	15, 19, 60, 576, I-17 RAPID to Rail, METRO Rail
	Mountain View Lutheran Church	48 <sup>th</sup> St. and Cheyenne St.	56, 540, ALEX
Paradise Valley Community College	32 <sup>nd</sup> St. and Union Hills Dr.	16, 186	
Paradise Valley Mall Transit Ctr (100)	Paradise Village Pkwy. and Tatum Blvd.	39, 44, 106, 138, RAPID SR-51	



Table 5  
VALLEY PARK-AND-RIDE FACILITIES (CONTINUED)

City	Facility/Lot	Location	Routes Served
Phoenix (Continued)	Safeway Shopping Ctr	7 <sup>th</sup> St. and Thunderbird Rd.	7, 138
	Shea & SR-51 P&R	SR-51 and Shea Blvd.	16, 512, RAPID SR-51
	Sunnyslope Transit Ctr	3 <sup>rd</sup> St., half block south of Dunlap Ave.	0, 8, 12, 16, 80, 90, 106, SMART
Scottsdale	Chaparral Park	Hayden Rd. and Jackrabbit Rd.	81, 510
	Costco (Hayden Rd.)	Butherus Dr. and 83 <sup>rd</sup> Pl.	81, 170
	Miller Plaza	Montecito Ave. and Miller Rd.	50, 76, 510
	Trinity Church	Hayden Rd. and McCormick Pkwy.	81, 510
Surprise	Surprise P&R	13327 W. Bell Rd.	571
Tempe	Cobblestone Village	Warner Rd. and McClintock Dr.	81, 540
	Costco	Priest Dr. and Elliot Rd.	56, 108
	Dorsey Ln./Apache Blvd. P&R (190)	Apache Blvd. and Dorsey Ln.	40, METRO Rail
	Grace Community Church	Southern Ave. and Dorsey Ln.	61, 520
	Loop 101 (Price Fwy)/Apache Blvd. P&R (693)	Loop 101 (Price Fwy) and Apache Blvd.	40, 511, METRO Rail
	McClintock Dr/Apache Blvd P&R (300)	Apache Blvd. and McClintock Dr.	40, 81, METRO Rail
	Shopping Center	McKellips Rd. and Scottsdale Rd.	72, 532
	Target Shopping Center	McClintock Dr. and Baseline Rd.	77, 81, 521
Tolleson	Tolleson City Offices	96 <sup>th</sup> Ave. and Van Buren St.	560

Prepared by Wilson & Company, February, 2012.

( ) Numbers in parentheses identifies spaces at location, as provided at source.

Source: Park-and-Ride Locations, Valley Metro Web Site, February, 2012. Map and list at: [http://www.valleymetro.org/park\\_and\\_rides/bus/](http://www.valleymetro.org/park_and_rides/bus/).

## 2.4 Specialized Transportation Services

Within the study area, there are other transportation and mobility opportunities that have been devised to address specific demands or needs of the traveling public. Car pools and van pools specifically address the commute-to-work trips and are considered a major player in the effort to reduce congestion and pollution by removing vehicles from the road, especially during the morning and afternoon/evening peak periods. Dial-a-Ride systems provide special access/mobility options for those without vehicles or who are significantly disadvantaged and unable to provide for their own transportation. The principal characteristics of these special transportation opportunities are outlined in the following subsections.

### 2.4.1. Commuting Alternatives

#### Car Pool

Car pools involve two or more persons sharing a motor vehicle to save time and money. In the Valley, carpoolers (and motorcycles) get to use available high-occupancy vehicle (HOV) lanes, which are focused on reducing commute times and congestion in the general travel lanes. Carpoolers save gas money and vehicle wear and tear, stress of travel is reduced. Information about vanpooling opportunities is readily available at <http://www.valleymetro.org/carpool/>, an email contact, or by phone at 602.262.RIDE.

Valley Metro maintains a Web site – ShareTheRide – and phone number for people to query potential partnerships with others to car pool. ShareTheRide is a state-of-the-art ride matching system that allows commuters to quickly and securely find a carpooling partner or view available bus and Metro Rail options.



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The system matches commuters, based on proximity, destination, and travel route, as well as schedules and preferences. The Web site helps prospective carpoolers by providing information about potential benefits, tips for engaging in a successful carpool, and a checklist for organizing driving responsibilities, expenses, and personal preferences.

### **Van Pool**

Van pools are comprised of commuters sharing the monthly rental fee and gasoline cost associated with the use of a Valley Metro clearly marked, multi-passenger (6 to 15 persons) van. Fuel, insurance, and vehicle maintenance costs are covered through a monthly fee paid to the primary driver. Some employers may offer company-owned vans as an alternative mode incentive to employees. Like the car pool program, Valley Metro maintains a Web site with information about vanpooling opportunities, which is readily available at <http://www.valleymetro.org/vanpool/>. Prospective vanpoolers also can contact Valley Metro via email contact or by phone at 602.262.RIDE.

Routes traveled by van pool vehicles generally are oriented to collecting employees with a common destination, such as an economic activity center (e.g., downtown Scottsdale) or the same corporation (e.g., the Intel Chandler and Ocotillo campuses). Vanpool members also are eligible for special commuter tax benefits. According to the Valley Metro Van Pool Web site, “the Federal Government has enacted tax laws that benefit commuters who travel to work in government-owned vanpools. Employees are eligible for employer subsidies or they may set aside up to \$115 a month of their pre-tax income towards commuting costs. Employers who subsidize their employees’ commute may receive equivalent deductions free of additional payroll and federal income taxes.”

### **Bike/Walk**

With excellent year-round weather, cycling or walking are practical & fun alternative modes of transportation for Valley commuters and residents. Not only are biking and walking great ways to exercise each day, but they reduce traffic congestion and air pollution. Most public fixed-route, scheduled transit vehicles (METRO light rail and buses) have bicycle racks to accommodate bicyclists. Larger station/stops, such as transit centers, have bike stands and some have bike lockers to permit transition to the transit mode. Most arterial roadways in the Valley have pedestrian-friendly sidewalks, and efforts are going forward to improve the safety and ambiance of the walk environment through wider sidewalks and buffers between sidewalks and traffic. Improved bus routes and bus schedules, including the centralized number to call for bus arrival time at every stop – NextRide, makes walking at least a portion of any trip easier to coordinate with public transit services. As noted above, the NextRide electronic service provides quick access to arrival information of the next bus or train at each stop.

#### **2.4.2. Dial-A-Ride**

Dial-a-Ride is a shared-ride service provided by a number of different agencies throughout the Valley, depending on the city or town where the service exists. For instance, there can be Dial-a-Ride service for seniors, persons with disabilities, or the general public. The vehicles are not route oriented, and drivers may pick-up or drop-off people at multiple, predetermined locations during the course of the trip, although advance reservations may be required. In most cases, travel on the Dial-a-Ride system can be accomplished without transferring to another vehicle, unless a person’s trip extends beyond the service area of the system. Valley Metro facilitates transfers between Dial-a-Ride systems and between the Dial-a-Ride systems and regularly scheduled, fixed-route transit services. Dial-a-Ride services are provided by Phoenix, Peoria, Glendale, Scottsdale, Tempe, Chandler, Mesa, Paradise Valley, and Tolleson:

- Route 685 – Ajo/Gila Bend Connector: This particular service operates on a defined schedule throughout the day, but Flex Stop service is available. Transit patrons can choose a pick-up and drop-off location within 3/4 of a mile of the regular route by calling in advance. Some restrictions apply for this service.
- East Valley Dial-a-Ride: Chandler, Gilbert, Mesa, Scottsdale, Tempe



- East Valley Ride Choice
- El Mirage Dial-a-Ride
- Glendale Dial-a-Ride
- Maricopa County Special Transportation Services (STS): Maricopa County (by approval) and Fountain Hills.
- Paradise Valley ADA (Americans with Disabilities Act) Service
- Peoria Dial-a-Ride
- Phoenix Dial-a-Ride
- Southwest Valley ADA Service
- Sun City and Youngtown Mobility Program: Valley Metro discount cab service
- Surprise Dial-a-Ride
- Tolleson Senior Transportation.

#### **2.4.3. Coupons for Cabs**

Chandler, Gilbert, Mesa and Tempe residents may receive for a nominal co-pay a coupon book valued at \$10. Coupons can be applied toward the fare and tip of participating taxi companies. Scottsdale residents may receive up to sixteen vouchers per month per user through Cab Connection. Vouchers are subsidized by the City of Scottsdale at a rate of 80% up to a maximum of \$10.

## **2.5 Bus System Performance Issues**

Valley Metro has made note of studies indicating freeway-oriented RAPID and Express Bus services (and potentially Bus Rapid Transit (BRT) in the future) would benefit from direct access ramps and similar features that would expedite bus operations, wherever feasible. Weaving in and out of the HOV lanes has a negative effect on service times and safety and creates disruptions to traffic flow. Valley Metro anticipates direct access ramps could be used by buses, HOVs, and single-occupant vehicles (SOVs). The agency also has reviewed the potential use of measures to give transit priority, particularly at intersections, such as transit signal priority (TSP), queue jumping/bypass lanes (see below), curb extensions, and station spacing.

Valley Metro has indicated that more P&R lots also would be desirable. Planners consider the lack of lots a limiting factor with respect to transit usage. Structured parking integrated with condominiums, as was developed next to the McClintock Drive/Apache Boulevard METRO light rail station in Tempe, is an example of mixed-use development that would aid in attracting riders. However, structured parking likely would need private sector involvement.

Valley Metro has expressed interest in the use of “queue jumps” with farside bus stops, referred to in this context as Bus-and-Turn or BAT lanes (sometimes called Business Access and Transit lanes). A queue jump is a type of roadway geometry and signal operation typically implemented in relation to BRT systems. The queue jump consists of an additional travel lane (usually the curbside) on the approach to a signalized intersection, which is installed to favor progression of transit vehicles through the intersection. Some variants of the queue jump may permit bicyclists, mopeds, and/or motorcycles. The intent of the added travel lane is to allow transit vehicles to cut to the front of the other vehicles waiting at the intersection – the queue. A queue jump lane generally includes a signal phase specifically for transit vehicles, reducing delay and improving operational efficiency of the transit system. A dedicated signal and phase reduces the need for a designated receiving lane on the opposite side of the intersection. Thus, transit vehicles get a "head-start" over other queued vehicles and enter into the regular travel lanes immediately beyond the signal without being required to merge. The additional phasing of the signal, however, reduces green time for the general



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traffic queue, and additional of the queue jump lanes widens the roadway, possibly requiring additional right-of-way and increasing the distance pedestrians must travel to cross the road.

### 3.0 Operations and Maintenance Facilities

A number of operations and maintenance (O&M) facilities are required to support the delivery of transit services in the Valley. These facilities serve multiple purposes including: vehicle service and fueling, employee training, system administration, and operational management. Some O&M facilities are designed to meet specialized needs of the services supported. Capital development funds available through Federal Transit Administration (FTA) formula and discretionary grant programs support a significant portion of the costs associated with constructing transit O&M facilities. There are five regional publicly owned facilities supporting fixed-route and demand-response (e.g., Dial-a-Ride) and one METRO rail O&M facility (Table 6).

Table 6  
VALLEY METRO OPERATIONS AND MAINTENANCE (O&M) FACILITIES

Facility	Contractor	Vehicle Capacity	Modes Served	Primary Functions
Phoenix South Division 2225 W Lower Buckeye Phoenix	Veolia	250	Fixed Route & DASH Circulator	<ul style="list-style-type: none"> <li>• Heavy Vehicle Maintenance</li> <li>• Liquefied Natural Gas (LNG) and Diesel Fueling</li> <li>• Cleaning and Painting</li> <li>• Operator Dispatch</li> <li>• Regional Radio Support</li> </ul>
Phoenix North Division 2010 W Desert Cove Phoenix	Veolia	150	Fixed Route	<ul style="list-style-type: none"> <li>• Vehicle Maintenance</li> <li>• LNG and Diesel Fueling</li> <li>• Vehicle Cleaning</li> <li>• Operator Dispatch</li> </ul>
Phoenix West Division 79th Avenue & Van Buren St. Phoenix	First Transit	250	Fixed Route	<ul style="list-style-type: none"> <li>• Vehicle Maintenance</li> <li>• Compressed Natural Gas (CNG), LNG, and Diesel Fueling</li> <li>• Vehicle Cleaning</li> <li>• Operator Dispatch</li> </ul>
Tempe/Scottsdale 2050 W. Rio Salado Parkway Tempe	Veolia	250	Fixed Route	<ul style="list-style-type: none"> <li>• Vehicle Maintenance</li> <li>• LNG fueling</li> <li>• Vehicle Cleaning</li> <li>• Operator Dispatch</li> </ul>
RPTA Mesa 3320 N. Greenfield Rd. Mesa	Veolia	250	Demand Response	<ul style="list-style-type: none"> <li>• Vehicle Maintenance</li> <li>• Fueling</li> <li>• Cleaning</li> <li>• Operator Dispatch</li> </ul>
Metro Rail 48th & Washington St. Phoenix	METRO	100	Light Rail	<ul style="list-style-type: none"> <li>• Vehicle Maintenance</li> <li>• Cleaning</li> <li>• Operator Dispatch</li> </ul>

Prepared by Wilson & Company, February, 2012.

Source: Table 3-5: Existing Publicly-Owned Operations and Maintenance Facilities, Chapter 3, Existing & Planned Transit Capital Infrastructure, *Short-Range Transit Program – FY 2010/11-2015/16*, Regional Public Transportation Authority/Valley Metro, September 22, 2011.

### 4.0 Ridership

The latest *Transit Performance Report* published by Valley Metro was issued December, 2010 (Revised May 12, 2011). This report provides a summary of key statistics regarding system operations and service provided.



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Table 7, extracted from this report reveals overall farebox recovery of from ridership amounted to 23.3 percent of operating costs. Fixed-route bus services performed slightly better than this average with a 24.1 percent farebox recovery, and METRO light rail performed even better at 28.0 percent. Clearly, the METRO light rail service was the most expensive to operate at \$12.43 per revenue mile. Vanpooling proved to be the most efficient with a cost of only \$0.47 per revenue mile. However, vanpooling is the second most expensive to access at \$2.17 for an average fare, compared to \$0.84 for fixed-route bus service and \$0.76 for METRO light rail riders.

There were 69.6 million total boardings in FY 2010, defined as July 1, 2009 – June 30, 2010). Fixed-route bus services accounted for close to 80 percent of all boardings in the system. The METRO light rail service accounted for over 17 percent of system ridership, attracting 4.57 boardings per revenue mile. METRO light rail boardings per revenue mile operated clearly outstripped the other services, which would be expected for the high-capacity LRT service. Approximately 10 percent of all boardings were served by routes supported with Proposition 400 funding, which attracted 1.12 boardings per revenue mile.

Table 7  
VALLEY METRO SYSTEM SUMMARY REPORT

Performance Indicator	Proposition 400 Fixed Route Level	Fixed-Route	Paratransit	Vanpool	Light Rail	System Total
Fare box Recovery	19.7%	24.1%	6.3%	92.9%	28%	23.3%
Operating Cost Per Boarding	\$5.22	\$3.50	\$36.99	\$2.34	\$2.72	\$3.72
Subsidy Per Boarding	\$4.19	\$2.66	\$34.69	\$0.17	\$1.96	\$2.85
Operating Cost Per Revenue Mile	\$5.86	\$5.90	\$4.38	\$0.47	\$12.43	\$5.41
Average Fare	\$1.03	\$0.84	\$2.30	\$2.17	\$0.76	\$0.87
Total Boardings	7,008,830	55,574,959	777,525	1,135,783	12,112,738	69,601,005
Percent of Total Boardings	10.07%	79.85%	1.12%	1.63%	17.40%	----
Boardings Per Revenue Mile	1.12	1.69	0.12	0.20	4.57	1.46

Source: Extracted from *Transit Performance Report, FY 2010* (July 1, 2009 – June 30, 2010), Valley METRO, December 2010, Revised 5.12.11.



The Annual Ridership Report for FY 2010 – 2011 produced by Valley Metro (Table 8) shows that total boardings were down slightly from the year before: 67.6 million (FY 2011) compared to 69.6 million (FY 2010). However, the system, as a whole, was more productive, achieving 2.1 boardings per revenue mile in FY 2011 compared to 1.46 in FY 2010. Table 8 indicates ridership in Phoenix accounted for 65.02 percent of total ridership, attracting 2.5 boardings per revenue mile. Tempe was the only other city to achieve a ridership rate per revenue mile (2.2) that exceeded the overall system average.

METRO Rail attracted 12.8 million riders, accounting for 18.9 percent of total ridership, which is an increase of two percentage points over the previous year. Combined, the three cities participating/supporting METRO Rail, which serves the core area of the Valley Metro system, accounted for 90.7 percent of total system ridership.

Table 8  
VALLEY METRO ANNUAL RIDERSHIP, FY 2010-2011

ANNUAL RIDERSHIP REPORT FY 2010 -2011									
Summary by City									
Jurisdiction	Boardings	Percent	Revenue		Boardings			W/C	Percent
			Miles	Percent	Per Mile	Bikes	Percent		
Avondale	120,943	0.18%	188,071	0.59%	0.6	5,026	0.33%	435	0.16%
Chandler	874,178	1.29%	937,621	2.96%	0.9	50,015	3.32%	4,044	1.49%
El Mirage	3,238	0.00%	6,309	0.02%	0.5	169	0.01%	54	0.02%
Fountain Hills	2,517	0.00%	4,719	0.01%	0.5	60	0.00%	1	0.00%
Gila River Indian Comr	4,583	0.01%	5,707	0.02%	0.8	199	0.01%	46	0.02%
Gilbert	165,766	0.25%	433,402	1.37%	0.4	12,297	0.82%	957	0.35%
Glendale	2,395,053	3.54%	1,559,304	4.92%	1.5	72,263	4.80%	14,736	5.44%
Goodyear	34,062	0.05%	31,139	0.10%	1.1	216	0.01%	35	0.01%
Guadalupe	41,882	0.06%	56,580	0.18%	0.7	1,146	0.08%	195	0.07%
Litchfield Park	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mesa*	5,702,483	8.43%	2,870,510	9.06%	2.0	194,359	12.94%	28,459	10.51%
Paradise Valley	11,900	0.02%	68,958	0.22%	0.2	501	0.03%	32	0.01%
Peoria	92,725	0.14%	49,088	0.15%	1.9	2,573	0.17%	516	0.19%
Phoenix*	43,955,347	65.02%	17,664,306	55.74%	2.5	848,925	56.39%	180,978	66.83%
Scottsdale	2,440,512	3.61%	2,195,209	6.93%	1.1	87,743	5.83%	10,043	3.71%
Sun City	32,929	0.05%	44,127	0.14%	0.7	2,235	0.15%	259	0.10%
Surprise	20,825	0.03%	19,548	0.06%	1.1	590	0.04%	103	0.04%
Tempe*	11,653,939	17.25%	5,251,317	16.57%	2.2	225,158	14.96%	29,619	10.94%
Tolleson	23,258	0.03%	31,819	0.10%	0.7	750	0.05%	52	0.02%
Rural Connector Svcs	21,390	0.03%	271,034	0.86%	0.1	791	0.05%	223	0.08%
<b>Total</b>	<b>67,607,530</b>		<b>31,688,717</b>		<b>2.1</b>	<b>1,505,476</b>		<b>270,787</b>	
<i>*Metro Rail ridership portion included above was:</i>			<i>*Metro Rail mileage portion included above was:</i>						
Mesa - 1,216,730			Mesa - 117,614						
Phoenix - 7,885,771			Phoenix - 1,613,369						
Tempe - 3,691,028			Tempe - 674,152						

Source: Extracted from Annual Ridership Report FY 2010-2011, Valley METRO.

In FY 2010 – 2011, 1.5 million persons accessed transit with bicycles, accounting for 2.23 percent of total ridership. The share of bike riders using transit in most cities was greater than the city’s share of total ridership, with the prominent exception of Phoenix and Tempe. However, bike riders accounted for 0.05 percent of less of total ridership in eight cities.



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Wheelchair users accounted for less than one percent of total system ridership. Like bike riders, the share of wheelchair users by city generally is greater than the city's share of total ridership with the prominent exception of Tempe. However, wheelchair users accounted for 0.05 percent of less of total ridership in six cities.

The *2011 Rider Satisfaction Survey – Total Market* conducted for Valley Metro, contains the following conclusions regarding the transit system use and acceptance:

- Light rail ridership continues to grow and expand the base of transit users in the Valley.
- Overall satisfaction with the transit system among all riders increased this year to the highest level since 2005.
- In a shift from last year, there was a notable increase in the percentage of transit users indicating they are likely to continue using transit next year.
- It appears that the rider angst about the increase in fares that occurred in the spring of 2010 was short lived.
- After increasing last year, the percent of riders indicating they primarily use the Transit Book for transit information decreased.



## **Appendix B Reference Summary**

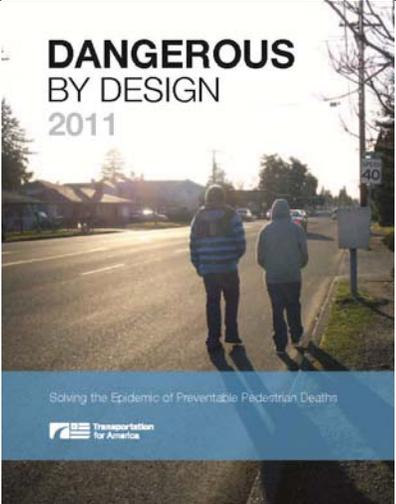


<p>MINETA TRANSPORTATION INSTITUTE</p> <p><b>Bicycling Access and Egress to Transit: Informing the Possibilities</b></p> <p>MTI Report: 10-07</p>	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>BICYCLING ACCESS AND EGRESS TO TRANSIT: INFORMING THE POSSIBILITIES</b>	✓	✓		✓					✓	
<p><b>Date Completed:</b> 2011</p> <p><b>Sponsoring Agency:</b> CALTRANS, US Department of Transportation</p> <p><b>Authors:</b> Mineta Transportation Institute, College of Business, San Jose University Kevin J. Krizek, Ph.D.; Eric Stonebraker, M.S.; and Seth Tribbey</p>										
<p><b>Purpose:</b> To aid in developing a framework to evaluate the cost effectiveness of different strategies to integrate transit and bicycling this project: (1) reviews the state of the knowledge, (2) proposes an analysis framework for communities and transit agencies to consider in efforts to maximize the integration of bicycling and transit, (3) conducts focus groups with cyclists from five case study communities to gauge preferences for bicycle and transit integration strategies, and (4) develops a preliminary application to evaluate four bicycle and transit integration strategies based on focus group discussions and use of the Analytic Hierarchy Process (AHP). These evaluation measures are applied to five communities.</p>										
<p><b>Study Area:</b> Five Communities located in California, Colorado, New York, and Oregon.</p>										
<p><b>Recommendations Relevant to the Study:</b> Looking at the four primary biking options the Bike ON Transit was the most desired but runs into problems with the maximum capacity limits and high retrofit costs. The second highest option, bike TO Transit was considered to be relatively cost effective; its main concern was the lack of security associated with leaving a bike. The Two bike and share bike modes were found to be significantly trailing in the focus group analysis</p>										

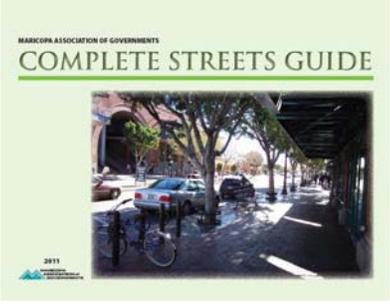


	<b>Document's Relevancy to Designing Transit Accessible Communities</b>								
Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>COMMUNITY CHARATERISTICS PROMOTING TRANSIT AND WALKING</b>		✓							✓
<b>Date Completed:</b> 2007									
<b>Sponsoring Agency:</b> Sierra Club									
<b>Author:</b> Dr. John Holtzclaw									
<b>Purpose:</b> To document national and international land use densities and types that promotes transit use and walking.									
<b>Study Area:</b> International									
<b>Recommendations Relevant to the Study:</b> Suggests the appropriate level of transit service for different densities. Good bus service is around 7 du/res acre. Development goals are also given of 10,000 people plus jobs within a kilometer of a transit stop and 100,000 within 3 kilometers of a city center. "An automobile-dependent city can be reconstructed around a series of transit cities"									



 <p><b>DANGEROUS BY DESIGN</b> 2011</p> <p>Solving the Epidemic of Preventable Pedestrian Deaths</p> <p>Transportation for America</p>	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>DANGEROUS BY DESIGN</b>	✓			✓				✓		
<p><b>Date Completed:</b> 2011</p> <p><b>Sponsoring Agency:</b> Transportation for America</p> <p><b>Author:</b> Michelle Ernst</p> <p><b>Purpose:</b> To evaluate pedestrian safety across the country in order to find trends and imbalances in order to make recommendations on how to increase the safety of roads for all users, specifically pedestrians.</p> <p><b>Study Area:</b> National</p> <p><b>Recommendations Relevant to the Study:</b> Retain dedicated federal funding through the Transportation Enhancements and Safe Routes to schools programs. Adopt a national complete streets policy, looking at safety of all users not just cars. Fill in the gaps, add sidewalks and paths to old streets and connect missing sections, just designing new roads with pedestrian facilities is not enough. Commit a fair share for safety. Funding and safety goals should be focused to specific areas such as pedestrians and bicyclists, not just overall safety, which has created a disproportionately dangerous environment for non motorists. Hold states accountable, for new street, and retrofits that promote safety and using federal funding to save lives and promote active populations</p>										

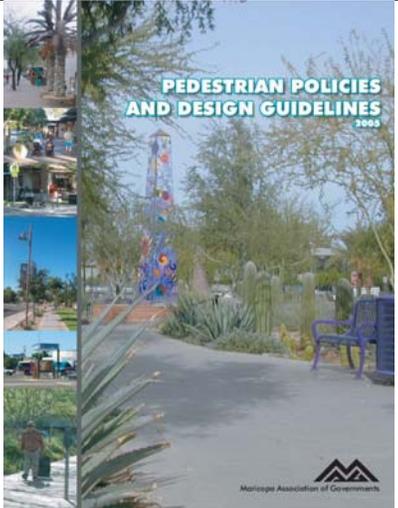


	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>MAG COMPLETE STREETS GUIDE</b>	✓	✓	✓				✓	✓	✓	✓
<p><b>Date Completed:</b> 2011  <b>Sponsoring Agency:</b> MAG  <b>Author:</b> PLAN*et</p> <p><b>Purpose:</b> Help ensure that bicycles, pedestrians, and transit are viewed as an integral part of well designed streets. It also moves towards implementing the March, 2010 U.S. Secretary of Transportation's Policy Statement on Bicycle and Pedestrian Accommodation. To provide best practices and design examples for each of the 6 steps in the complete streets design process.</p> <p><b>Study Area:</b> Maricopa County</p> <p><b>Recommendations Relevant to the Study:</b> The 6 step design process is applicable to all streets, especially in a transit friendly community. It incorporates sustainability safety and non-motorized transportation to create complete streets</p>										



	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>MARICOPA REGIONAL BIKEWAY MASTER PLAN (BMP)</b>	✓	✓	✓	✓				✓	✓	
<p><b>Date Completed:</b> 2007  <b>Sponsoring Agency:</b> MAG  <b>Author:</b> Sprinkle Consulting</p>										
<p><b>Purpose:</b> This document mainly serves as a guide for improving, expanding, and connecting the MAG Region's bicycle facility network. The BMP has several distinct purposes. Above all, it is designed to help the Region develop an interconnected bikeway system of on-street and off-street facilities. One particular focus is to demonstrate the importance and viability of relatively short bicycle trips that allow neighborhoods to be linked, thereby making connections that enable all cyclists to get where they want and/or need to go. The Plan's goals are focused on the topics of access, safety/health/education, connectivity, user-friendliness, and implementation. Another important aspect of the Plan is to provide examples of several design solutions such as mid-block trail crossings options. Chapter 6 of the Plan describes issues and opportunities for eight locations throughout the Region that represent typical conditions.</p>										
<p><b>Study Area:</b> MAG Region</p>										
<p><b>Recommendations Relevant to the Study:</b> Use Chapter 6 of the BMP to inform development of bicycle recommendations when developing the improvement prototypes. Planning a safe, comfortable and well-connected bicycle system serves as a building block to a transit accessible community.</p>										

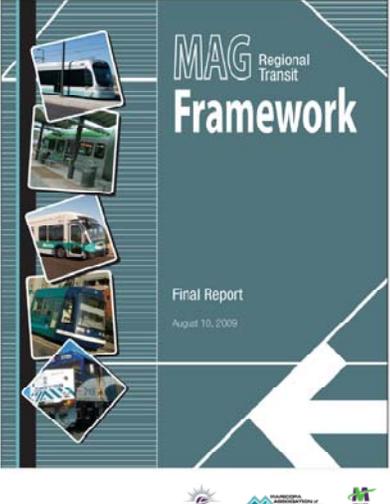


	Document's Relevancy to Designing Transit Accessible Communities								
	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects
<b>PEDESTRIAN POLICIES AND DESIGN GUIDELINES</b> <i>Date Completed:</i> 2005 <i>Sponsoring Agency:</i> MAG <i>Author:</i> MAG <p><b>Purpose:</b> This document is intended to provide a source of information and design assistance to support walking as an alternative transportation mode. Through application of the policies and design guidance in this document, jurisdictions, neighborhoods, land planners, and other entities will be able to: 1) better recognize opportunities to enhance the built environment for pedestrians; 2) better create and redevelop pedestrian areas throughout the region that integrate facilities for walking with other transportation modes; 3) support the development of areas where walking is the preferred transportation mode; and 4) encourage the development of other independent pedestrian focused transportation facilities. The document has a section on identifying pedestrian facility need that may translate to the DTAC project. Specifically, the document describes the Roadside Pedestrian Conditions Model which can be used to define pedestrian level of service along a roadway based on lateral separation between pedestrians and motor vehicles, amount and speed of motor vehicles, percent of heavy vehicles, number of travel lanes, presence of paved shoulder, bike lane or on-street parking, and trees or other buffers.</p> <p><b>Study Area:</b> MAG Region</p> <p><b>Recommendations and/or Guidelines Relevant to the Study by Task:</b>  <i>Task 5a – Develop Prototype Concepts:</i>                      The discussion on identifying pedestrian need as well as on conducting pedestrian walk audits can support development of prototypical pedestrian improvements.  <i>Task 5b – Define Baseline and Enhanced Improvement Types:</i>                      The pedestrian/transit interface is specifically discussed in terms of transit stop location and pedestrian friendly transit center design. In addition, the Roadside Pedestrian Conditions model could be employed in our field reviews of bus stop</p>				✓	✓	✓			



	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>PEDESTRIAN PLAN</b>	✓	✓	✓	✓			✓			✓
<p><b>Date Completed:</b> 1999  <b>Sponsoring Agency:</b> MAG  <b>Author:</b> The Planning Center</p> <p><b>Purpose:</b> This document is intended assist the MAG Pedestrian Working Group and therefore MAG's member agencies by: 1) providing guidance for future targeted activities and programs that will result in increasing the number of people in the Region who walk instead of drive single-occupancy vehicles; 2) identifying potential capital investment projects that will contribute to an expanded, safer, and improved environment for walking in the region; 3) identifying actions and policies that will help the group use existing and potential opportunities and bypass existing and potential constraints to increasing the number of people who walk instead of drive single-occupancy vehicles in the region; and 4) providing guidance for evaluating potential projects on a regional basis. The Plan presents an existing conditions analysis, goals and objectives, demand estimations, and a policy action plan.</p> <p><b>Study Area:</b> MAG Region</p> <p><b>Recommendations Relevant to the Study:</b> The Plan assesses pedestrian level of service across the entire roadway network, and then proposes a method for translating this level of service into design recommendations. The pedestrian level of service results could be employed in DTAC to direct prototype development.</p>										

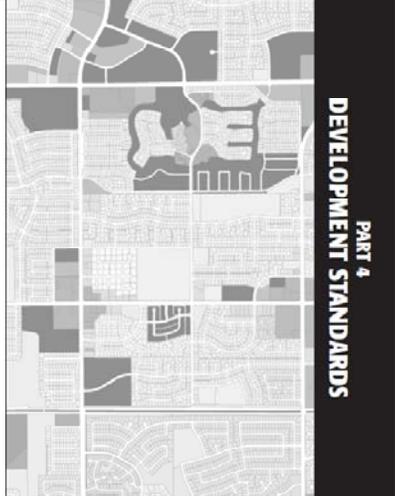


	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>REGIONAL TRANSIT FRAMEWORK</b> <i>Date Completed:</i> 2010 <i>Sponsoring Agency:</i> MAG <i>Author:</i> HDR Engineering, Inc., URS Corporation, AECOM, Hexagon Transportation, Ordonez & Vogelsang, and WestGroup Research <i>Purpose:</i> The intend for the MAG Regional Transit Framework is to understand the region's transit needs and deficiencies with the goal of identifying high-leverage transit investments that can attract a significant number of new passengers while improving transit service for existing patrons. Methods employed for this study include: a review of previous studies, input from the community, an evaluation of the MAG region by external transit peers, and a technical review of regional mobility needs and deficiencies. Chapter 10 of this study describes transit and sustainable development, including transit-supportive land uses, activity centers and parking. The study calls out high-quality, pedestrian-oriented urban designs and streetscapes as an important component of successful transit systems. <i>Study Area:</i> MAG Region <i>Recommendations Relevant to the Study:</i> This study is relevant to DTAC in that it is critical to understand the direction of transit system development in the MAG Region in conjunction with planning for strong levels of access to bus stop areas.			✓	✓						



 <b>Retrofit of Urban Corridors: Land Use Policies and Design Guidelines for Transit-Friendly Environments</b>  Anastasia Loukaitou-Sideris  Working Paper UCTC No. 130  The University of California Transportation Center University of California Berkeley, CA 94720	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>RETROFIT OF URBAN CORRIDORS: LAND USE POLICIES AND DESIGN GUIDELINES FOR TRANSIT FRIENDLY ENVIRONMENTS</b>	✓	✓	✓				✓			✓
<b>Date Completed:</b> 1993 <b>Sponsoring Agency:</b> CALTRANS, U.C. Berkeley, Transportation Center <b>Author:</b> Anastasia Loukaitou-Sideris, UCLA										
<b>Purpose:</b> This study documents the change in Urban Corridors from transit and pedestrian friendly environments in the pre-1920's to the unfriendly urban landscape that existed in the Los Angeles area in the 1990's. The study examines the attributes that cause a physical environment to be supportive or inhibiting to pedestrians. Although this study focused on Los Angeles commercial corridors, similar corridors can be found in almost any major American city. The study provides urban design guidelines to retrofit commercial corridors into pedestrian and transit friendly environments. The design guidelines are based on the desired use of the corridor post retrofit (Mixed-Use, Office Commercial, Retail/ Service Commercial, Industrial and Residential) and provide the desired densities, activity nodes, parking, street design and esthetics, landscaping, street furniture, open space, and transit stops.										
<b>Study Area:</b> Greater Los Angeles Area										
<b>Recommendations Relevant to the Study:</b> Provides examples of good and bad transit accessible corridors in the greater Los Angeles area.										



	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>TEMPE DEVELOPMENT STANDARDS – PART 4</b>	✓	✓	✓		✓		✓	✓	✓	✓
<p><b>Date Completed:</b> 2010  <b>Sponsoring Agency:</b> City of Tempe  <b>Author:</b> City of Tempe</p> <p><b>Purpose:</b> This document is Part 4 of the City of Tempe's Zoning and Development Code. Chapter 2 of Part 4 provides general development standards (e.g., densities, setbacks, and building heights) for all zoning districts. Chapter 3 addresses public infrastructure and states that development projects shall "provide for a safe, attractive, and functional transportation system that is accessible and accommodates all modes of transportation." Chapter 3 discusses connectivity, maximum block lengths, traffic calming, and provides guidelines for bus facilities (e.g., pull-outs and stops). Chapter 3 also requires pathway connections between primary building entrances, transit stops, and public sidewalks; requires shading of pathways and transit stops; and requires pedestrian-scale lighting in overlay districts and redevelopment areas. Chapter 4 addresses building design and includes a requirement for larger developments to contribute to public art projects. Chapter 5 focuses on access and circulation. It addresses driveway locations and widths, accommodation of emergency vehicles, sight distance, and pedestrian and bicycle access. Chapter 5 states that pedestrian and bicycle accessibility requires a "direct, convenient, and attractive pathway system" that is continuous (on public and private lands), free from hazards, well lit, suitable for wheelchairs, direct, connected to primary building entrances, compliant with the Americans with Disabilities Act, supported with appropriate amenities and landscaping, and constructed of appropriate materials. Chapter 6 addresses parking standards for vehicles and bicycles. Chapter 6 requires parking structures to have clearly marked and accessible pedestrian routes, wayfinding, lighting, and surveillance. Bicycle parking ratios are provided; different ratios apply in the "Bicycle Commute Area." Shared parking is allowed. Chapter 7 addresses landscaping, walls, and pedestrian amenities along sidewalks and pathways (where required). Pedestrian amenities include extra-wide sidewalks, seating, shade, weather protection, plazas, courtyards, pedestrian-scale lighting, and public art. Chapter 8 addresses on-site lighting. It includes lighting for pedestrian pathways, plazas, courtyards, building entrances, parking areas, and driveways. Chapter 9 addresses signs, including wayfinding signs. Wayfinding signs are defined as signs that help pedestrians find businesses.</p>										
<b>Study Area:</b> City of Tempe, AZ										
<b>Recommendations Relevant to the Study:</b> This document identifies several design and planning criteria that the Study should include. Prototype stations should, for example, be accompanied by standards for landscaping, lighting, and art.										



<p>City of Phoenix Arizona Section 662. Inertin Transit-Oriented Zoning Overlay District One (TOD-1) -1</p> <p><b>A. Purpose and Intent.</b> The purpose of the Transit-Oriented District One (TOD-1) is to encourage an appropriate mixture and density of activity around transit stations to increase ridership along the Central Phoenix East Valley (CPVEV) Light Rail Corridor and promote alternative modes of transportation to the automobile. The secondary intent is to decrease auto dependency, and mitigate the effects of congestion and pollution. These regulations seek to achieve this by providing a pedestrian-, bicycle-, and transit-supportive environment development supportive uses with a complementary mix of land uses, where streets have a high level of connectivity and the blocks are small, all within a comfortable walking and bicycling distance from light rail stations.</p> <p>Transit-oriented development often occurs as infill and reuse within areas of existing development. The regulations within this ordinance vary in some cases from other ordinances, such as the Urban Residential (UR) District, related to infill development in the City because of the additional need to support transit ridership. The Transit-Oriented District prohibits uses that do not support transit ridership.</p> <p>The specific objectives of this district are to:</p> <ul style="list-style-type: none"> <li>- Encourage people to walk, ride a bicycle or use transit;</li> <li>- Allow for a mix of uses designed to attract pedestrians;</li> <li>- Achieve a compact pattern of development more conducive to walking and bicycling;</li> <li>- Provide a high level of amenities that create a comfortable environment for pedestrians, bicyclists, and other users;</li> <li>- Maintain an adequate level of parking and access for automobiles and integrate this use safely with pedestrians, bicyclists, and other users;</li> <li>- Encourage uses that allow round-the-clock activity around transit stations;</li> <li>- Provide sufficient density of employees, residents and recreational users to support transit; and,</li> <li>- Generate a relatively high percentage of trips accessible by transit.</li> </ul> <p><b>B. Definitions.</b> These definitions shall apply only to the Transit-Oriented District One (TOD-1) Overlay District. (* Definition currently found in Phoenix Zoning Ordinance.)</p>	<p><b>Document's Relevancy to Designing Transit Accessible Communities</b></p>								
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle
<p><b>TOD MODEL ORDINANCE CITY OF PHOENIX TRANSIT ORIENTED ZONE DISTRICT OVERLAY</b></p>			✓				✓	✓	✓
<p><b>Date Completed:</b> 2004  <b>Sponsoring Agency:</b> City of Phoenix  <b>Author:</b> City of Phoenix</p>									
<p><b>Purpose:</b> This document consists of sections of the Zoning Ordinance of the City of Phoenix.</p> <p>Section 662 defines Transit-Oriented Zoning Overlay District One (TOD-1). The general purposes of TOD-1 are (1) encouraging transit-supportive densities and land use mixes around light rail stations and (2) encouraging use of non-auto transportation modes. Section 662 specifies allowed uses, setbacks, building orientation, facades, parking and loading, minimum sidewalk width (which is 8 feet except in lower-density residential areas), signs, and access locations. TOD-1 generally applies up to 2,000 feet from a light rail station; some zoning requirements vary with the distance to the station.</p> <p>Section 663 defines Transit-Oriented Zoning Overlay District Two (TOD-2). TOD-1 and TOD-2 share the same purposes but differ in allowed uses.</p> <p>Section 664 defines the North Central Avenue Special Planning District (SPD) Overlay District. The SPD Overlay District applies to properties zoned R1-10 within the District boundary. It specifies different standards for frontage, setbacks, garages, walls, and fences.</p>									
<p><b>Study Area:</b> City of Phoenix, AZ</p>									
<p><b>Recommendations Relevant to the Study:</b> The scope of the Study does not include light rail stations, but the uses and parameters identified as "transit-supportive" in the reviewed document can nevertheless be used to inform any policy language developed through the Study.</p>									

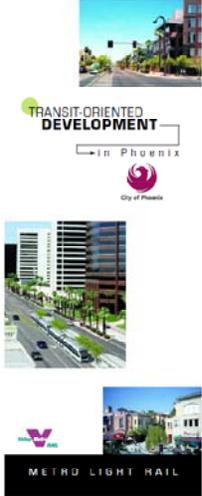


	Document's Relevancy to Designing Transit Accessible Communities								
	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects
<b>TOOLKIT FOR THE ASSESSMENT OF BUS STOP ACCESSIBILITY AND SAFETY</b>				✓		✓			
<p><b>Date Completed:</b> 2006  <b>Sponsoring Agency:</b> Easter Seals Project Action  <b>Author:</b> Nelson/Nygaard Consulting Associates</p>									
<p><b>Purpose:</b> This toolkit is primarily targeted towards staffs at transit agencies and public works departments who are responsible for bus stop design and placement. The toolkit is intended to be a convenient resource that can be used to enhance the accessibility of specific bus stops, or help in the development of a strategic plan to achieve system-wide accessibility. The toolkit primarily emphasizes design enhancements, improvements and barrier removal to improve the transit experience for the disability community.</p>									
<p><b>Study Area:</b> National</p>									
<p><b>Recommendations Relevant to the Study:</b> Although this toolkit focuses on bus stops, the accessibility benefits for recommended improvements are applicable. Where the guide is most applicable includes:</p> <p><i>Task 5b – Define Baseline and Enhanced Improvement Types:</i> Discussions in the Creating Accessible and Safe Bus Stops section provides some guidance to safe accessible paths to bus stops. Focus on ADA standards show the minimum or baseline improvements needed to make pathways safer and more accessible.</p> <p><i>Task 5d – Develop Transit Access Tool Kit:</i> This toolkit has a user friendly layout that both the practitioner and the layman can both understand and utilize. The study team can draw upon the way this toolkit is formatted when developing the MAG DTAC toolkit.</p>									

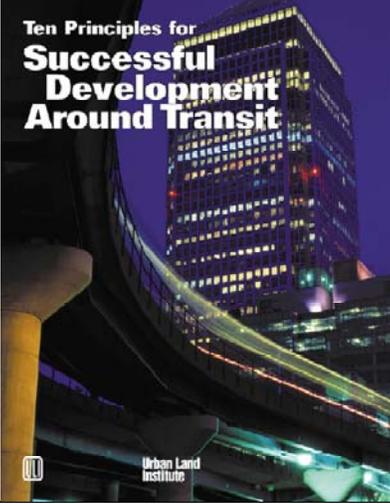


	Document's Relevancy to Designing Transit Accessible Communities									
TRANSIT ORIENTED DEVELOPMENT GUIDE	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths &	Bicycle	Design
<p><b>Date Completed:</b> 2006</p> <p><b>Sponsoring Agency:</b> Twin Cities Metropolitan Council</p> <p><b>Author:</b> Twin Cities Metropolitan Council</p>			✓			✓				✓
<p><b>Purpose:</b> This guide highlights key ideas about transit-oriented development and shows how local Twin Cities projects have put these ideas to work. The guide defines the key elements of TOD. The guide provides a checklist of TOD components related to compact development, mixed uses, pedestrian orientation, and transportation interfaces</p>										
<p><b>Study Area:</b> Twin Cities metropolitan area</p>										
<p><b>Recommendations Relevant to the Study:</b> The checklist provided in this document can provide a useful resource for pedestrian and bicycle improvement prototype development.</p>										



	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>TRANSIT ORIENTED DEVELOPMENT IN PHOENIX</b> <i>Date Completed:</i> Current <i>Sponsoring Agency:</i> Valley Metro RPTA <i>Author:</i> City of Phoenix <i>Purpose:</i> This study provides design standards and zoning regulations pertaining to Transit Oriented Development (TOD) around the light rail alignment within the City of Phoenix. Characteristics of Transit-Oriented Development are provided. The study defines two TOD zones around the light rail alignment; TOD 1 primarily applies to commercial and residential areas, while TOD 2 applies to industrial and support areas. <i>Study Area:</i> Light Rail Corridor within the City of Phoenix <i>Recommendations Relevant to the Study:</i> Highlights prohibited uses within the TOD zones, as well as, conditional and non-conforming uses.			✓				✓			✓



 <p>Ten Principles for <b>Successful Development Around Transit</b></p> <p>Urban Land Institute</p>	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<p><b>10 PINCIPLS FOR SUCCESSFUL DEVELOPMENT AROUND TRANSIT</b></p> <p><i>Date Completed:</i> 2003  <i>Sponsoring Agency:</i> Urban Land Institute  <i>Author:</i> Urban Land Institute</p> <p><i>Purpose:</i> To identify key design and development principals which can serve as a checklist for the development of pedestrian scale communities suitable for public transit. This study highlights good examples of development around transit stops. By illustrating a mix of development around transit, this study shows how to ensure the generation of sufficient numbers of riders to support transit and how transit can enhance the community.</p> <p><i>Study Area:</i> United States and International</p> <p><i>Recommendations Relevant to the Study:</i> This study provides examples of good transit accessible design.</p>		✓	✓			✓				



RTD TRANSIT ACCESS GUIDELINES	Document's Relevancy to Designing Transit Accessible Communities								
	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects
 Regional Transportation District January 2009  Prepared by the RTD Transit Access Committee									
<b>TRANSIT ACCESS GUIDELINES</b>	✓	✓		✓		✓			
<p><b>Date Completed:</b> 2009  <b>Sponsoring Agency:</b> Regional Transportation District (Denver)  <b>Author:</b> Regional Transportation District Transit Access Committee</p>									
<p><b>Purpose:</b> The purpose of the transit access guidelines is to improve the quality of transit access. When safety, convenience and attractiveness are maximized, transit will be both easier to use and more likely to be used. The RTD guidelines adopted an access hierarchy encouraging an optimal balance of modes accessing the transit system. Pedestrians are given the highest priority, as each transit trip begins and ends with a pedestrian trip. The guidelines address standards for pedestrians, bus transfer, bicycle, and auto access with the goal to achieve an optimal balance between them. Since each city and location is unique, the guidelines are meant to be flexible.</p>									
<p><b>Study Area:</b> Regional Transportation District Denver</p>									
<p><b>Recommendations and/or Guidelines Relevant to the Study by Task:</b></p> <p><i>Task 4a – Categorize Transit Stops:</i> It is of high importance and relevance to understand the existing station area conditions to successfully address transit access. The document provides a table with seven (7) Station Area Typologies relating to land use mix, housing types, employment types, and transit system function. Also, in section 2, there are interesting findings about factors that influence the access mode choice.</p> <p><i>Task 4f – Intercept Surveys:</i> The document may help with the survey question composition as it points out the various themes related to transit access quality and choice. Also, section 2 summarizes access research and observed behavior and brings up important factors as to mode choice for transit access.</p> <p><i>Task 5a – Define Baseline and Enhanced Improvement Types:</i> Based on task 4 and the information from the RTD documents used in task 4, task 5 can also use the standards and guidelines in section 3 of the document to ensure optimizing safety, accessibility, and design of transit stops.</p> <p><i>Task 5c – Develop Transit Access Tool Kit:</i> The guidelines and standards in section 3 are intended to support the implementation of the access hierarchy with the goal of achieving an optimal balance of access to the transit system. They are categorized by access mode: walking, biking, bus transfer, and auto (kiss-and-ride and park-and-ride). The standards refer to walking distances between facilities of the transit stop, parking facilities and capacities, safety standards, design guidelines, and more.</p>									

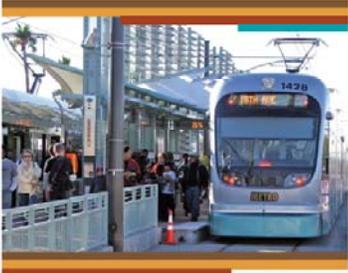


<p>Accessible Community Transportation In Our Nation WWW.PROJECTACTION.ORG</p> <p><b>UNIVERSAL DESIGN &amp; ACCESSIBLE TRANSIT SYSTEMS: FACTS TO CONSIDER WHEN UPDATING OR EXPANDING YOUR TRANSIT SYSTEM</b></p> <p>When making purchasing decisions for transportation infrastructure and equipment capital investment purchases, here are some accessibility features and concepts to consider:</p> <p>Consider Universal Design (UD) – it benefits everyone.</p> <p>Universal Design (UD) extends the benefits of accessible design (as defined by the Americans with Disabilities Act ADA) to all riders. The goal of UD is to make environments, products and systems safer, healthier, and more usable for everyone. Universal design addresses accessibility across the built environment and on to vehicles.</p> <p>Implementing Universal Design has many benefits and research has demonstrated:<sup>16</sup></p> <ul style="list-style-type: none"> <li>• UD provides a business advantage to organizations by: <ul style="list-style-type: none"> <li>- increasing customer base and customer loyalty,</li> <li>- reducing operating and renovation costs,</li> <li>- increasing productivity and operating efficiency,</li> <li>- reducing specialty maintenance costs, and</li> <li>- expanding the labor pool.</li> </ul> </li> </ul> <p>Here are some Universal Design Features to consider before finalizing plans for capital improvement projects.</p> <p>Easter Seal Project Action API</p> <p>1608 • Transit 300, July 2009 • Washington, DC 20005 • P 202 547 3666 • F 202 547 3614 • T 800 488 6726 • FAX 202 547 3749</p>	<p><b>Document’s Relevancy to Designing Transit Accessible Communities</b></p>									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<p><b>UNIVERSAL DESIGN &amp; ACCESSIBLE TRANSIT SYSTEM: FACTS TO CONSIDER WHEN UPDATING OR EXPANDING YOUR TRANSIT SYSTEM</b></p>	✓	✓			✓		✓			✓
<p><b>Date Completed:</b> 2009</p>										
<p><b>Sponsoring Agency:</b> Easter Seals Project Action</p>										
<p><b>Author:</b> Rehabilitation Engineering Research Center on Accessible Public Transportation (RERC-APT)</p>										
<p><b>Purpose:</b> To provide information about universal design and accessibility features that can be considered when making purchasing decisions about transportation infrastructure and equipment investments.</p>										
<p><b>Study Area:</b> National</p>										
<p><b>Recommendations Relevant to the Study:</b> Extending the benefits of accessible design to all users will create a more user friendly transit system. This can be done by using computers, GPS, and ITS to relieve the burden from operators as well as riders. Make sure all information is easily accessible. Ensure ease of access to all transit facilities at all times. Audio and visual signaling is important. Consider the location, provide shelter at stops, and make transfers logical and organized.</p>										

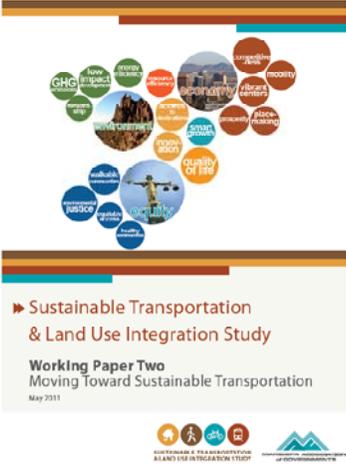


<p>VISION FOR AN IDEAL ACCESSIBLE COMMUNITY - Transport Canada Page 1 of 10</p>	<p><b>Document's Relevancy to Designing Transit Accessible Communities</b></p>								
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle Design Standards
<p><b>VISION FOR AN IDEAL ACCESSIBLE COMMUNITY</b></p>							✓	✓	✓
<p><b>Date Completed:</b> 2007</p>									
<p><b>Sponsoring Agency:</b> International Center for Accessible Transportation</p>									
<p><b>Author:</b> Suen, Blais, D.Souzza</p>									
<p><b>Purpose:</b> This paper describes the characteristics of an "ideal" accessible community. These characteristics pertain to mix of uses, mobility options, sustainability, walkability, affordability (for users), the needs the elderly and disabled, and the cultural mix of the population. Concepts discussed are "visitability," "universal design," and "seamless travel." Public-private partnerships are identified as a potential implementation tool.</p>									
<p><b>Study Area:</b> Canada</p>									
<p><b>Recommendations Relevant to the Study:</b> "Sustainability" potentially adds a new dimension to the Study. Provision of transportation information should be considered as well.</p>									



 Sustainable Transportation & Land Use Integration Study Working Paper One Regional Transportation Framework & Issues Revised April 2011	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>STLUIS WORKING PAPER 1: REGIONAL TRANSPORTATION FRAMEWORK &amp; ISSUES</b> <b>Date Completed:</b> 2011 <b>Sponsoring Agency:</b> MAG <b>Author:</b> Arup/Sustainable Transportation & Land Use Integration Study <b>Purpose:</b> As the initial working paper associated with this study, the paper identifies established themes for the region's transportation network; reviews previous studies; describes recent progress toward sustainability and land use integration in the region; reviews planned, proposed, and potential transit corridors; and highlights challenges and opportunities related to creating a sustainable regional transportation network that maximizes economic, social, and environmental value. <b>Study Area:</b> MAG Region <b>Recommendations Relevant to the Study:</b> Project background information			✓	✓	✓					

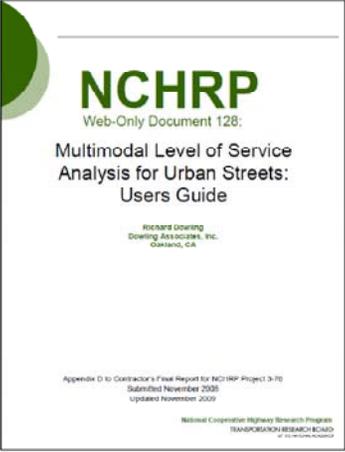


	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<p><b>STLUIS WORKING PAPER 2: MOVING TOWARD SUSTAINABLE TRANSPORTATION</b></p> <p><i>Date Completed:</i> 2011  <i>Sponsoring Agency:</i> MAG  <i>Author:</i> ARUP/Sustainable Transportation &amp; Land Use Integration Study</p> <p><i>Purpose:</i> The purpose of this working paper is to focus on defining the elements of sustainable transportation in the MAG region and identify strategies to turn those into reality. The working paper is based on research and studies and screens the presented strategies for applicability to the MAG region. The main subjects discussed include: walkability and bicycle access, multi-modal mobility, access to destinations, equitable access, and energy efficiency. The strategies refer to walkable streets, mixed-use communities, affordable TOD housing, transportation demand management, transit-supportive densities, and fast and convenient transit service.</p> <p><i>Study Area:</i> MAG Region</p> <p><i>Recommendations Relevant to the Study:</i> The studies presented provide important background material and a number of relevant strategies for transit accessible community planning.</p>			✓		✓	✓	✓			



	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>PROMOTING BICYCLE COMMUTER SAFETY</b> <i>Date Completed:</i> 2012 <i>Sponsoring Agency:</i> USDOT, Caltrans <i>Author:</i> Asbjorn Osland - Mineta Transportation Institute <i>Purpose:</i> This paper discusses safety issues related to bicycle travel in detail and discusses how engineering, education, enforcement, encouragement, and evaluation ("the Five Es") can make bicycle travel safer. Accident data and case studies are described. Use of social psychology models to change behaviors related to bicycle safety is described. The paper covers more than just commuting. <i>Study Area:</i> National <i>Recommendations Relevant to the Study:</i> This paper offers a comprehensive list of bicycle facility types and planning factors (e.g., pavement quality and level of "rider stress") that could be considered in the Study.	✓	✓	✓			✓	✓		✓	



	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>MULTIMODAL LEVEL OF SERVICE ANALYSIS FOR URBAN STREETS:USERS GUIDE</b>								✓	✓	✓
<b>Date Completed:</b> 2009 <b>Sponsoring Agency:</b> AASHTO Federal Highway Administration <b>Author:</b> National Cooperative Highway Research Program										
<b>Purpose:</b> To provide a multimodal level of service (MMLOS) analysis for urban streets. It provides a set of recommended procedures for predicting traveler perception of quality of service and performance measures for urban streets. It does not provide an over-all LOS but rather individual LOS ratings for each mode: auto, transit, bicycle, and pedestrian.										
<b>Study Area:</b> National										
<b>Recommendations Relevant to the Study:</b> Section V provides basic guidelines and quick tables for levels of service based on capacity and a few other of the most pertinent variables for each LOS. There are also two examples at the end that walk through the entire process for example street sections.										



<p><b>ACCESSING TRANSIT</b> Design Handbook for Florida Bus Passenger Facilities Version II, 2008 Florida Planning and Development Lab Florida State University</p>	Document's Relevancy to Designing Transit Accessible Communities								
	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects
<p><b>ACCESSING TRANSIT: DESIGN HANDBOOK FOR FLORIDA PASSENGER FACILITIES</b></p> <p><i>Date Completed:</i> 2008  <i>Sponsoring Agency:</i> Florida Department of Transportation Public Transit Office  <i>Author:</i> Florida Planning and Development Lab, Department of Urban and Regional Planning, Florida State University</p> <p><i>Purpose:</i> This handbook was written in order to provide a framework for transit agency staff that could ultimately be tailored to provide specific physical design criteria for identifying programs, capital resources, and operations. The proposed standards and guidelines can be integrated with local comprehensive plan policies, land use ordinances, pedestrian plans, and street design guidelines. Transit agencies can use the handbook as a basis for planning access improvements to transit facilities and for working with local jurisdictions to comply with transit concurrency levels of service in existing and proposed transit service areas. Some agencies may use the handbook when attempting to plan a bus passenger facility in tandem with street improvements. Others will want to integrate them into the broader policies of the local government and everyday practices. The handbook covers the following topics: curb-side guidelines, street-side guideline, facility prototypes, land use, and safety.</p> <p><i>Study Area:</i> non-descript</p> <p><i>Recommendations Relevant to the Study:</i>  <i>Task 4a – Categorize Transit Stops:</i> This document proposes a bus stop prototype based upon the level of transit service provided. The prototypes are as follows:</p> <ul style="list-style-type: none"> <li>• <i>On-line bus stops</i> – Provides access to transit in a variety of locations, including arterials, collectors, and local streets. May be adjacent to a variety of land uses.</li> <li>• <i>Primary bus stops</i> – Provides access to more important destinations whose density of employees or residents results in either high peak hour use or regular use several times a day. May also serve as a transfer point</li> <li>• <i>Transit Malls</i> – Provides transit access to traditional downtowns and commercial centers and serves as a base for local circulator service, express routes and other special modes of bus transit. The facility may also serve as the first element in a bus rapid transit mode of service.</li> <li>• <i>University Transfer Centers</i> – Transfer center located at a university.</li> <li>• <i>Transfer Centers</i> – Serve as major nodes in the transit network connecting various regional and local bus lines and express routes and circulator services. Designed to ease transferring between bus routes and between bus transit and other travel modes. Located within major activity centers.</li> </ul>	✓	✓	✓	✓					



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- *Park-and-Rides* – Bus stop located at a park-and-ride.
- *Air-Bus Intermodal Centers* – Bus stop located at an airport.
- *Bus Rapid Centers* – Bus transit center served by multiple express bus rapid transit routes

*Task 4f – Intercept Surveys:* The document provides a listing of potential intercept survey questions focused on mode of access to transit.

*Task 5a – Develop Prototype Concepts:* The document has extensive discussion on design elements associated with bus stop areas. Land use around bus stops is also discussed.

*Task 5b – Define Baseline and Enhanced Improvement Types:* Extensive discussion of design elements in this document should be reference in order to develop prototypical improvements.

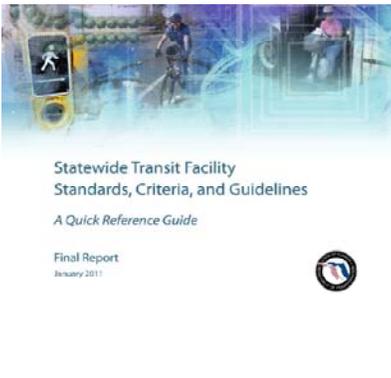


	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>TRANSIT FACILITIES GUIDELINES</b>										✓
<p><b>Date Completed:</b> 2006  <b>Sponsoring Agency:</b> State of Florida Department of Transportation  <b>Author:</b> State of Florida Department of Transportation</p>										
<p><b>Purpose:</b> This study is a technical guide for engineers. The study provides design standards for bus stops (near-side, far-side and mid-block), intersections, roadway geometry (for roadways with transit), and pedestrian crossing treatments (be it intersection or midblock).</p>										
<p><b>Study Area:</b> The State of Florida</p>										
<p><b>Recommendations Relevant to the Study:</b> Engineering design blueprints/templates are provided for a variety of transit stop locations.</p>										

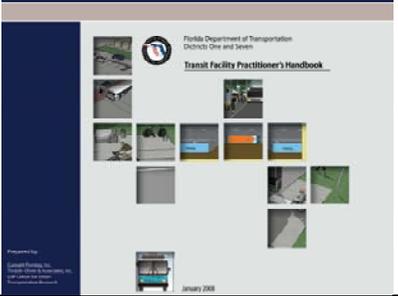


<p>Appendix A to Part 1191: Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities</p> <p><b>Americans with Disabilities Act (ADA)</b></p> <p><b>Accessibility Guidelines for Buildings and Facilities</b></p> <p>U.S. Architectural and Transportation Barriers Compliance Board (Access Board) 1331 F Street, N.W., Suite 1000 Washington, D.C. 20004-1111 (202) 272-0080 (202) 272-0082 TTY (202) 272-0081 FAX</p>	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<p><b>AMERICAN WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES</b></p>			✓				✓	✓		
<p><b>Date Completed:</b> 2002</p> <p><b>Sponsoring Agency:</b> U.S. Architectural and Transportation Barriers Compliance Board (Access Board)</p> <p><b>Author:</b> U.S. Architectural and Transportation Barriers Compliance Board (Access Board)</p>										
<p><b>Purpose:</b> This study is designed to assist with the scoping and technical requirements for accessibility to buildings and facilities by individuals with disabilities under the Americans with Disabilities Act (ADA) of 1990. These scoping and technical requirements are to be applied during design, construction, and alteration of buildings and facilities covered by Titles II and III of the ADA to the extent required by regulations issued by Federal agencies, including the Department of Justice and the Department of Transportation.</p>										
<p><b>Study Area:</b> National</p>										
<p><b>Recommendations Relevant to the Study:</b> This guide provides guidelines and illustrative regulations to assist with adhering to compliance with the Americans with Disability Act (ADA) 1990.</p>										



	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>STATEWIDE TRANSIT FACILITIES STANDARDS, CRITERIA, GUIDELINES: A QUICK REFERENCE</b>			✓		✓		✓	✓	✓	✓
<b>Date Completed:</b> 2011 <b>Sponsoring Agency:</b> Florida Department of Transportation – Public Transit Office <b>Author:</b> Florida Department of Transportation – Public Transit Office										
<b>Purpose:</b> This report was prepared as part of the Statewide Transit Accessibility and Facilities Design Course initiated and funded by the Florida Department of Transportation (FDOT) Public Transit Office. The study provides best practices and standards for both curb-side and street-side treatments pertaining to the following: Bus Stop Boarding and Alighting Areas, Bus Stop Shelters, Bus Stop Signs, Bus Benches, Bus Stop Hurricane Wind Loads, Bus Stop Information and Way-finding Loads, Bus Stop Shelter Lighting, Landscaping, Bus Stop Leaning Rails, Bus Stop Trash Receptacles, Bollards, Bike Racks at Bus Shelters, Shopping Cart Storage at Bus Shelters, Public Telephones, Police Call Box, Vending Machines, Roadway & Special Land-Use Lanes, Traffic Signals and Giving Transit Priority, Street Lighting, Vehicle Characteristics, Pavement Markings, Bus Stop Locations, Emergency Medical Services (ES) Access, Road-Side Bus Stops, Bus Bays/Queue Jumper Bus Bays, Bus Bulbs/Intersection Nubs, Off-Street Half-sawtooth Bus Bays, Bus Stops and Railroad Crossings, Bike Lanes, Pedestrian Crossings, Raised Pedestrian Crossing/Speed Tables, Pedestrian Islands, Transit Provision During Construction and Street Signage.										
<b>Study Area:</b> The State of Florida										
<b>Recommendations Relevant to the Study:</b> Possible transit facility standards and guidelines.										

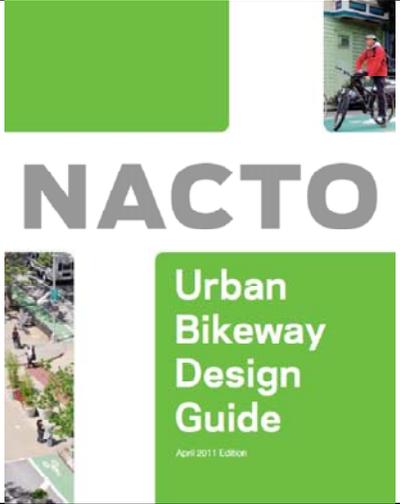


Document Name	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>TRANSIT FACILITY PRACTITIONER'S HANDBOOK</b>	✓	✓	✓		✓	✓	✓	✓	✓	✓
<b>Date Completed:</b> 2008										
<b>Sponsoring Agency:</b> Florida department of Transportation Districts One and Seven										
<b>Author:</b> Gannett Fleming, Inc., Tindale-Oliver & Associates, Inc., USF Center for Urban Transportation Research										
<b>Purpose:</b> This document provides a bulleted overview of three substantial documents: the <i>Transit Facility Handbook</i> , <i>Transit and Development Review Process</i> , and <i>Transit-Oriented Development</i> . It can be used as a reference for searching topics in these three documents.										
<b>Study Area:</b> Two DOT districts (1 and 7) within the state of Florida DOT										
<b>Recommendations Relevant to the Study:</b> This document provides an overview of three guidelines that are excellent resources for the DTAC study.										



	Document's Relevancy to Designing Transit Accessible Communities								
	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects
 <p><b>TRANSIT FACILITY HANDBOOK</b></p>	✓		✓	✓					
<p><b>Date Completed:</b> 2007  <b>Sponsoring Agency:</b> Florida department of Transportation Districts One and Seven  <b>Author:</b> Gannett Fleming, Inc., Tindale-Oliver &amp; Associates, Inc., USF Center for Urban Transportation Research</p>									
<p><b>Purpose:</b> The goal of this handbook is to provide comprehensive guidance for planning and designing transit facilities, activities, and services for two DOT districts in the state of Florida. Specific goals of the document including expanding the integration of transit considerations in the development review process, supporting the integration of transit infrastructure with land use, accommodating neighborhoods in the design of transit stops, and encouraging transit-oriented development. The handbook addresses traffic control devices, street design, stop location, stop design, ADA requirements, and pedestrian crossings. It also proposes a stop classification method, along with associated bus stop infrastructure and amenities.</p>									
<p><b>Study Area:</b> Two DOT districts (1 and 7) within the state of Florida DOT</p>									
<p><b>Recommendations Relevant to the Study:</b>            Task 4a – Categorize Transit Stops: A simple bus stop classification approach is presented that includes local/neighborhood, primary, on/off street transit station, off-street intermodal station, and park-and-ride.            Task 5a – Develop Prototype Concepts: This document provides detailed design guidelines for transit stops including bike lane and sidewalk approaches to bus stops. Pedestrian crosswalk standards for accessing bus stops are reviewed. There is a complete chapter on “curb-side” amenities.            Task 5b – Define Baseline and Enhanced Improvement Types:            This handbook serves as a state-of-the-art design guideline for bus stop designs. The DTAC study should carefully reference this handbook when developing transit access recommendations.</p>									

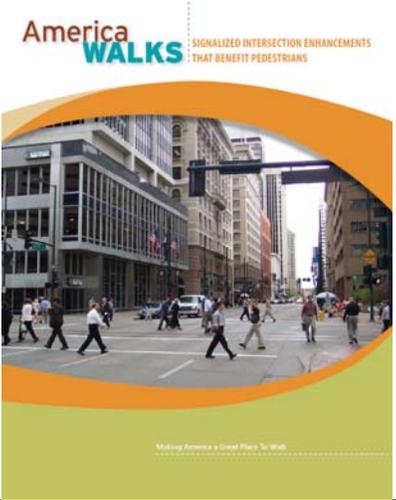


	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>URBAN BIKEWAY DESIGN GUIDE</b>	✓	✓							✓	✓
<b>Date Completed:</b> 2011										
<b>Sponsoring Agency:</b> National Association Of City Transportation Officials										
<b>Author:</b> National Association Of City Transportation Officials										
<b>Purpose:</b> To provide cities with state-of-the-practice solutions that can help create complete streets that are safe and enjoyable for bicyclists. To help practitioners make good decisions about urban bikeway design										
<b>Study Area:</b> International										
<b>Recommendations Relevant to the Study:</b> Many different bike options are presented. For each bike friendly strategy, cross sections and diagrams are provided, as well as requirements to implement the chosen strategy, what is recommended to make it more successful, and what else could be added, but is generally not needed to be functional. There are many options provided from many different locations so that any urban environment can find a strategy that will fit its form.										

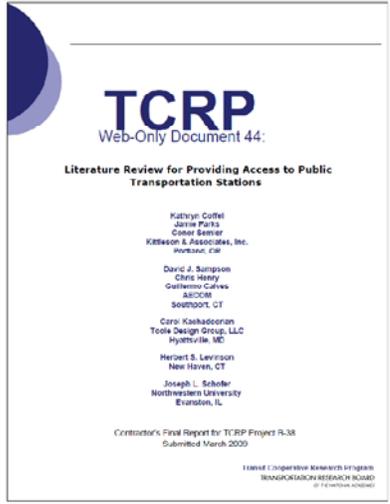


	Document's Relevancy to Designing Transit Accessible Communities								
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle
<b>RPTA BUS STOP PROGRAM AND STANDARDS DESIGN GUIDELINES</b>							✓	✓	✓
<p><b>Date Completed:</b> 2007  <b>Sponsoring Agency:</b> RPTA Valley Metro  <b>Author:</b> Parsons Brinckerhoff (PB)</p>									
<p><b>Purpose:</b> This document presents guidelines from RPTA's Bus Stop Program and Standards project. The project was intended to prioritize use of Regional Transportation Plan (RTP) funds to improve bus stops throughout the region.</p> <p>The guidelines are intended to serve as a common, "best practices" resource for bus stop design in the region. They address siting, basic bus stop components, accessibility, amenities, information, signage, and design considerations. Accessibility here means satisfying the Americans with Disabilities Act (ADA) and providing connectivity between bus stops and surrounding land uses.</p>									
<p><b>Study Area:</b> Phoenix region, AZ</p>									
<p><b>Recommendations Relevant to the Study:</b> These guidelines are relevant to the study because they provide design parameters that reflect current practice in the region, satisfy the ADA, and represent lessons already learned in the region. The document notes that, if a city applies for RTP funding for bus stop improvements, submitted plans will need to show multimodal facilities within 250 feet of the site.</p>									



	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
<b>SIGNALIZED INTERSECTION ENHANCEMENTS THAT BENEFIT PEDESTRIANS</b>	✓	✓				✓	✓	✓		✓
<p><b>Date Completed:</b> 2012</p> <p><b>Sponsoring Agency:</b> America Walks</p> <p><b>Author:</b> Fehr &amp; Peers</p> <p><b>Purpose:</b> to educate decision makers, planners, engineers, and citizens on signalized intersection enhancements that can improve pedestrian safety and convenience, summarize a wide array of potential treatments for a variety of signalized intersections</p> <p><b>Study Area:</b> National</p> <p><b>Recommendations Relevant to the Study:</b> Gives recommendations for ways to improve signal timing based around 3 different categories Geometric treatments such as curb radii, street widths and pedestrian islands. Signal hardware like countdown timers, protected left turn, and blank out turn restriction LED signs. Operational measures such as cycle lengths, scramble phases, and leading pedestrian intervals.</p>										



	Document's Relevancy to Designing Transit Accessible Communities									
	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects	Task 7b – Prepare a Prioritization Spreadsheet
<p><b>TCRP WEB DOC 44 LITERATURE REVIEW FOR PROVIDING ACCESS TO PUBLIC TRANSPORTATION STATIONS</b></p>	✓		✓	✓	✓	✓				
<p><b>Date Completed:</b> 2009  <b>Sponsoring Agency:</b> Transportation Research Board  <b>Author:</b> Kittelson &amp; Associates</p>										
<p><b>Purpose:</b> TCRP Web Document 44 is the literature review conducted for the TCRP B-38 research project, which has concluded and is anticipated to be published in 2012. TCRP B-38 developed a guidebook on planning for transit station access. The guidebook addresses benefits, costs, synergies, and trade-offs relating to parking at transit stations, feeder transit services, pedestrian and bicycle access to stations, and transit-oriented development (TOD).</p> <p>Web Document 44 summarizes 79 documents categorized under access issues, evaluation tools, TOD, park-and-ride, feeder service, and pedestrian and bicycle access. The findings that resulted from the literature review are as follows:</p> <ol style="list-style-type: none"> <li>1. Local characteristics must be considered.</li> <li>2. Both individual characteristics and external factors play a role in access decisions.</li> <li>3. Well-established tools exist for evaluating the quality of pedestrian, bicycle, and transit facilities.</li> <li>4. TOD must be sensitive to local market conditions.</li> <li>5. Park-and-ride lots currently play a large role in station access and are likely to continue to play a large role for the foreseeable future.</li> <li>6. Parking and transportation demand management techniques can be effective but must be priced appropriately.</li> <li>7. Competitive feeder services can be difficult to provide but can have major benefits.</li> <li>8. Pedestrian access is affected by distance, urban design, pedestrian facilities, crime, and individual characteristics. Transit agencies can influence some of these factors.</li> <li>9. Surveys show that pedestrians will walk up to 1 mile to access transit, contrary to the commonly used 0.5-mile rule of thumb.</li> <li>10. Transit agencies do not have a lot of influence on bicycle access to transit except in the case of bicycle parking at stations.</li> </ol>										
<p><b>Study Area:</b> International</p>										
<p><b>CONTINUED ON THE NEXT PAGE</b></p>										



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***Recommendations and/or Guidelines Relevant to the Study by Task:***

Task 4a – Categorize Transit Stops: Multiple reviewed documents identify relevant components and features of transit stops and transit stop access. The finding related to maximum walking distance to access transit is potentially relevant to the Study.

Task 5a – Develop Prototype Concepts: The reviewed agency guidelines are potentially relevant to the Study.

Task 5b – Define Baseline and Enhanced Improvement Types: The reviewed agency guidelines are potentially relevant to the Study. One of the reviewed documents notes that bus rapid transit stations and light rail stations may not differ much in terms of station access needs and access patterns if the transit services provided are similar. Multiple reviewed documents provide relevant principles for the planning of transit stations.

Task 5c – Implementation Strategies: The identified evaluation tools and the reviewed agency guidelines are potentially relevant to the Study. Multiple reviewed documents provide relevant principles for the planning of transit stations.

Task 5d – Develop Transit Access Tool Kit: The identified evaluation tools and the reviewed agency guidelines are potentially relevant to the Study.



<p>RPTA Bus Stop Program and Standards</p> <p><b>Final Report</b></p> <p><b>Findings and Recommendations</b></p> <p>Prepared for REGIONAL PUBLIC TRANSPORTATION AUTHORITY</p>  <p>Prepared by <b>PB</b></p> <p>January 2008</p>	Document's Relevancy to Designing Transit Accessible Communities									
	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects	Task 7b – Prepare a Prioritization Spreadsheet
<p><b>RPTA BUS STOP PROGRAM AND STANDARDS FINDINGS AND RECOMMENDATIONS</b></p>	✓		✓	✓	✓	✓	✓	✓	✓	
<p><b>Date Completed:</b> 2008  <b>Sponsoring Agency:</b> RPTA Valley Metro  <b>Author:</b> PB</p>										
<p><b>Purpose:</b> This document presents findings and recommendations from RPTA's Bus Stop Program and Standards project. The project was intended to prioritize use of Regional Transportation Plan (RTP) funds to improve bus stops throughout the region.</p> <p>Included in the findings and recommendations are a discussion of bus stop improvement option costs (tied to five levels of amenities). The levels of amenities range from Base (a bus stop sign, costed at \$150) to Level 4 (a full package of infrastructure and amenities, costed at \$23,300). Criteria for bus pull-outs are provided. Needs-based criteria for determining bus stop eligibility for a given level of funding are identified.</p>										
<p><b>Study Area:</b> Phoenix region, AZ</p>										
<p><b>Recommendations and/or Guidelines Relevant to the Study by Task:</b></p> <p>Task 4a – Categorize Transit Stops: The bus stop categorization/prioritization methodology is relevant to the Study, as it is intended to be objective, covers a range of different types of bus stops, and identifies the infrastructure that should be provided for each type. The information about city-maintained bus stop databases and the region-wide bus stop database will be useful.</p> <p>Task 5a – Develop Prototype Concepts: The bus stop design guidelines developed in parallel to these findings and recommendations are intended to serve as a common, "best practices" resource for bus stop design in the region. They address siting, basic bus stop components, accessibility, amenities, information, signage, and design considerations.</p> <p>Task 5b – Define Baseline and Enhanced Improvement Types: The bus stop categorization/prioritization methodology is relevant to the Study, as it is intended to be objective, covers a range of different types of bus stops, and identifies the infrastructure that should be provided for each type.</p> <p>Task 5c – Implementation Strategies: The bus stop categorization/prioritization methodology is relevant to the Study, as it is intended to be objective, covers a range of different types of bus stops, and identifies the infrastructure that should be provided for each type.</p>										
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Task 5d – Develop Transit Access Tool Kit: The bus stop categorization/prioritization methodology is relevant to the Study, as it is intended to be objective, covers a range of different types of bus stops, and identifies the infrastructure that should be provided for each type. The document indicates that a methodology for forecasting boardings exists.

Task 6a – Cost Analysis: The cost and funding information and criteria are relevant because Study implementation is likely to rely on RTP funds to some degree.

Task 6b – Funding Options: The cost and funding information and criteria are relevant because Study implementation is likely to rely on RTP funds to some degree. An application must be submitted to receive RTP funds. Other potential funding sources are described in an appendix.

Task 7a – Develop a Framework for Prioritizing Accessibility Projects: The bus stop categorization/prioritization methodology is relevant to the Study, as it is intended to be objective, covers a range of different types of bus stops, and identifies the infrastructure that should be provided for each type. The document concludes with a listing of actions that could be undertaken to improve the prioritization and funding allocation process; these actions should be considered in the Study.



**Appendix C**  
**Presentation – Stakeholder Outreach Workshop, February 7, 2012**



# DESIGNING TRANSIT ACCESSIBLE COMMUNITIES STUDY

Stakeholder Outreach Workshop  
February 7, 2012





# Agenda

1. Introductions (5 minutes)
2. Project Overview (10 minutes)
3. Workshop Overview (5 minutes)
4. Workshop Breakout Group Discussion (50 minutes)
5. Review Breakout Sessions & Wrap-up ( 20 minutes)
6. Adjourn at 3:00 pm



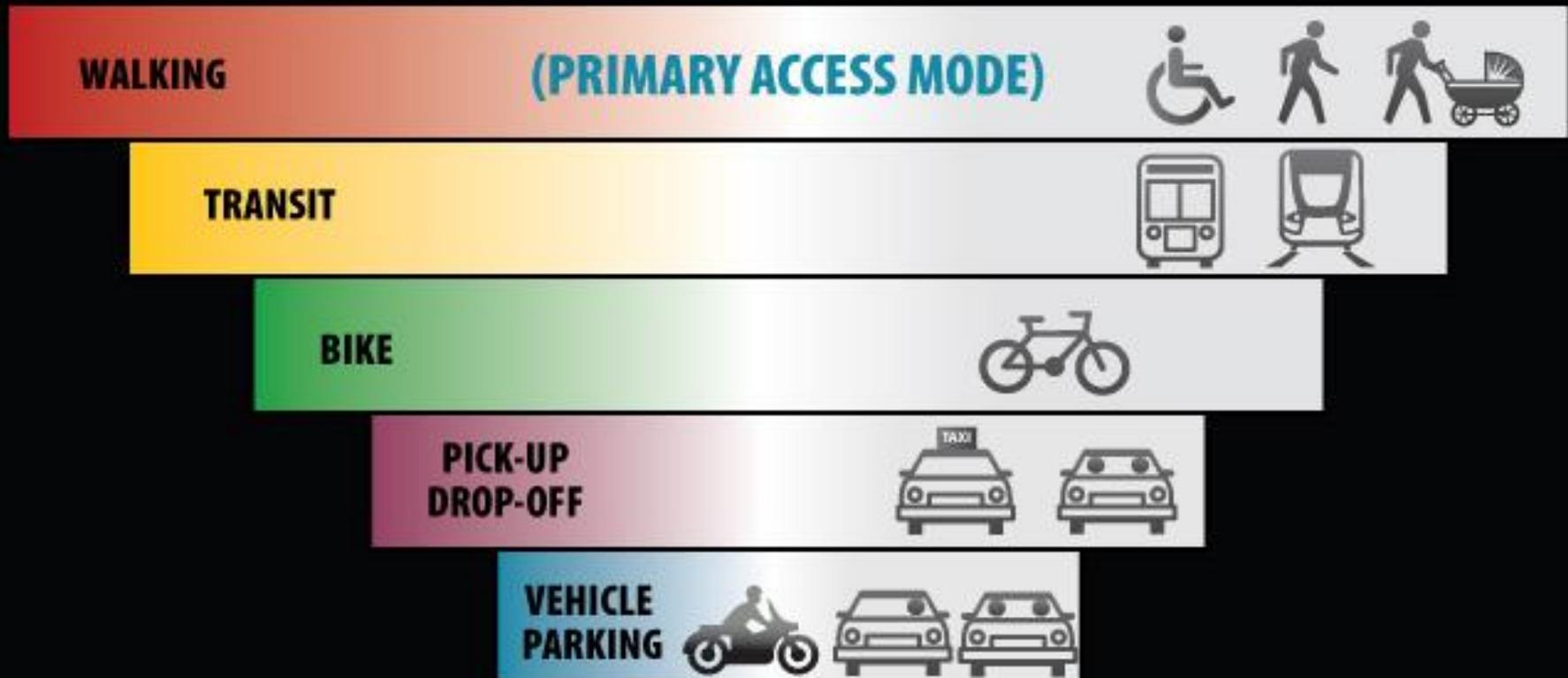
# Project Overview – Goals & Objectives

- Identify the challenges faced by users getting to transit.
- Recommend improvements, policies and guidelines to enhance transit accessibility.
- Provide measures and strategies for local governments to create transit accessible and livable neighborhoods.
- Identify options and provide a regional framework for applying for federal grants.



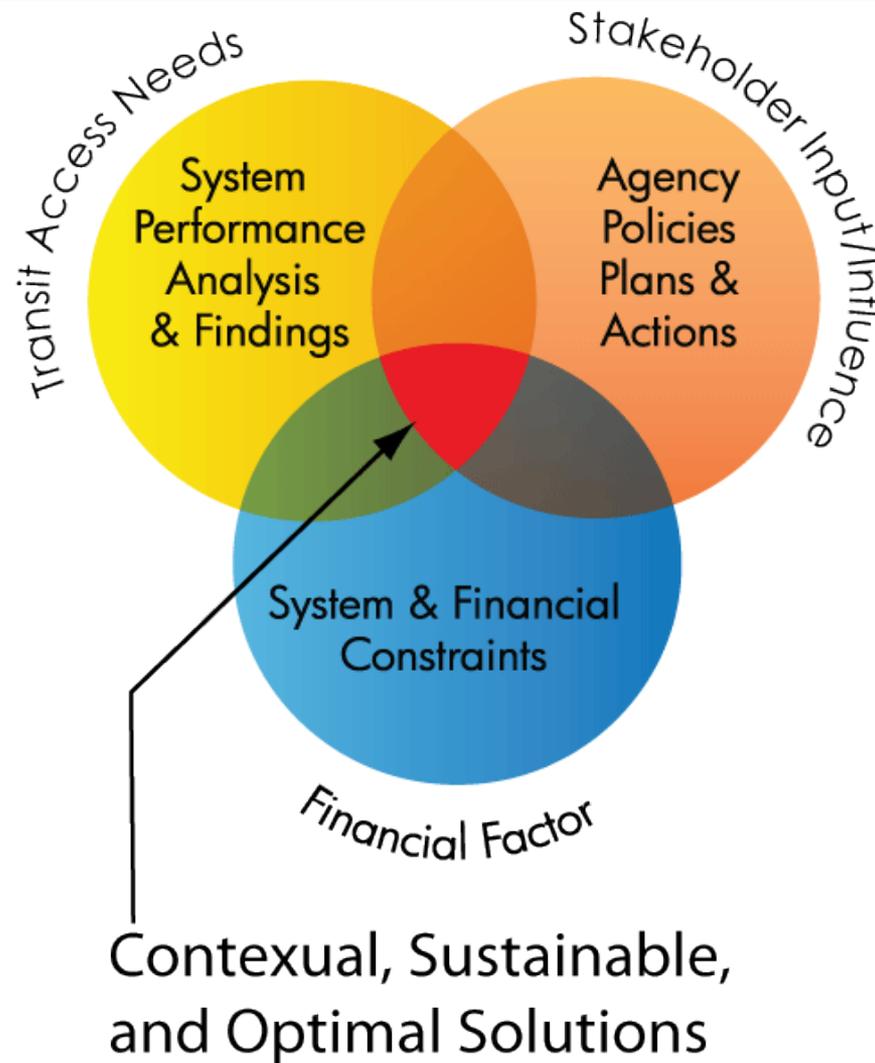
# Transit Accessibility

## ACCESS HIERARCHY



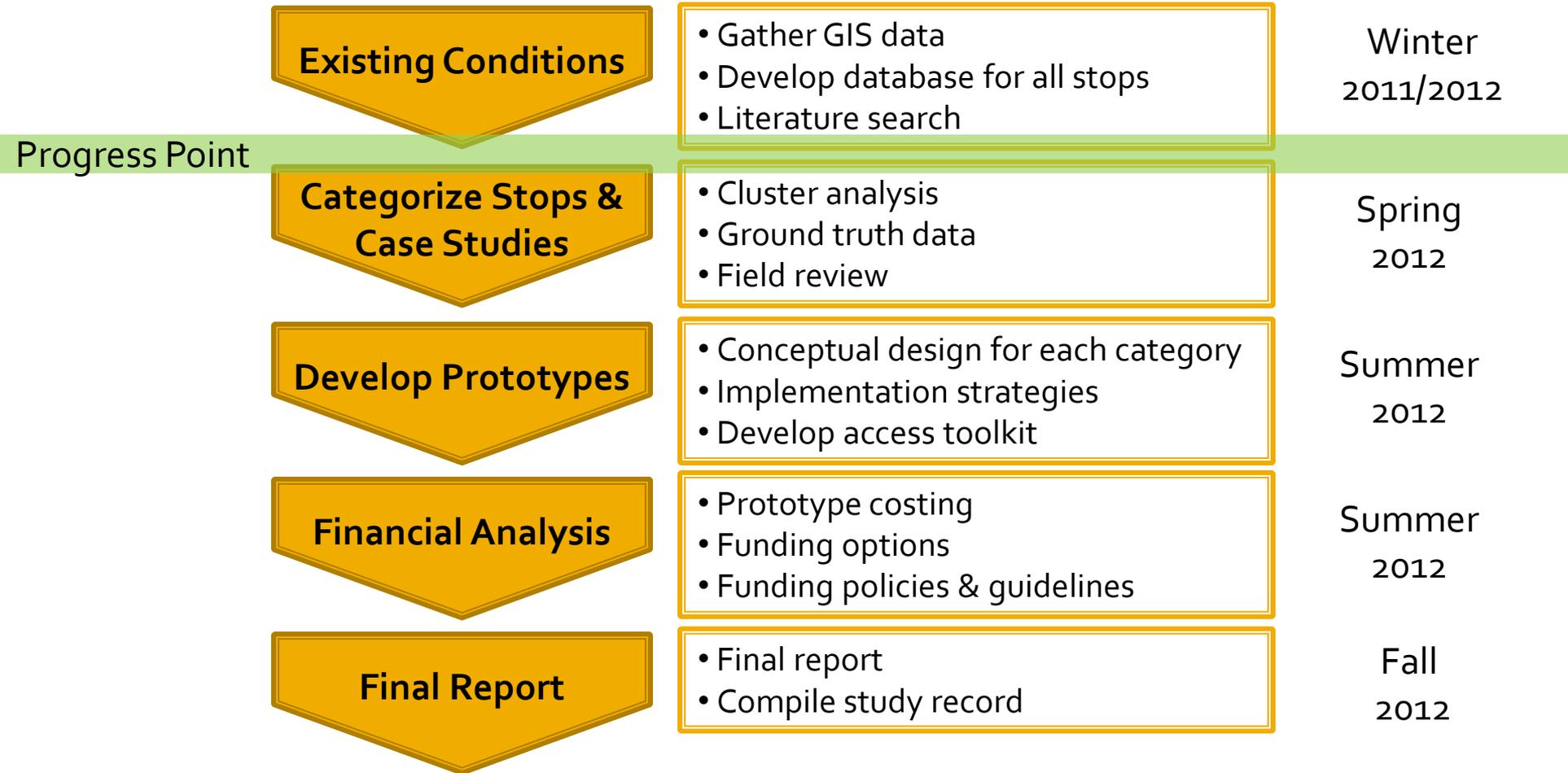


# Transit Accessibility





# Project Overview – Work Program





# Workshop Objectives

- Identify challenges faced by users getting to transit.
- Identify universe of potential improvements to help users get to and from bus/transit stops.
- Offer possible solutions to help create transit accessible neighborhoods.
- Propose ways to prioritize accessibility improvements.



# Workshop Outcome

- A refined list of known or perceived challenges and/or needs of transit patrons.
- A list of potential bicycle, pedestrian, ADA improvements, policies, and/or guidelines to enhance transit accessibility.
- Give input to project team on accessibility enhancements.



**ACCESS & COMFORT INVENTORY**

**LOW**

**MODERATE**

**HIGH**

**TRANSIT CENTER  
PARK-N-RIDE**



- ⊖ Not ADA Accessible
- ⊖ No Sidewalks
- ⊖ No Passenger Waiting Amenities
- ⊖ No Weather Protection



- ⊕ Sidewalk
- ⊕ Adjacent Bike lane
- ⊕ Passenger Waiting Amenities
- ⊖ No Weather Protection



- ⊕ Adjacent Land Use Access
- ⊕ ADA Accessible
- ⊕ Weather Protection
- ⊕ Bike Racks



- GILBERT TRANSIT CENTER**
- ⊕ Adjacent to Western Canal Trail
  - ⊕ Weather Protection
  - ⊕ Bike Lockers
  - ⊕ Restrooms



- ⊕ Sidewalk
- ⊖ No Buffer Against Traffic
- ⊖ No Passenger Waiting Amenities
- ⊖ No Weather Protection



- ⊕ Sidewalk
- ⊕ Access to Shade
- ⊖ No Passenger Waiting Amenities
- ⊖ No Weather Protection



- ⊕ Passenger Waiting Amenities
- ⊕ ADA Accessible
- ⊕ Weather Protection
- ⊕ Bike Racks



- SYCAMORE TRANSIT CENTER**
- ⊕ Adjacent Bike Lanes
  - ⊕ Bike Lockers
  - ⊕ Weather Protection
  - ⊕ Restrooms



- ⊕ Sidewalk
- ⊖ No Adjacent Access to Neighborhood
- ⊖ No Passenger Waiting Amenities
- ⊖ No Weather Protection



- ⊕ Bike Facilities
- ⊕ Passenger Waiting Amenities
- ⊕ ADA Accessible
- ⊖ No Weather Protection



- ⊕ Passenger Waiting Amenities
- ⊕ ADA Accessible
- ⊕ Weather Protection
- ⊕ Bike Racks



- CHANDLER PARK-N-RIDE**
- ⊕ Security Cameras
  - ⊕ Adjacent Bike Lanes
  - ⊕ Weather Protection
  - ⊕ Bike Lockers



# Workshop #1

- Breakout into groups
  - Collaborate on identifying issues & concerns
  - Work cooperatively to find innovative solutions
- Reconvene
  - Group facilitator to recap group's session
  - Open discussion
  - Wrap-up and review next steps



# Questions to be Asked

PROJECT GOAL	QUESTION
1. Identify the challenges faced by users getting to transit.	<ol style="list-style-type: none"><li>1. What are transit users challenges in accessing transit?</li><li>2. How can these challenges be addressed?</li></ol>
2. Recommend improvements, polices and guidelines to enhance transit accessibility	<ol style="list-style-type: none"><li>1. What type of bicycle and pedestrian facilities should be provided near transit stops in the MAG region?</li><li>2. What does ADA not address when considering bus/transit stops?</li></ol>



# Questions to be Asked

PROJECT GOAL	QUESTION
<p>3. Provide measures and strategies helpful in creating transit accessible neighborhoods.</p>	<ol style="list-style-type: none"><li>1. What obstacles do communities face in planning and implementing transit accessible improvements?</li><li>2. What ideas do you have to help communities better plan and implement improvements for transit accessibility?</li></ol>
<p>4. Provide a cost analysis and framework for funding options and prioritization of improvements.</p>	<ol style="list-style-type: none"><li>1. If the region were to invest in transit accessibility improvements, what would you list as the most important criteria in prioritizing improvements and why?</li><li>2. What are the challenges in funding accessibility improvements and how can we overcome them?</li></ol>



# Workshop #1

## Breakout Sessions





# Workshop #1

## RECAP & DISCUSSION





# Next Steps

- Document workshop and outreach results (Technical Memorandum #1).
- May follow-up with additional questions.
- Summarize access challenges and needs.
- Summarize potential access improvements.
- Opportunity to review draft findings and recommendations – MAG website ([www.azmag.gov](http://www.azmag.gov)), MAG standing committee presentations.



# Project Contact

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**Appendix D**  
**Comment Form - Stakeholder Outreach Workshop, February 7, 2012**



NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_

REPRESENTING: \_\_\_\_\_

EMAIL: \_\_\_\_\_

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Based upon the discussion today, please provide a summary of your ideas and concerns regarding transit accessibility in the MAG region. You may use the back of this sheet and additional sheets if necessary.

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**ADVOCACY**

**POLICIES/GUIDELINES**

**OPERATIONS/MAINTENANCE**

**IMPROVMENTS/ENHANCEMENTS**



 **Appendix E**

**Data Request List**

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**DATA REQUEST LIST**  
**Designing Transit Accessible Communities**  
**Updated: 03/19/12**

Data Requested	File Type/Needs	Agency	Contact	Date Requested	Date Received	Notes
Maricopa County Trip Reduction Program Data	GIS or Database	Maricopa County Department of Air Quality	Alice Chen 602.452.5066 achen@azmag.gov	2/23/2012	3/19/2012	Alice Chen to follow up with Maricopa County to obtain the Trip Reduction Data as discussed in the TWG Meeting on Feb. 23, 2012.
Valley Metro RPTA Montly Boardings Report	GIS or Database	Valley Metro RPTA	Eric Iwersen City of Tempe 480.350.8810 eric_iwersen@tempe.gov	2/23/2012	3/19/2012	Alice Chen to follow up with Eric on obtaining the montly report as discussed in the TWG Meeting on Feb. 23, 2012.
Detailed Transit Budget	Itemized revenue sources and expenses and broken out into	Maricopa Association of Governments	Jorge Luna 602.254.6300 JLuna@azmag.gov	2/13/2012		
Bus Stop Construction Costs (new and upgraded)	Unit Costs	Valley Metro/ Regional Public Transit Authority		2/13/2012		Need to request from individual agencies. May look to the City of Phoenix as a regional indicator of construction costs.
Bus Stop Improvement Program	Goals, Funding Sources, Available Funding, and Prioritization	Maricopa Association of Governments	Jorge Luna 602.254.6300 JLuna@azmag.gov	2/13/2012		This data is agency specific. Will need to contact individual agencies for this data.
Bus Stop Maintenance Program	Goals, Funding Sources, Available Funding, Frequency of Maintenance	Maricopa Association of Governments	Jorge Luna 602.254.6300 JLuna@azmag.gov	2/13/2012		This data is agency specific. Will need to contact individual agencies for this data.
2011 O & D Study Questionnaire	Text or PDF	Valley Metro/ Regional Public Transit Authority		1/13/2012		



Data Requested	File Type/Needs	Agency	Contact	Date Requested	Date Received	Notes
Bus Count APC Data		Valley Metro/ Regional Public Transit Authority		1/13/2012		City of Phoenix may have this data.
Employment Centers	Shapefiles	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	1/12/2012	1/31/2012	
Employment by TAZ	Shapefiles	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	1/12/2012	1/31/2012	
Bus Service Frequency, by stop	Database or GIS files	Valley Metro/ Regional Public Transit Authority		1/10/2012		Limited data given to WCI by Jorge Luna at MAG on 2/8/12
MAG Region Roadway Network	Shapefiles	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	1/4/2012	1/4/2012	
City of Phoenix North Central Bridal Path ADA Study/Guide	PDF	City of Phoenix	Jorie Bresnahan 602.534.8294 jorie.bresnahan@phoenix.gov	1/3/2012		
2010 Bicycle and Pedestrian Collisions	Point shapefile	Maricopa Association of Governments	Sarath Joshua 602.254.6300 sjoshua@azmag.gov	1/3/2012		May need to request from ADOT if RPTA or MAG have sufficient data.



Data Requested	File Type/Needs	Agency	Contact	Date Requested	Date Received	Notes
2010 Building Footprints	Polygon shapefile	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	1/3/2012		May need to contact City of Phoenix and other member agencies.
2010 Tax Assessor Parcels	Polygon shapefile	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	1/3/2012		May need to contact Maricopa County.
Transit Stops - all modes	Point shapefile	Valley Metro/ Regional Public Transit Authority		1/3/2012	1/6/2012	
Transit Routes - all modes	Line shapefile	Valley Metro/ Regional Public Transit Authority	Jorge Luna 602.254.6300 JLuna@azmag.gov	1/3/2012	2/8/2012	
2010 Transit Ridership Ons/Offs by Stop	Point shapefile or Database with Unique Stop ID	Valley Metro/ Regional Public Transit Authority		1/3/2012		Data may be limited to only a few routes.
2011 RPTA O-D Study	Point shapefile	Valley Metro/ Regional Public Transit Authority	Ratna Korepella 602.253.604 rkorepella@valleymetro.org	1/3/2012		



Data Requested	File Type/Needs	Agency	Contact	Date Requested	Date Received	Notes
Inventory of Parking at bus stop locations	Text or shapefile	Valley Metro/ Regional Public Transit Authority	Alice Chen 602.452.5066 achen@azmag.gov	1/3/2012	1/31/2012	Park-N-Ride information supplied by Jacobs (Vamshi Yellisetty)
Transit Stop Amenities	Text or shapefile	Varies by MAG member agency.	Varies	1/3/2012		May need to contact each owning agency.
2010 Street Trees	Point shapefile	Varies by MAG member agency.	Varies	1/3/2012		Will determine the appropriate agency when case study locations are finalized.
2010 Sidewalks	Line shapefile	Varies by MAG member agency.	Varies	1/3/2012		Will determine the appropriate agency when case study locations are finalized.
2010 Curb Ramps	Line shapefile	Varies by MAG member agency.	Varies	1/3/2012		Will determine the appropriate agency when case study locations are finalized.
2010 Street Lights	Point shapefile	Varies by MAG member agency.	Varies	1/3/2012		Will determine the appropriate agency when case study locations are finalized.
2010 Population	Census Block shapefile or smallest available geography	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	12/12/2011	12/20/2011	
2010 Employment	Census Block shapefile or smallest available geography	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	12/12/2011		2010 Employment data may not be available until spring 2012.



Data Requested	File Type/Needs	Agency	Contact	Date Requested	Date Received	Notes
2010 Census Data	Census Block shapefile or smallest available geography	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	12/12/2011	12/20/2011	Some census data may not be available until spring 2012.
2010 Housing Units	Census Block shapefile or smallest available geography	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	12/12/2011	12/20/2011	
2010 Land uses	Polygon shapefile	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	12/12/2011	12/20/2011	
210 Roads with ADT	Line shapefile	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	12/12/2011	12/20/2011	
2010 Bicycle Facilities	Line shapefile	Maricopa Association of Governments	Alice Chen 602.452.5066 achen@azmag.gov	12/12/2011	12/20/2011	Only 2008 Bikeway information available.