FINAL REPORT

Lake Havasu City
McCulloch Corridor Improvement Study

Task Assignment MPD 27-11

September 23, 2012

Prepared for

Lake Havasu City

Prepared by HDR


LAKE HAVASU
USA


GIANT

Lake Havasu City

McCulloch Corridor Improvement Study

Final Report

Prepared for:

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Prepared by:

HDR Engineering, Inc.

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Lake Havasu City

COUNCIL COMMUNICATION

CC NO.: 20
MEETING DATE: 2/19/13
TYPE OF MEETING: Regular

TO: Honorable Mayor and Council

FROM: Gary Parsons, Operations Department Director

SUBJECT: **Resolution Adopting the McCulloch Corridor Improvement Study (PARA Program)**

COUNCIL GOAL: **#1 Financially Sound City Government.**

SUMMARY:

The Arizona Department of Transportation (ADOT), in cooperation with Lake Havasu City, conducted a long-range study for Mesquite Avenue, McCulloch Boulevard, and Swanson Avenue traffic and pedestrian corridor. The study identified a vision for the Corridor that balances the City's Main Street Uptown District goals with the need to accommodate future travel demand along each road in the Corridor.

At the December 11, 2012 Work Session, staff provided a presentation of the Lake Havasu City McCulloch Corridor Improvement Study and its recommendations. The Lake Havasu City McCulloch Corridor Improvement Study was funded by ADOT's Multimodal Planning Division's Planning Assistance for Rural Areas (PARA) program. The PARA program is funded through the Federal Highway Administration's State Planning and Research program to nonmetropolitan communities for the purpose of conducting transportation planning studies.

City Council adoption of the study is requested should Lake Havasu City desire to apply for future State or Federal funds to implement any of the study's recommendations. This resolution shows the City's commitment to move forward with projects within the document as recommended.

FISCAL IMPACT: None at this time. To be determined should a future contract(s) be awarded.

ATTACHMENTS: Resolution No. 13-2709
McCulloch Corridor Improvement Study

RECOMMENDATION: Staff recommends that the City Council adopt the McCulloch Corridor Improvement Study.

SUGGESTED MOTION: I move to adopt Resolution No. 13 - 2709 approving the McCulloch Corridor Improvement Study.

CITY MANAGER'S REVIEW

RESOLUTION NO. 13- 2709

COPY

A RESOLUTION OF THE MAYOR AND CITY COUNCIL OF LAKE HAVASU CITY, MOHAVE COUNTY, ARIZONA, ADOPTING THE MCCULLOCH CORRIDOR IMPROVEMENT STUDY

WHEREAS, the Arizona Department of Transportation, in cooperation with Lake Havasu City, conducted a long-range study know as the McCulloch Corridor Improvement Study for McCulloch Boulevard, Mesquite Avenue, and Swanson Avenue traffic corridor; and

WHEREAS, Lake Havasu City desires funding assistance from State and Federal agencies for future traffic and pedestrian corridor improvements and this study will be beneficial for this purpose.

NOW, THEREFORE, BE IT RESOLVED that the Mayor and City Council of Lake Havasu City, Arizona, adopt the McCulloch Corridor Improvement Study.

PASSED AND ADOPTED by the City Council of Lake Havasu City, Arizona, this 19th day of February, 2013.

APPROVED:

Mark S. Nexsen, Mayor

ATTEST:

Kelly Williams, City Clerk

APPROVED AS TO FORM:

Kelly Garry, City Attorney

REVIEWED BY:

Charlie Cassens, City Manager

Contents

Appendices

Figures

Tables

Acronyms and Abbreviations

ADA	Americans with Disabilities Act
ADOT	Arizona Department of Transportation
APTNA	Arkansas Public Transportation Needs Assessment
ASU	Arizona State University
BLOS	bicycle level of service
DTS	Downtown Transfer Station
FHWA	Federal Highway Administration
FY	fiscal year
GADA	Greater Arizona Development Authority
HAT	Havasu Area Transit
HCM	*Highway Capacity Manual*
HELP	Highway Extension Expansion and Loan Program
HURF	Highway User Revenue Fund
LOS	level of service
mph	miles per hour
NHTSA	National Highway Traffic Safety Administration
PARA	Planning Assistance for Rural Arizona
PLOS	pedestrian level of service
R/UDAT	Regional/Urban Design Action Team
TAZ	traffic analysis zone
TIP	Transportation Improvement Program
VMT	vehicle miles of travel
WACOG	Western Arizona Council of Governments

1.0 Introduction

Recent efforts to revitalize the Lake Havasu Main Street Uptown District on McCulloch Boulevard are paying off. Sidewalk and streetscape improvements provide a more seamless pedestrian experience. New restaurants and night spots are attracting a steady clientele. Trolley service recently began along McCulloch Boulevard, giving tourists an easy connection between the London Bridge area and Uptown District attractions. These efforts have started a renaissance in the corridor.

The Arizona Department of Transportation (ADOT), in cooperation with Lake Havasu City (City), conducted a long-range corridor study for Mesquite Avenue, McCulloch Boulevard, and Swanson Avenue (referred to in this document collectively as the Corridor). The study looked at ways to support and enhance this revitalization by developing a vision for the Corridor that balances the City's Main Street Uptown District goals with the need to accommodate future travel demand along each road in the Corridor.

Mesquite Avenue, McCulloch Boulevard, and Swanson Avenue provide a connection between the Uptown District and Lake Havasu activities. The City's long-term vision for McCulloch Boulevard through the Uptown District is a walkable, pedestrian-friendly urban street experience. The goal is to have McCulloch Boulevard become a "complete street" providing space for bicyclists, pedestrians, public transit, and motorized vehicles.

Reconfigured parking is one of the keys to realizing this vision for the Uptown District. First, the angled parking on McCulloch Boulevard should be replaced by parallel parking. This will help achieve the vision in several ways. The extra space used for angled parking can be converted into a wider pedestrian zone and bicycle lanes. This will improve the pedestrian experience while making the corridor more bicycle-friendly. With a wider pedestrian zone, more space will be available for landscaping or even outdoor cafés. Parallel parking will also make McCulloch Boulevard safer. Studies have associated angled parking with higher accident rates. Drivers often cannot see oncoming traffic as they back out of an angled parking space. The curvilinear alignment of McCulloch Boulevard through the Uptown District contributes to this shortcoming.

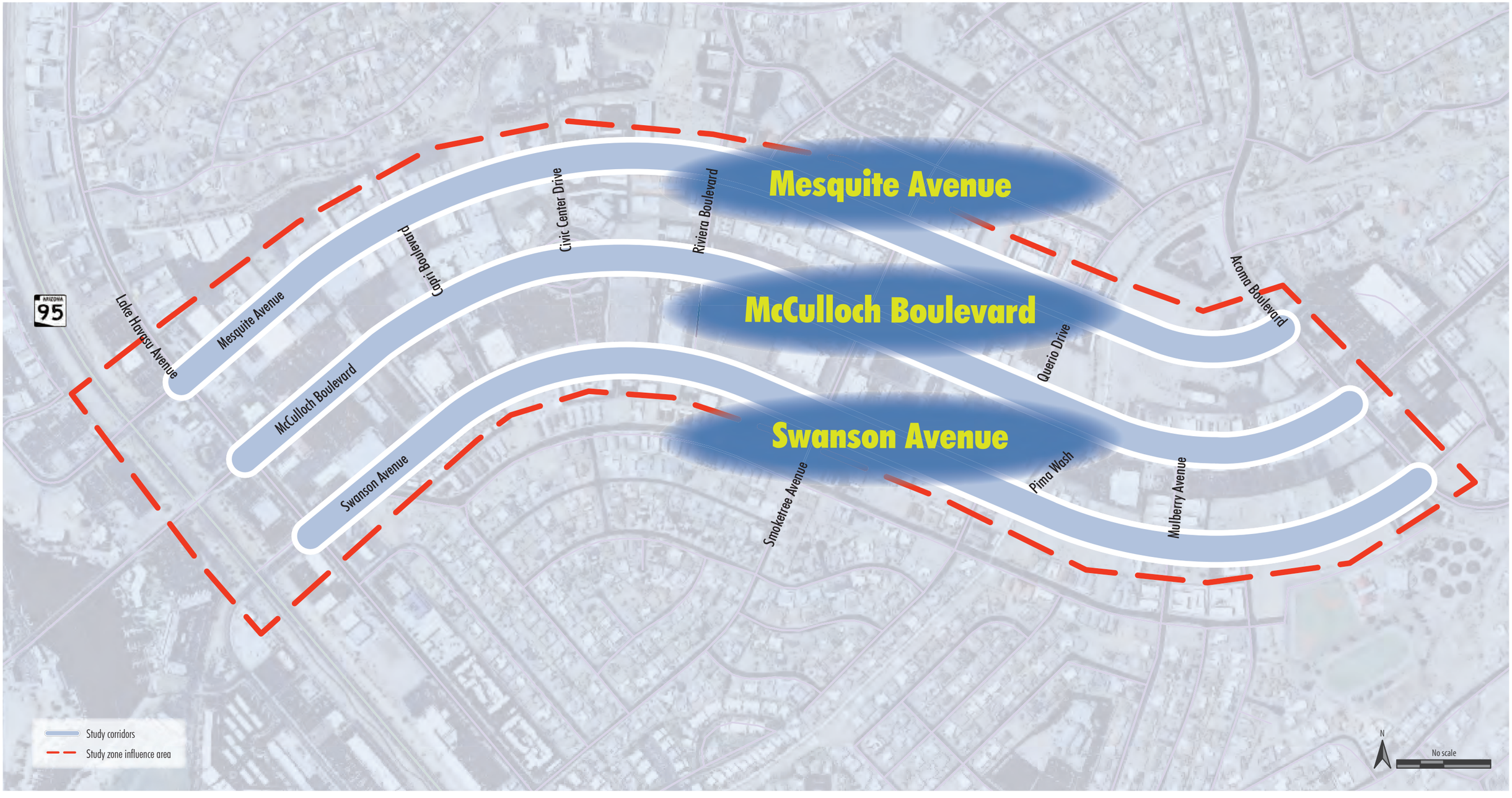
Before parallel parking can be implemented and changes to the streetscape made, additional new parking spaces need to be added close to existing businesses. These new spaces can be added first through improvements to existing common parking areas behind storefronts. Later, parking can also be added on a city-owned parcel located next to Pima Wash between McCulloch Boulevard and Mesquite Avenue.

Improved transit service can be another catalyst for resurgence of the Uptown District. Relocating the current Havasu Area Transit (HAT) transfer center to the Uptown District will bring transit riders closer to work and shopping while improving access to the Arizona State University (ASU) campus on Swanson Avenue.

Changes will also be made to Mesquite Avenue and Swanson Avenue to improve traffic operations and enhance bicycle and pedestrian mobility.

Figure 1 shows the study area and the wider study zone influence area for this multimodal plan. The study area was the focus of transportation issue identification and alternative development. The influence area was used to capture possible impacts that would affect the study area.

The Lake Havasu City McCulloch Corridor Improvement Study was funded by the ADOT Multimodal Planning Division's Planning Assistance for Rural Areas (PARA) program. The PARA program is funded through the Federal Highway Administration (FHWA) State Planning and Research program to support nonmetropolitan communities' efforts to conduct transportation planning studies. PARA funds may be applied to address a broad range of planning issues related to roads and nonmotorized transportation modes.


Mesquite Avenue
McCulloch Boulevard
Swanson Avenue
Lake Havasu Avenue
Mesquite Avenue
McCulloch Boulevard
Swanson Avenue
Capri Boulevard
Civic Center Drive
Riviera Boulevard
Smoketree Avenue
Querio Drive
Pima Wash
Mulberry Avenue
Acoma Boulevard
ARIZONA 95
Study corridors
Study zone influence area
N
No scale

2.0 Existing Road Conditions

This section describes the existing conditions of Lake Havasu City's road system, including the roads' functional classification, characteristics, traffic volumes, level of service (LOS), and crash history. The existing number of lanes for each road is displayed in Figure 2 and the intersection control and turn lane configurations are presented in Figure 3.

2.1 Previous Studies

Previous planning studies are shown below together with notes identifying how these documents were used to prepare the recommendations of the McCulloch Corridor Study.

2002 Lake Havasu City General Plan

The *General Plan* provides an overall citywide vision for development in Lake Havasu City and contains goals and policies related to transportation, economic development, and land use. The *General Plan* states that the City should take appropriate steps to create and enhance the availability of parking for the downtown area so as not to obstruct future business development and existing business expansion plans. The *General Plan* encourages the creation of a multimodal transportation system and access to community activity centers, such as the downtown. It also recommends a corridor study be completed for the McCulloch Corridor. The McCulloch Corridor Study is consistent with this plan identifying specific steps to improve parking and business development in the downtown area.

2007 Lake Havasu City Regional/Urban Design Action Team Plan

The *Lake Havasu City Regional/Urban Design Action Team (R/UDAT) Plan*, completed under the American Institute of Architects' R/UDAT program, recommends that Mesquite and Swanson Avenues be used as transitional areas between the commercial core (McCulloch Boulevard) and adjacent residential neighborhoods. Instead of adding lanes, the R/UDAT plan recommends eliminating the center turn lane, except at intersections; adding bicycle lanes in each direction; adding on-street parking in defined areas; and including other traffic-calming measures to reduce traffic speeds to 25 miles per hour (mph). The McCulloch Corridor Study builds on the overall goals identified in R/UDAT plan by identifying specific projects for implementation.

2006 Bridgewater Channel Redevelopment Plan

The *Bridgewater Channel Redevelopment Plan* was prepared by students from the University of Arizona in 2006. It is a comprehensive examination of, and plan for, redevelopment of the Bridgewater Channel area. The plan notes the importance of sales tax revenues and the value of tourism to the local and regional economy. The McCulloch Corridor Study recommendations are consistent with this plan.

2005 Lake Havasu City Small Area Transportation Study

The purpose of the *Lake Havasu City Small Area Transportation Study (SATS)* was to evaluate future travel demand throughout the City and to develop a roadway plan to meet the demand. This study recommended that Mesquite and Swanson Avenues be reconstructed/restriped with two lanes in one direction, a center left-turn lane, and one lane in the other direction. The long-term recommendation

was to convert the avenues into one-way couplets with three lanes of travel. These recommendations focused on maximizing the capacity of the roads. The McCulloch Corridor Study revisited the SATS recommendation for one-way couplets concluding that they would cause traffic operations to deteriorate in the corridor.

1998 Pedestrian and Bike Path Plan

The *Pedestrian and Bike Path Plan* mapped a network of sidewalks, multiuse paths, and bike routes using striping and signs to integrate with the existing roadway system and to provide safe travel by bicycle for transportation and recreation purposes. The McCulloch Corridor Study recommendations are consistent with this plan.

2.2 Existing Road Conditions

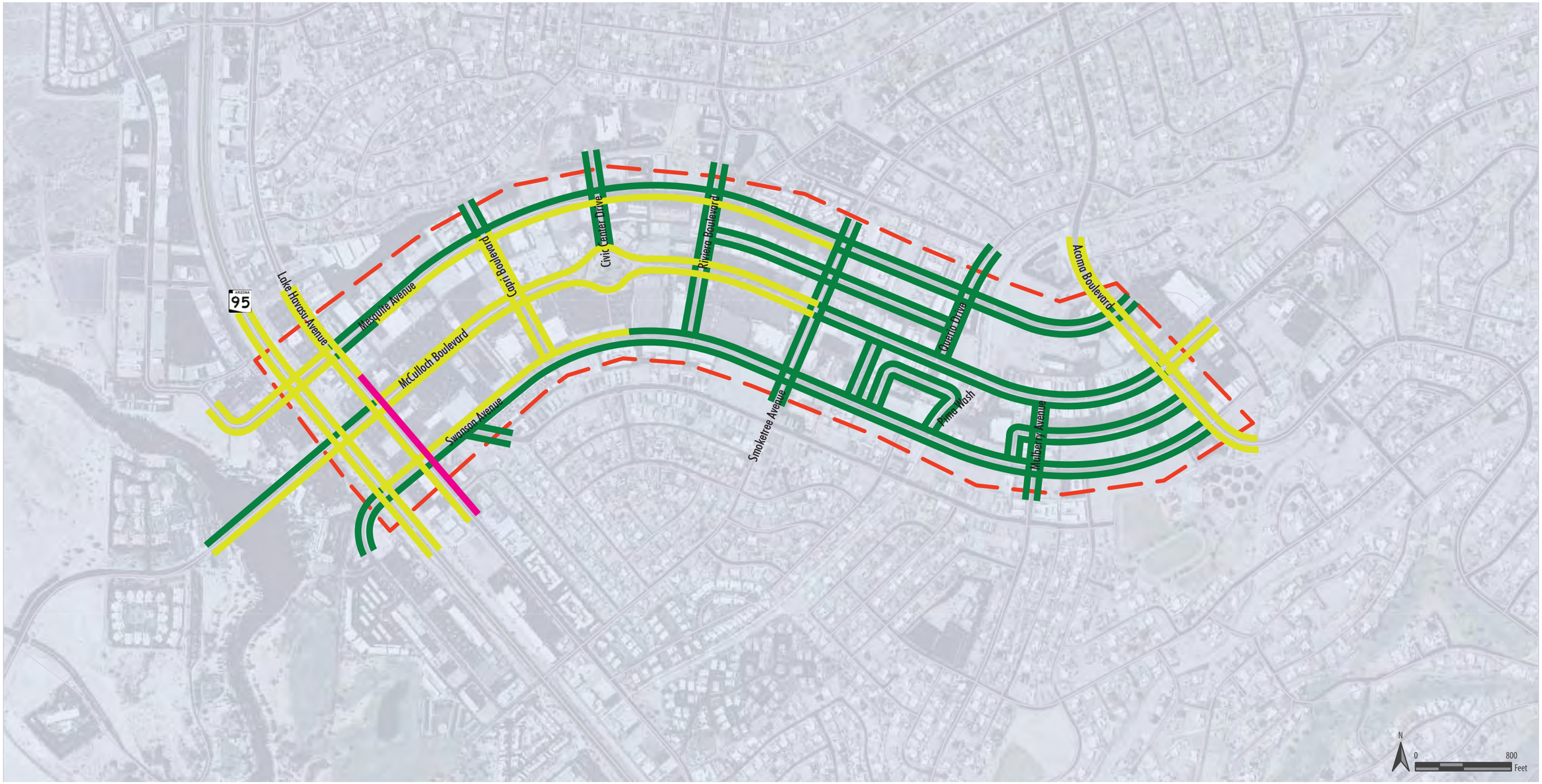
This section describes the existing conditions of Lake Havasu City's road system, including the roads' functional classification, characteristics, traffic volumes, level of service (LOS), and crash history. The existing number of lanes for each road is displayed in Figure 2 and the intersection control and turn lane configurations are presented in Figure 3.

2.3 Road Functional Classification

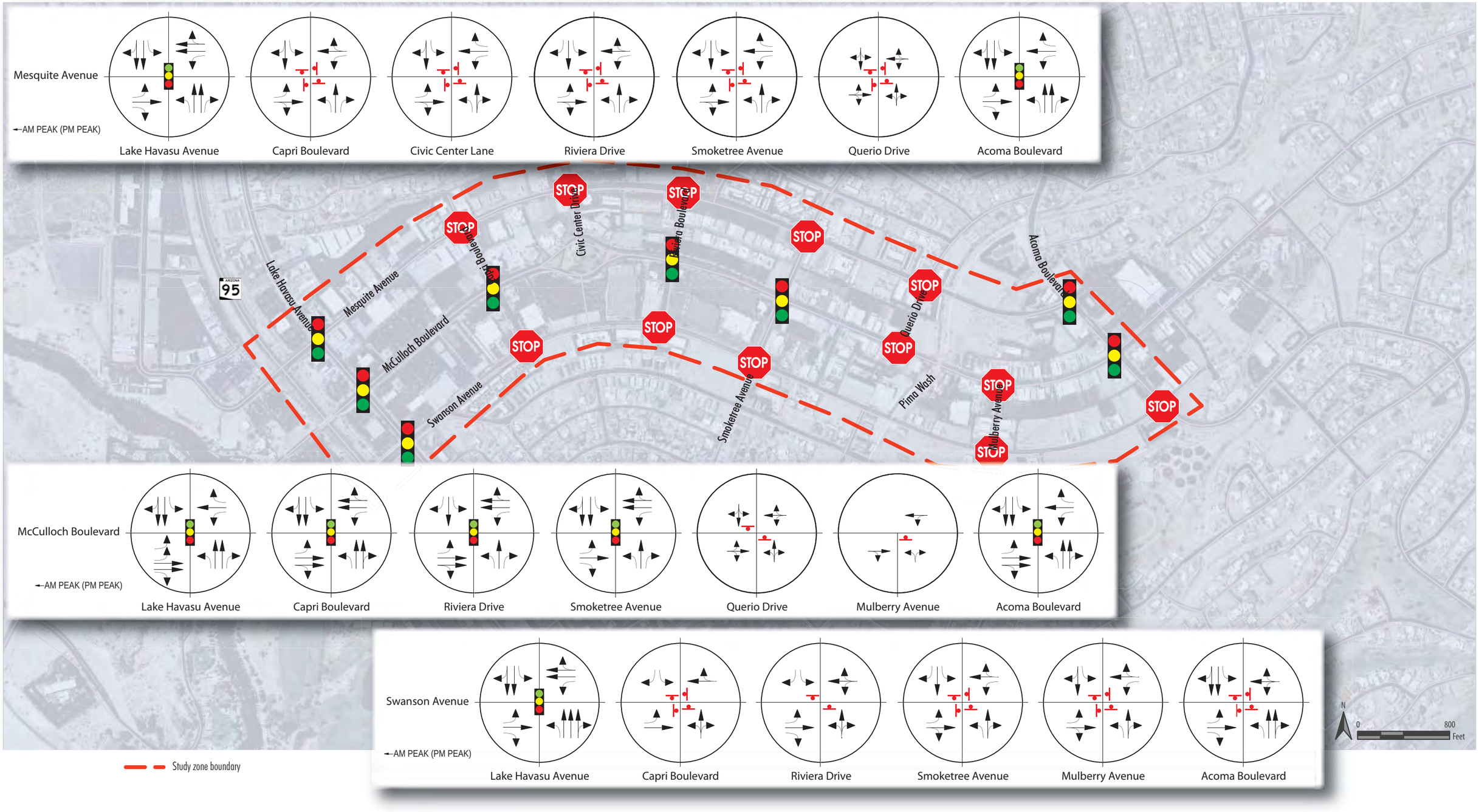
The functional classification process assigns highways, roads, and streets into classes based on mobility and land access. In general, arterials provide greater mobility with less direct access to land, while local roads and collectors provide more access to land with less mobility. The City's *General Plan* uses four road classifications: principal arterial, minor arterial, collector, and minor road. Using the system described in the *General Plan*, the roads within the study area would be classified as follows:

- Principal arterial: State Route 95 (SR 95)
- Minor arterial: Lake Havasu Avenue and Acoma Boulevard
- Collector: Mesquite Avenue, McCulloch Boulevard, Mulberry Avenue, Swanson Avenue, Capri Boulevard, Riviera Boulevard, and Smoketree Avenue
- Minor road: Del Rio Lane, Library Lane, Civic Center Drive, Jay's Way, Scott Drive, Wings Loop, Querio Drive, Mulberry Avenue, Van Vilet Lane, and Magnolia Drive

The functional classification for roads in the study area is displayed in Figure 4.



3 lanes
2 lanes
1 lane
Study zone boundary


Mesquite Avenue
AM PEAK (PM PEAK)
Lake Havasu Avenue
Capri Boulevard
Civic Center Lane
Riviera Drive
Smoketree Avenue
Querio Drive
Acoma Boulevard
STOP
Lake Havasu Avenue
Mesquite Avenue
McCulloch Boulevard
Swanson Avenue
Capri Boulevard
Civic Center Drive
Riviera Boulevard
Smoketree Avenue
Querio Drive
Pima Wash
Mulberry Avenue
Acoma Boulevard
95
McCulloch Boulevard
AM PEAK (PM PEAK)
Lake Havasu Avenue
Capri Boulevard
Riviera Drive
Smoketree Avenue
Querio Drive
Mulberry Avenue
Acoma Boulevard
Swanson Avenue
AM PEAK (PM PEAK)
Lake Havasu Avenue
Capri Boulevard
Riviera Drive
Smoketree Avenue
Mulberry Avenue
Acoma Boulevard
Study zone boundary
N
0
800
Feet

Principal arterial
Minor arterial
Collector
Minor road
Study zone boundary

2.4 Roadway Characteristics

Field surveys and aerial photography were used to identify the major road characteristics for Mesquite Avenue, McCulloch Boulevard, and Swanson Avenue. The findings are summarized below in Table 1.

Table 1 Study Corridor Road Characteristics

Road	Limits	Directional through lanes	Speed limit (mph)	Median type
Mesquite Avenue	Lake Havasu Avenue to Smoketree Avenue	1 eastbound 1 westbound	30	paved TWLTL[a]
	Smoketree Avenue to Querio Drive	1 eastbound 1 westbound	30	paved TWLTL
	Querio Drive to Acoma Boulevard	1 eastbound 1 westbound	30	paved TWLTL
McCulloch Boulevard	Lake Havasu Avenue to Smoketree Avenue	2 eastbound 2 westbound	30	raised
	Smoketree Avenue to Acoma Boulevard	1 eastbound 1 westbound	25	none
Swanson Avenue	Lake Havasu Avenue to Civic Center Drive	1 eastbound 2 westbound	30	paved TWLTL
	Civic Center Drive to Acoma Boulevard	1 eastbound 2 westbound	30	paved TWLTL

[a] two-way left-turn lane

2.5 Existing Traffic Levels

An extensive traffic count exercise was conducted for the study the week of December 5, 2011. The data collection locations are presented in Appendix A. Each intersection was counted between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. Each road segment (as noted in the figure in the appendix) was counted for a 72-hour period in 15-minute intervals.

Intersection Turning Movement Counts

Peak-hour volumes for the intersections are presented in Figure 5. Notable observations from the figure include:

- The highest hourly through traffic volumes along McCulloch Boulevard and Swanson Avenue are in the eastern area at Mulberry Avenue. The highest through traffic volume along Mesquite Avenue is in the western area at Civic Center Drive.
- The highest total intersection traffic volumes occur at the intersection of Lake Havasu Avenue and Acoma Boulevard.

Road Segment Counts

This section presents information related to the segment counts conducted on Mesquite Avenue, McCulloch Boulevard, and Swanson Avenue between Lake Havasu Avenue and Capri Boulevard. A general summary of the existing conditions is provided in Table 2.

Table 2 Existing Traffic Conditions, Lake Havasu Avenue to Capri Boulevard

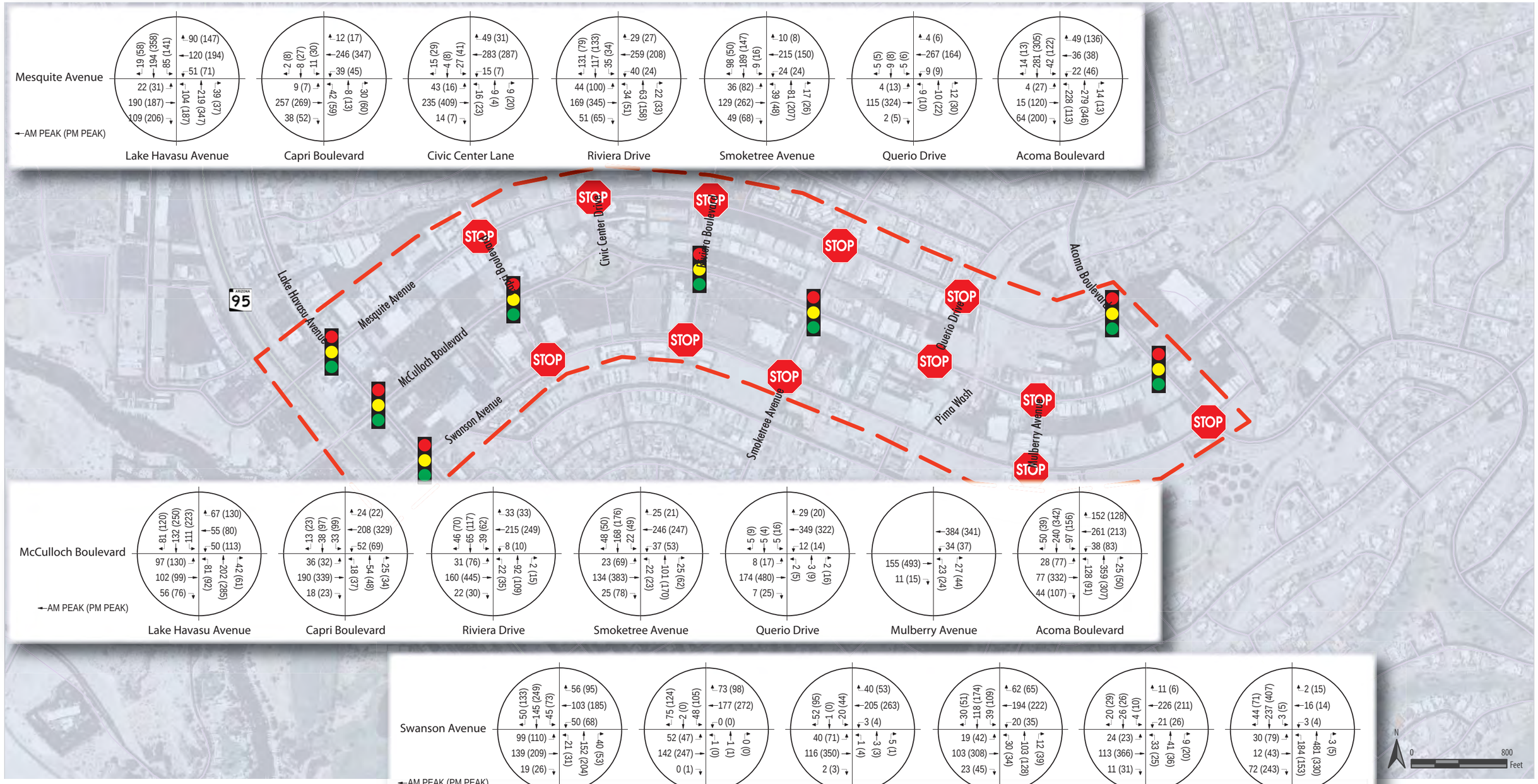
Road	Average daily traffic volume	Average speed (mph)	85th-percentile speed (mph)	Truck percentage (%)
Mesquite Avenue	10,220	30.3	34.7	4.1
McCulloch Boulevard	10,020	30.7	35.9	1.8
Swanson Avenue	9,130	29.3	33.9	3.8

Source: Traffic counts performed the week of December 5, 2011

Notable observations from the table include:

- Average daily traffic is relatively evenly distributed among the three roads in the study area corridor.
- The average speeds on the roads are right at the speed limit of 30 mph. The 85th-percentile speeds are within 5 mph of the average speed limit.
- Approximately 4 percent of the total traffic on Mesquite and Swanson Avenues is large trucks, while 2 percent of the traffic on McCulloch Boulevard is large trucks.

The segment count data for the three roads shown in Table 2 were combined to evaluate the travel pattern throughout the day. The traffic counts provided information related to the number of vehicles by 15-minute intervals. These data were averaged over the 72-hour period and summed for each of the three roads to create the hourly travel distribution presented in Figure 6. Each data point along the curve represents the previous hourly traffic volume at that time of day.


Mesquite Avenue
AM PEAK (PM PEAK)
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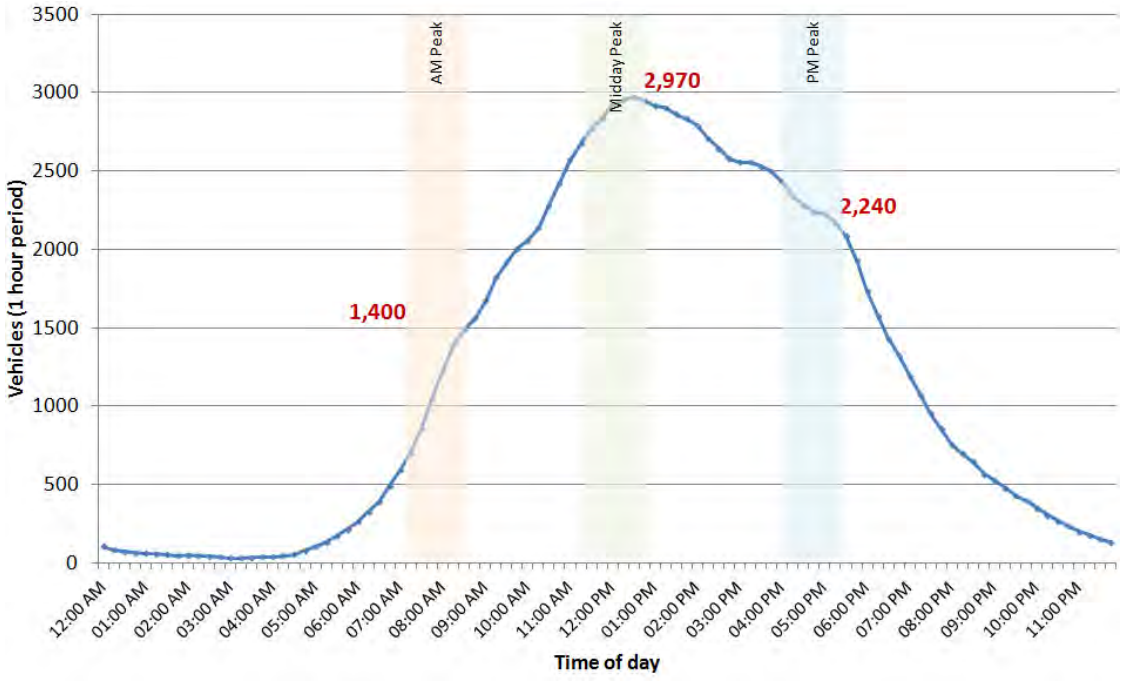
Smoketree Avenue
Querio Drive
Acoma Boulevard
McCulloch Boulevard
Swanson Avenue
Mulberry Avenue
Pima Wash
STOP
95
N
0
800
Feet
Study zone boundary

Figure 6 Daily Trip Distribution, Lake Havasu Avenue to Capri Boulevard



Notable observations from the figure include:

- The hourly traffic volume in the morning (7 a.m. to 8 a.m.) is 1,400 vehicles; in the midday (11 a.m. and 12 p.m.) the volume is 2,970; and in the evening (4 p.m. to 5 p.m.) the volume is 2,240.
- The peak hour of travel along the three primary roads in the corridor between Lake Havasu Avenue and Capri Boulevard is during the midday. This period is approximately 25 to 30 percent higher than the evening peak hour and more than twice as high as the morning peak hour.

2.6 Operational Analysis

Level of Service

LOS is a qualitative measurement of operational characteristics of traffic and the perception of traffic conditions by both motorists and passengers. The *Highway Capacity Manual* (HCM) defines six LOS conditions. Each LOS is given a letter designation from A to F, with A representing the optimal or best condition and F the worst (Transportation Research Board 2000). Road segment LOS is characterized by the HCM as follows:

- LOS A: Best, free flow operations (on uninterrupted flow facilities) and very low delay (on interrupted flow facilities). Freedom to select desired speeds and to maneuver within traffic is extremely high.
- LOS B: Flow is stable, but presence of other users is noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within traffic.

- LOS C: Flow is stable, but the operation of users is becoming affected by the presence of other users. Maneuvering within traffic requires substantial vigilance on the part of the user.
- LOS D: High density but stable flow. Speed and freedom to maneuver are severely restricted. The driver is experiencing a generally poor level of comfort and convenience.
- LOS E: Flow is at or near capacity. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within traffic is extremely difficult. Comfort and convenience levels are extremely poor.
- LOS F: Worst, facility has failed, or a breakdown has occurred.

LOS A, B, and C are generally considered to be satisfactory service levels, while the influence of congestion becomes more noticeable at LOS D. LOS E is undesirable and is considered by most agencies to be the limit of acceptable delay, and LOS F conditions are considered to be unacceptable. The City's *General Plan* does not designate a design LOS; however, for this study, LOS C will be designated as desirable and LOS D will be designated as the minimally acceptable LOS for the analysis of intersections and road segments.

Analysis Results

The intersection traffic analysis was performed using the Synchro/SimTraffic simulation analysis package (Version 7, Build Series 773, Revision 8) developed by Trafficware, Inc. Synchro is a widely used traffic analysis tool that evaluates intersection delays and congestion based on procedures similar to those described in the 2000 HCM. It is often used for localized intersection analyses, signal coordination, and traffic study work. SimTraffic is a microsimulation tool that provides network measures of effectiveness and allows the user to visually review the geometry and traffic progression. Combined, they were used to evaluate the intersection performance in the study area. The results of the analysis are summarized in Table 3 and are shown graphically in Figure 7.

Notable observations from the table and figure include:

- All but one of the intersections operates at LOS C or better during the morning (AM) and evening (PM) peak hour.
- The all-way, stop-controlled intersection at Swanson Avenue and Acoma Boulevard operates at LOS D, near capacity, during the PM peak hour.

Table 3 Existing Intersection Level of Service Analysis Results

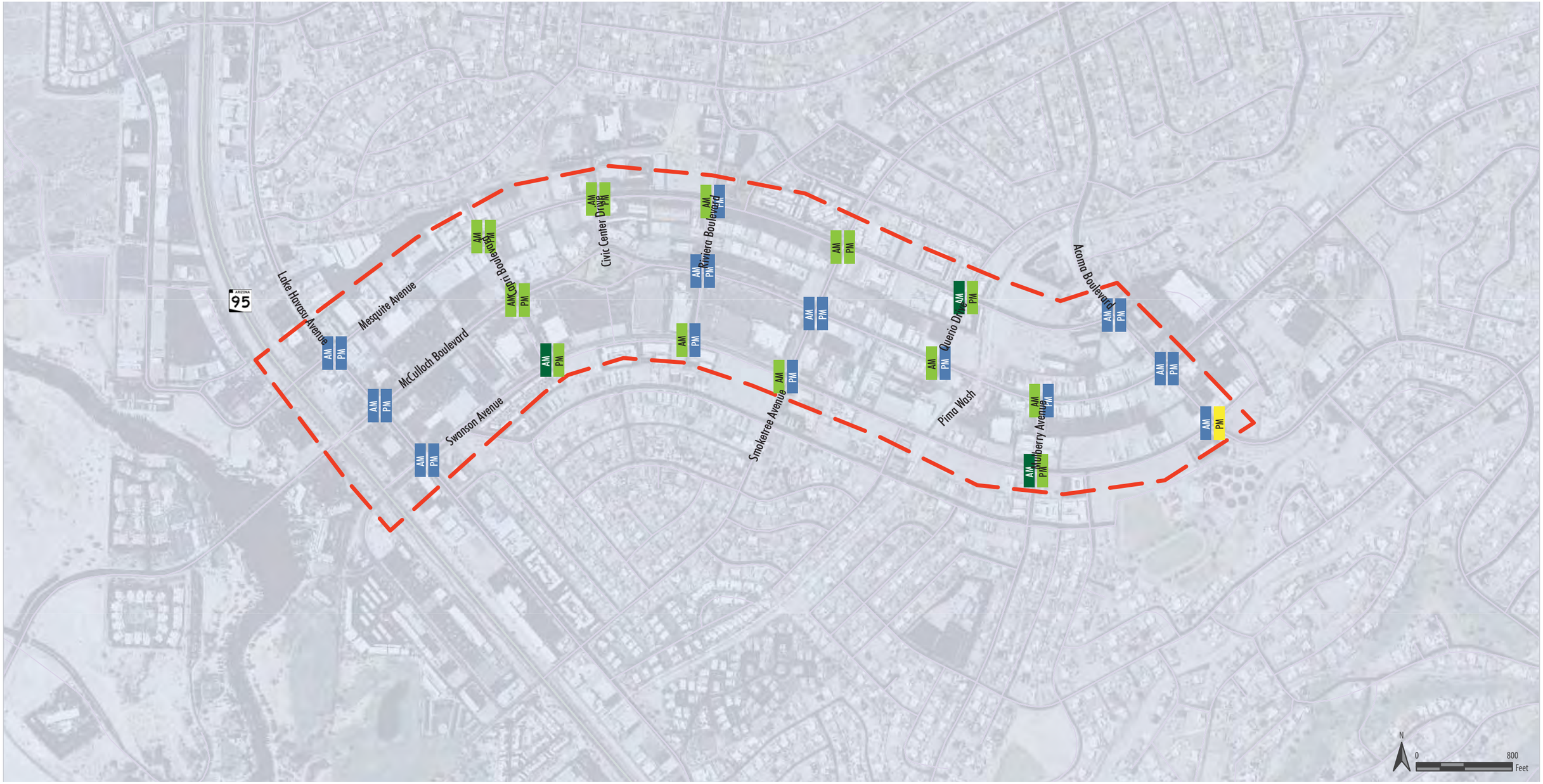
Intersection	Intersection control type	AM peak		PM peak	
		LOS	Average control delay (seconds)	LOS	Average control delay (seconds)
Mesquite Avenue at Lake Havasu Avenue	Signal	C	28.8	C	27.8
Mesquite Avenue at Capri Boulevard	AWSC[a]	B	10.0	B	13.3
Mesquite Avenue at Civic Center Drive	AWSC	B	10.4	B	14.0
Mesquite Avenue at Riviera Drive	AWSC	B	12.7	C	20.6
Mesquite Avenue at Smoketree Avenue	AWSC	B	11.9	B	14.5
Mesquite Avenue at Querio Drive	AWSC	A	9.0	B	10.0
Mesquite Avenue at Acoma Boulevard	Signal	C	28.6	C	28.9
McCulloch Boulevard at Lake Havasu Avenue	Signal	C	26.1	C	27.6
McCulloch Boulevard at Capri Boulevard	Signal	B	16.1	B	18.6
McCulloch Boulevard at Riviera Drive	Signal	C	21.8	C	20.6
McCulloch Boulevard at Smoketree Avenue	Signal	C	22.8	C	22.5
McCulloch Boulevard at Querio Drive	SSSC[b]	B	13.4	C	20.3
McCulloch Boulevard at Mulberry Avenue	SSSC	B	11.8	C	16.5
McCulloch Boulevard at Acoma Boulevard	Signal	C	30.8	C	34.3
Swanson Avenue at Lake Havasu Avenue	Signal	C	31.0	C	30.7
Swanson Avenue at Capri Boulevard	AWSC	A	8.0	B	10.2
Swanson Avenue at Riviera Drive	SSSC	B	10.7	C	20.7

Table 3 Existing Intersection Level of Service Analysis Results

Intersection	Intersection control type	AM peak		PM peak	
		LOS	Average control delay (seconds)	LOS	Average control delay (seconds)
Swanson Avenue at Smoketree Avenue	AWSC	B	10.1	C	18.6
Swanson Avenue at Mulberry Avenue	AWSC	A	8.7	B	12.4
Swanson Avenue at Acoma Boulevard	AWSC	C	16.9	D	33.9

Source: HDR Engineering, Inc., February 2012

[a] all-way stop control [b] side-street stop control



LOS A
LOS B
LOS C
LOS D
LOS E
LOS F
Study zone boundary
Morning peak
Afternoon peak

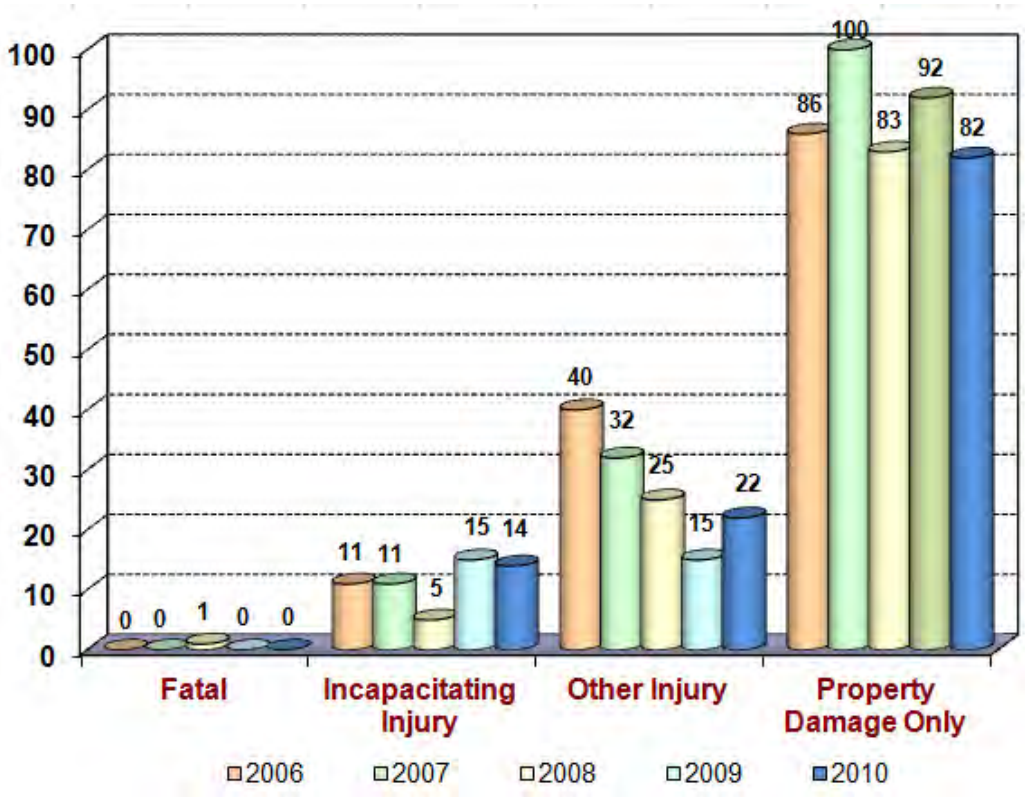
2.7 Crash Data

A crash analysis was conducted to identify crash patterns, trends, and types. The analysis included the three major corridors—McCulloch Boulevard, Swanson Avenue, and Mesquite Avenue—between SR 95 and Acoma Boulevard during the 5-year period from January 1, 2006, to December 31, 2010. The crash data were obtained from the ADOT Traffic Safety Division and included crashes that occurred along these roadways and at or near the intersections. The data provided by ADOT contained information regarding the date, time, location, severity, type, and cause of the crash as well as the environmental conditions at the time of the crash.

Crash Summary

A total of 634 crashes involving 1,262 vehicles were reported within the study area during the 5-year analysis period. There was 1 fatal crash and 190 injury crashes (30 percent of total—both incapacitating and possible injury). The remaining 443 crashes (70 percent of total) were noninjury, property damage only, or unreported. Figure 8 presents the yearly crash trend and severity for the analysis period.

Figure 8 Crash Trend During 5-Year Crash Analysis Period

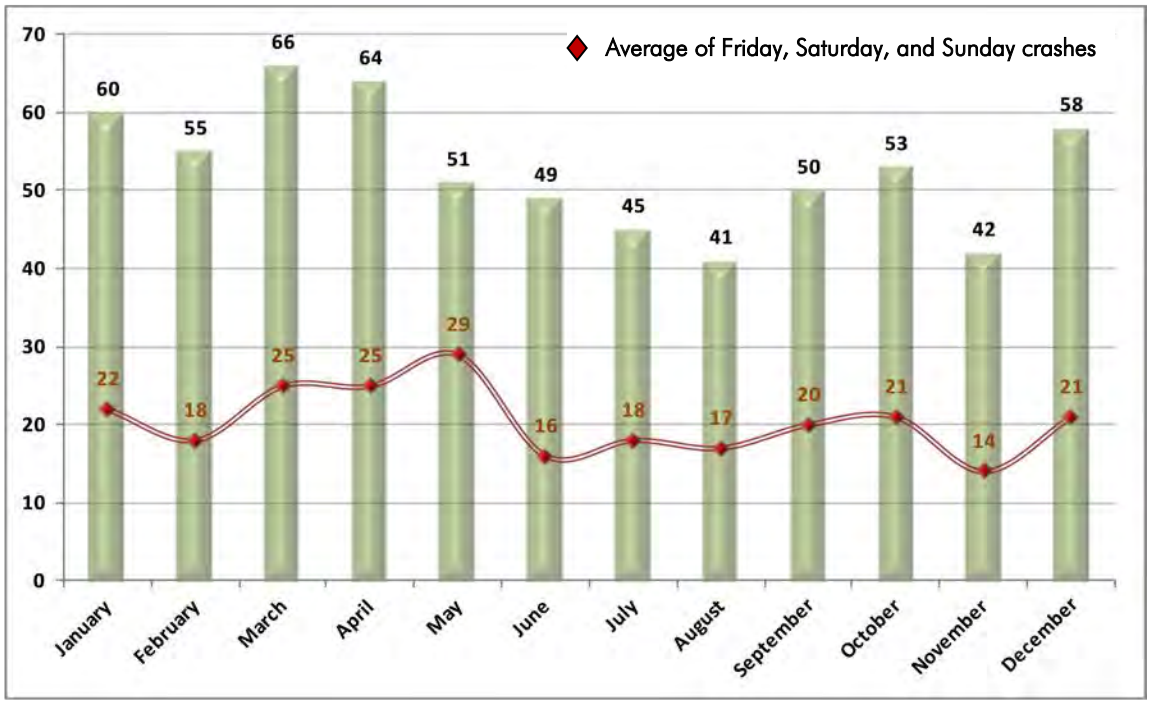


Source: ADOT Traffic Safety Division, data from January 1, 2006, to December 31, 2010

The only fatal crash took place on Swanson Avenue between Mariposa Drive and Mulberry Avenue on November 18, 2008. Three vehicles were involved in a head-on crash under clear weather conditions during the daytime. No alcohol or drugs were involved with this fatal crash.

Crashes were analyzed by month of the year. Average Friday, Saturday, and Sunday crashes were summarized to compare the monthly trend with the weekend crashes. This was helpful to identify whether the influx of visitors during the summer break and long weekends had any direct influence on the number of crashes along the study corridors. Figure 9 shows the highest number of crashes were during the month of March (66 crashes) while the highest average Friday through Sunday crashes were in the month of May (29 crashes, 57 percent of total crashes of that month). The average crashes on Friday through Sunday were higher during the spring months (March through May).

Figure 9 Crash Trend, by Month, and Average of Friday, Saturday, and Sunday Crashes



Source: ADOT Traffic Safety Division, data from January 1, 2006, to December 31, 2010

Crash Type

Various crash types from the ADOT database that occurred during the analysis period were analyzed. Rear-end and angle crashes were the predominant crash type that occurred along the study corridors, with 241 (38 percent) and 149 (24 percent) crashes, respectively. There were 101 sideswipe crashes (16 percent of the total crashes), 70 single-vehicle crashes (11 percent), 39 left-turn crashes (6 percent), and 34 other crash types (5 percent).

Most of the crashes (548 crashes, 86 percent) were multiple-vehicle crashes. There were 30 crashes (5 percent) involving pedestrians and bicyclists. Fifty-six crashes (9 percent) consisted of overturning vehicles, collisions with fixed objects, and unknown or unreported crashes.

About 86 percent of crashes took place under clear weather conditions. The remaining 11 percent of crashes occurred in cloudy weather conditions and 3 percent in rainy or other weather conditions. Approximately 79 percent of crashes were in daylight and 21 percent of crashes were in dawn, dusk, or dark conditions.

Corridor Crashes by Severity and Type

Out of the total 634 crashes, 177 crashes were along McCulloch Boulevard (28 percent), followed by 95 crashes along Mesquite Avenue (15 percent), and 72 crashes on Swanson Avenue (11 percent). The remaining 290 crashes (46 percent) occurred on side streets intersecting these three major corridors.

Table 4 shows the breakdown of crash types and severity by corridor. McCulloch Boulevard had 76 rear-end and 41 single-vehicle crash types, with 47 injury crashes. Swanson Avenue had 26 rear-end and 24 angle crashes, with 1 fatal (discussed previously) and 22 injury crashes. Mesquite Avenue had 34 rear-end and 30 angle crashes, with 34 injury crashes.

Table 4 Crash Types, by Corridor

Description	Corridors between SR 95 and Acoma Boulevard			
	Swanson Avenue	McCulloch Boulevard	Mesquite Avenue	All cross-streets combined
Crash Type				
Single-vehicle	5	41	5	19
Angle	24	20	30	75
Left-turn	9	3	5	22
Rear-end	26	76	34	105
Sideswipe	6	27	16	52
Other/ Unknown	2	10	5	17
Severity				
Fatal	1	0	0	0
Incapacitating injury	6	16	9	25
Other injury	16	31	25	62
Property damage	49	130	61	203
Total (634 crashes)	**72 (11%)**	**177 (28%)**	**95 (15%)**	**290 (46%)**

Source: ADOT Traffic Safety Division, data from January 1, 2006, to December 31, 2010

Intersection Crashes

The majority of crashes occurred at intersections because of the high number of potential conflict points with other vehicles, pedestrians, and bicyclists. For this reason, crashes at intersections were analyzed further to identify high crash locations and potential mitigation measures. The crash rate at each intersection was calculated as a function of the crashes per million entering vehicles (MEV). Six intersections were found to have a crash rate higher than 1 crash per MEV. The intersections of Lake Havasu Avenue at Mesquite Avenue, McCulloch Boulevard, and Swanson Avenue had crash rates of 1.54, 1.44, and 1.20, respectively. Because the crash rate is a function of the number of entering vehicles at that intersection, higher crashes do not always result in a higher crash rate. The intersection of McCulloch Boulevard at Mulberry Avenue had only 33 crashes but, because of the lower MEV, the crash rate was 1.52. Table 5 summarizes the intersections with crash rates above 1 crash per MEV.

The crash types at these six high-crash intersections are shown in Figure 10. Overall, rear-end was the most dominant crash type, followed by angle crashes. The following section provides additional detail for each intersection related to potential causes and mitigation measures to improve operations.

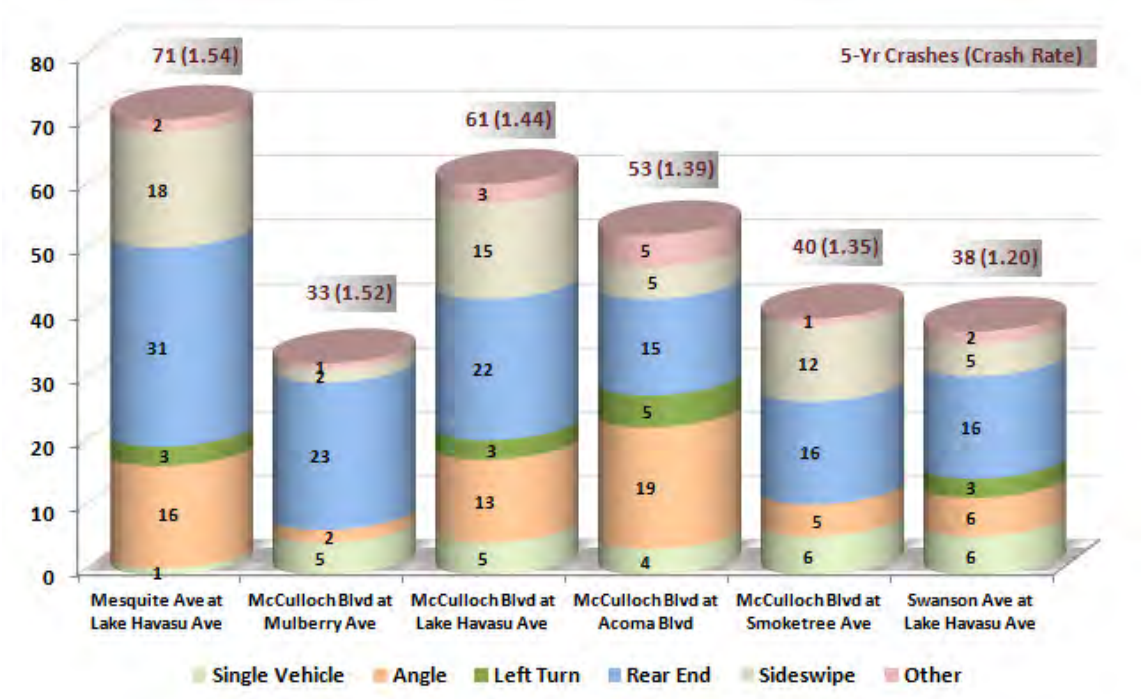
Table 5 High-crash Intersections

Intersection	5-year total crashes	Daily entering volume	Crash rate
Mesquite Avenue at Lake Havasu Avenue	71	25,300	1.54
McCulloch Boulevard at Mulberry Avenue	33	11,900	1.52
McCulloch Boulevard at Lake Havasu Avenue	61	23,200	1.44
McCulloch Boulevard at Acoma Boulevard	53	20,900	1.39
McCulloch Boulevard at Smoketree Avenue	40	16,200	1.35
Swanson Avenue at Lake Havasu Avenue	38	17,300	1.20

Source: ADOT Traffic Safety Division, data from January 1, 2006, to December 31, 2010

Notes: Table shows total crashes during 5-year analysis period. Intersection crash rate = total 5-year crashes x 1,000,000)/(daily entering volume x 365 x 5).

Figure 10 Crashes, by Type, at High-crash Intersections



Source: ADOT Traffic Safety Division, data from January 1, 2006, to December 31, 2010

Intersection Assessment

Crash type, pattern, and driver behaviors were reviewed for the six high-crash intersections. Notable observations, primary causes, and intersection assessments are summarized for each intersection below.

Mesquite Avenue at Lake Havasu Avenue

This intersection had 71 crashes and a crash rate of 1.54 during the 5-year analysis period. Notable observations include:

- High number of rear-end and angle crashes
- Heavy turning movements at intersection
- Driver distraction and failure to yield right-of-way were primary causes
- 61 crashes were during daylight and 10 were during dawn, dusk, or nighttime

To improve safety at this intersection, installation of an exclusive westbound right-turn lane on Mesquite Avenue at Lake Havasu Avenue is recommended. An inadequate yellow phase and a lack of all-red signal phase could be potential causes for the high number of angle crashes. Signal timing and phasing optimization with better visibility may improve the safety at this location.

McCulloch Boulevard and Mulberry Avenue

Although a moderate number of crashes (33) occurred over the 5-year analysis period, a low volume of entering vehicles yielded a high crash rate (1.52) at this intersection. Notable observations include:

- High number of rear-end and single-vehicle crashes
- Driver distraction, failure to yield right-of-way, and following too closely were the primary causes
- Two crashes occurred with parked vehicles, two with pedestrians, and two with the curb
- 26 crashes were during daylight and 7 were during dawn, dusk, or nighttime conditions
- In 2008, a bump-out was constructed at this intersection
- There were 8, 6, 3, 10, and 6 crashes in 2006, 2007, 2008, 2009, and 2010, respectively

Enforcing the speed limit and violations of traffic control is the potential countermeasure recommended to alleviate the issues at this intersection. Flexible reflective delineators along McCulloch Boulevard may enhance driver attention. Improvements in intersection lighting are also recommended.

McCulloch Boulevard and Lake Havasu Avenue

This intersection had 61 crashes (1.44 crash rate) over the 5-year analysis period, including 22 rear-end and 15 sideswipe crashes. Notable observations include:

- High number of rear-end and sideswipe crashes
- Heavy turning movements at intersection
- Driver distraction, speeding, and failure to yield right-of-way were primary causes
- Six crashes involved pedestrian and/or bicyclists
- 53 crashes were during daylight and 8 were during dawn, dusk, or nighttime

Considering the high number of pedestrian and bicyclist movements, potential mitigation could include installing advance pedestrian warning signs with flashes at the intersection of McCulloch Avenue at Lake

Havasu Avenue to alert drivers about the presence of pedestrians and bicyclists. Monitoring speed and red light violations, optimizing signals, and installing light-emitting diode (LED) traffic signal heads would also improve traffic safety.

McCulloch Boulevard and Acoma Boulevard

There were 53 crashes (1.39 crash rate) during the 5-year analysis period. Notable observations include:

- High number of angle and rear-end crashes
- High number of turning traffic movements
- Driver inattention, disregarding red light, speeding, and failure to yield right-of-way were the primary causes of crashes
- Four crashes involved pedestrians and/or bicyclists and two were with a parked vehicle
- 43 crashes during daylight; 10 crashes during dawn, dusk, or nighttime

Installing signs and/or flashing warning lights to alert drivers to the presence of pedestrians may help improve safety at this location. Signal optimization and LED traffic signal head installation may also improve traffic safety.

Unrestricted access to the business facility near the intersection may be the contributing factor to angle crashes. Prohibiting left turns from driveways near the intersection could improve traffic safety.

McCulloch Boulevard and Smoketree Avenue

Out of 40 total crashes during the 5-year analysis period, this intersection had 16 rear-end and 12 sideswipe crashes, with a crash rate of 1.35. Notable crash characteristics include:

- High number of rear-end and sideswipe crashes
- Driver inattention, followed too closely, and improper lane change were the major causes of crashes
- Three crashes involved bicyclists, three were with parked vehicles, and three were with a signal sign post
- 34 crashes were during daylight and 6 were during dusk or nighttime conditions

Installing recessed pavement markers along with lane markings would improve visibility. Installing signs to warn drivers about the pedestrian and parking activity at this intersection would also improve safety. Speeding and sudden stops at the traffic signal could be contributing factors to the high number of rear-end crashes.

Swanson Avenue and Lake Havasu Avenue

This intersection had 38 crashes, with a 1.20 crash rate during the 5-year analysis period. Notable crash characteristics include:

- High number of rear-end, angle, and single-vehicle crashes
- Driver inattention and failure to yield right-of-way are the primary causes of crashes
- Four crashes involved a traffic sign post
- Heavy right- and left-turn movements occur to and from Swanson Avenue
- 27 crashes were during daylight and 11 were during dusk or nighttime conditions

Installation of an exclusive southbound right-turn lane on Lake Havasu Avenue at Swanson Avenue would enhance safety. Speeding and reckless driving are potential contributing factors to the high number of single-vehicle crashes. Traffic signal timing and phasing optimization with adequate yellow and all-red intervals may help reduce angle and rear-end crashes.

Intersection Assessment Summary

In general, driver education, speed enforcement, periodic monitoring of traffic control (signal, stop, and yield sign), improved traffic signal visibility, pavement marking and striping, and advance warning for pedestrian and bicyclists activity are among the measures that could be implemented to enhance road user safety throughout the corridor.

The final recommended projects do not include all of these recommendations. Factors such as right-of-way impacts, cost, and traffic performance were also used to evaluate the projects. The City should continue to monitor the crashes and traffic operations at the closely-spaced intersections along SR 95 and Lake Havasu Avenue to identify spot improvements that would help make the intersections more efficient and safer.

3.0 Existing Transit Conditions

HAT, Lake Havasu City's public transportation system, provides service to Lake Havasu City, Desert Hills, Horizon Six, and the Shops at Lake Havasu. HAT provides both fixed-route bus service and Curbside service (demand-responsive service) for seniors and persons with disabilities.

3.1 Fixed-route Transit Service

Fixed-route bus service consists of five routes, which connect every 60 minutes at the Downtown Transfer Station (DTS) and provide passengers with a free transfer between routes. One route (the Trolley) provides service on more frequent headways (30 minutes) on Fridays and Saturdays. Operating characteristics are provided in Table 6, while a map of the routes is shown in Figure 11.

Table 6 HAT Fixed-route Bus Service Operating Characteristics

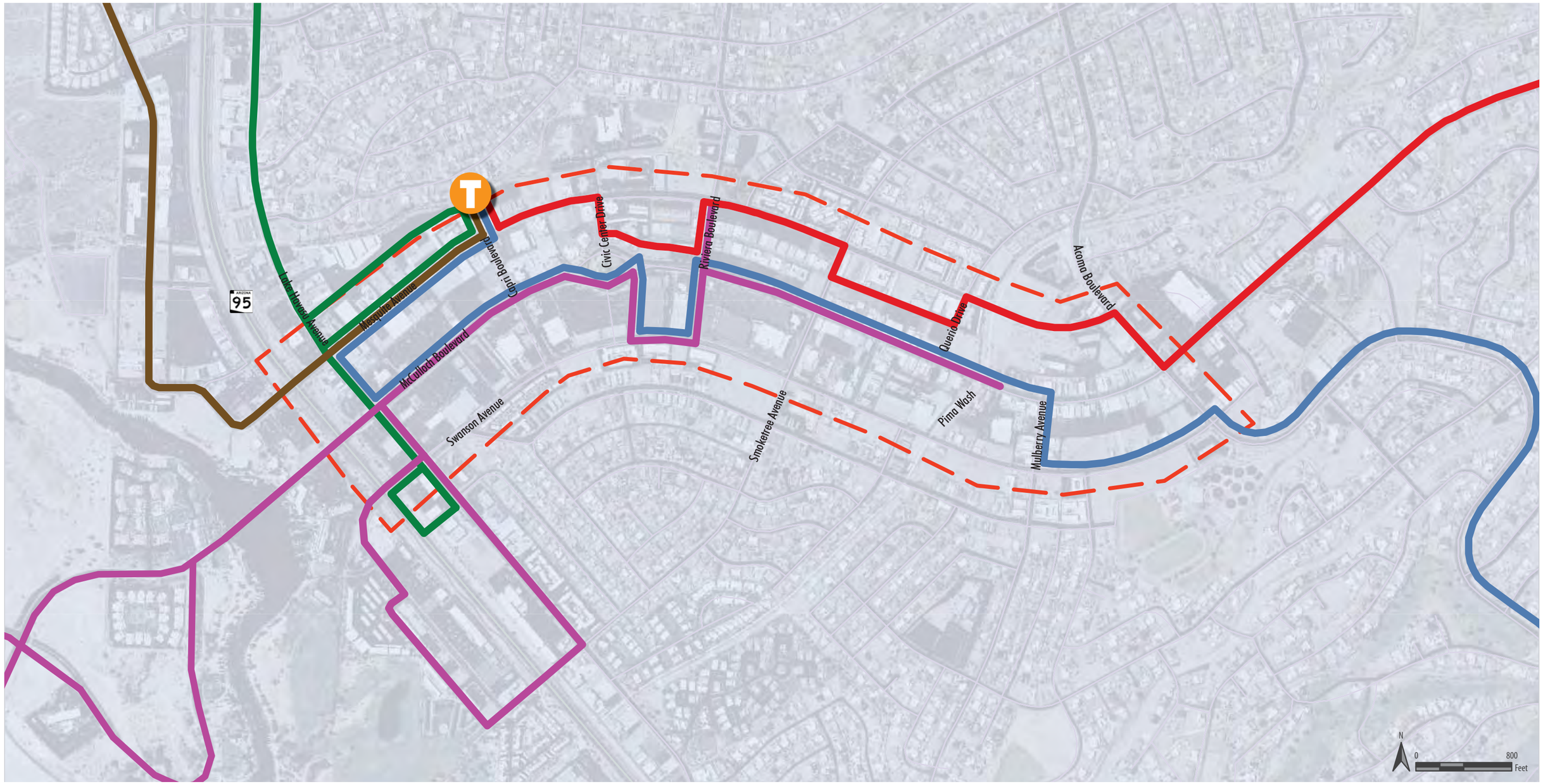
Route	Weekday headway (minutes)	Friday/ Saturday headway (minutes)	Weekday hours	Friday hours	Saturday hours
Trolley	60	30	9:00 a.m.–6:00 p.m.	9:00 a.m.–6:00 p.m.	9:00 a.m.–6:00 p.m.
Red	60	60	6:05 a.m.–7:05 p.m.	6:05 a.m.–7:05 p.m.	8:05 a.m.–6:05 p.m.
Blue	60	60	6:00 a.m.–7:00 p.m.	6:00 a.m.–7:00 p.m.	8:00 a.m.–6:00 p.m.
Brown	60	60	5:50 a.m.–7:00 p.m.	5:50 a.m.–7:00 p.m.	7:50 a.m.–6:00 p.m.
Green	60	60	9:00 a.m.–3:30 p.m.	9:00 a.m.–3:30 p.m.	9:00 a.m.–3:30 p.m.

Source: 2011 HAT Transit Service Guide

Three routes operate from approximately 6 a.m. to 7 p.m. on weekdays (Red, Blue, and Brown), while these same routes operate from approximately 8 a.m. to 6 p.m. on Saturdays. The Trolley and Green Routes begin service after the other routes and also end service earlier in the day. There is no service on Sundays and city holidays (with the exception of Good Friday and Veterans Day).

HAT is structured as a traditional hub-and-spoke, or radial transit system. The DTS is located at 83 Capri Lane, north of Mesquite Avenue behind a commercial strip development, and provides approximately 250 parking stalls on the 3-acre site. All five HAT routes are scheduled to meet at the DTS at approximately 25 minutes past the hour and depart at 30 minutes past the hour. This service configuration provides passenger access to all routes at a single location with a relatively seamless transfer option.

Fixed-route passenger fares start at $1.25 per trip (age 5 and over). Frequent system users can purchase a monthly pass for $36. Additionally, HAT sells 30-pack Bus Bucks for $30. Each Bus Buck is valid for $1 and can be used on fixed-route or Curbside service.



Trolley route
Red route
Brown route
Blue route
Green route
Transit center
Study zone boundary

3.2 Demand-responsive Service

HAT's demand-responsive service, Curbside service, was Lake Havasu City's primary transit service until 4 years ago when the first fixed-route service was implemented. Today, Curbside provides service for seniors, qualified persons with disabilities, and individuals who live outside the fixed-route area. Curbside service is a first-come, first-served shared ride program. HAT recommends that users request trips with a 24-hour advanced reservation; however, same-day trip requests are accepted pending availability.

Curbside service operates Monday through Friday from 6:30 a.m. to 7 p.m., and on Saturdays from 8 a.m. to 6 p.m. Consistent with HAT's fixed-route service, Curbside service is not provided on Sundays or city holidays, except Good Friday and Veterans Day.

Curbside fares range from $2.50 for seniors age 65 and over and qualified persons with disabilities, while all other qualified trips (outside of the fixed-route service area) for passengers ages 5 to 65 have a $3.75 fare.

3.3 Fixed-route and Demand-responsive Service Facilities and Fleet

HAT's primary capital asset inventory includes passenger facilities and transit vehicles. Passenger facilities, including bus stops and the DTS, are provided for the convenience and comfort of HAT's fixed-route transit riders. HAT has 88 bus stops, excluding the DTS, located throughout the service area. Bus stops include a range of amenities from a simple sign to a passenger shelter with a bench. The DTS has three passenger shelters and includes marked slots for all five HAT bus routes. Table 7 provides an inventory of the number of bus stops by route.

Table 7 HAT Bus Stops, by Route

Route	Stop Locations
Blue	15
Brown	19
Green	14
Trolley	20
Red	20
Total	**88**

Source: 2011 HAT Transit Service Guide

HAT's transit vehicle fleet consists of 20 revenue vehicles and 1 nonrevenue vehicle. The 20 revenue vehicles comprise six different models from five different manufacturers. Most of the fleet (85 percent) is powered by diesel fuel; the rest is powered by unleaded fuel. All of the revenue vehicles are American

with Disabilities Act (ADA)-accessible with the exception of the four trolley vehicles. An inventory of HAT's fleet is provided in Table 8.

Table 8 HAT Transit Fleet Inventory

Year	Make	Model	Quantity	Fuel	Seats	ADA accessible?
2003	Ford	Startrans	5	Diesel	8	Yes
2006	Classic American Trolleys	Trolley	4	Diesel	22	No
2007	Chevrolet	Aero Elite	6	Diesel	20	Yes
2008	International	EZ Trans	2	Diesel	21	Yes
2008	Braun	Entervan	2	Unleaded	5	Yes
2009	Chevrolet	Arboc	1	Unleaded	10	Yes
2011	Chevrolet	Pickup	1	Unleaded	4	No

Source: WACOG Regional Transportation Coordination Plan Transit Provider Service and Inventory Form – 2011 Plan Update

Fixed-route and Demand-responsive Service Operations and Capital Costs

HAT is partially funded through the ADOT-administered Federal Transit Administration 5311 Rural Transit Grant Program. The funding helps HAT operate, service, purchase, and maintain transit capital assets including vehicles and passenger facilities. Lake Havasu City's 2011–2012 budget identifies HAT costs in four major categories: personnel, operations and maintenance, capital, and contingency. Table 9 summarizes the actual or budgeted expenditures between fiscal year (FY) 2009 and 2012, while Table 10 provides the percentage of expenditures by category.

Table 9 HAT Actual or Budgeted Expenditures for FY 2009–2012, Total

Expenditure category	Actual FY 2009 ($)	Actual FY 2010 ($)	Budget FY 2011 ($)	Budget FY 2012 ($)
Personnel	1,331,488	1,110,836	1,133,426	1,025,804
Operations and maintenance	504,146	440,771	645,559	650,700
Capital	83,580	45,753	668,250	103,066
Contingency	0	7,908	20,000	20,000
Total	**1,919,214**	**1,605,268**	**2,467,235**	**1,799,570**

Source: Lake Havasu City 2011–12 Annual Budget (page 230)

Table 10 HAT Actual or Budgeted Expenditures for FY 2009–2012, Percentage

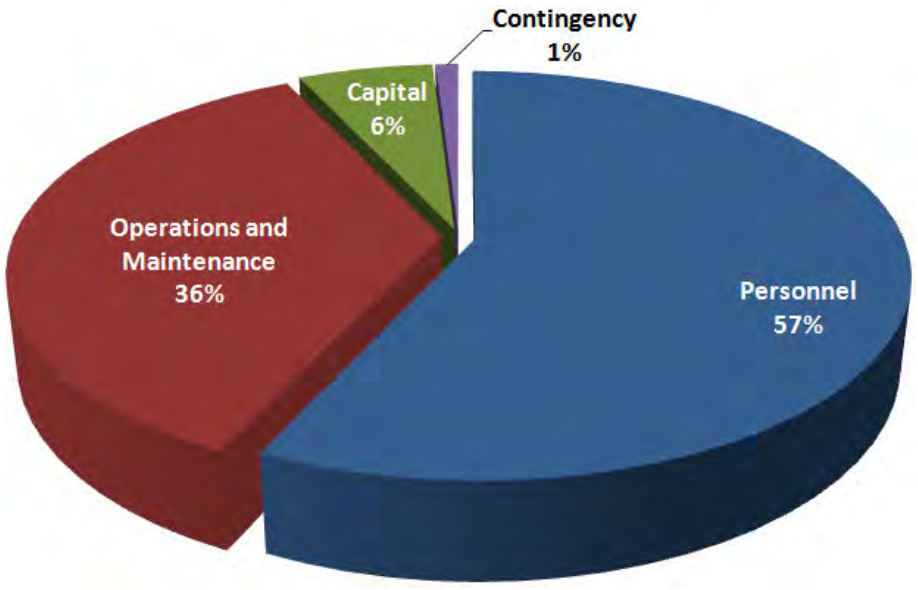
Expenditure category	Actual FY 2009 (%)	Actual FY 2010 (%)	Budget FY 2011 (%)	Budget FY 2012 (%)
Personnel	69.4	69.2	45.9	57.0
Operations and maintenance	26.3	27.5	26.2	36.2
Capital	4.4	2.9	27.1	5.7
Contingency	0.0	0.5	0.8	1.1
Total	100.0	100.0	100.0	100.0

Source: Lake Havasu City 2011-12 Annual Budget (page 230)

HAT's projected FY 2012 budget is approximately $1.8 million. By category, personnel costs are projected to be lower than in any year reported; however, operating and maintenance costs are expected to be the highest. Combined, FY 2012 budgeted cost for personnel and operations is expected to represent 92.3 percent of all FY 2012 expenditures. Compared with previous years (FY 2009 through FY 2011), FY 2012 has the lowest percentage of budget allocated to personnel and operations and maintenance, with the exception of FY 2011, which has an atypical allocation for transit capital.

Figure 12 illustrates the FY 2012 budgeted expenditures by category.

Figure 12 FY 2012 Expenditures, by Category



Source: Lake Havasu City 2011-12 Annual Budget (page 230)

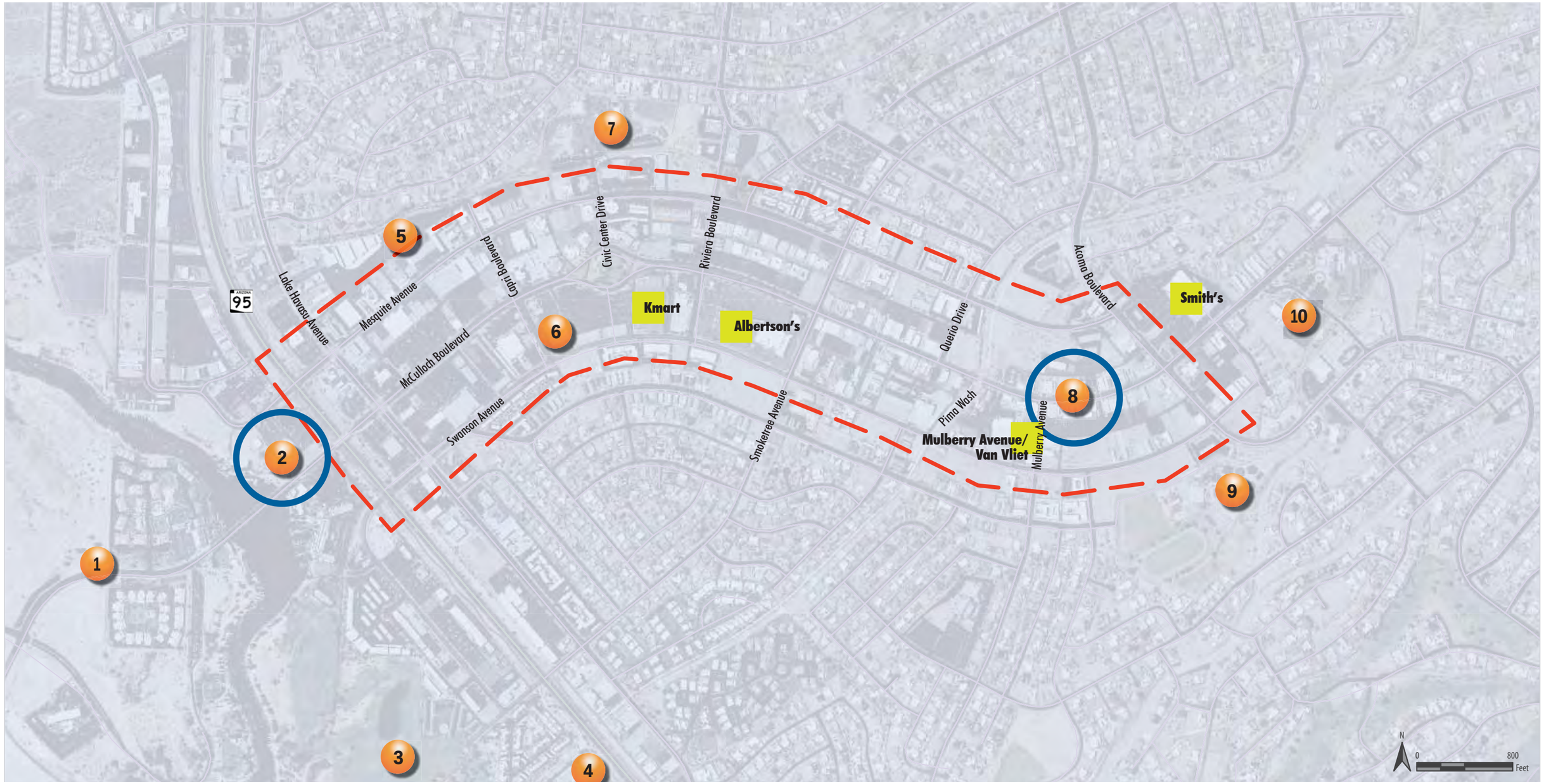
3.4 Current Activity Centers

Analyzing HAT's existing ridership data by stop is invaluable in identifying the top destinations or activity centers accessed by HAT passengers. Excluding the passenger boardings at the DTS—the highest-ranked stop location in the HAT system—all of HAT's top boarding locations are near retail, multifamily, or light industrial land uses. The top five boarding locations (with the exception of the DTS) are located near large retail stores including Wal-Mart, Bashas', Smith's, and Albertsons. While these locations provide shopping access to community members and visitors, they also represent mid-sized employment centers. Finally, half of the top ten boarding locations are located within the central business corridor, along or near McCulloch Boulevard. A ranked list, by total annual boardings of the top passenger boarding locations in HAT's service area, is provided in Table 11. Figure 13 illustrates HAT's top boarding locations and activity centers.

Table 11 HAT Top Passenger Boarding Locations

Stop\Location	Nearby major land uses	FY 2011 annual boardings	Route
DTS	Small retail and medical	42,117	All
Shops at Lake Havasu/Wal-Mart	Large retail	4,959	Green
Bashas' South	Large retail and multifamily residential	4,332	Blue
Smith's	Large retail	3,192	Red
Albertsons	Large retail	2,584	Blue
Mulberry Avenue/Van Vilet	Large retail	2,192	Blue
Lake Drive/London Bridge Road	Mobile home/RV residential	2,046	Green
Kmart	Large retail	1,958	Blue
Commander Drive/San Juan Drive	Light industrial and multifamily residential	1,830	Brown
Neighbors/Chemehuevi Boulevard	Church, small retail, and multifamily residential	1,776	Blue
Havasupai Boulevard/ Kiowa Boulevard	Elementary school and multifamily residential	1,617	Brown

Source: *FY-2011 HAT Ridership Report*



# Activity center (general)	1. Pittsburg Point	6. County Library
Activity center (transit)*	2. London Bridge	7. Medical Center
Commercial nodes**	3. Rotary Park	8. Uptown District
Study zone boundary	4. Aquatic Center	9. ASU Campus
	5. Transit Center	10. City Hall

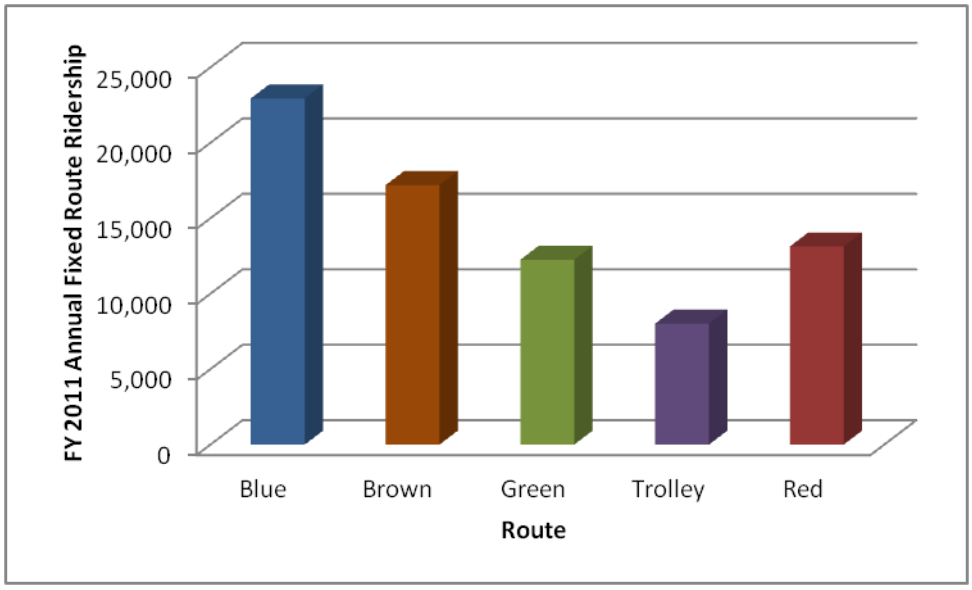
* Transit stops in the Study Area with the highest annual boardings
** as identified in the City of Lake Havasu City General Plan Update Future Transportation/Circulation Plan (Aug. 2005)

3.5 Transit Demand

Existing transit demand is expressed by actual ridership data collected by HAT during FY 2011. However, potential unmet demand exists for service in areas of the region without direct access to fixed-route transit service, and during weekday nights and on Sundays when service is unavailable. Section 6.2 discusses the potential existing unmet demand estimated from the Arkansas Public Transportation Needs Assessment (APTNA) transit demand methodology.

In FY 2011, HAT counted nearly 74,000 passenger boardings on the fixed-route transit service. Figure 14 summarizes ridership by route. More than half (55 percent) of the passenger boardings are accommodated by two routes: Blue and Brown. The Blue Route alone accounts for nearly one-third (31 percent) of HAT's ridership, while the Brown Route accounts for another 23 percent. Because the Trolley started operation in July 2011, the Trolley ridership shown in Figure 14 reflects a partial year of operation.

Figure 14 FY 2011 Annual Fixed-route Transit Ridership by Route



Source: FY-2011 HAT Ridership Report

As a radial configuration, passenger transfers are an important part of HAT's ridership. During FY 2011, transfers at the DTS accounted for 41 percent of HAT's ridership. The transfer rate indicates that three out of five linked passenger trips taken on HAT are completed by using more than one route. Looking more closely at HAT's ridership data, the total passenger boardings (transfers and paid boardings) that occurred at the DTS during FY 2011 exceeded 42,000 passengers, or 57 percent of all system boardings.

On a route-level basis, the number of transfers by route does not necessarily correlate with total passenger boardings. The Blue Route has more total passenger boardings than any route; however, the Brown Route has slightly more total transfers than the Blue Route. On a percentage basis, the Blue Route has the lowest transfer rate (passengers transferring to the route) at 32 percent—9 percentage points

lower than the system average of 41 percent. The Trolley Route has the highest passenger transfer rate, at 47 percent. The relatively high transfer rate on the Trolley Route provides evidence of the strong demand in Lake Havasu City's central business corridor, where the Trolley operates.

Furthermore, while the origin and destination of transferring passengers is not known, HAT's ridership data indicate that 57 percent of total passenger transfers occur on the Blue, Red, and Trolley Routes; all of which serve segments of Lake Havasu City's central business corridor. Table 12 summarizes HAT's FY 2011 ridership information.

Table 12 HAT FY 2011 Passenger Boarding's and Transfers at the DTS

Route	Total boardings	Transfers at DTS	Percentage transfers (%)	Paid boardings at DTS	Total DTS boardings	Percentage DTS boardings (%)
Blue	22,947	7,371	32.1	3,243	10,614	46.3
Brown	17,198	7,505	43.6	2,898	10,403	60.5
Green	12,252	5,518	45.0	2,870	8,388	68.5
Trolley	8,019	3,793	47.3	1,225	5,018	62.6
Red	13,131	5,997	45.7	1,697	7,694	58.6
Total	**73,547**	**30,184**	**41.0**	**11,933**	**42,117**	**57.3**

Source: *FY-2011 HAT Ridership Report*

Demand-responsive Transit Demand

Ridership data are not currently available for HAT's Curbside service.

4.0 Traffic Forecasts

To understand the traffic impacts of projected population and employment growth on McCulloch Corridor, the study team updated Lake Havasu City's travel demand model and prepared new traffic forecasts for the corridor. This included reviewing the socioeconomic inputs to the model and refining traffic forecasts within the corridor.

4.1 Travel Demand Model Update

The forecast year traffic volumes for the *Lake Havasu City SATS* (ADOT 2004) were developed through application of the Lake Havasu travel demand model. The original model was developed using the TP+ modeling software and was validated using 2004/2005 traffic data. For this study, several enhancements to the modeled network were made to improve the model's forecasting accuracy. Prior to making the enhancements, the study team decided to convert the model from TP+ to the TransCAD modeling software since TransCAD offers an internal scenario manager that simplifies changes and allows multiple scenarios to run without updating the complicated scripts. Also, converting the model to TransCAD enables easy back-and-forth integration with ADOT's statewide model because it uses the same software.

The following sections present the steps taken to convert the model, make enhancements to the model, review the latest demographic and road network data, and validate the new model.

Converting TP+ Model to TransCAD

The first step of converting the model was to import the base model inputs into TransCAD. The inputs were:

- zonal demographics
- highway network
- trip distribution friction factors

The existing (2004) and future (2030) zonal demographics files, which contain population, retail employment, general employment, and office employment for each traffic analysis zone (TAZ), were converted to a format compatible with TransCAD. The highway network file that describes all the links, intersections, and TAZ centroids was georeferenced using geographic information software before importing. The friction factors file was converted to a database file to be useable in TransCAD's trip distribution routine.

Implement Model Steps

The next step of converting the model was to use TransCAD Model Manager to recreate the model steps described in the TP+ script files. The model steps are described in Table 13.

Table 13 TP+ Model Steps

Model step	Inputs	Outputs
Trip generation	• Population and employment	• Trip productions and attractions
Path time skim	• Highway network	• Time matrix
Add destination time to selected paths	• Time matrix	• Time matrix with destination times
Trip distribution	• Productions and attractions • Path times • Friction factors	• Zone to zone productions and attractions
Production/attraction to origin/destination	• Production/attraction trips	• Origin/destination trips
Highway assignment	• Highway network • Origin-Destination trips	• Loaded network

Base Year Model Verification

The TransCAD model conversion was validated by comparing the results with results of the 2004 TP+ model. The trip generation and path skim steps produced identical results. The other steps produced slightly different results because TransCAD's standard trip distribution and highway assignment produce slightly different results from TP+ even using identical inputs.

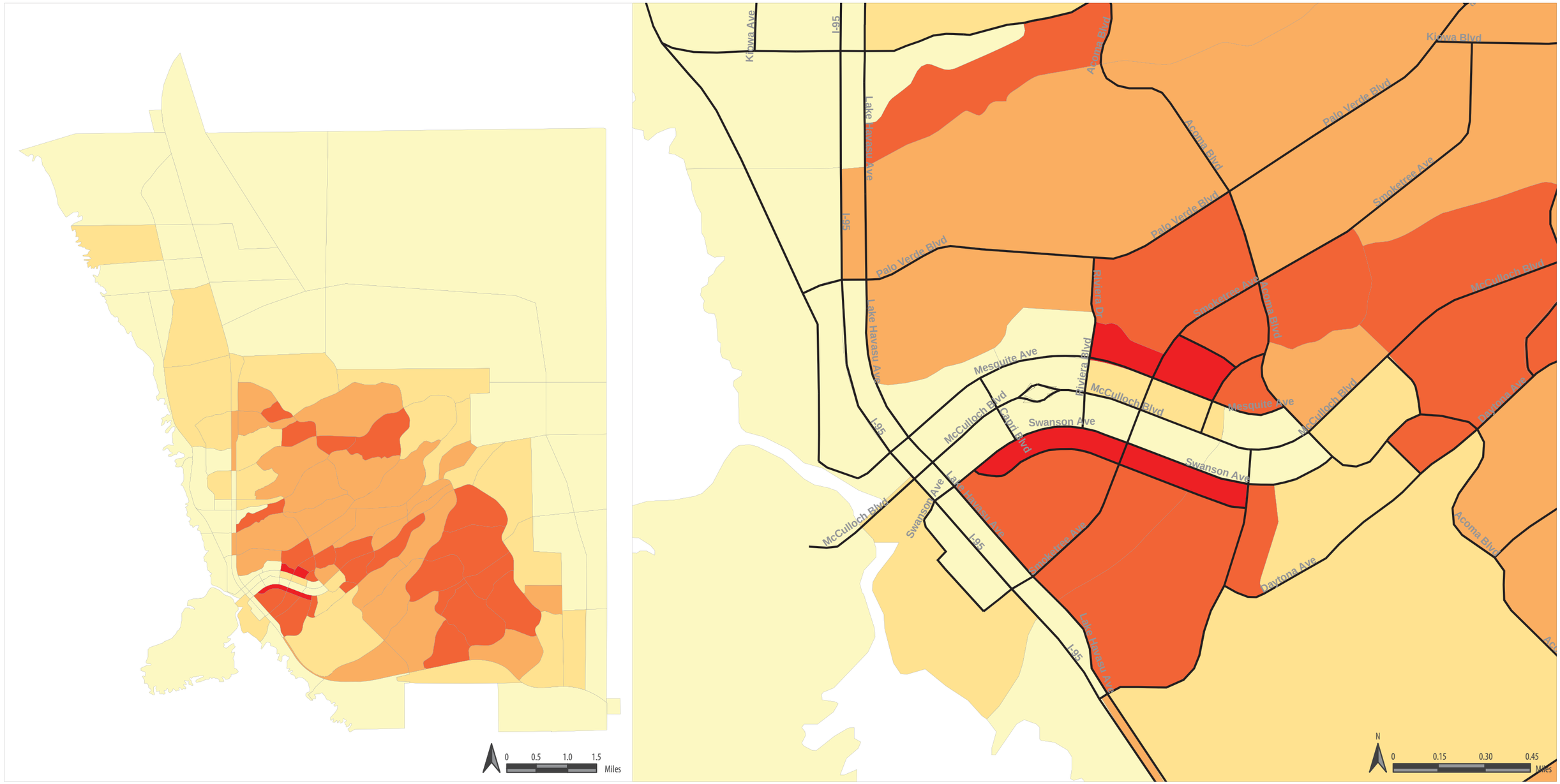
Model Enhancements

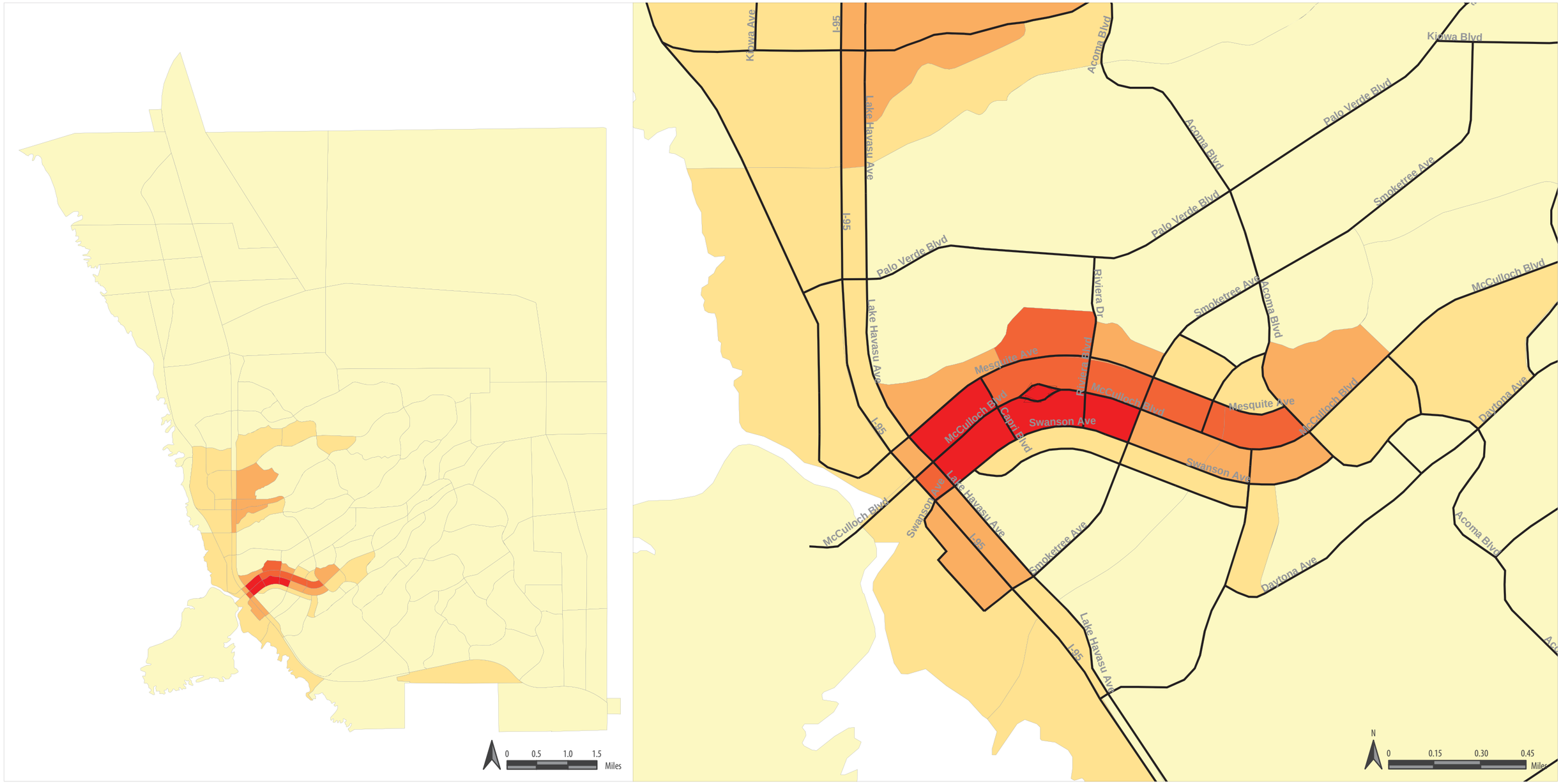
Once converted to TransCAD, a few enhancements were made to the model to allow for more detailed and meaningful results:

- TAZs were divided to provide more detail. The total TAZs increased from 121 to 135. The 2004 population and employment data for the new zones were estimated using land use data and aerial photographs. The 2030 population and employment were split using the same proportions shown in the 2004 data.
- The highway network was updated to add missing links for roads in the study area. Also, links in the network were georeferenced to aerial photographs to allow for more accurate measurements.
- Model steps were added to allow a single run to produce results for the overall model area as well as the study area.
- Trip generation for student trips to the ASU campus was added to the model. Trip rates were determined using production and attraction rates from the Institute of Transportation Engineer's *Trip Generation 8th Edition*.

4.2 Demographic Data and Highway Network Updates

The base year population was updated to 2010 using Census 2010 population by census block. The data for each block was assigned to the TAZ that enclosed the block centroid. The match was visually checked and a few adjustments to the data allocation were made for blocks that did not match closely with a single TAZ. Figure 15 and Figure 16 show the existing (2010) population and employment density.


Kiowa Ave
I-95
Lake Havasu Ave
Acoma Blvd
Kiowa Blvd
Palo Verde Blvd
Smoketree Ave
McCulloch Blvd
Riviera Blvd
Mesquite Ave
Swanson Ave
Capri Blvd
Daytona Ave
0 0.5 1.0 1.5 Miles
N
0 0.15 0.30 0.45 Miles
People per Square Mile
0 to 500
500 to 1,500
1,500 to 2,500
2,500 to 5,000
5,000 to 10,000



Total Employment per Square Mile

- 1 to1,000
- 1,000 to 5,000
- 5,000 to 10,000
- 10,000 to 20,000
- 20,000 and greater

Revised Model Validation

After all of the model updates were completed, an existing year model run was performed. The existing year model traffic assignment results were compared with traffic counts collected in December 2011 at three locations at each end of the corridor. The results of the comparison for vehicles entering the study area and exiting the study area are presented in Table 14 and Table 15, respectively. The range of percent-variance is between negative 41.8 percent and positive 58.3 percent. When totaled at all of the locations, the difference between the counts and model is less than 3 percent for both entering and exiting traffic. Less variance between observed traffic counts and model volume estimates on the segment basis is desirable. However, the overall corridor entering and exiting model volume estimates tracked closely with traffic count observations. This model validation is sufficient for the development of traffic growth factors to estimate future peak hour traffic volumes.

Table 14 Traffic Counts versus Link Volumes, Entering Vehicles

Route	Location	Direction	2011 count	Model	Percent-Variance (%)
McCulloch Boulevard	Between Lake Havasu Avenue and Capri Boulevard	eastbound	5,368	5,720	6.6
Mesquite Avenue	Between Lake Havasu Avenue and Capri Boulevard	eastbound	4,940	4,260	–13.8
Swanson Avenue	Between Lake Havasu Avenue and Capri Boulevard	eastbound	3,865	6,120	58.3
Acoma Boulevard	Between Mesquite Avenue and Sotol Lane	southbound	5,626	3,400	–39.6
McCulloch Boulevard	Between Acoma Boulevard and Agave Drive	westbound	6,219	6,440	3.6
Acoma Boulevard	South of Swanson Avenue	northbound	8,199	7,480	–8.8
		Total traffic entering study area	34,217	33,420	–2.3

Table 15 Traffic Counts versus Link Volumes, Exiting Vehicles

Route	Location	Direction	2011 count	Model	Percent-Variance (%)
McCulloch Boulevard	Between Lake Havasu Avenue and Capri Boulevard	westbound	4,853	5,450	12.3
Mesquite Avenue	Between Lake Havasu Avenue and Capri Boulevard	westbound	5,080	4,300	–15.4
Swanson Avenue	Between Lake Havasu Avenue and Capri Boulevard	westbound	5,267	6,180	17.3
Acoma Boulevard	Between Mesquite Avenue and Sotol Lane	northbound	5,924	3,450	–41.8
McCulloch Boulevard	Between Acoma Boulevard and Agave Drive	eastbound	5,371	6,520	21.4
Acoma Boulevard	South of Swanson Avenue	southbound	7,675	7,350	–4.2
	Total traffic exiting study area		34,170	33,250	-2.7

Model Results

Three alternatives of the model were run:

- existing year demographics on the existing roadway network
- future year demographics on the existing roadway network
- future year demographics on the future roadway network

A cut-line analysis was performed on the corridor using the 2011 counts and the three model scenarios described above. The cut lines, located at each end of the corridor, are summarized in Table 16. Traffic counts and model estimates are summed across each cut line for comparison.

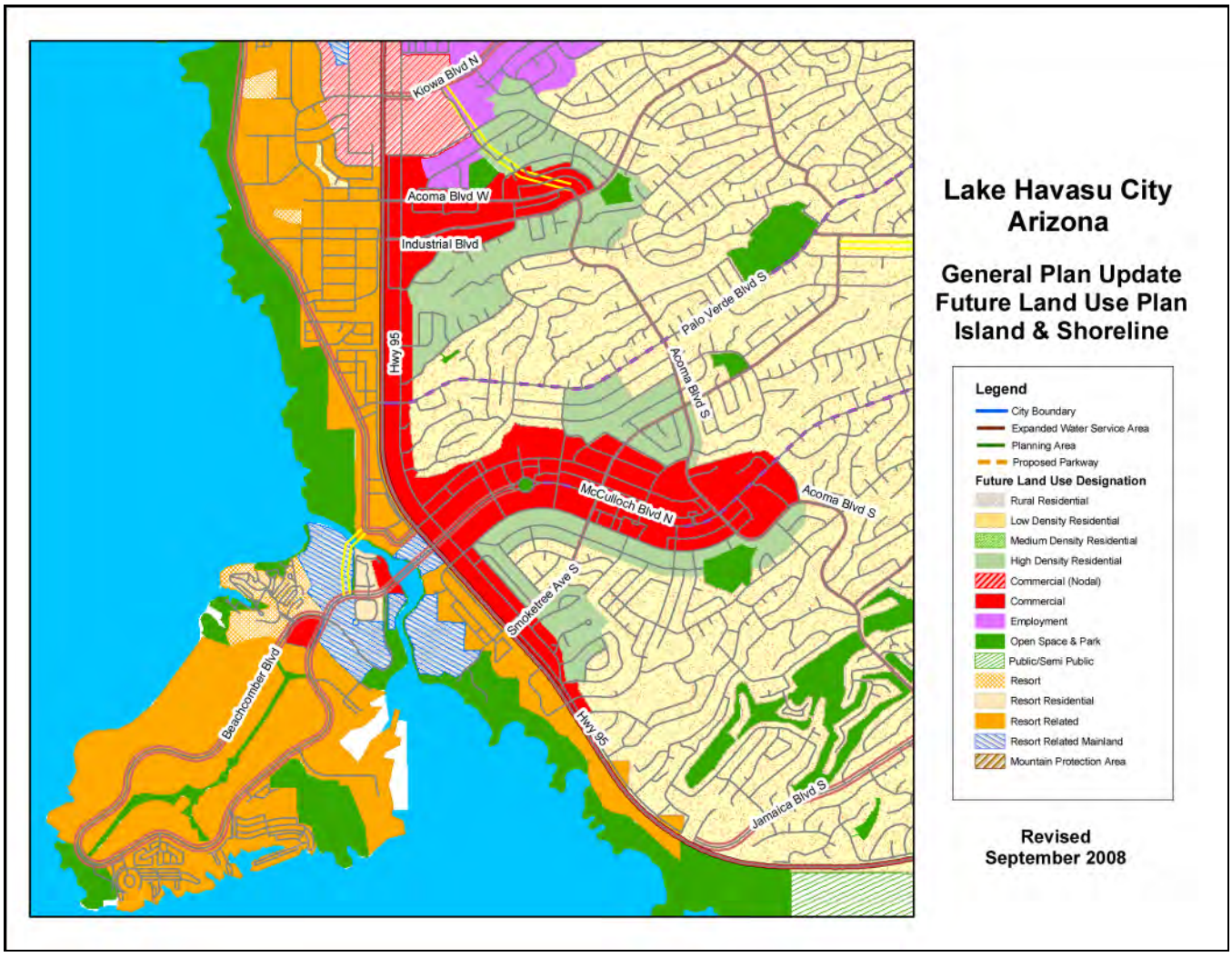
Table 16 Cut-line Traffic Volumes

Cut line	Direction	2011 count	2011 existing model	2030 existing network	2030 future network
West end of corridor	eastbound	14,173	16,100	21,950	17,160
	westbound	15,200	15,930	21,740	17,060
East end of corridor	westbound	20,044	17,320	21,620	24,250
	eastbound	18,970	17,320	21,780	24,400

4.3 Future Land Use

The Lake Havasu City General Plan Future Land Use map identifies future land uses for Lake Havasu City. The majority of land use in the study area is commercial, surrounded by high-density residential. Figure 17 shows the Lake Havasu City General Plan Land Use Map for the Island and Shoreline Area.

Figure 17 Future Island and Shoreline Land Use Plan



Source: *Lake Havasu City General Plan*, 2002, Revised 2008

4.4 Population and Employment Projections

The ASU campus in zone 46 southeast of the corridor was added to the 2030 demographic data. The future enrollment at the campus was specified as 4,000 students. Research found that campus employment ratios are approximately 1 employee per 20 students, so 150 general employees and 50 office employees were added to zone 46. Table 17 summarizes the 2030 population and employment projections. Reflecting Lake Havasu City's future land use plan, Figure 18 and Figure 19 show the projected population and employment density for the McCulloch Corridor.

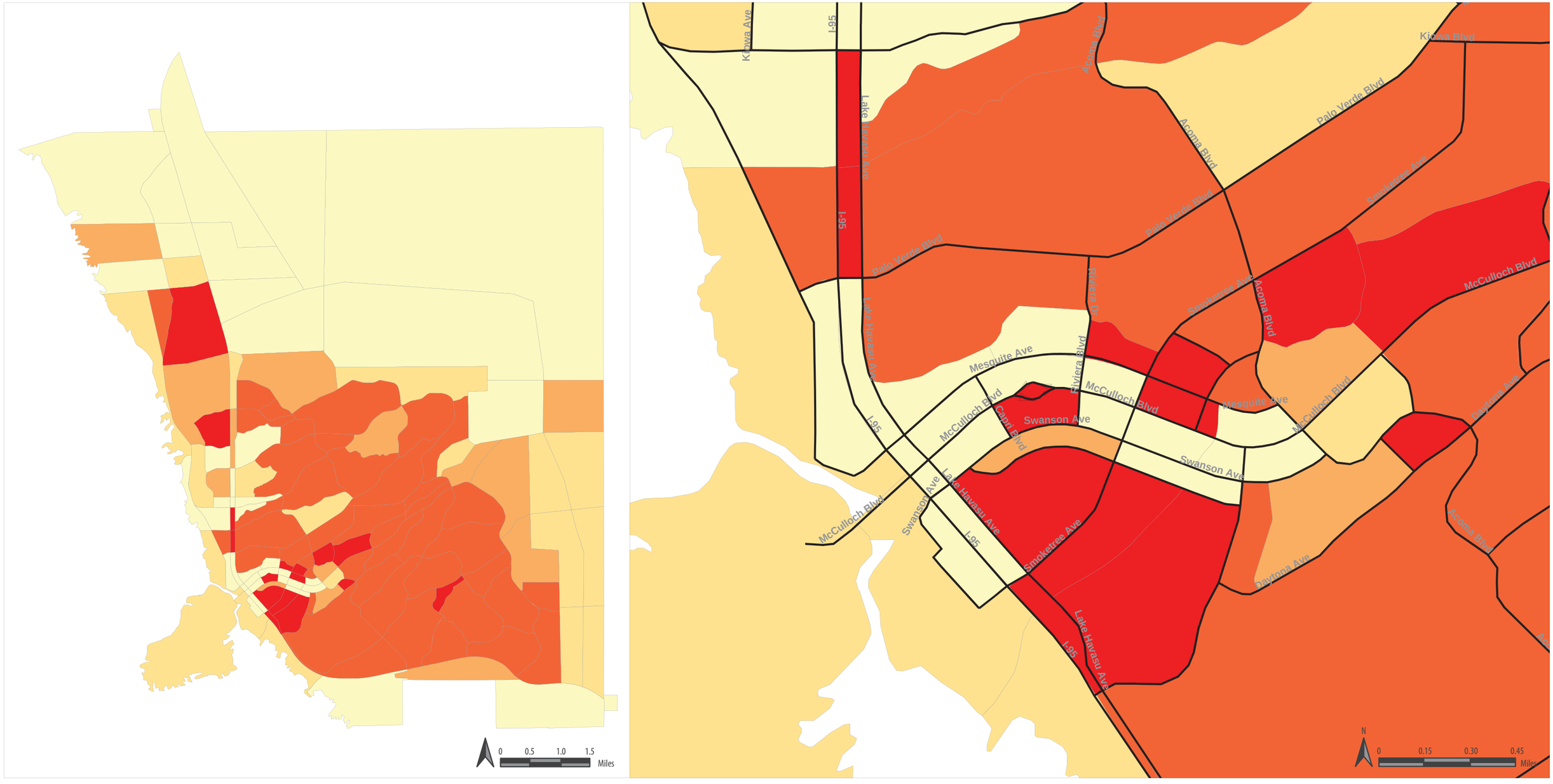
Table 17 Demographic Summary

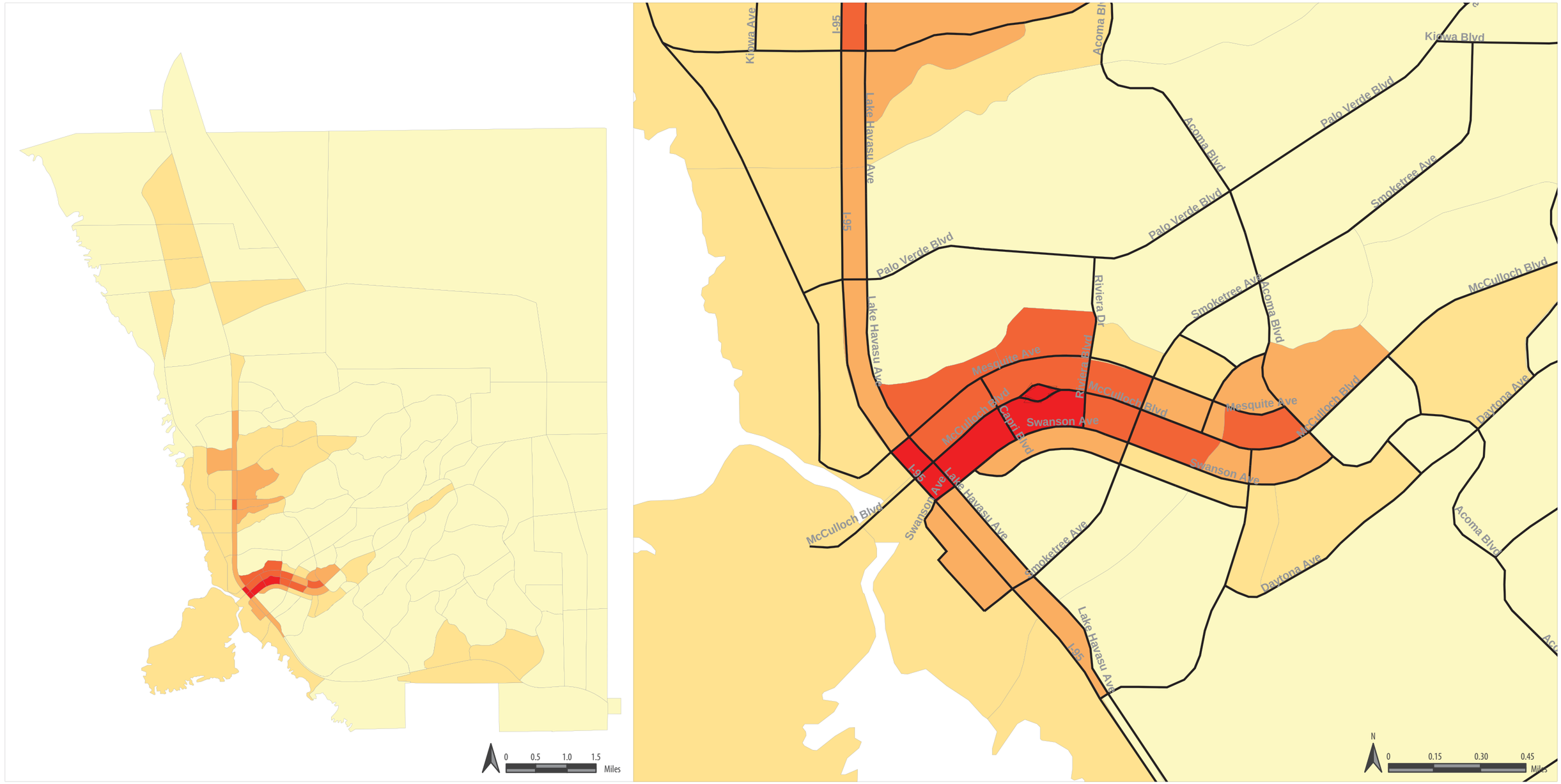
Demographic characteristic	2010 data	2030 data
Population	52,527	103,801
Total employment	23,400	42,957
Retail employment	9,325	19,150
General employment	9,915	16,322
Office employment	4,160	7,485

Sources: U.S. Census Bureau, Census 2010; Arizona Department of Economic Security, Research Administration, Population Statistics Unit, December 2006.

4.5 2030 Traffic Forecasts

The future highway network was updated to match the Lake Havasu City *SATS* Recommended Plan. Roadway link capacities were increased and new roads were added as specified in the plan. TAZs were connected to the new roadway links as needed. Figure 20 shows the 2030 traffic volume forecasts for the McCulloch Corridor.


Kiowa Ave
I-95
Lake Havasu Ave
Acoma Blvd
Palo Verde Blvd
Kiowa Blvd
Smoketree Ave
McCulloch Blvd
Riviera Blvd
Mesquite Ave
Swanson Ave
Daytona Ave
0 0.5 1.0 1.5 Miles
N
0 0.15 0.30 0.45 Miles
People per Square Mile
0 to 500
500 to 1,500
1,500 to 2,500
2,500 to 5,000
5,000 to 10,000



Total Employment per Square Mile

- 1 to1,000
- 1,000 to 5,000
- 5,000 to 10,000
- 10,000 to 20,000
- 20,000 and greater

Daily Vehicle Volume/Link Capacity Ratio

- 0.00 to 0.25
- 0.25 to 0.50
- 0.50 to 0.75
- 0.75 to 1.00
- 1.00 to 1.25
- 1.25 to 1.50
- 1.50 to 1.75
- > 1.75

Daily Vehicle Volume

25000 12500 6250

5.0 Future Conditions

5.1 Traffic Operations

The following sections describe the evaluation process for future traffic operations conditions. The process included identifying planned improvements, updating the travel demand model and related input data, and analyzing the future road network using revised travel demand projections.

Planned Improvements

No specific road improvements are funded in the study area. The City has appropriated funding in its annual budget for implementing recommendations from this study. The WACOG *Transportation Improvement Program* (TIP) and State TIP include approximately $400,000 for design in FY 2014 and approximately $2.1 million for construction during FY 2016.

The future road network includes the improvements outside of the study area that were proposed in the *Lake Havasu City SATS* (ADOT 2004), such as the new bridge connecting the Island and SR 95.

Operational Analysis

The future conditions operational analysis used similar methodology as the existing conditions analysis. The same Synchro network of roads and intersections were analyzed using the future traffic volumes presented in Figure 20. The results of the future conditions analysis is summarized in Table 18 and shown graphically in Figure 21.

Notable observations from the table and figures include:

- Nine of the 20 intersections are projected to operate at LOS E or F during the AM or PM peak hour.
- Seven of the poorly performing intersections are all-way stop-controlled, whereas the other two intersections are stop-controlled on the side streets only.
- The signal controlled intersection of McCulloch and Acoma Boulevards is projected to operate at LOS D during the PM peak hour.

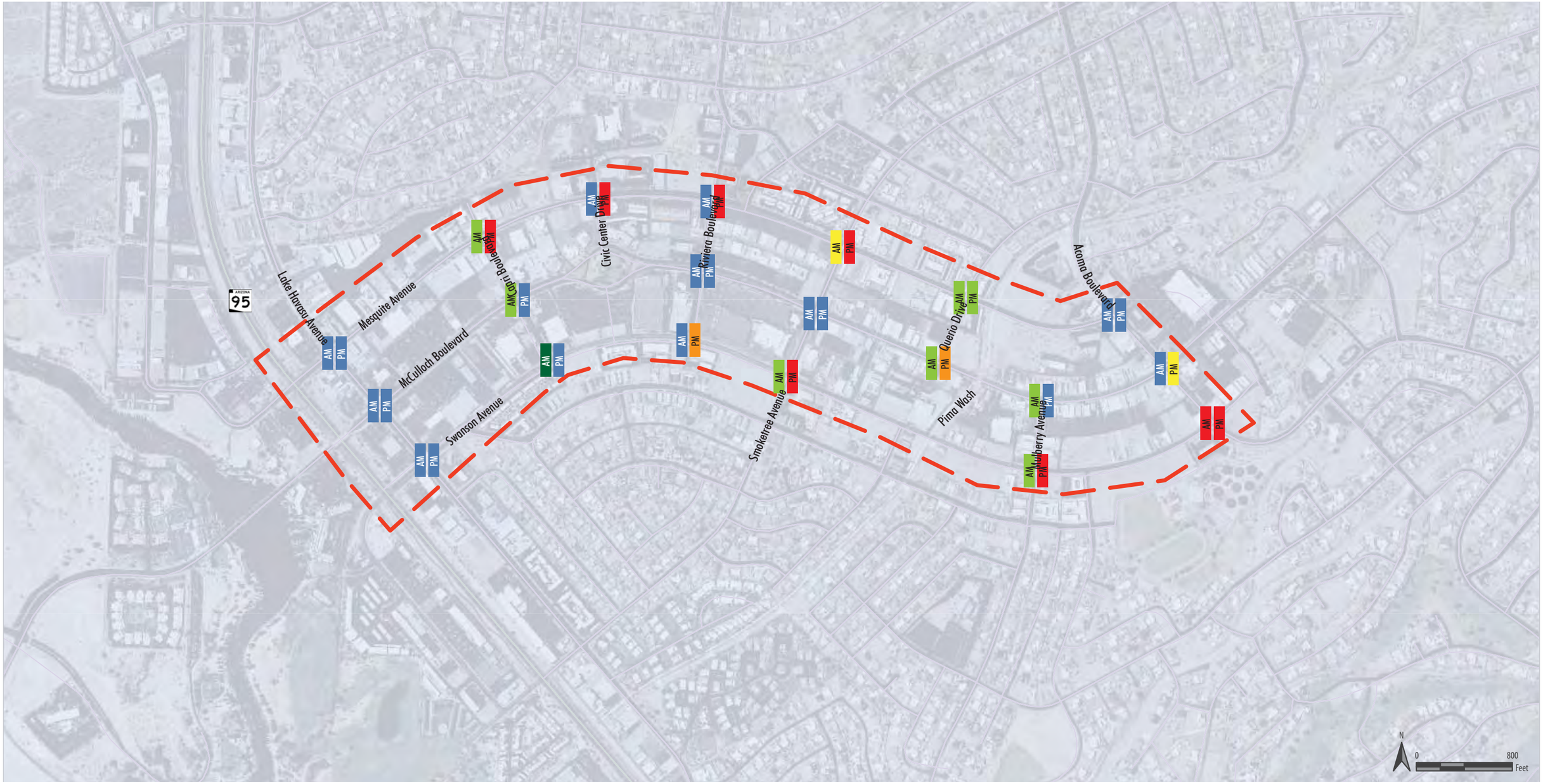
The results of the future conditions operational analysis supported previous recommendations from the *Lake Havasu City SATS* (ADOT 2004) related to the need for intersection enhancements to address the LOS E or F conditions projected for the study corridors.

Table 18 Future Intersection Level of Service Analysis Results

Intersection	Intersection control type	AM peak		PM peak	
		LOS	Average control delay (seconds)	LOS	Average control delay (seconds)
Mesquite Avenue at Lake Havasu Avenue	Signal	C	30.3	C	33.9
Mesquite Avenue at Capri Boulevard	AWSC[a]	B	11.6	F	>50.0
Mesquite Avenue at Civic Center Lane	AWSC	C	16.6	F	>50.0
Mesquite Avenue at Riviera Drive	AWSC	C	23.2	F	>50.0
Mesquite Avenue at Smoketree Avenue	AWSC	D	31.0	F	>50.0
Mesquite Avenue at Querio Drive	AWSC	B	11.1	B	13.1
Mesquite Avenue at Acoma Boulevard	Signal	C	29.3	C	31.4
McCulloch Boulevard at Lake Havasu Avenue	Signal	C	28.3	C	31.1
McCulloch Boulevard at Capri Boulevard	Signal	B	17.2	C	21.2
McCulloch Boulevard at Riviera Drive	Signal	C	20.3	C	23.1
McCulloch Boulevard at Smoketree Avenue	Signal	C	27.3	C	25.2
McCulloch Boulevard at Querio Drive	SSSC[b]	B	12.7	E	36.8
McCulloch Boulevard at Mulberry Avenue	SSSC	B	12.0	C	25.0
McCulloch Boulevard at Acoma Boulevard	Signal	C	31.7	D	38.0
Swanson Avenue at Lake Havasu Avenue	Signal	C	26.2	C	32.0
Swanson Avenue at Capri Boulevard	AWSC	A	9.2	C	20.7
Swanson Avenue at Riviera Drive	SSSC	C	21.4	E	42.4
Swanson Avenue at Smoketree Avenue	AWSC	B	12.6	F	>50.0
Swanson Avenue at Mulberry Avenue	AWSC	B	10.6	F	>50.0
Swanson Avenue at Acoma Boulevard	AWSC	F	>50.0	F	>50.0

Source: HDR Engineering, Inc., February 2012

[a] all-way stop control [b] side-street stop control


Lake Havasu Avenue
Mesquite Avenue
McCulloch Boulevard
Swanson Avenue
London Bridge Boulevard
Civic Center Drive
Riviera Boulevard
Smoketree Avenue
Pima Wash
Queirio Drive
Acoma Boulevard
Mulberry Avenue
AM
PM
N
0
800
Feet
LOS A
LOS B
LOS C
LOS D
LOS E
LOS F
Study zone boundary
Morning peak
Afternoon peak

5.2 Transit

The existing transit system provides a basic level of transit service to meet the community's general mobility needs. By offering fixed-route service with regularly scheduled trips and supplementing that service with demand-responsive service for the general public, HAT is able to fill in some geographic gaps in service. However, in the future, increased service levels (headways more frequent than 60 minutes) and expanded service spanning the community's growth areas will help HAT meet potential increases in general transit demand. This section identifies potential future corridor activity centers and transit demand.

Potential Future Corridor Activity Centers

As documented in Chapter 4, half of the top ten boarding locations in the HAT system are located in the study area. The arrival of the ASU campus near Swanson Avenue and Acoma Boulevard will likely further increase demand for transit service in the corridor. The significant demand currently documented in the central business corridor is likely driven by passengers accessing retail, medical, and government services as well as jobs. From a transit service perspective, there would be some significant advantages to treating the entire central business corridor as a single activity center with multiple activity nodes. By adjusting transfer meet times at the DTS, overlapping transit service could operate with increased frequency in the central business corridor at no additional operating cost. This approach would allow HAT to efficiently address potential future growth in demand at multiple locations within the central business corridor.

The City recently purchased a parcel near Pima Wash between Mesquite Avenue and McCulloch Boulevard. This parcel may be considered for a new transit center and parking lot.

Future Transit Demand

Applying the APTNA method to the Lake Havasu City area provided a methodology to help determine future transit demand based on transit-dependent populations in a defined geographic area. Additional demand associated with choice riders is not accounted for in the APTNA method. The APTNA method uses calibrated trip rates of three demographic groups including elderly persons age 60 and over, persons with a disability under age 60, and persons of low income under age 60.

The ATPNA methodology was applied for a similar set of demographic data based on the 2000 Census for Lake Havasu City and three incremental growth scenarios:

- Scenario 1: 25 percent of total population growth from 2000 with all APTNA-applicable demographic rates held constant
- Scenario 2: 25 percent of total population growth with a double rate of senior population
- Scenario 3: 50 percent of total population growth with a double rate of senior population

The APTNA demand estimates indicated that current total transit demand is potentially not being met as observed by current fixed-route ridership. Table 19 identifies the trip rates used for the APTNA assessment, while Table 20 provides the estimated future demand for the three conceptual growth scenarios.

Table 19 APTNA Annual Transit Trip Rates

Demographic group	Trip rates: Annual one-way passenger trips	Lake Havasu City 2000 Census data (%)
Elderly persons age 60 and over	6.8	26[A]
Persons with a disability under age 60	4.5	21[B]
Low-income persons under age 60	20.5	10[C]

Source: *Northwest Arkansas Transit Assessment Study*, March 2000

[a] *age 65 or over* [b] *all persons with a disability* [c] *all persons living below the poverty level*

Table 20 APTNA Estimated Future Trip Demand

Scenario	APTNA estimated annual transit trip demand
2000 Census population	194,592
2010 Census population	243,725
Future scenario 1	304,657
Future scenario 2	418,509
Future scenario 3	502,211

Source: 2000 and 2010 Census

Summary

The results of the analysis indicated that changes in general population growth (25 percent through 50 percent) and/or increase in elderly population may have significant impacts on future transit demand in Lake Havasu City.

5.3 Parking Availability

Parking is an expressed, ongoing concern, especially in the Uptown District. As is typical, most drivers—locals and tourists—want to park in front of the business they are shopping at, and will drive around the block more than once to try to obtain their desired spot. However, plenty of parking can be found behind most of the buildings in the Uptown District. Reasons why this parking might not be used as much as expected include a lack of wayfinding/direction signs; the poor condition of rear parking lots; a lack of signs and/or entrances at the rear of buildings, where available; a perceived sense that it's farther to walk to the desired business; or a lack of lighting. Unstriped, unmaintained parking areas in particular make it difficult to confirm whether and where parking is allowed, especially for visitors, making the parking areas inefficient in terms of maximizing parking capacity.

To get a broad sense of parking availability in the Uptown District, the consultant team used aerial maps to count parking stalls, including on-street parking. Parking stalls were counted if they were clearly striped. Stalls were not counted if they appeared to be predominantly for a specific building (gas station, hotel, etc.), if they appeared to be used for a trash dumpster, or if there was a car visible but no apparent "official" stall markings. All these parking stalls are within 200 to 250 feet of the buildings, not an onerous distance given the typical shopping mall parking lot can put a shopper upwards of 800 feet from the building during peak shopping periods.

Using the same aerials, general square footage of the businesses in the Uptown District was calculated, including vacant lots, in anticipation they will be built out in the future. Because this effort was not an official parking study, the type of business was not a factor nor were detailed building square footages calculated or requested. Again, this was just to get a sense as to whether there is a serious lack of parking in Uptown.

The *Uptown McCulloch Main Street District* parking guidelines require most retail/commercial uses to provide 1 parking stall per 500 square feet of gross floor area. This calculation was used for all businesses, with the exception of restaurants. Seven restaurants were noted in the area. The parking requirement for restaurants is 1 stall per 75 square feet of gross floor area, including outdoor seating. A factor of 70 percent was used to calculate the dining area versus kitchen area.

Table 21 and Figure 22 display the results of the research. From the information gathered, there does not appear to be an overall lack of parking but there is certainly an issue with where available parking is distributed. The City recently purchased a parcel near Pima Wash between Mesquite Avenue and McCulloch Boulevard. This parcel may be considered for a new transit center and parking lot.

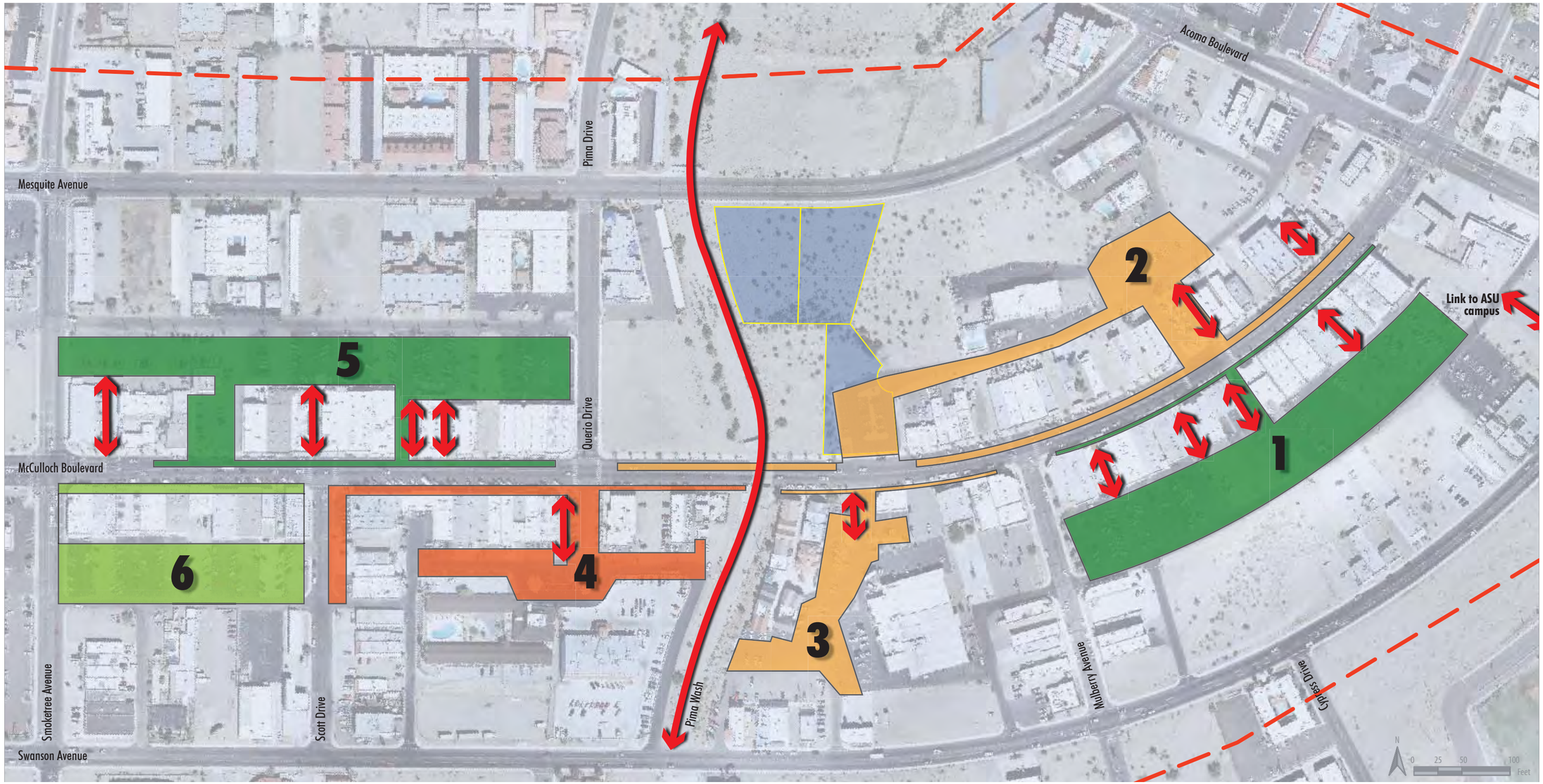
The *Uptown McCulloch Main Street District* parking guidelines also have the suggested guideline to provide a 20-foot-wide pedestrian access link within each block, every 250 feet, connecting McCulloch Boulevard to the rear parking structures and/or parking areas. This appears to be met on all blocks except the two blocks on the southern side of McCulloch Boulevard, from Querio Drive to Scott Drive and from Scott Drive to Smoketree Avenue (see Figure 22).

Table 21 Parking Availability in the Uptown District

Area	Marked spaces	Remarks	Square footage of building (including vacant lots, not including restaurants)	Parking needed (1 stall per 500 square feet)	Square footage of restaurant (number reflects 30% less for production area)	Parking needed (1 stall per 75 square feet)	Parking space difference
1. Acoma to Mulberry, south side of McCulloch to alley	305		80,300	161	0	0	+144
2. Acoma to Querio Drive, north side of McCulloch to alley	191		59,100	118	8,500	80	–7
3. Mulberry to Pima Wash, south side of McCulloch to Swanson	252		54,700	109	15,600	146	–3
4. Pima Wash to Scott Drive, south side of McCulloch to alley/hotel	134	Includes random parking behind buildings (32 +/–), where no striping exists and is not paved in spots. Does not include hotel parking.	51,100	102	14,900	139	–107
5. Querio to Smoketree, north side of McCulloch to alley	340	Includes what appears to be approximately 30 unmarked spots at northwest corner of block along alley	85,900	172	5,000	47	+121

Table 21 Parking Availability in the Uptown District

Area	Marked spaces	Remarks	Square footage of building (including vacant lots, not including restaurants)	Parking needed (1 stall per 500 square feet)	Square footage of restaurant (number reflects 30% less for production area)	Parking needed (1 stall per 75 square feet)	Parking space difference
6. Scott Drive to Smoketree, south side of McCulloch to alley	168		39,800	80	7,000	66	+22
Total	1,371		370,900	742	51,000	478	+151



Excess parking available
Extra parking available
Short on parking
Very short on parking
City-owned parcels
Existing pedestrian pass-through routes
6 Study zone number
Study area boundary

5.4 Sidewalk Conditions and Pedestrian Amenities

Along the three study corridors (Mesquite Avenue, McCulloch Boulevard, and Swanson Avenue) there are a variety of existing facilities for pedestrian and bicyclists, the majority of which are for pedestrians, with virtually none specifically for bicyclists. Sidewalks are the main pedestrian facility, with all three corridors having sidewalks on both sides for almost the entire distance between Lake Havasu Avenue and Acoma Drive. Sidewalks are the most basic facility for pedestrians. The elderly, children, and those with physical impairments are the most likely to use them as a means of getting around.

Following are detailed descriptions of the existing facilities, by corridor.

Mesquite Avenue

Mesquite Avenue has standard, attached sidewalks on both sides of the street. The sidewalks are 5 to 6 feet wide and in good condition. Six feet is the minimum preferred width for sidewalks along arterials (Image 1).[1] This width provides comfortable room for two wheelchairs to pass or for two people to walk side by side. The recommended pedestrian zone dimension of 5 feet is met (see Image 2).[2] The recommended curb zone of 6 inches exists and is in addition to the pedestrian zone. There is no planter/furniture zone. A frontage zone does not exist and is not generally needed because the sidewalk is almost always adjacent to landscaped areas. There is no buffer of either landscaped area or on-street parking between the pedestrian traffic and vehicular traffic (Image 1).

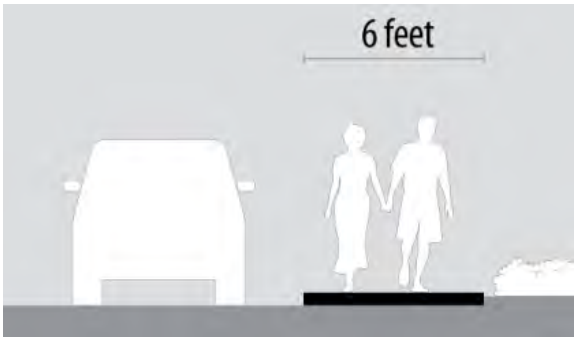


Image 1 – Sidewalk section

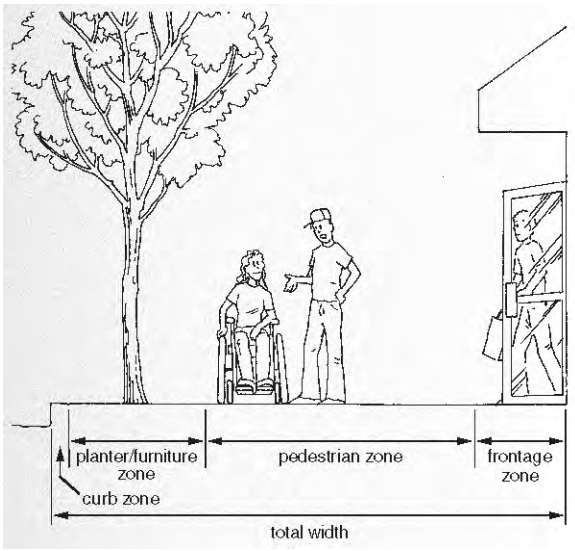


Image 2 – Sidewalk zones

Source: *Figure 4-4, Designing Trails and Sidewalks for Access, Part II of II: Best Practices Design Guide.*

[1] *Guide for the Planning, Design, and Operation of Pedestrian Facilities. Washington, D.C.: American Association of State Highway and Transportation Officials, 2004.*

[2] *Designing Trails and Sidewalks for Access, Part II of II: Best Practices Design Guide. Chapter 4. Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration, 2001.*

Two short segments, one east of Pima Wash and one west of Riviera Boulevard, both on the northern side of the road, are the only sections without a sidewalk; the properties are vacant in these sections.

None of the driveways are ADA-compliant. Noncompliant driveways incorporate the sidewalk crossing at the curb line as part of the driveway as it slopes rapidly toward the street. Compliant driveways wrap the sidewalk behind the driveway apron where the sidewalk can remain on a continuous plane (see Image 3).

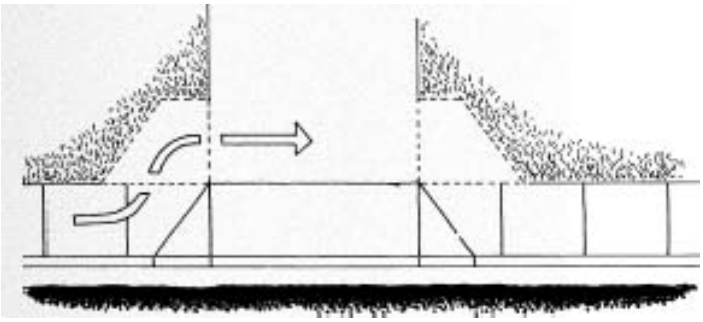


Image 3 – ADA-compliant level landings at driveway crossings

Source: *Figure 4-11, Designing Trails and Sidewalks for Access, Part II of II: Best Practices Design Guide.*

Given that the running grade of the street and the sidewalk are naturally steeper than the allowable 5 percent for ADA purposes, there are not likely to be many manually propelled wheelchair users along this corridor or the other two study corridors. However, ADA-compliant driveways also benefit other pedestrians such as those with walkers, canes, or crutches or people pushing strollers or carts, helping to minimize the stumbling or slipping that can occur when walking at an angle.

Crosswalks exist at most intersections (see Table 22). However, the curb ramps do not have truncated domes or other tactile surfaces to warn those with visual impairments of a crossing and are not directional.

Street lighting is limited predominantly to signalized intersections. Adjacent building and parking lot lighting provide some sidewalk lighting.

There is some landscaping beyond the back of sidewalk; however, since it is mostly shrubs, it does not provide much, if any, shade. There are no adjacent buildings from which to hang awnings or canopies to provide shade. The pedestrian environment is fairly severe.

Swanson Avenue

Swanson Avenue has standard, attached sidewalks on both sides of the street. The sidewalks are 5 to 6 feet wide and in good condition. The recommended pedestrian zone dimension of 5 feet is met.[3] The recommended curb zone of 6 inches exists and is in addition to the pedestrian zone. There is no

[3] *Designing Trails and Sidewalks for Access, Part II of II: Best Practices Design Guide. Chapter 4. Washington D.C.: U.S. Department of Transportation, Federal Highway Administration, 2001.*

planter/furniture zone. A frontage zone does not exist and is not generally needed because the sidewalk is almost always adjacent to landscaped areas. There is no buffer of either landscaped area or on-street parking between the pedestrian traffic and vehicular traffic. None of the driveways are ADA-compliant.

Crosswalks exist at most intersections (see Table 22). However, the curb ramps do not have truncated domes or other tactile surfaces to warn those with visual impairments of a crossing and are not directional.

Street lighting is limited predominantly to signalized intersections. Adjacent building and parking lot lighting provide some sidewalk lighting. Some landscaping is beyond the back of sidewalk; however, since it is mostly shrubs, it does not provide much, if any, shade. There are no adjacent buildings from which to hang awnings or canopies to provide shade. The pedestrian environment is fairly severe.

McCulloch Boulevard, east of Smoketree Avenue

Uptown McCulloch Boulevard is an active tourist destination during the tourist season. Visitors stay in the numerous hotels and resorts scattered throughout the area. The Uptown District with its shops and restaurants is one of several Lake Havasu City tourist destinations. The Uptown District is also a destination for residents because many of the businesses provide local services such as insurance, travel, hardware, and personal services. One of the newest businesses in the Uptown District is the Lake Havasu City Campus of ASU, located at the old Daytona Middle School at Swanson Avenue and Acoma Boulevard. The campus opened in the fall of 2012. At this time, there is no direct, convenient pedestrian connection between the Uptown District and the campus; however, there are easements available in which to create these facilities.

Fairly recent pedestrian improvements have occurred along McCulloch Boulevard. The sidewalk was improved, is in good condition, and is generally about 10 feet wide from curb to building face (see Image 4). Ten feet is the minimum comfortable sidewalk dimension[4] in active areas to allow room for benches, trash cans, newspaper boxes, and outdoor dining, to name a few uses. Based on the recommended minimum widths,[5] the sidewalk in this area should be 12 feet wide, with a 6-inch curb zone, 48-inch planter/furniture zone, 60-inch pedestrian zone, and 30-inch frontage zone. However, given the physical constraints, 10 feet is a workable dimension. A buffer of both landscaping and on-street parking exists between pedestrian traffic and vehicular traffic. None of the driveways are ADA-compliant.

There is a bench and trash can approximately every 160 feet (including both sides of the street), providing resting spots and adding to the life of the street. Street and pedestrian lighting is provided on a combined pole located every 120 to 130 feet. The style of the fixture adds to the character of the street.

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[4] Guide for the Planning, Design, and Operation of Pedestrian Facilities. Washington, D.C.: American Association of State Highway and Transportation Officials, 2004.

[5] Designing Trails and Sidewalks for Access, Part II of II: Best Practices Design Guide. Chapter 4. Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration, 2001.

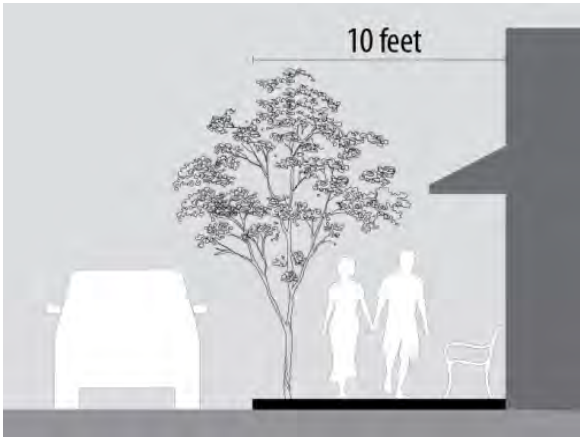


Image 4 – Sidewalk section

Five pedestrian crossings occur at these locations: Scott Drive, Querio Drive, Pima Wash, Mulberry Avenue, and at the entrance to Birch Square (see Table 22). Pima Wash has signs for pedestrians; the other four have high-visibility crosswalks. However, the curb ramps at these crossings do not have truncated domes or other tactile surfaces to warn those with visual impairments and are not directional. The study team was told that a fair amount of jaywalking occurs along McCulloch Boulevard in the Uptown District.

A new bump out exists at Mulberry Avenue on the northern side of the road where two crosswalks from the south side connect across McCulloch Boulevard. The bump out was enhanced with additional benches, trees, and trash cans. However, the study team was told by city staff that more than one westbound vehicle—in an effort to go around someone turning left onto Mulberry Avenue—has driven through the parking stalls (when empty) and up onto the sidewalk.

In this urban setting, there is less room for landscaping. Tree wells with grates are found approximately every 25 to 30 feet on center; however, many of these trees are palms, which provide little shade but do provide vertical identifying elements for the District. A few businesses are set back a few feet or have planters adjacent to the sidewalk that provide additional landscaping but no shade. Almost none of the buildings have awnings or canopies that could provide shade.

McCulloch Boulevard, west of Smoketree Avenue

The western portion of McCulloch Boulevard is dominated by strip malls and large-building businesses set back from the street; this contrasts with the Uptown area, which is dominated by small, narrow businesses set close to the street. This segment of McCulloch Boulevard has standard, attached sidewalks on both sides of the street. The sidewalks are 6 to 7 feet wide and in good condition. The recommended pedestrian zone dimension of 5 feet is met.[6] The recommended curb zone of 6 inches exists and is in addition to the pedestrian zone. There is no planter/furniture zone. A frontage zone does not exist and is not generally needed because the sidewalk is almost always adjacent to landscaped areas. There is no buffer of either landscaped area or on-street parking between the pedestrian traffic and vehicular traffic.

[6] *Designing Trails and Sidewalks for Access, Part II of II: Best Practices Design Guide. Chapter 4. Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration, 2001.*

None of the driveways are ADA-compliant.

There are crosswalks at most intersections (see Table 22); however, the curb ramps do not have truncated domes or other tactile surfaces to warn those with visual impairments of a crossing and are not directional. There are no apparent crossings of McCulloch Boulevard to reach Wheeler Park and no parking inside the park circle, making this feature difficult to reach on foot. While this is not a typical park where one would expect to see families picnicking, if it were more accessible there might be some daytime users who would come to take a stroll or sit in the shade of the trees.

Street lighting is limited predominantly to signalized intersections. Adjacent building and parking lot lighting provide some sidewalk lighting.

There is some landscaping beyond the back of sidewalk; however, since it is mostly shrubs, it does not provide much, if any, shade. There are no adjacent buildings from which to hang awnings or canopies to provide shade. The pedestrian environment is fairly austere.

Pima Wash Path

The City continues to improve the Pima Wash pedestrian and bicycle facility that crosses the study corridors generally perpendicularly. Currently, the path extends from Acoma Boulevard at the northeastern end to SR 95 at the southwestern end. From Acoma Boulevard to McCulloch Boulevard, the path is on the southern and eastern side of the wash, and from McCulloch Boulevard to SR 95 it is on the western and northern side. The Pima Wash path is an important nonmotorized route for area residents.

Arizona State University

ASU's Lake Havasu City campus opened for classes in the fall of 2012. Opening enrollment is predicted to be several hundred students but as it gets established, the number of students will rise to approximately 4,000. The campus location, at the old Daytona Middle School site, is only two blocks from the eastern end of Uptown. While most of the students will be commuter students, there will likely be a fair amount of pedestrian traffic between Uptown and the campus, predominantly during school hours. Creating pedestrian and bicycle facilities within the existing easements that connect these destinations will help facilitate this movement, bringing more business to the area. This connection would also provide a connection for customers of the hotel on the corner of Acoma and Swanson Boulevards to gain easy pedestrian access to Uptown shops.

In addition to the campus site, the university recently contracted with the Days Inn on McCulloch Boulevard, just west of Capri Boulevard, as a future dormitory facility. The dormitory will be in easy bicycling distance (1.3 miles) from the campus. Providing safe, direct bicycle access between the two destinations will encourage students to use this form of transportation rather than driving unnecessarily.

Crossings

Table 22 summarizes nonmotorized crossings of the study corridors.

Table 22 Nonmotorized Crossings of the Study Corridors

Cross street	Mesquite Avenue	McCulloch Boulevard	Swanson Avenue
Lake Havasu Avenue	4-way signal; 4-way crosswalks	4-way signal; 4-way crosswalks	4-way signal; 4-way crosswalks
Capri Boulevard	4-way stop; 4-way crosswalks	4-way signal; 4-way crosswalks	3-way stop; 3-way crosswalks
Civic Center Boulevard	4-way stop; 4-way crosswalks	1-way stop; crosswalk parallel to McCulloch, across Civic Center Blvd.; north side only; south side not applicable; vehicles do not stop on McCulloch	Not applicable (no intersection)
Riviera Boulevard	4-way stop; 4-way crosswalks	4-way signal; 4-way crosswalks	1-way stop; crosswalk parallel to Swanson, across north only (south not applicable); vehicles do not stop on Swanson
Smoketree Avenue	4-way stop; 4-way crosswalks	4-way signal; 4-way crosswalks	4-way stop; 4-way crosswalks
Scott Drive	Not applicable (no intersection)	1-way stop; high-visibility crosswalks across McCulloch; crosswalk parallel to McCulloch on south side; vehicles do not stop on McCulloch	1-way stop; crosswalk parallel to Swanson, across north only (south not applicable); vehicles do not stop on Swanson
Querio Drive/ Pima Dive	2-way stop; crosswalks parallel to Mesquite on both north and south side; no crosswalks across Mesquite; vehicles on Mesquite do not stop	2-way stop; high-visibility crosswalks across McCulloch; vehicles do not stop on McCulloch	Not applicable
Pima Wash	High-visibility crosswalks across Mesquite; vehicles do not stop on Mesquite, except when pedestrian are in crosswalk	High-visibility crosswalks across McCulloch; vehicles do not stop on McCulloch	High-visibility crosswalks across Swanson; vehicles do not stop on Swanson
Mulberry Avenue	Not applicable (no intersection)	1-way stop; high-visibility crosswalks across McCulloch; crosswalk parallel to McCulloch, south side; vehicles do not stop on McCulloch	4-way stop; 2 crosswalks parallel to Swanson; vehicular

Table 22 Nonmotorized Crossings of the Study Corridors

Cross street	Mesquite Avenue	McCulloch Boulevard	Swanson Avenue
Birch Square	Not applicable (no intersection)	1-way stop; high-visibility crosswalks across McCulloch; crosswalk parallel to McCulloch, north side; vehicles do not stop on McCulloch	Not applicable (no intersection)
Acoma Boulevard	4-way signal; 4-way crosswalks	4-way signal; 4-way crosswalks	4-way stop; 4-way crosswalks

Safety

All of the study corridors are generally well-lit by streetlights. They are also generally busy vehicular routes and thus have many eyes on the area at all times of the day and night. The corridors appear to be well-maintained, which discourages vandalism or graffiti. There are many vacant lots along all the corridors. They are, however, overall clean and weed-free so they don't appear threatening or provide hiding spots.

5.5 Bicycle Facilities

There are no bicycle lanes or other bicycle amenities in the study area with the exception of occasional bike racks.

5.6 Bicycle and Pedestrian Existing Condition Levels of Service

Existing bicycle and pedestrian LOS (BLOS and PLOS, respectively) were calculated along the corridors in the study area (McCulloch, Swanson, and Mesquite). The methodology used was developed by the League of Illinois Bicyclists[7] and Sprinkle Consulting, Inc., and is becoming the emerging national standard for quantifying the bicycle- or pedestrian-friendliness of a roadway. While other LOS indices relate to traffic capacity, BLOS indicates bicyclist comfort level for specific roadway geometries and traffic conditions. Similarly, PLOS measures the walking condition. Future LOS will be calculated when improvements are proposed later in this study.

A BLOS and PLOS evaluation is useful in several ways:

- Most appropriate routes can be identified for inclusion in the community bicycle/pedestrian network.
- "Weak links" in the network can be determined and sites needing improvements can be prioritized.
- Alternative treatments for improving bicycle and pedestrian friendliness of a roadway can be

[7] "Bike/Ped Level of Service Measures and Calculators." League of Illinois Bicyclists, 2011. Website accessed October 7, 2011, <http://www.bikelib.org>.

evaluated.

- Road selection formulas can include BLOS and PLOS to encourage implementation of bicycle and pedestrian planning goals.
- These can be used as performance measures that can be tied to goals and policies for all road projects. Policies can range from simply reporting bicycle/pedestrian impact up to target LOS levels.

Bicycle Level of Service

BLOS is a qualitative/quantitative measurement indicating the comfort level of a bicyclist relative to the specific roadway and traffic conditions. BLOS measures on-road bicycling conditions; it is not applicable to off-road sidewalks, separate trails, or side paths. The parameters used in the BLOS model (available online at the League of Illinois Bicyclists website) that affect the comfort and safety of bicyclists are: traffic volume, traffic speed, percentage of heavy truck traffic, percentage of occupied parking, number of traffic lanes, pavement condition, width of outside traffic lane, and width of extra pavement (shoulder/parking/bike lanes). Roadways with a better (lower) score are more attractive (and usually safer) for cyclists. Table 23 illustrates BLOS levels.

Table 23 Bicycle Levels of Service and Scores

Level of service	BLOS score	Compatibility level
A	≤1.5	Extremely high
B	>1.5 and ≤2.5	Very high
C	>2.5 and ≤3.5	Moderately high
D	>3.5 and ≤4.5	Moderately low
E	>4.5 and ≤5.5	Very low
F	>5.5	Extremely low

Pedestrian Level of Service

PLOS measure the walker's perception of comfort and safety. PLOS is measured at mid-block cross sections, including any sidewalks and buffers, but is not measured at intersections. The parameters used in the PLOS model (available online at the League of Illinois Bicyclists website) that affect the comfort and safety of pedestrians are: traffic volume, traffic speed, percentage of heavy truck traffic, percentage of occupied parking, number of traffic lanes, pavement condition, width of outside traffic lane, width of extra pavement (shoulder/parking/bike lanes), sidewalk width, sidewalk buffer width, and spacing of trees. Table 24 describes the PLOS levels and scores for measurement.

Table 24 Pedestrian Levels of Service and Scores

Level of service	PLOS score	Compatibility level
A	≤1.5	Extremely high
B	>1.5 and ≤2.5	Very high
C	>2.5 and ≤3.5	Moderately high
D	>3.5 and ≤4.5	Moderately low
E	>4.5 and ≤5.5	Very low
F	>5.5	Extremely low

Methodology

The BLOS analysis was performed using the BLOS/PLOS Calculator Form developed by the League of Illinois Bicyclists and Sprinkle Consulting, Inc. This form uses the BLOS and PLOS models, which are based on the equations below:

$$BLOS = 0.507 \ln(Vol_{15}/L) + 0.199 SP_t(1+10.38HV)^2 + 7.066(1/PR_5)^2 - 0.005 W_e^2 + 0.760$$

Vol_{15} = volume of directional traffic in 15-minute time period

L = total number of through lanes

SP_t = effective speed limit = $1.1199 \ln(SP_p-20) + 0.8103$, where SP_p is posted speed

HV = percentage of heavy vehicles

PR_5 = FHWA's 5-point surface condition rating (5=best)

W_e = average effective width of outside through lane = $W_t + W_l - \Sigma W_r$

W_t = total width of outside lane and shoulder/parking pavement

W_l = width of paving from outside lane stripe to pavement edge

ΣW_r = width reduction due to encroachments in outside lane

$$PLOS = -1.227 \ln(Wol + Wl + fP \times \%OSP + fb \times Wb + fSW \times WS) + 0.009 (Vol15/L) + 0.0004 SPD2 + 6.046$$

W_{ol} = width of outside lane

W_l = width from outside lane stripe to pavement edge (shoulder, parking, bike lanes)

F_p = on-street parking effect coefficient

%OSP = percent of segment with on-street parking

F_b = buffer area barrier coefficient

W_b = buffer width (between edge of pavement and sidewalk)

f_{SW} = sidewalk presence coefficient

W_S = width of sidewalk

Vol_{15} = volume of directional traffic in 15-minute time period

L = total number of through lanes

SPD = average running speed of traffic

Study Scenarios and Assumptions

The analysis was conducted along the three project corridors for existing conditions in 2011. The BLOS and PLOS analysis was conducted using the existing traffic provided by the City (various dates from 2006 to 2011), existing roadway conditions, and speed limits. The following are some of the additional assumptions used for conducting the analysis.

1. Percentage of heavy vehicles = 2 percent (McCulloch Boulevard); 4 percent (Mesquite and Swanson Avenues)
2. FHWA's pavement condition rating = 4 (where default is 4-Good, 5-Best, and 1-Worst)

Analysis Findings

For existing 2011 conditions, the study roadway segments operated at BLOS "C" or better, and PLOS "C." Table 25 below shows the BLOS and PLOS at various segments in the study area. The detailed BLOS and PLOS analysis reports with input variables and the output results are included in Appendix B.

Table 25 BLOS and PLOS along Study Corridors

Segment	From	To	Speed limit (mph)	Existing		
				Traffic volume (average daily traffic)	BLOS	PLOS
McCulloch Boulevard	Lake Havasu Avenue	Smoketree Avenue	30	11,544	C (3.24)	C (2.54)
McCulloch Boulevard	Smoketree Avenue	Acoma Boulevard	25	14,150	B (2.15)	C (2.75)
Mesquite Avenue	Lake Havasu Avenue	Acoma Boulevard	30	7,464	D (3.59)	C (2.76)
Swanson Avenue	Lake Havasu Avenue	Acoma Boulevard	30	8,733	D (3.67)	C (2.85)

6.0 Corridor Alternatives

This study aims to create a transportation framework that supports the Uptown District revitalization goals while accommodating multimodal travel demand. The study team developed three road alternative scenarios for analysis and community consideration. The alternatives included a one-way couplet concept, a bicycle focus, and a median and roundabout focus. A brief description of each alternative by corridor is presented in Table 26. More detailed descriptions are provided in the following sections. Ultimately, the recommended alternative is a mixture of elements from each alternative scenario. A no-build scenario was also evaluated.

Table 26 Road Alternative Scenarios by Corridor

Corridor	Alternative		
	One-way Couplet	Bicycle Focus	Medians and Roundabouts
Mesquite Avenue	Two travel lanes westbound only; bicycle lane each direction	One travel lane each direction, center turning lane; bicycle lane each direction	Two travel lanes east, one travel lane west, landscaped median; no bicycle lanes
McCulloch Boulevard (west)	No change	Bicycle lane each direction	No change
McCulloch Boulevard (east)	North side landscaping	Bicycle lanes each direction	Median landscaping
Swanson Avenue	Two travel lanes eastbound only; bicycle lanes each direction	One travel lane each direction; bicycle lane each direction; landscape buffer	One travel lane each direction; bicycle lane each direction; roundabout at Smoketree and Mulberry Avenues

In developing the road configurations in the alternatives scenarios, key principles used included:

- Lane widths should be consistent within the road corridor. A desirable travel lane width is 12 feet, while a minimum width of 10 feet could be used as a traffic-calming measure.
- Bicycle lane widths should be a maximum of 6 feet and a minimum of 4 feet.
- Unused pavement should be converted to landscaping or additional sidewalk.
- Parallel parking spots should be a minimum of 8 feet by 24 feet (see section 6.3 for discussion of parking issues).
- Intersection improvements such as additional turning lanes or signals should be proposed based on the traffic microsimulation analysis.

The alternative scenarios focused on the three major road corridors; however, additional spot improvements identified through the safety analysis or traffic analysis would be included in the recommended alternative.

6.1 One-way Couplets

The concept of converting Mesquite and Swanson Avenues from two-way roads to one-way roads was previously introduced in the 2005 *Lake Havasu City SATS*. The SATS recommended further study of the one-way couplet because it could provide additional road capacity at a low cost while also providing safety benefits. Since the SATS, there has been some concern within the community and Lake Havasu City staff regarding the feasibility of this option; therefore, this study team decided to include it in the alternative scenarios to perform a more detailed analysis of its application using microsimulation.

The road typical sections are presented in Figure 23 and the scenario overview is presented in Figure 24. Descriptions of each road configuration are provided in the following sections.

Mesquite Avenue and Swanson Avenue

Each road would be converted to two 12-foot-wide travel lanes in one direction. For this analysis (and similar to the assumption in the SATS), Mesquite Avenue would be westbound-only and Swanson Avenue would be eastbound-only. In addition to changing the roads to one-way, 6-foot-wide bicycle lanes in each direction would be added. The total paved width needed would be 36 feet. Any additional paved area could be removed and converted to landscaping or new sidewalk to improve the aesthetics or walkability of the road.

No new signals along Mesquite or Swanson Avenues were proposed for this alternative.

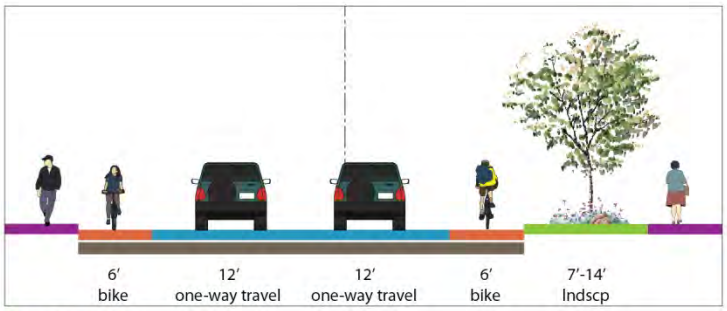
McCulloch Boulevard (west)

This alternative did not include any improvements to McCulloch Boulevard between Lake Havasu and Smoketree Avenues.

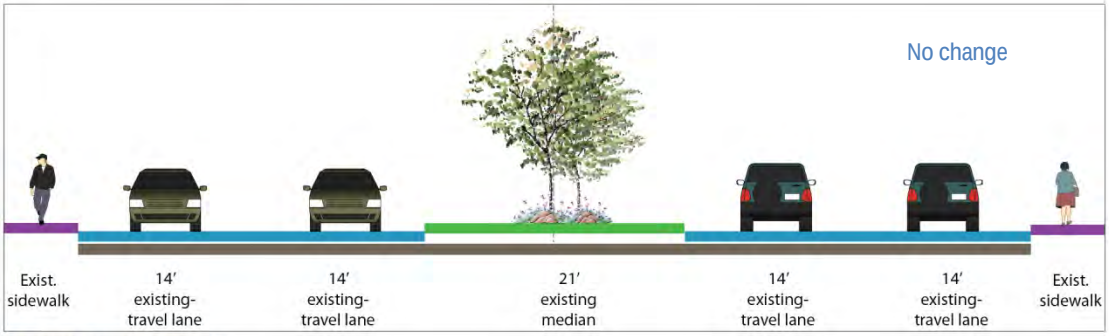
McCulloch Boulevard (east)

In this scenario, McCulloch Boulevard between Smoketree Avenue and Acoma Boulevard was modified with the purpose of expanding the sidewalk on one side of the roadway. This would be accomplished by converting the angled parking into parallel parking. The road would be restriped with two 13-foot-wide travel lanes and 10-foot-wide by 24-foot-long parallel parking spots on each side. With these changes, approximately 10 feet of paved area could be converted to sidewalk or landscaping to improve the walkability of the road. No changes to the intersection control were proposed for this alternative.

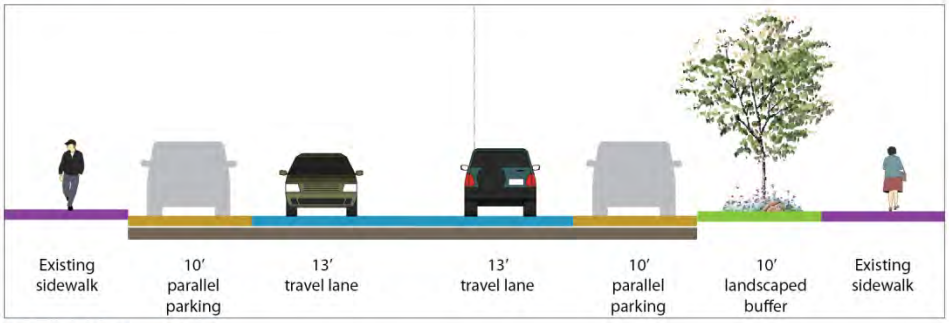
Figure 23 One-way Couplet Typical Sections



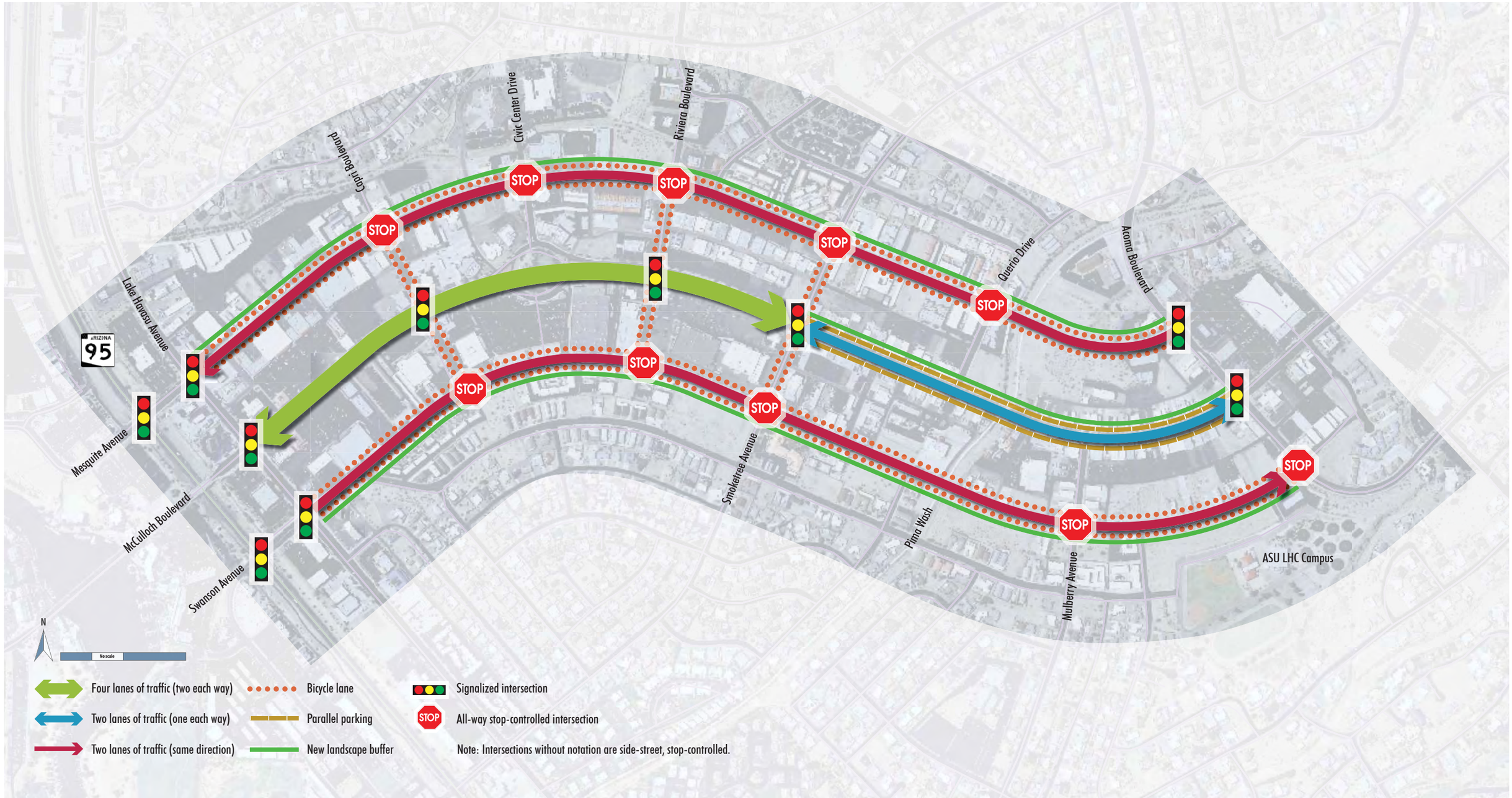
Mesquite and Swanson Avenues



McCulloch Boulevard (west)



McCulloch Boulevard (east)


Capri Boulevard
Civic Center Drive
Riviera Boulevard
Lake Havasu Avenue
ARIZONA 95
Mesquite Avenue
McCulloch Boulevard
Swanson Avenue
Smoketree Avenue
Palo Verde Avenue
Pima Wash
Mulberry Avenue
Queric Drive
Acoma Boulevard
ASU LHC Campus
STOP
N
No scale
Four lanes of traffic (two each way)
Two lanes of traffic (one each way)
Two lanes of traffic (same direction)
Bicycle lane
Parallel parking
New landscape buffer
Signalized intersection
All-way stop-controlled intersection
Note: Intersections without notation are side-street, stop-controlled.

6.2 Bicycle Focus

The goal of this alternative was to provide bicycle lanes along each of the study area roads between Lake Havasu Avenue and Acoma Boulevard. The tradeoff of adding bicycle lanes for each road was either a reduction in travel lane width, loss of a travel lane, or loss of a two-way left-turn lane. The road typical sections are presented in Figure 25 and the scenario overview is presented in Figure 26. Descriptions of each road configuration are provided in the following sections.

Mesquite Avenue

Mesquite Avenue would be modified to provide one 12-foot-wide travel lane in each direction with a 12-foot-wide two-way left-turn lane median. Outside of the travel lanes, a 5-foot-wide bicycle lane would be added in each direction. The required 46-foot-wide paved section would generally match the existing paved area so there would be limited or no opportunity for adding landscaping or additional sidewalk width.

New signals are proposed at Riviera Boulevard and Smoketree Avenue. It is also proposed to change the four-way stop control to side-street stop control at Capri Boulevard, Civic Center Drive, and Querio Drive.

Swanson Avenue

Swanson Avenue would be modified to provide one 12-foot-wide travel lane in each direction with no median. Outside of the travel lanes, a 5-foot-wide bicycle lane would be added in each direction. The required 34-foot-wide paved section would leave up to 8 feet of pavement width that could be converted to landscaping or additional sidewalk width.

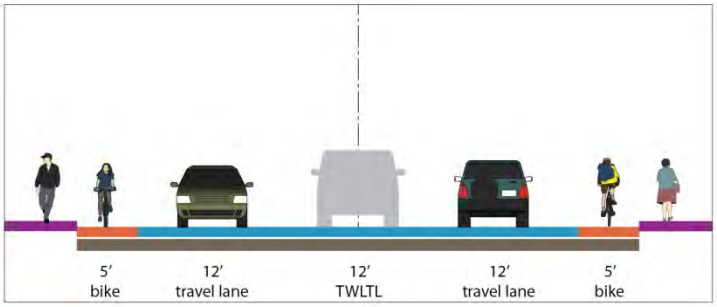
A new signal is proposed at Smoketree Avenue. It is also proposed to change the four-way stop control to side-street stop control at Capri Boulevard, Riviera Boulevard, and Mulberry Avenue. The four-way stop control at Acoma Boulevard would remain.

McCulloch Boulevard (west)

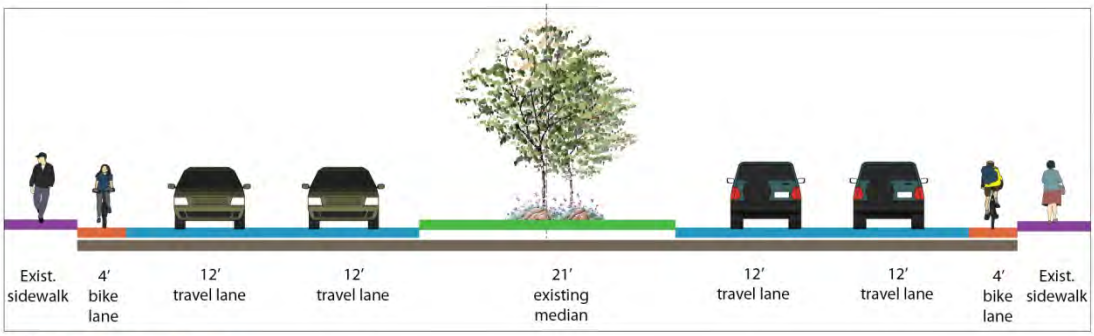
A review of the existing pavement width showed that there is adequate room to add bicycle lanes along McCulloch Boulevard between Lake Havasu and Smoketree Avenues without widening the road or eliminating a vehicle travel lane. The existing lane widths vary, but are typically 15 feet wide. By restriping the entire corridor to two consistent 12-foot-wide travel lanes in each direction, a 4-foot-wide bicycle lane can be added in each direction.

No changes to the intersection control were proposed for this alternative.

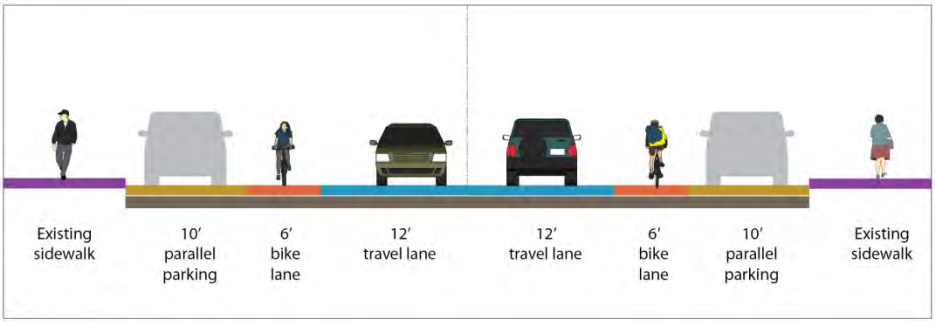
Figure 25 Bicycle Focus Typical Sections



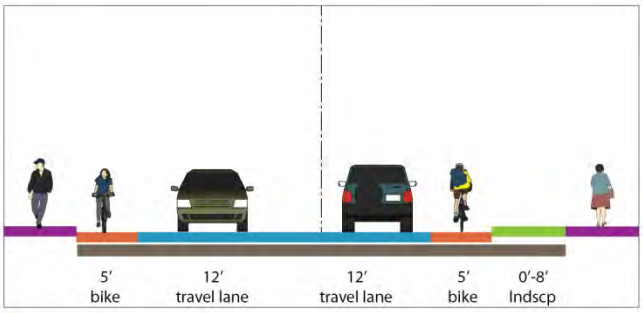
Mesquite Avenue



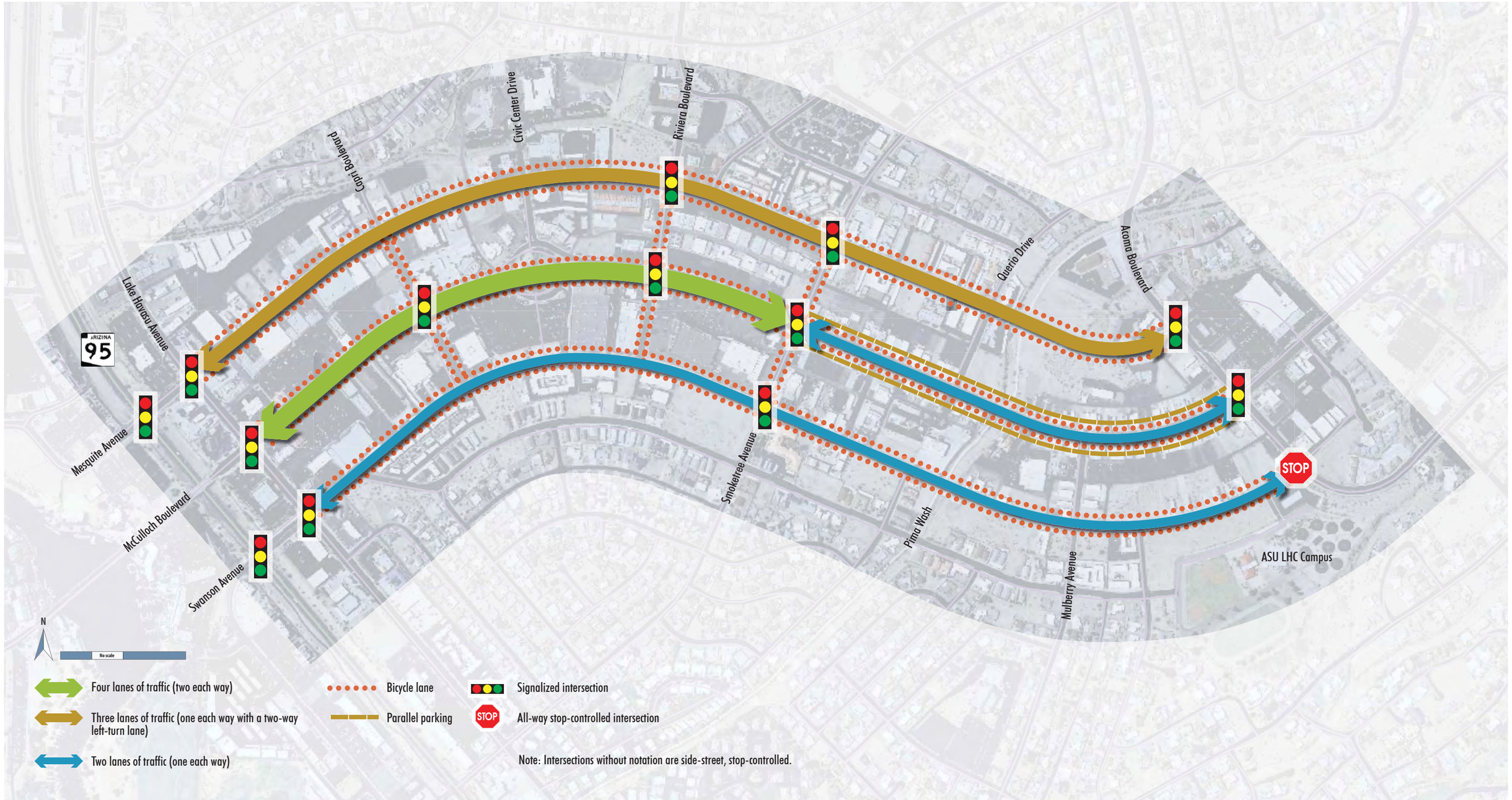
McCulloch Boulevard (west)



McCulloch Boulevard (east)



Swanson Avenue


Copper Boulevard
Civic Center Drive
Riviera Boulevard
Lake Havasu Avenue
ARIZONA 95
Mesquite Avenue
McCulloch Boulevard
Swanson Avenue
Smoketree Avenue
Palo Verde Avenue
Queriq Drive
Acoma Boulevard
Pima Wash
Mulberry Avenue
STOP
STOP
ASU LHC Campus
N
No scale
Four lanes of traffic (two each way)
Three lanes of traffic (one each way with a two-way left-turn lane)
Two lanes of traffic (one each way)
Bicycle lane
Parallel parking
Signalized intersection
All-way stop-controlled intersection
Note: Intersections without notation are side-street, stop-controlled.

McCulloch Boulevard (east)

The addition of bicycle lanes in this section of McCulloch Boulevard would be accomplished by converting the angled parking into parallel parking. The road would be restriped with a 12-foot-wide travel lane and a 6-foot-wide bicycle lane in each direction. Outside of the bicycle lane, 10-foot-wide by 24-foot-long parallel parking spots on each side would be provided. The required 56-foot-wide paved section would generally match the existing paved area, so there would be limited or no opportunity for adding landscaping or additional sidewalk width.

No changes to the intersection control were proposed for this alternative.

6.3 Median and Roundabout Focus

The goal of this alternative was to maximize the travel capacity along Mesquite Avenue by using raised medians instead of a two-way left-turn lane and to evaluate the feasibility of using roundabouts along Swanson Avenue instead of signalized intersections. Along McCulloch Drive, the landscaped medians west of Smoketree Avenue would be extended into the uptown area to Acoma Boulevard.

The road typical sections are presented in Figure 27 and the scenario overview is presented in Figure 28. Descriptions of each road configuration are provided in the following sections.

Mesquite Avenue

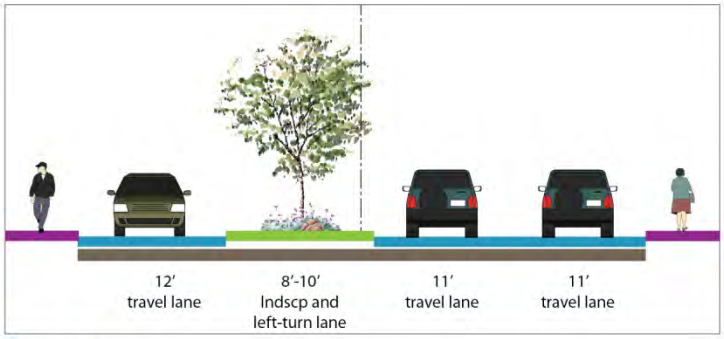
Mesquite Avenue would be modified to provide one 12-foot-wide travel lane in the westbound direction and two 11-foot-wide lanes in the eastbound direction (similar to the existing conditions). The existing 12-foot-wide two-way left-turn lane would be converted into a raised median with landscaping. Midblock turning bays would be provided at major business entrances and exits (similar to existing McCulloch Boulevard between Lake Havasu and Smoketree Avenues). The required 46-foot-wide paved section would generally match the existing paved area.

New signals are proposed at Riviera Boulevard and Smoketree Avenue. It is also proposed to change the four-way stop control to side-street stop control at Capri Boulevard, Civic Center Drive, and Querio Drive.

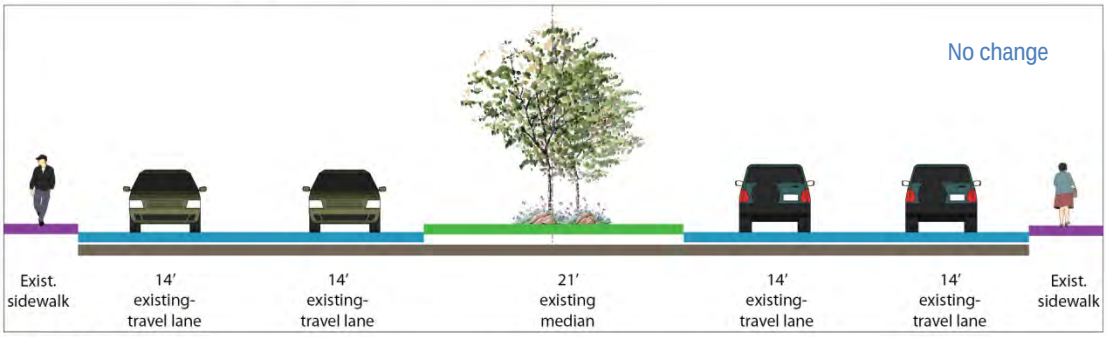
Swanson Avenue

Mesquite Avenue would be modified to provide one 12-foot-wide travel lane in each direction with no median. Outside of the travel lanes, a 5-foot-wide bicycle lane would be added in each direction. The required 34-foot-wide paved section would leave up to 8 feet of pavement width that could be converted to landscaping or additional sidewalk width.

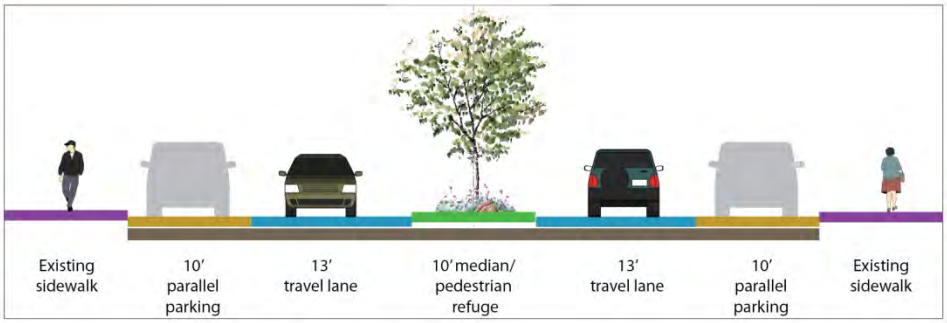
Figure 27 Median and Roundabout Focus Typical Sections



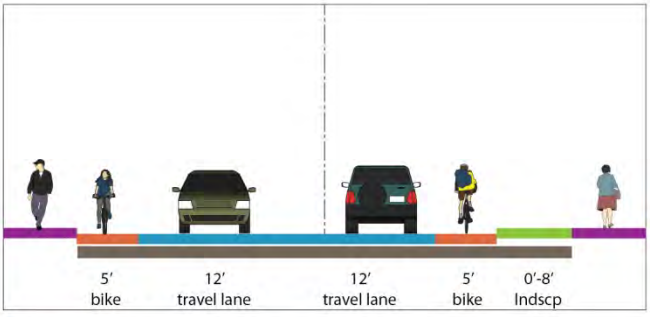
Mesquite Avenue



McCulloch Boulevard (west)

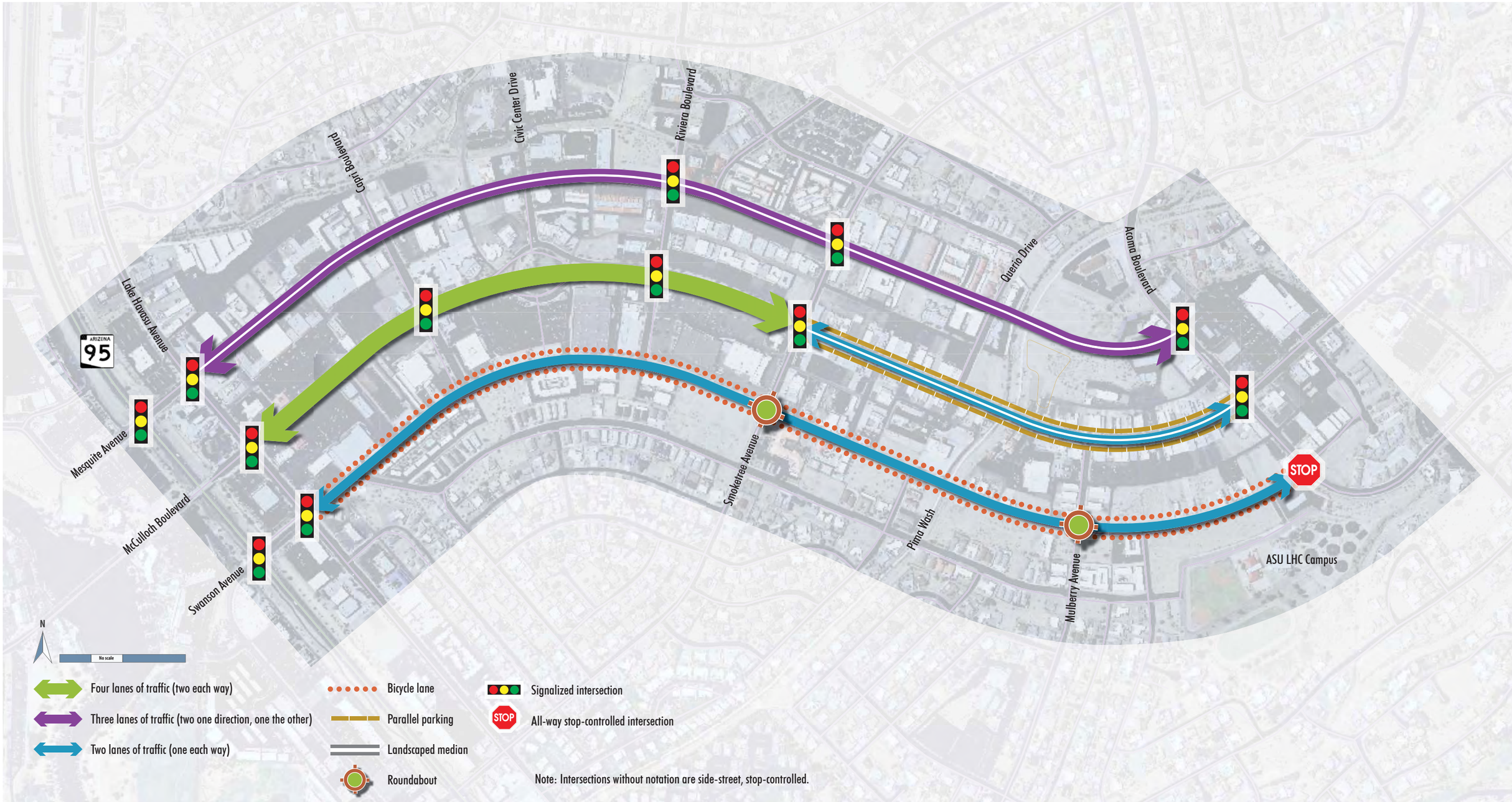


McCulloch Boulevard (east)



Swanson Avenue

Figure 28 | Median and Roundabout Focus Overview



Instead of signals, modern roundabouts are proposed at Smoketree and Mulberry Avenues to provide free-flow travel along the road. It is also proposed to change the four-way stop control to side-street stop control at Capri Boulevard, Riviera Boulevard, and Mulberry Avenue. The four-way stop control at Acoma Boulevard would remain.

McCulloch Boulevard (west)

This alternative did not include any improvements to McCulloch Boulevard between Lake Havasu and Smoketree Avenues.

McCulloch Boulevard (east)

The addition of a raised median with landscaping in this section of McCulloch Boulevard would be accomplished by converting the angled parking into parallel parking. The road would be restriped with a 13-foot-wide travel lane in each direction and a 10-foot-wide median. Outside of the travel lanes, 10-foot-wide by 24-foot-long parallel parking spots on each side would be provided. The required 56-foot-wide paved section would generally match the existing paved area so there would be limited or no opportunity for adding landscaping or additional sidewalk width.

No changes to the intersection control were proposed for this alternative.

6.4 Traffic Operations

A microsimulation model was developed for the study area using the VISSIM software. The model was calibrated using existing road and traffic conditions presented in Working Paper #1.

Future conditions models were developed for the proposed lane configurations in each of the three alternative scenarios. The No-Build alternative was also modeled as a baseline for comparison of the proposed improvements. Each model was run using the 2030 traffic projections presented in Working Paper #1.

The alternatives were evaluated based on measures of effectiveness focused on intersection operations and systemwide operations. At each intersection, a delay per vehicle and LOS was calculated. For each alternative, a systemwide delay per vehicle, average stops per vehicle, average speed, total travel time, and vehicles served were calculated.

No-Build

The No-Build alternative included no improvements to the road network or the intersection control. The results of the intersection traffic operational analysis are presented in Table 27. Notable observations from the table include:

- Almost half (10 of 23) of the intersections analyzed would operate at LOS E or F in 2030 with no improvements.
- Of the 10 failing intersections, 4 are signalized intersections and 6 are stop-controlled intersections.
- The 4 signalized intersections (Lake Havasu Avenue and Mesquite Avenue, Lake Havasu Avenue and McCulloch Boulevard, SR 95 and Mesquite Avenue, and SR 95 and Swanson Avenue) are heavily congested, and improvements are heavily constrained by adjacent

development. Some operational improvement could be experienced by optimizing coordination among the adjacent signalized intersections.

- To improve operations at the stop-controlled intersections to LOS D or better, the following improvements could be made:
    - Change Mesquite Avenue and Capri Boulevard to a two-way stop-controlled intersection
    - Change Mesquite Avenue and Riviera Drive to a signalized intersection
    - Change Swanson Avenue and Capri Boulevard to a side-street stop-controlled intersection
    - Change Swanson Avenue and Smoketree Avenue to a signalized intersection
    - Change Swanson Avenue and Mulberry Avenue to a two-way stop-controlled intersection

Table 27 No-Build Intersection Analysis

Intersection	Traffic control	Average delay (seconds)	LOS
Lake Havasu Avenue and Mesquite Avenue	Signal	109.7	F
Mesquite Avenue and Capri Boulevard	AWSC[a]	>50.0	F
Mesquite Avenue and Civic Center Lane	AWSC	>50.0	F
Mesquite Avenue and Riviera Drive	AWSC	>50.0	F
Mesquite Avenue and Smoketree Avenue	AWSC	26.5	D
Mesquite Avenue and Querio Drive	TWSC[b]	9.8	A
Mesquite Avenue and Acoma Boulevard	Signal	39.9	D
McCulloch Boulevard and Lake Havasu Avenue	Signal	82.9	F
McCulloch Boulevard and Capri Boulevard	Signal	53.2	D
McCulloch Boulevard and Riviera Boulevard	Signal	42.9	D
McCulloch Boulevard and Smoketree Avenue	Signal	39.1	D
McCulloch Boulevard and Querio Drive	TWSC	12.0	B
McCulloch Boulevard and Mulberry Avenue	SSSC[c]	9.0	A
McCulloch Boulevard and Acoma Boulevard	Signal	42.8	D
Swanson Avenue and Lake Havasu Avenue	Signal	53.0	D

Table 27 No-Build Intersection Analysis

Intersection	Traffic control	Average delay (seconds)	LOS
Swanson Avenue and Capri Boulevard	AWSC	>50.0	F
Swanson Avenue and Riviera Drive	TWSC	15.0	B
Swanson Avenue and Smoketree Avenue	AWSC	>50.0	F
Swanson Avenue and Mulberry Avenue	AWSC	>50.0	F
Swanson Avenue and Acoma Boulevard	AWSC	19.3	C
SR-95 and Mesquite Avenue	Signal	59.6	E
SR-95 and Swanson Avenue	Signal	81.3	F
Magnolia Drive and Swanson Avenue	SSSC	10.3	B

[a] all-way stop control [b] two-way stop control [c] side-street stop control (three-leg)

One-way Couplets

The One-way Couplets alternative included changes to the road network described in Section 6.1. The results of the intersection traffic operational analysis are presented in Table 28. Notable observations from the table include:

- Almost half (10 of 23) of the intersections analyzed would operate at LOS E or F in 2030.
- The one-way configuration of Mesquite and Swanson Avenues would adversely affect operations of the closely spaced signalized intersections along Lake Havasu Avenue and SR 95. Because of the short spacing between intersections and minimal storage area, the queues at these intersections cause additional backups at adjacent intersections.

Table 28 One-way Couplet, Intersection Analysis Results

Intersection	Traffic control	Average delay (seconds)	LOS
Lake Havasu Avenue and Mesquite Avenue	Signal	145.0	F
Mesquite Avenue and Capri Boulevard	AWSC[a]	83.3	F
Mesquite Avenue and Civic Center Lane	AWSC	47.3	E
Mesquite Avenue and Riviera Drive	AWSC	40.3	E
Mesquite Avenue and Smoketree Avenue	AWSC	27.5	D
Mesquite Avenue and Querio Drive	TWSC[b]	13.1	B
Mesquite Avenue and Acoma Boulevard	Signal	33.8	C
McCulloch Boulevard and Lake Havasu Avenue	Signal	90.3	F
McCulloch Boulevard and Capri Boulevard	Signal	43.2	D
McCulloch Boulevard and Riviera Boulevard	Signal	65.2	E
McCulloch Boulevard and Smoketree Avenue	Signal	50.7	D
McCulloch Boulevard and Querio Drive	TWSC	298.8	F
McCulloch Boulevard and Mulberry Avenue	SSSC[c]	31.1	D
McCulloch Boulevard and Acoma Boulevard	Signal	50.0	D
Swanson Avenue and Lake Havasu Avenue	Signal	33.4	C
Swanson Avenue and Capri Boulevard	AWSC	9.8	A
Swanson Avenue and Riviera Drive	TWSC	115.0	F
Swanson Avenue and Smoketree Avenue	AWSC	18.5	C
Swanson Avenue and Mulberry Avenue	AWSC	22.5	C
Swanson Avenue and Acoma Boulevard	AWSC	49.6	E
SR-95 and Mesquite Avenue	Signal	74.3	E
SR-95 and Swanson Avenue	Signal	28.4	C
Magnolia Drive and Swanson Avenue	SSSC	2.2	A

[a] all-way stop control [b] two-way stop control [c] side-street stop control (three-leg)

Bicycle Focus

The Bicycle Focus alternative included the changes to the road network described in Section 6.2. The results of the intersection traffic operational analysis are presented in Table 29. Notable observations from the table include:

- Only one of the intersections analyzed would operate at LOS E or F in 2030 with the proposed lane configurations and intersection control changes.
- Even with the addition of a bicycle lane and subsequent loss of a travel lane along Mesquite Avenue, the overall operations would improve with the Bicycle Focus alternative when compared with the No-Build alternative.

Table 29 Bicycle Focus, Intersection Analysis Results

Intersection	Traffic control	Average delay (seconds)	LOS
Lake Havasu Avenue and Mesquite Avenue	Signal	78.7	E
Mesquite Avenue and Capri Boulevard	TWSC[a]	25.7	D
Mesquite Avenue and Civic Center Lane	TWSC	17.5	C
Mesquite Avenue and Riviera Drive	Signal	30.4	C
Mesquite Avenue and Smoketree Avenue	Signal	21.3	C
Mesquite Avenue and Querio Drive	TWSC	16.0	C
Mesquite Avenue and Acoma Boulevard	Signal	32.1	C
McCulloch Boulevard and Lake Havasu Avenue	Signal	45.5	D
McCulloch Boulevard and Capri Boulevard	Signal	20.9	C
McCulloch Boulevard and Riviera Boulevard	Signal	19.2	B
McCulloch Boulevard and Smoketree Avenue	Signal	26.6	C
McCulloch Boulevard and Querio Drive	TWSC	17.7	C
McCulloch Boulevard and Mulberry Avenue	SSSC[b]	6.6	A
McCulloch Boulevard and Acoma Boulevard	Signal	24.7	C
Swanson Avenue and Lake Havasu Avenue	Signal	52.1	D
Swanson Avenue and Capri Boulevard	SSSC	8.4	A
Swanson Avenue and Riviera Drive	TWSC	22.1	C

Table 29 Bicycle Focus, Intersection Analysis Results

Intersection	Traffic control	Average delay (seconds)	LOS
Swanson Avenue and Smoketree Avenue	Signal	17.7	B
Swanson Avenue and Mulberry Avenue	TWSC	24.8	C
Swanson Avenue and Acoma Boulevard	AWSC[c]	18.0	C
SR-95 and Mesquite Avenue	Signal	38.2	D
SR-95 and Swanson Avenue	Signal	25.3	C
Magnolia Drive and Swanson Avenue	SSSC	8.1	A

[a] two-way stop control [b] side-street stop control (three-leg) [c] all-way stop control

Median and Roundabout Focus

The Median and Roundabout Focus alternative included the changes to the road network described in Section 6.3. The results of the intersection traffic operational analysis are presented in Table 30. Notable observations from the table include:

- The roundabout proposed at Swanson Avenue and Smoketree Avenue would not operate in a favorable fashion. The poor operations would result because the traffic movements from east-to-south and south through the roundabout are high enough that they would not allow sufficient gaps for the traffic wishing to travel east through the roundabout. This would cause extensive delay and queues that would back up into adjacent intersections.
- If the roundabout at Swanson and Smoketree Avenues is removed and replaced by a signalized intersection, the intersection operations for the entire study area would closely match the results for the Bicycle Focus alternative.

Table 30 Median and Roundabout Focus, Intersection Analysis Results

Intersection	Traffic control	Average delay (seconds)	LOS
Lake Havasu Avenue and Mesquite Avenue	Signal	67.0	E
Mesquite Avenue and Capri Boulevard	TWSC[a]	83.0	F
Mesquite Avenue and Civic Center Lane	TWSC	17.1	C
Mesquite Avenue and Riviera Drive	Signal	37.2	D
Mesquite Avenue and Smoketree Avenue	Signal	24.1	C

Table 30 Median and Roundabout Focus, Intersection Analysis Results

Intersection	Traffic control	Average delay (seconds)	LOS
Mesquite Avenue and Querio Drive	TWSC	16.2	C
Mesquite Avenue and Acoma Boulevard	Signal	30.5	C
McCulloch Boulevard and Lake Havasu Avenue	Signal	30.5	C
McCulloch Boulevard and Capri Boulevard	Signal	57.3	E
McCulloch Boulevard and Riviera Boulevard	Signal	43.2	D
McCulloch Boulevard and Smoketree Avenue	Signal	29.4	C
McCulloch Boulevard and Querio Drive	TWSC	17.7	C
McCulloch Boulevard and Mulberry Avenue	SSSC[b]	7.6	A
McCulloch Boulevard and Acoma Boulevard	Signal	25.6	C
Swanson Avenue and Lake Havasu Avenue	Signal	40.6	D
Swanson Avenue and Capri Boulevard	SSSC	52.2	F
Swanson Avenue and Riviera Drive	TWSC	638.6	F
Swanson Avenue and Smoketree Avenue	Roundabout	42.4	E
Swanson Avenue and Mulberry Avenue	Roundabout	22.0	C
Swanson Avenue and Acoma Boulevard	AWSC[c]	14.8	B
SR-95 and Mesquite Avenue	Signal	36.7	D
SR-95 and Swanson Avenue	Signal	21.9	C
Magnolia Drive and Swanson Avenue	SSSC	4.7	A

[a] two-way stop control [b] side-street stop control (three-leg) [c] all-way stop control

Summary

The systemwide operational performance of each alternative is presented in Table 31. Notable observations include:

- Of all of the alternatives, the One-way Couplet would perform the worst. The poor intersection operations on the western end of the study area cause extensive delays throughout the study corridors and restrict the number of vehicles that are able to travel within and through the corridor.

- The Bicycle Focus alternative would provide the best overall operations throughout the study area. The loss of a through lane along Mesquite Avenue and the loss of the two-way left-turn lane along Swanson Avenue would not adversely affect the ability to travel through the study area.

Table 31 Systemwide Operational Performance

Measure of effectiveness	Alternative			
	No-Build[a]	One-way Couplet	Bicycle Focus	Median and Roundabout
Average delay time per vehicle (seconds)	119	504	96	119
Average number of stops per vehicle	3.8	5.2	2.8	3.0
Average speed (mph)	9.4	3.7	11.8	10.4
Total travel time (hours)	1,113	1,675	865	1,068
Total distance traveled (miles)	13,583	5,650	14,161	14,044
Number of vehicles that have left the network	8,309	8,471	8,646	8,664
Number of vehicles in the network	910	2391	740	841

[a] Includes the intersection improvements described in Section 6.2; without such improvements, the model would reach gridlock

6.5 Evaluation Matrix

The road alternatives were evaluated based on criteria selected by the study team. The evaluation is generally subjective; however, it provides comparative information to assist the City and public in making recommendations for implementation of road improvements in each corridor. The criteria and general rating attributes include:

- Bicycle mobility: based on presence of bicycle lanes or other facilities
- Pedestrian mobility: based on pedestrian enhancements
- Vehicle mobility: based on operational performance
- Cost: based on cost of improvements
- Public support: based on input received at the February 16, 2012, visioning workshop
- City support: based on input received from City staff

Results of the evaluation are presented for Mesquite Avenue, McCulloch Boulevard (west), McCulloch Boulevard (east), and Swanson Avenue in Table 32, Table 33, Table 34, and Table 35, respectively.

Table 32 Evaluation Matrix, Mesquite Avenue

Criteria	Alternative		
	One-way Couplet	Bicycle Focus	Medians and Roundabouts
Bicycle mobility	Good	Good	Poor
Pedestrian mobility	Good	Good	Fair
Vehicle mobility	Poor	Fair	Good
Cost	$$	$$$	$$$$$
Public support	Poor	Fair	Good
City support	Poor	Fair	Good

Table 33 Evaluation Matrix, McCulloch Boulevard (west)

Criteria	Alternative		
	One-way Couplet	Bicycle Focus	Medians and Roundabouts
Bicycle mobility	Poor	Good	Poor
Pedestrian mobility	Good	Good	Good
Vehicle mobility	Good	Good	Good
Cost	0	$	0
Public support	Fair	Good	Fair
City support	Fair	Good	Fair

Table 34 Evaluation Matrix, McCulloch Boulevard (east)

Criteria	Alternative		
	One-way Couplet	Bicycle Focus	Medians and Roundabouts
Bicycle mobility	Poor	Good	Poor
Pedestrian mobility	Good	Fair	Fair
Vehicle mobility	Good	Good	Good
Cost	$$$$	$$$$	$$$$
Public support	Fair	Good	Good
City support	Fair	Good	Fair

Table 35 Evaluation Matrix, Swanson Avenue

Criteria	Alternative		
	One-way Couplet	Bicycle Focus	Medians and Roundabouts
Bicycle mobility	Good	Good	Good
Pedestrian mobility	Good	Good	Good
Vehicle mobility	Poor	Good	Fair
Cost	$$	$$$	$$$$$
Public support	Poor	Good	Fair
City support	Poor	Good	Fair

7.0 Nonmotorized and Transit Alternatives

7.1 Nonmotorized Alternatives

Finding near-term solutions to improve parking is the key to longer-term changes to the streetscape and road network that will make Mesquite Avenue, McCulloch Boulevard, and Swanson Avenue more bicycle and pedestrian friendly. The goal of these changes is to create a system of "complete streets" in the corridor that provide space for bicyclists, pedestrians, public transit, and motorized vehicles. These enhancements will support the City's long-term vision to make the Uptown District and the Mesquite-McCulloch-Swanson corridor a more walkable, pedestrian-friendly urban street experience.

7.2 Parking Amenities and Policies

At first glance, parking throughout the corridor does not appear to be lacking in quantity. However, the perception that there is a lack of parking is more likely attributable to its distribution, its condition, and whether drivers can find it.

All of the alternatives recommend switching the angled parking along McCulloch Boulevard in the Uptown area to parallel parking. Currently, there are approximately 207 angled or parallel parking spaces evenly spread along McCulloch Boulevard. The proposed alternatives would include 160 parallel parking spaces, a reduction of approximately 47 spaces.

The most important factor in recommending the change to parallel parking is safety. Backing out of angled parking stalls on a curved street, no matter the angle of the stall, is unsafe because the driver backing out can not see oncoming traffic and bicyclists. Another benefit of the parallel parking is that it uses less of the road's width, providing room for other amenities. Some people dislike parallel parking because they find it difficult; however, there is plentiful nonparallel parking at the rear of the buildings.

The demographics of Lake Havasu City make these improvements to the parking areas directly behind the Uptown District businesses a priority. Census data shows that nearly 27 percent of the city's population is 65 years and over, which is nearly twice as high as in Arizona's population overall. In addition, much of the business activity in the Uptown District occurs during the winter months when the city's population swells with seasonal visitors. Close parking access with short walking distances to businesses is important to elderly snowbirds. It also makes a difference for year-round residents who face daytime summer temperatures exceeding 110 degrees Fahrenheit.

All of the alternatives include the recommendation to improve the parking lots behind the buildings along the Uptown portion of McCulloch Boulevard as communal parking lots rather than individually maintained lots. This will require the City to obtain easements over all the parking areas and for the City to build and maintain the improvements. Redesigning the rear parking lots as singular parking areas would increase the efficiency of the lots and include room to add pedestrian amenities such as trees, pedestrian walkways, and area lighting (see conceptual layouts on the following page).


Smoketree Avenue
Querio Drive
McCulloch Boulevard


McCulloch Boulevard
Pima Wash
Mulberry Avenue
Swanson Avenue

Another recommendation of this study is for Uptown business owners to improve the rear of their buildings to make them more inviting, especially if they have rear building entry doors. Discreet business signs over doors would help customers easily locate their desired destination from the rear of the building, making the rear parking areas that much more desirable.

Also, the city should consider funding a branding and wayfinding study for the Uptown area. A coordinated system of signs guiding drivers to available parking would help make the most of the parking facilities. Examples of the type of bold graphics recommended are shown below.

The city has two undeveloped parcels along Pima Wash, south Mesquite Avenue. This would be an ideal location to relocate the HAT DTS. This location would increase the visibility of the transfer station and make it easier to use. The DTS could be built initially to accommodate only bus traffic. Later, the station could be expanded to include public parking. Combining the DTS with a surface parking lot would create approximately 115 surface parking stalls, bicycle parking, and bus bays, as shown in the conceptual layout below.

A second conceptual layout shows a combined transit center and parking garage facility on these city parcels. Vehicular and bicycle parking amenities would help to create a multimodal transfer hub. Small retail uses could be included in the facility such as a small variety store, small drugstore, coffee bar, or a service-type business such as a dry cleaner or shoe repair.

7.3 Pedestrian Amenities

Throughout the corridor, the pedestrian facilities—specifically sidewalks—are adequate to good, both in width and quality. Features that would improve the PLOS are buffers, preferably landscape, between the sidewalk and vehicular traffic; safer crossings of McCulloch Boulevard in the Uptown area; and additional shade along the outside edge of the sidewalks in segments other than Uptown McCulloch Boulevard.

The One-way Couplet alternative would provide room for a landscape buffer between the sidewalk and the traffic lanes along one side each of Mesquite and Swanson Avenues, the northern and southern sides, respectively. It also would include a landscape buffer along the northern side of Uptown McCulloch Boulevard. This buffer on McCulloch Boulevard, or portions of it, could be used alternatively for an expanded sidewalk, providing additional room for outdoor dining or similar activities. The Bicycle Focus and Median and Roundabout alternatives would have room for a small landscape buffer along the northern side of Swanson Avenue.

All the alternatives would include curb extensions along McCulloch Boulevard between Smoketree Avenue and Acoma Boulevard. These would provide a shorter distance for pedestrians to cross the street and would put the waiting pedestrian in a more visible location relative to drivers. Curb extensions also help define the parallel parking spots and provide space for either additional landscape and/or areas for benches, trash receptacles, or other site furnishings. It was noted the one curb extension at Mulberry Avenue has caused some concern since its installation. However, between the proposed parallel

parking, new lane striping, and the fact there will be additional curb extensions, drivers will become more familiar with and adjust to these features.

All the alternatives recommend providing additional landscaping along the outside edge of the sidewalk, predominantly trees to provide shade. Native desert trees or low-water adapted trees with a broad canopy, planted near the sidewalk, will provide shade. Providing at least 50 percent shade coverage of the sidewalk should be the desired target.

7.4 Safety Lighting

Pedestrian lighting along the corridor's streets is primarily accomplished through street lights, with the exception of the Uptown area, where pedestrian lights are combined with street lights on single poles. All of the alternatives include a recommendation to improve the shared parking areas and as part of those improvements, add lighting to increase the sense of safety in these areas.

7.5 Bicycle Facilities

Currently, there are few bicycle facilities in the corridor. All of the alternatives propose bicycle lanes. With the ASU extension campus recently opened, it is expected there will be students either traveling to the campus by bicycle, between the campus and the dormitory, or driving to campus but bringing their bicycles so they can get around downtown during the day. The One-way Couplet alternative includes bicycle lanes on both Mesquite and Swanson Avenues but none on McCulloch Boulevard. The Bicycle Focus alternative includes bicycle lanes on all three streets in the corridor. The Medians and Roundabouts alternative includes bicycle lanes only on Swanson Avenue to facilitate bicycle movement between the dormitory and the campus; the bicycle lanes do continue through the roundabout. Wherever bicycle lanes are included, it is proposed they be painted a color (typically blue or green, see example below) to clearly identify their function and minimize the possibility that vehicles will try to use the lane.

In addition to these alternatives, bicycle racks, at a minimum, or bicycle lockers should be installed at the proposed new city parking lot or transit center. Bicycle racks or lockers should also be liberally installed throughout the corridor close to businesses, in well-lit, easily observed areas.

7.6 Transit Alternatives

The trolley service that began in 2011 has given tourists an easy connection between the London Bridge area and the Uptown District attractions. More can be done to use public transit service as a driver for revitalization in the McCulloch Boulevard corridor. Relocating the current HAT transfer center to the Uptown District would bring transit riders closer to work and shopping while improving access to the ASU campus on Swanson Avenue. Savings generated by optimizing some routes could be used to keep services running later at night to better serve both tourists and hospitality workers.

This section presents three alternative scenarios for optimizing transit service in the study area. The alternatives focused independently on the HAT lines and the trolley service. The following sections outline the description of each scenario as well as the associated cost, advantages, and disadvantages. Ultimately, the recommended alternative includes aspects of each scenario.

7.7 Increased Frequency on McCulloch Boulevard

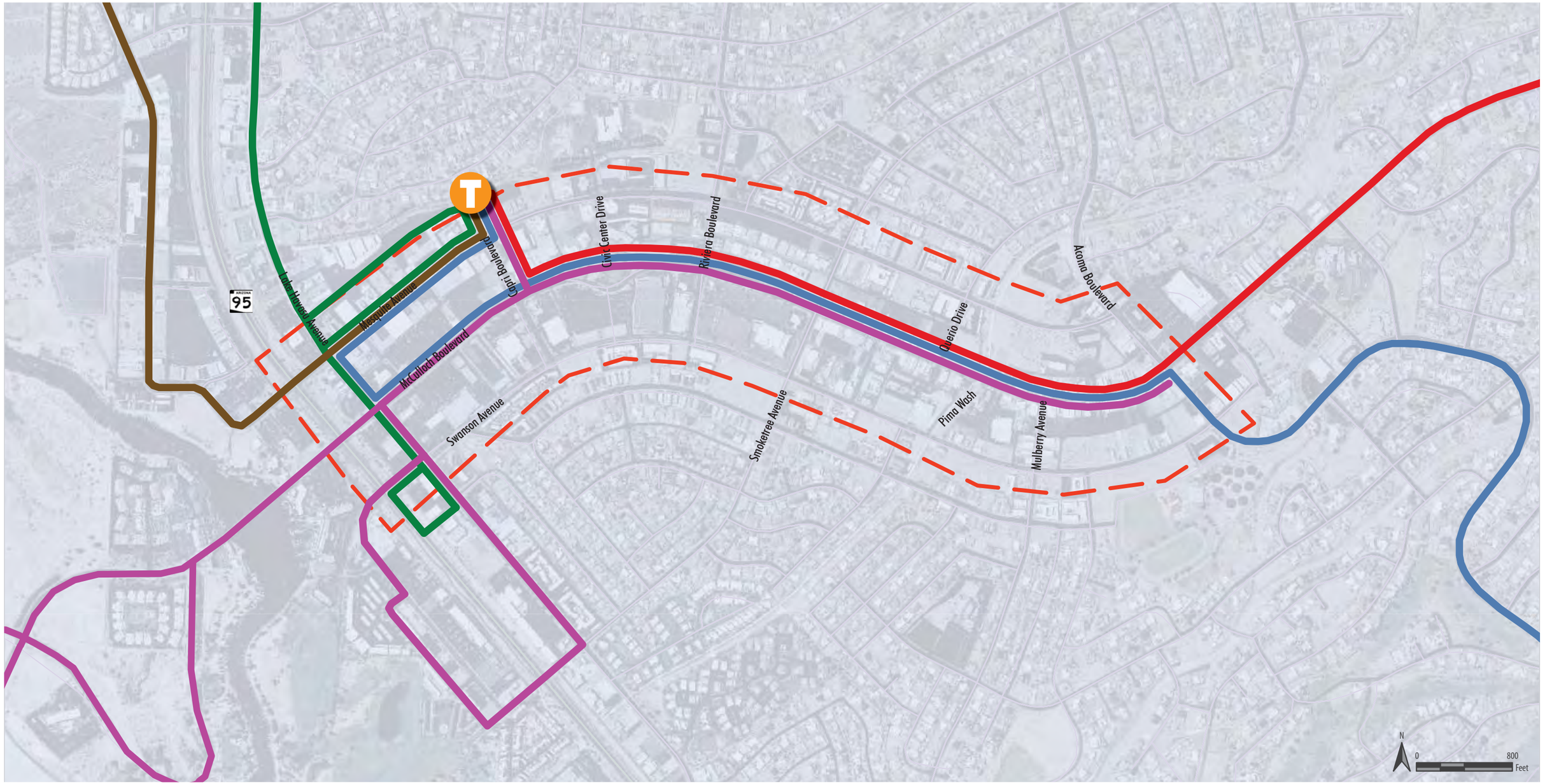
The focus of this alternative is to provide frequent service along McCulloch Boulevard. This would be accomplished by routing the Red Line to operate on McCulloch Boulevard between Acoma Boulevard and Capri Drive and staggering the schedules of the Red Route, Blue Route, and Trolley so there are 20-minute headways between Acoma Boulevard and the DTS. A map of this concept is presented in Figure 29. Notable observations from the map and scenario include:

- Cost: there would be no additional operating costs to implement this alternative
- Advantage: provides more frequent service through the Uptown area, which could promote ridership
- Disadvantage: passengers requiring transfers between other routes would be required to wait for the transfer at the DTS; would remove direct service access from Mesquite and Swanson Avenues

7.8 One-way Service on Mesquite and Swanson Avenues

This alternative would be applicable along with the One-way Couplet alternative. The Red and Blue Routes would be routed to operate westbound on Mesquite Avenue and eastbound on Swanson Avenue between Acoma Boulevard and SR 95. The lines would be staggered to provide a combined headway of 30 minutes. The DTS would be relocated to the Uptown area (see section 8.10, *Relocated Transfer Station*, for more information). A map of this concept is presented in Figure 30. Notable observations from the map and scenario include:

- Cost: there would be no additional operating costs to implement this alternative; there are potential capital costs for road and shelter improvements
- Advantage: provides a broader service area (includes all three road corridors) and improves bus frequency in the Uptown area
- Disadvantage: passengers requiring transfers between other routes would be required to wait for the transfer at the DTS; one-way service could be confusing to passengers (especially visitors)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Blue route
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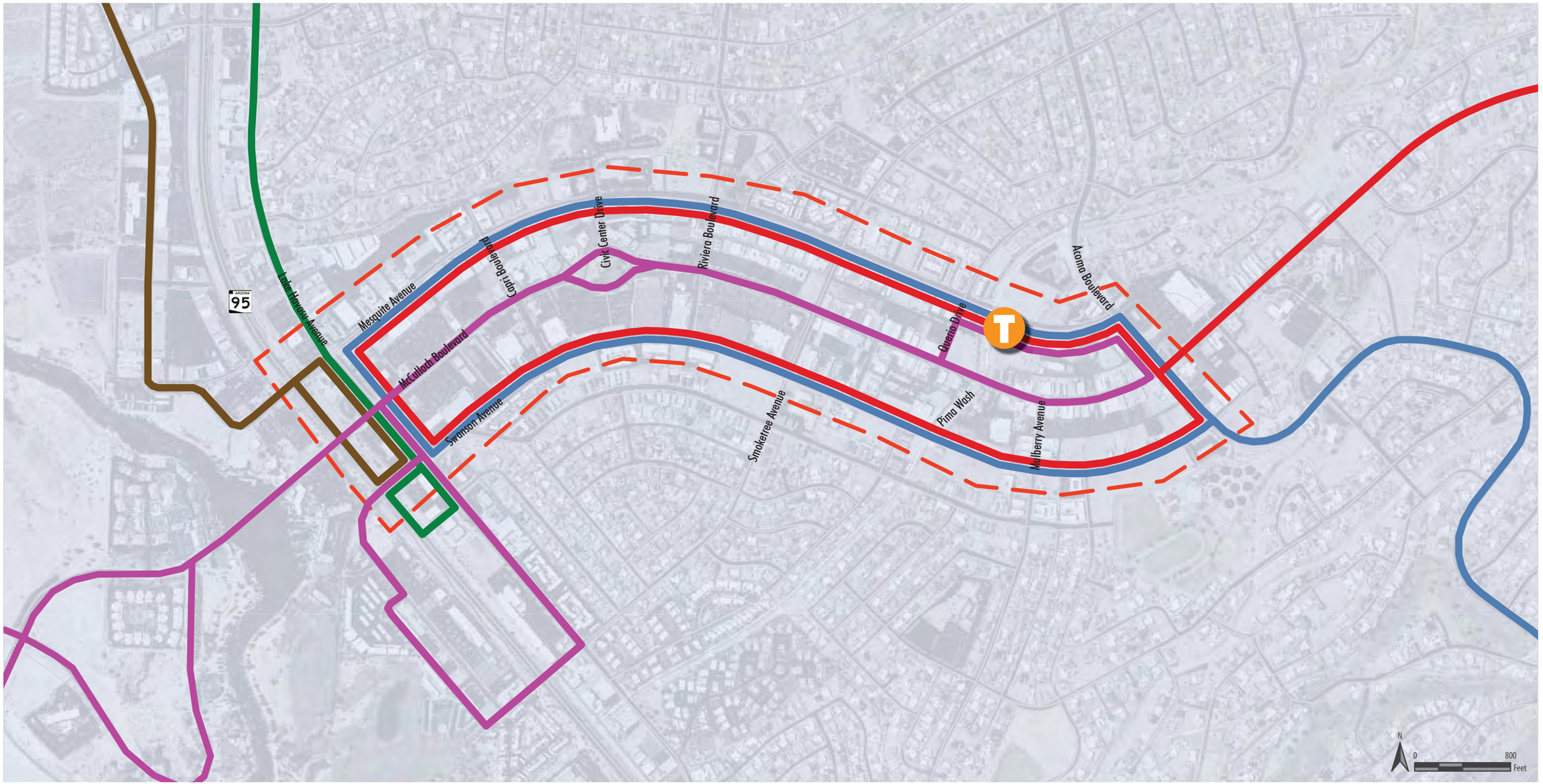
Transit center
Study zone boundary



Trolley route
Red route
Brown route
Blue route
Green route
Transit center
Study zone boundary

7.9 Streamlined Trolley

This alternative focuses on improving the efficiency of the Trolley. The recommended change includes removing the "figure 8" configuration on the Island by dropping the Beachcomber Boulevard circulation and staying on McCulloch Boulevard, eliminating the deviation to the DTS (transfer on the street), and extending the route to Acoma Boulevard. A map of this concept is presented in Figure 31. Notable observations from the map and scenario include:

- Cost: there would be no additional operating costs to implement this alternative; there are potential capital costs for road and shelter improvements
- Advantage: reduces one-way loops, which can be confusing and time-consuming for passengers
- Disadvantage: London Bridge Beach would not be directly served

7.10 Relocated Transfer Station

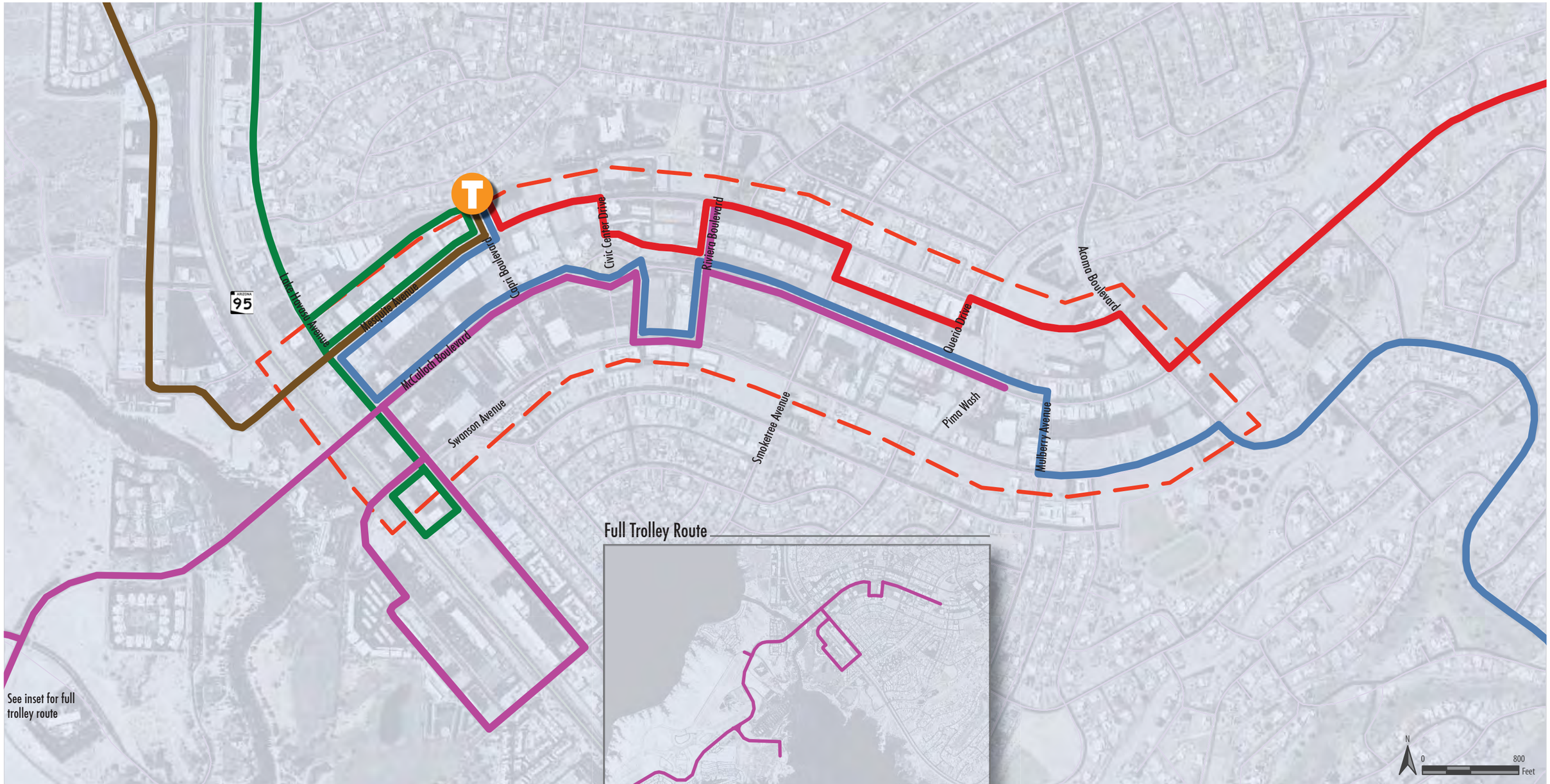
This alternative proposes to relocate the DTS to the City-owned lot located at McCulloch Boulevard and Pima Wash. Any of the previous alternatives could be modified to route the HAT lines and Trolley to the new DTS location. A map of this concept is presented in Figure 32. Notable observations from the map and scenario include:

- Cost: there would be no additional operating costs to implement this alternative; there is a large capital cost associated with moving facilities and constructing the new parking and bus loading areas
- Advantage: The proposed location is more visible, which could increase the likelihood people would use it; the proposed location requires less "off main route" circulation for buses, reducing circulation travel time and potentially lowering operating expenses; the proposed location is within easy walking or cycling distance from the new ASU campus. This could be especially important if many of the students are commuters and don't live on campus.
- Disadvantage: cost

7.11 Miscellaneous Options

Through the development of the alternatives presented above, the study team identified a number of minor options that could be implemented to further improve transit service for passengers. They include:

- Increase signage and stop amenities including benches and shelters
- Extend service hours longer into the evening to support tourism and college schedules
- Add Sunday service in study corridor to support tourism
- Develop unique and appealing branding for the trolley and identify crosspromotional opportunities to get visitors to use the trolley
- Use trolley branding to identify stops and possibly paint logo on street along trolley route to let public know of its availability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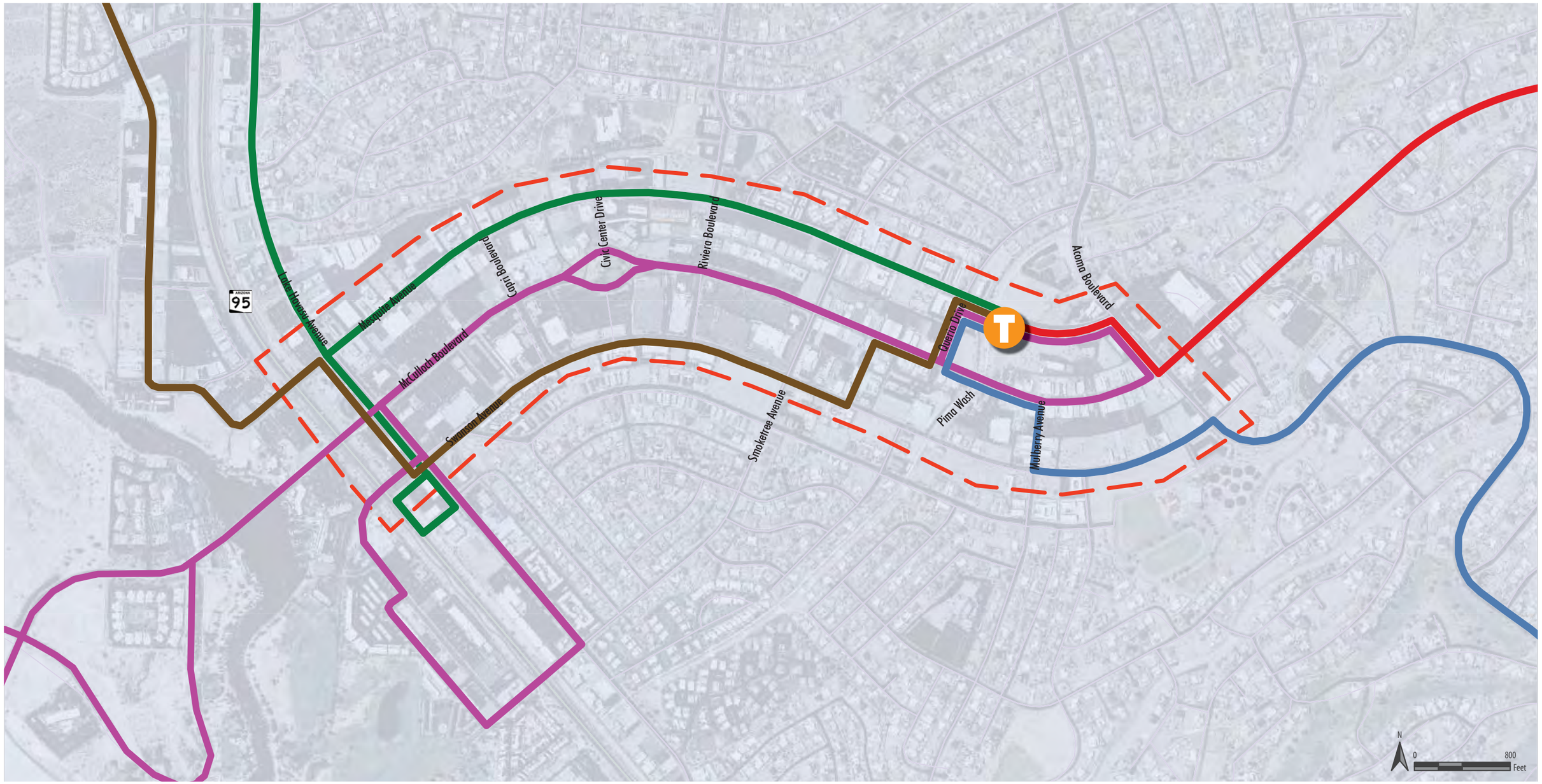
Study zone boundary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Trolley route
Red route
Brown route
Blue route
Green route
Transit center
Study zone boundary

8.0 Improvement Plan

The previous sections have presented a number of concepts and scenarios for consideration. Recommendations for improving the corridor consider input received from the public, results of the mobility and cost evaluation, and input from the study's Technical Advisory Committee, which includes City and ADOT staff. In addition to providing an overall vision for the study corridor, this section identifies specific improvement projects and prioritizes those projects for future budgeting. Improvement cost estimates for the recommended alternative are included.

This section also includes a discussion of environmental justice in the transportation project development process. Environmental justice is the fair treatment for people of all races, cultures, and incomes regarding the development of environmental laws, regulations, and policies.

8.1 Public Outreach

Two public meetings that were held in the spring and summer of 2012 provided stakeholders an opportunity to review the corridor recommendations and provide feedback. The initial road, nonmotorized, and transit improvement plans were presented at a public meeting held on April 19, 2012, at the City Council chambers:

- One-Way Couplet
- Bicycle Focus
- Medians and Roundabouts

These plans were also posted to the ADOT project website. The public was asked to complete comment cards identifying their preference for each segment of the corridor. Nine responses were received. Several property owners provided their comments by e-mail. There was no support for the One-way Couplet plan. The Medians and Roundabouts plan was generally supported except for the use of medians where they do not already exist. The Bicycle Focus alternative received the most overall support.

The second public meeting was held on August 13, 2012, at the Red Onion Restaurant on McCulloch Boulevard. The study team presented the recommended plan, including the specific improvement projects to property owners, business owners, elected officials, and other interested residents. The meeting generated discussion about bicycle lanes, parking, raised medians and roundabouts.

The public involvement summary reports include the presentations and comments from these meetings.

8.2 Recommended Alternative

This section provides a brief overview of the major road, nonmotorized, and transit elements included in the recommended alternative. This represents the overall vision for the corridor based on both performance analyses and public and staff input.

Road

The recommended road improvements are a hybrid of the three alternatives presented in Section 6.0. A brief description of each is provided in Table 36.The road typical sections are presented in Figure 33 and the scenario overview is presented in Figure 34.

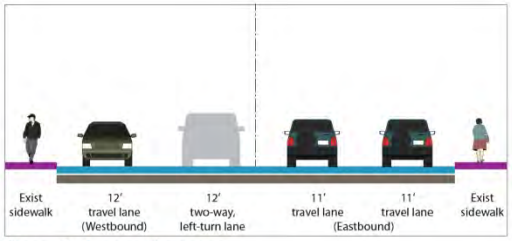
Table 36 Recommended Alternative, by Corridor

Corridor	Alternative scenario	Priorities	Notes
Mesquite Avenue	Medians and Roundabouts Focus	Intersections	Extend three-lane striping to Acoma Boulevard
McCulloch Boulevard (west)	Bicycle Focus	Intersections, bicycle lanes	
McCulloch Boulevard (east)	Bicycle Focus and One-way Couplet	Parking	Hybrid option includes bicycle lanes and landscape buffer
Swanson Avenue	Bicycle Focus	Restripe for bicycle lanes, intersections	Coordinate with ASU

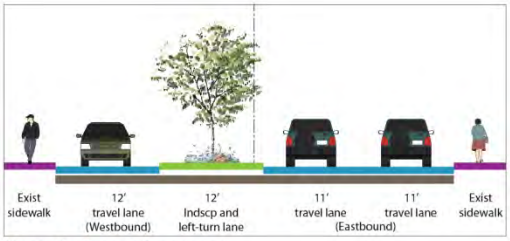
Other recommended improvements identified through safety and traffic analysis:

- Increase storage distance for left turns at intersections along McCulloch Boulevard
- Add bicycle lanes along crossroads between McCulloch Boulevard and Swanson Avenue
- Add raised medians along Lake Havasu Avenue and Acoma Boulevard between Mesquite and Swanson Avenues to control access to and from adjacent driveways

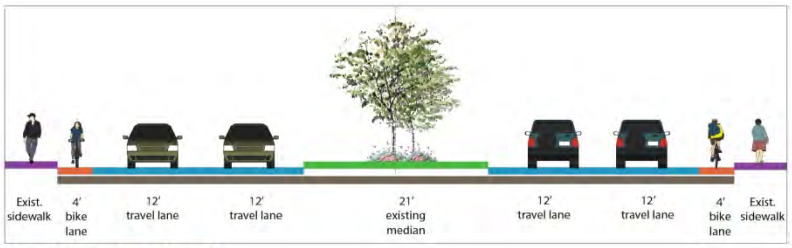
Figure 33 Recommended Alternative Typical Sections



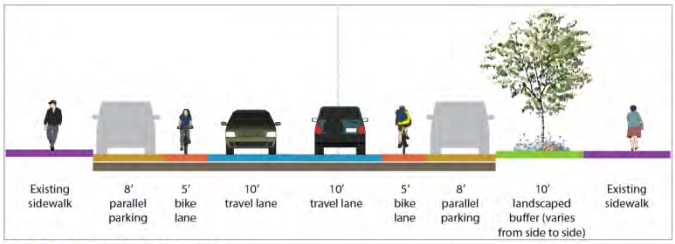
Mesquite Avenue *short range*



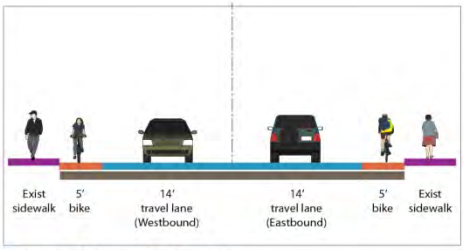
Mesquite Avenue *long range*



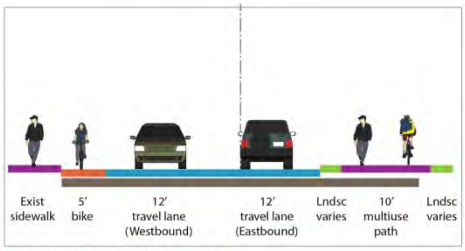
McCulloch Boulevard (west)



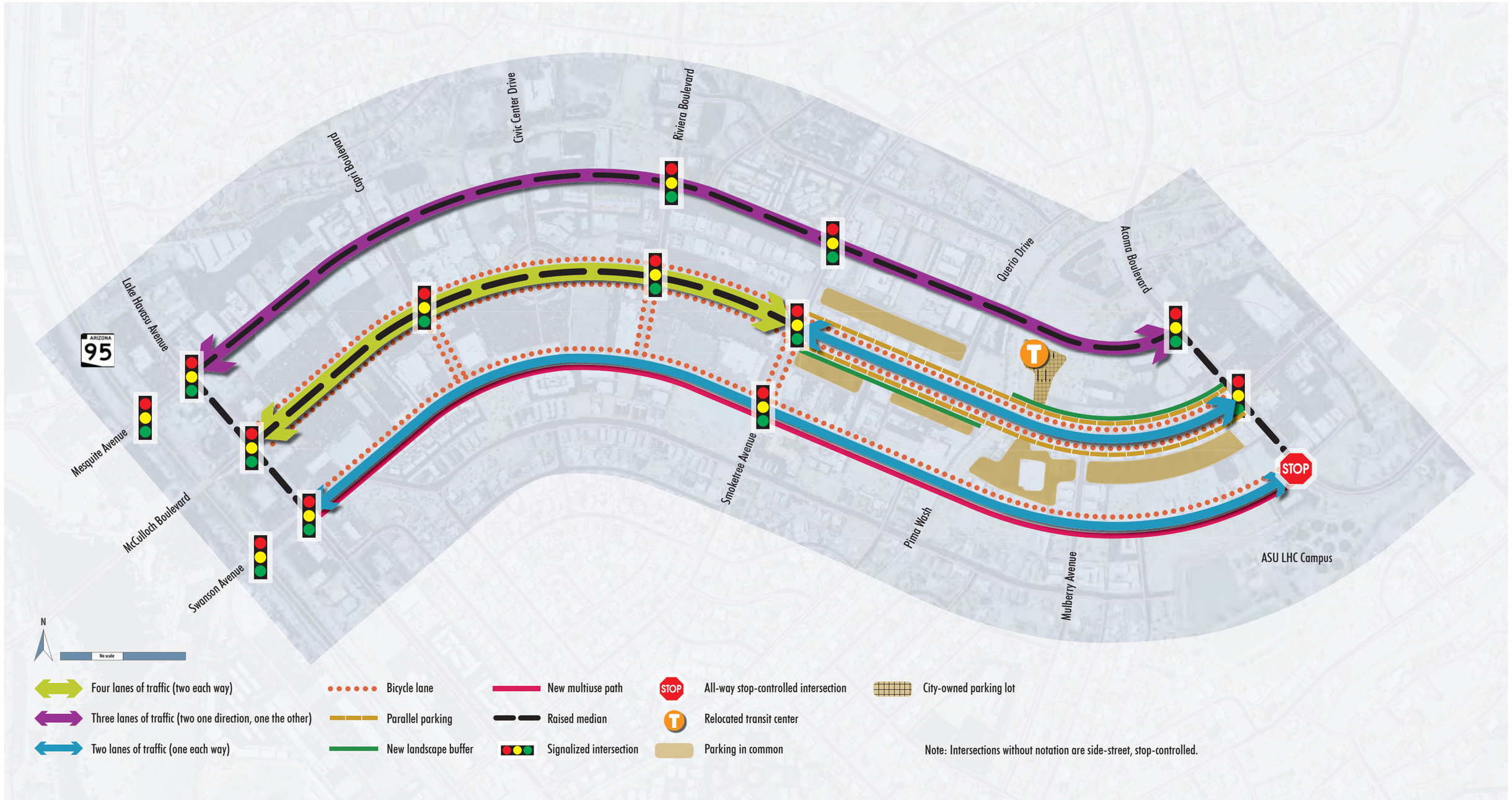
McCulloch Boulevard (east)



Swanson Avenue *short range*



Swanson Avenue *long range*


Capri Boulevard
Civic Center Drive
Riviera Boulevard
Lake Havasu Avenue
ARIZONA 95
Mesquite Avenue
McCulloch Boulevard
Swanson Avenue
Smoketree Avenue
Querio Drive
Acoma Boulevard
T
STOP
Pima Wash
Mulberry Avenue
ASU LHC Campus
N
No scale
Four lanes of traffic (two each way)
Three lanes of traffic (two one direction, one the other)
Two lanes of traffic (one each way)
Bicycle lane
Parallel parking
New landscape buffer
New multiuse path
Raised median
Signalized intersection
All-way stop-controlled intersection
Relocated transit center
Parking in common
City-owned parking lot
Note: Intersections without notation are side-street, stop-controlled.

Nonmotorized

Parking is one of the keys to realizing the community's vision for the Uptown District. The nonmotorized plan for the corridor includes off-street parking solutions combined with changes to on-street parking. To achieve the goal for wider sidewalks with bicycle lanes, angled parking on McCulloch Boulevard has to be converted to parallel parking. However, before this can happen, additional new parking needs to be added close to existing businesses. The primary nonmotorized plan recommendations include:

- Construct parking facility on City-owned land near McCulloch Boulevard and Pima Wash
- Improve the parking lots behind the buildings along the Uptown portion of McCulloch Boulevard as communal parking lots rather than individually maintained lots.
- Install wayfinding signs throughout the Uptown area, guiding drivers to rear parking facilities.
- Support Uptown District road development with parallel parking.

Much of the improvements associated with pedestrian and bicycle enhancements are covered in the recommended road alternative. Other minor capital improvements include:

- Install bicycle racks in strategic locations.
- Install ADA-compliant sidewalk ramps.

Transit

Transit can provide an additional catalyst for resurgence in the Uptown District. The recommended transit improvements include aspects of each of the transit alternatives considered. The primary recommendations include:

- Relocate the transfer station to new City parking lot near McCulloch Boulevard and Pima Wash.
- Solicit rider input related to changes in HAT line headways.
- Develop a policy for providing benches and shelters at bus stops.
- Implement proposed Trolley route changes; stamp pavement with Trolley logo along route.

Relocating the current HAT transfer center to the Uptown District will bring transit riders closer to work and shopping while improving access to the ASU campus on Swanson Avenue. All of this will contribute to the critical mass of activity needed to make the Uptown District economy self-sustaining.

8.3 Prioritized projects

A list of projects or spot improvements was identified to encompass the vision of the recommended alternative. The latest update to the WACOG TIP includes funding for the high-priority projects in this study. A total of $424,000 is allocated in FY 2014 for design and $2,098,000 in FY 2016 for construction of the initial projects. The projects are prioritized into short-, medium-, and long-range improvements. The short-range projects are recommended for construction using the programmed funds. The remaining projects would be funded through future budgeting efforts or other methods (see Section 9.0). The improvement plan is presented in Table 37.

Table 37 McCulloch Corridor Improvement Plan

Project description	Type	Priority	Cost opinion
Obtain easement to institute communal parking in Uptown area	Parking	Short-range	N/A
Improve rear parking lots with landscaping, lights, etc., in Uptown area	Parking	Short-range	$1,463,000
Add signs for parking lots in Uptown area	Parking	Short-range	$71,000
Construct new parking lot at Mesquite Avenue and Pima Wash	Parking	Short-range	$313,000
Relocate transfer station facilities	Transit	Short-range	$50,000
Extend left-turn bays along McCulloch Boulevard (five locations)	Road	Short-range	$42,000
Restripe McCulloch Boulevard (Lake Havasu to Smoketree Avenues) with bicycle lanes	Road	Short-range	$39,000
Restripe Swanson Avenue to recommended typical section	Road	Short-range	$69,000
Restripe Mesquite Avenue to recommended typical section	Road	Short-range	$19,000
Reconstruct McCulloch Boulevard (Smoketree Avenue to Acoma Boulevard)	Road	Medium-range	$676,000
Install signal at Mesquite Avenue and Riviera Boulevard	Road	Medium-range	$434,000
Install signal at Mesquite Avenue and Smoketree Avenue	Road	Medium-range	$434,000
Install signal at Swanson Avenue and Smoketree Avenue	Road	Medium-range	$434,000

Table 37 McCulloch Corridor Improvement Plan

Project description	Type	Priority	Cost opinion
Modify intersection control to two-way stop at Mesquite Avenue and Capri Boulevard; Mesquite Avenue and Civic Center Drive; and Mesquite Avenue and Querio Drive	Road	Medium-range	$21,000
Modify intersection control to two-way or side-street stop at Swanson Avenue and Capri Boulevard and at Swanson and Mulberry Avenues	Road	Medium-range	$14,000
Construct multiuse path along Swanson Avenue	Road	Long-range	$1,578,000
(optional pavement preservation, mill, overlay)			$519,000
(optional multiuse path lighting)			$748,000
Construct raised medians with landscaping along Mesquite Avenue	Road	Long-range	$814,000
Construct raised medians on Lake Havasu Avenue between Mesquite and Swanson Avenues	Road	Long-range	$75,000
Construct raised medians on Acoma Boulevard between Mesquite and Swanson Avenues	Road	Long-range	$108,000
Construct parking garage	Parking	Long-range	$7,000,000
		Short-range subtotal	$2,066,000
		Medium-range subtotal	$2,013,000
		Long-range subtotal	$10,842,000
		Total all projects	**$14,921,000**

8.4 Title VI and Environmental Justice Populations

The U.S. Environmental Protection Agency and FHWA define environmental justice as the "fair treatment for people of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies." Environmental justice principles and procedures are followed to improve all levels of transportation decision making. Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin. The 1994 Executive Order 12898 on environmental justice addresses minority and low-income populations. The rights of women, the elderly, and the disabled are protected under related statutes. These Presidential Executive Orders and other related statutes fall under the umbrella of Title VI.

Three environmental justice principles apply to the transportation project development process:

- to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations
- to ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- to prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations

Effective transportation decision making depends on understanding and properly addressing the unique needs of different socioeconomic groups. Properly implemented, environmental justice principles and procedures improve all levels of transportation decision making.

The five minority groups addressed by Title VI and Executive Order 12898 are:

1. Black (a person having origins in any of the black racial groups of Africa)
2. Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American descent, or other Spanish culture or origin, regardless of race)
3. Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands)
4. American Indian and Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition)
5. Some other race or persons of more than one race

The protected populations considered in this analysis are described below:

- Minority populations include people who identify themselves as Hispanic or Latino, Black or African American, American Indian and Alaskan Native, Asian, Native Hawaiian and Other Pacific Islander, persons of some other race, or persons of more than one race.
- Low-income populations include people living in households with an income at or below the U.S. Department of Health and Human Services poverty guidelines. Low-income populations may have greater difficulty locating replacement housing in the area. They may rely on public services and facilities, such as public transit and public recreational amenities, to a greater extent than the general population.
- Elderly populations consist of people who are age 65 and older. While elderly citizens often drive, the National Highway Traffic Safety Administration (NHTSA) reports that both high-

speed and high-traffic routes may present a problem for some (NHTSA 2007). In addition, the elderly may have a need for transit service or may opt to use transit if it is offered.

- Disabled populations are civilian, noninstitutionalized persons aged 5 and over with disabilities (such as sensory, physical, mental, self-care, going outside of home, and employment disabilities).
- Female head-of-household populations consist of households headed by a female with no husband present and with her own children under the age of 18. These households tend to have lower incomes than households headed by married couples or a single man and oftentimes have a greater need for affordable housing.

The U.S. Department of Health and Human Services poverty guidelines state that the poverty level for a family of four in 2010 is $22,050 (note, however, that this income level cannot be compared directly with current income levels because the value of money changes year to year).

The protected populations for Lake Havasu City, Mohave County, and Arizona are shown in Table 38.The recommended improvements should be evaluated for potential impacts to these protected populations. Future public outreach efforts should be tailored to ensure that these populations are fully represented in the planning and implementation process.

Table 38 Title VI and Environmental Justice Populations

Protected population	Arizona (%)	Mohave County (%)	Lake Havasu (%)
Minority	42.2	20.4	16.0
Hispanic or Latino	29.6	14.8	12.1
Black or African American	4.1	0.9	0.7
American Indian or Alaskan Native	4.6	2.2	1.0
Asian	2.8	1.1	1.0
Native Hawaiian or Other Pacific Islander	0.2	0.2	0.1
Some other race	11.9	6.0	4.7
More than one race	3.4	2.7	2.3
Persons living below the poverty level[a]	15.3	16.1	11.5
Disabled[b]	11.5	18.0	14.9
Age 65 and older	13.8	23.3	26.9
Female heads of household	37.3	34.2	32.6

Source: U.S. Census Bureau, Census 2010, SF-1, Redistricting Data (PL94-171) Summary File [a] U.S. Census Bureau, 2006–2010 American Community Survey [b] U.S. Census Bureau, 2008–2010 American Community Survey

Compared with Mohave County and Arizona overall, Lake Havasu City has:

- Fewer minorities
- Fewer persons living below the poverty level
- Fewer female heads of households
- More persons age 65 and older

9.0 Funding Opportunities

The following section summarizes revenue sources that are currently available for funding road transportation projects in Lake Havasu City. It should be noted that in the current environment, the funding of significant transportation projects is complex and, in most cases, requires multiple sources. Also, transportation funding is dynamic and there is a need to continuously monitor the existing sources and new sources that may become available as state and federal legislation changes. Innovation has become the mainstay of successful transportation funding.

Federal Funding Sources

Community Development Block Grant

Funds are provided by the U.S. Department of Housing and Urban Development. A transportation improvement project must benefit and be located in a census tract or block group with at least 51 percent of the population in low- and moderate-income groups. Projects that alleviate slums or address an urgent need such as natural disaster may be eligible.

Highway Safety Improvement Program

The Highway Safety Improvement Program aims to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. Each state's apportionment of Highway Safety Improvement Program funds is subject to a set-aside for construction and operational improvements on high-risk rural roads. High-risk rural roads are roads functionally classified as rural major or minor collectors or rural local roads with a fatality and incapacitating injury crash rate above the statewide average for those functional classes of roads, or likely to experience an increase in traffic volume that leads to a crash rate in excess of the average statewide rate.

National Highway System Program

The program provides funding for improvements to rural and urban roads that are part of the National Highway System, including the Interstate System, and designated connections to major intermodal terminals. Under certain circumstances, these funds may also be used to fund transit improvements in National Highway System corridors.

Safe Routes to School Program

The purpose of the federal Safe Routes to School Program is to make walking and bicycling to school a safe and routine activity. The program provides reimbursable funds for elementary and middle schools to implement projects that encourage children to walk and bicycle to school.

Surface Transportation Program

The Surface Transportation Program provides flexible funding that may be used by states and localities for projects on any Federal-aid highway, including the National Highway System, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities. For projects programmed with Surface Transportation Program funds from a Council of Governments TIP, local

project sponsors may exchange Surface Transportation Program funds for a reduced amount of Highway User Revenue Fund (HURF) funds from ADOT, enabling the project sponsor to assume greater control over project development and implementation. The exchange program is currently on hold by ADOT until the HURF gains are shown for the revenue stream.

State Funding Sources

Arizona Gaming Sources (Proposition 202)

Proposition 202 was passed in November 2002 and set the stage for new gaming compacts between the State of Arizona and the respective tribes. A provision of Proposition 202 was the sharing of gaming revenues with the State and local governments. Proposition 202 allows an Indian tribe to make 12 percent of its total annual contribution to cities, towns, or counties for government services that benefit the general public, including public safety, mitigation of the impacts of gaming, or promotion of commerce and economic development.

Economic Strength Project Program

The Arizona Commerce Authority in collaboration with ADOT administers the Economic Strength Project Program. This joint program for local governments provides grants for road projects that result in economic development and meet three primary goals: create and retain a significant number of jobs in Arizona, lead to significant capital investment in Arizona, and make a significant contribution to the economy of Arizona. The Economic Strength Project Program has a continuous funding source through ADOT. Annually, there are two funding rounds in which at least $500,000 is available for new road construction, upgrading existing roads, turn lanes, acceleration or deceleration lanes, and reconstruction and paving.

Greater Arizona Development Authority

The Greater Arizona Development Authority (GADA) was created by the Arizona State Legislature to assist local and tribal governments and special districts with the development of public infrastructure. GADA leverages its funds to lower the costs of financing and help accelerate project development for public facilities owned, operated, and maintained by a political subdivision, special district, or Indian tribe. GADA has both financial and technical assistance programs.

Highway Extension Expansion and Loan Program

House Bill 2488, enacted into law on August 21, 1998, established a comprehensive loan and financial assistance program for eligible highway projects in Arizona. The program, designated as Highway Extension Expansion and Loan Program (HELP), provides communities in Arizona a new financing mechanism to stretch limited transportation dollars and bridge the gap between the needs and available revenues. HELP provides the State and its communities with an innovative financing mechanism to accelerate the funding of road construction projects and has proven to be a significant tool for financing the construction of highway projects throughout the State. Similar to bond funds, the HELP is a loan, hence there are payback obligations. The major advantage is there are no application fees and the rate under statute is "below market." Currently, HELP loan applications are not being accepted due to state budget issues.

Highway User Revenue Fund

HURF represents the most significant source of transportation funds in the State of Arizona. Funds are derived primarily from motor vehicle fuel taxes and vehicle license taxes. HURF funds are shared with and allocated through ADOT and distributed as an entitlement to cities, towns, and counties based on population.

Transportation, Community, and System Preservation Program

The Transportation, Community, and System Preservation Program is intended to address the relationships among transportation, community, and system preservation plans and practices and identify private sector-based initiatives to improve those relationships. States, metropolitan planning organizations, local governments, and tribal governments are eligible for Transportation, Community, and System Preservation Program discretionary grants to plan and implement strategies that improve the efficiency of the transportation system, reduce environmental impacts of transportation, reduce the need for costly future public infrastructure investments, ensure efficient access to jobs, services, and centers of trade, and examine development patterns and identify strategies to encourage private sector development patterns that achieve these goals.

Transportation Enhancement Program

The Transportation Enhancement Program's purpose is to strengthen the cultural, aesthetic, and environmental aspects of the nation's intermodal transportation system. Funding is derived from the State's annual Surface Transportation Program apportionment. The program provides funding for facilities such as pedestrian walkways and bicycle paths, acquisition of scenic easements, restoration of scenic or historic sites, and landscaping and other scenic beautification.

For example, each year ADOT Transportation Enhancement and Scenic By-ways division provides approximately four million dollars for state projects, and eight million dollars for local projects for the enhancement and beatification of state highway, and local functional classified roadways. Some enhancement projects are; bicycle and pedestrian pathways, historic preservation projects, downtown main street beautification, way-finding signage/monuments, landscaping, and other roadway enhancement activities.

WACOG provides technical assistance to itsh member entities and tribes in preparing the grant application, which is highly competitive throughout the state. Once the applications are submitted to WACOG for review and ranking by the WACOG TAC, they are submitted through WACOG to ADOT.

The application process starts in November-December each year through WACOG.

Local Funding Sources

Development Impact Fees

An increasing number of growing Arizona communities are relying on transportation development impacts fees for both residential and commercial development. Development impact fees are one-time payments for public facilities based on a pro-rata share of costs incurred for facilities needed to accommodate new development. Development fees relate to only capital facility expansions benefiting new development and are not to be used for rehabilitation efforts or operating expenses.

General Fund

The Lake Havasu City Capital Improvement Program identifies City general fund monies used for improvements, operations, and maintenance.

Improvement Districts

Improvement districts are authorized by the State legislature for the construction of a wide range of public works facilities. They are formed to fund repaving projects, construction of roads or sidewalks, installation of landscaping, and other public improvements within a defined geographic area. The districts are initiated by property owners who combine resources with the City to finance the improvements. Property owners are assessed over a several-year time frame to repay their share of the cost of the improvement.

Revenue Bonds

The issuance of bonds against City revenues can be used to accelerate project construction. While not a direct funding source, bonding can be used to mitigate the immediate impacts of significant capital improvement projects and spread the costs over the useful life of the project.

Transit Funding Assistance

Transit services are funded through a variety of federal, state, and local programs, as well as farebox revenue, advertising, and other nongovernmental sources. Most local government funding for transit service is provided by general fund revenues of municipalities and/or counties. Sources of potential transit funding include:

Section 5311 Formula Funds

This funding supports capital expenditures (based on an 80/20 match with the municipality or other entity), operating expenses (50/50 match), and administrative expenses (80/20 match). The funding is allocated through an annual competitive application process.

Surface Transportation Program Flex Funds

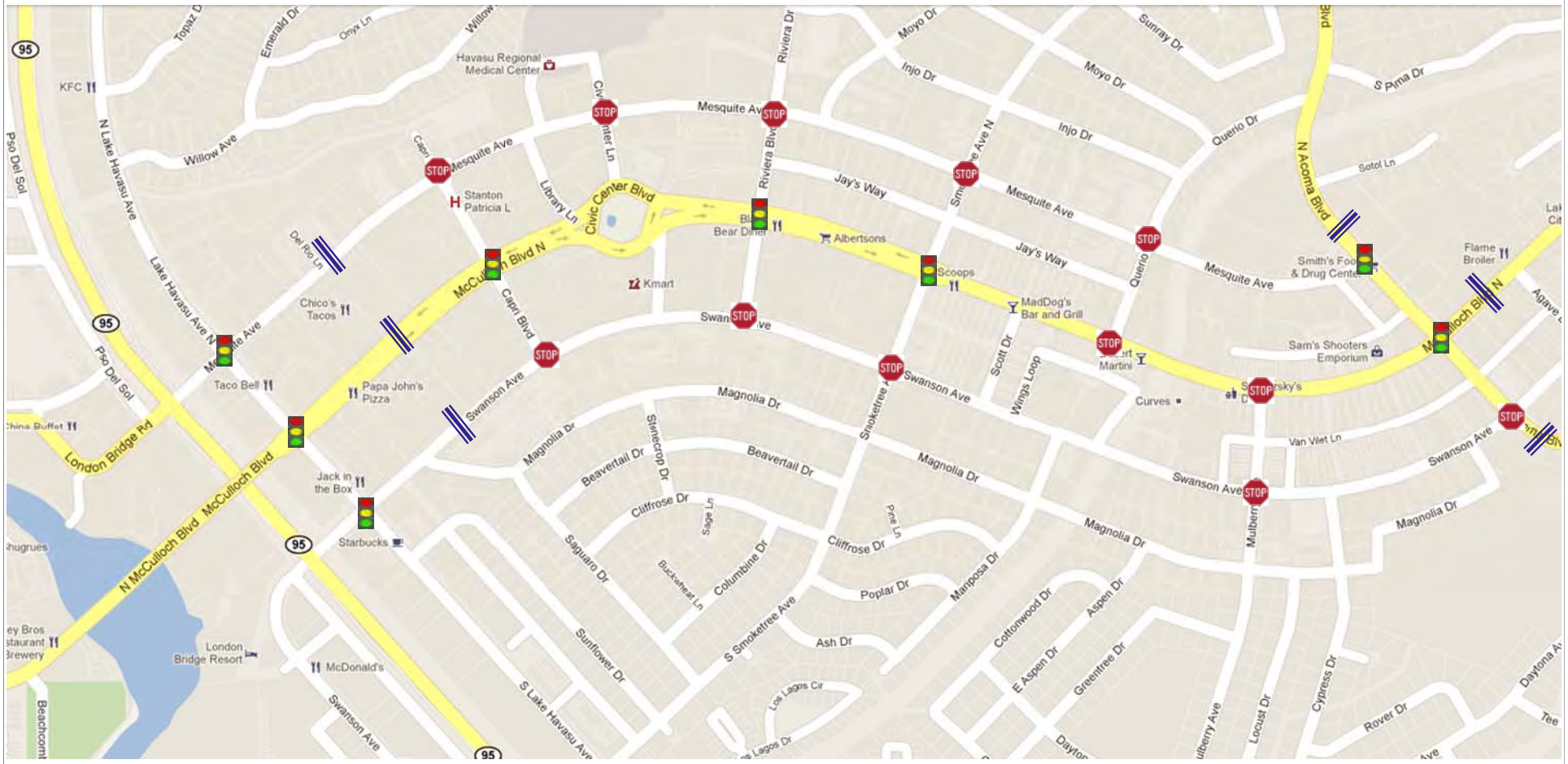
Surface Transportation Program flex funds are available through ADOT in support of the Section 5311 Program. Typically these funds are used to augment the capital procurement process. Surface Transportation Program funding levels for local governments are determined annually by the State Transportation Board.

Public-Private Partnerships

A public-private partnership refers to the contractual agreement between a public agency and a private sector entity that allows the private sector entity to have greater participation in the delivery of a transportation project. House Bill 2396, signed into law in 2009, allows ADOT to use public-private partnerships as a tool to address Arizona's transportation requirements. This law grants ADOT broad authority to partner with the private sector to build or improve Arizona transportation facilities. Under the law, public-private partnerships include any project in which the private partner takes on risk and responsibility for transportation improvements that would have previously been borne solely by ADOT.

Public-private partnerships include new contracting concepts such as design-build, which allows a single proposer to both design and build a facility rather than the traditional approach of bidding out one contract for design and another for construction. It also allows for the possibility that the private sector may design, build, maintain, and operate a new facility, leaving ADOT in an oversight role only. In that scenario, the private proposer could be paid for its work with public funds, through tolls or fees from users, or some combination of the two.

Appendix A: Traffic Count Data



Legend

- Signalized Intersection Count Location
- Unsignalized Intersection Count Location
- 24-Hr segment Count with Speed and Classification

Date: October 4, 2011

Traffic Data Collection Plan

LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978 •

Traffic Research and Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Site ID	File Name	Route	Location	Direction	Count Type	Count Dur	Start Date	Start Time	Avg Vol	AM PkHr	AM PkVol	AM PHF	PM PkHr	PM PkVol	PM PHF	Day Corr	Dir Split	pctSU	pctCB	Avg Spd	Spd 50pct	Spd 85pct	Latitude	Longitude
1	1105284	MCCULLOCH BLVD	Btwn LAKE HAVASU AVE & CAPRI BLVD	EB	SPD	72	12/6/2011	0:00	5368	11:45	551	0.9661	12:00	555	0.9720	0.9702	52.5%	1.6%	0.8%	30.6	30.9	35.0	34.4768	-114.3412
1	1105285	MCCULLOCH BLVD	Btwn LAKE HAVASU AVE & CAPRI BLVD	WB	SPD	72	12/6/2011	0:00	4853	11:30	499	0.9247	12:00	461	0.9665	0.9712	47.5%	3.4%	2.2%	29.9	29.9	34.4	34.4768	-114.3412
2	1105286	MESQUITE AVE	Btwn LAKE HAVASU AVE & CAPRI BLVD	EB	SPD	72	12/6/2011	0:00	4940	11:45	466	0.9061	12:30	523	0.9165	0.9702	49.3%	1.2%	0.6%	32.1	32.3	37.5	34.4770	-114.3435
2	1105287	MESQUITE AVE	Btwn LAKE HAVASU AVE & CAPRI BLVD	WB	SPD	72	12/6/2011	0:00	5080	11:15	577	0.8992	12:00	524	0.8176	0.9804	50.7%	0.9%	0.2%	29.3	29.7	34.3	34.4776	-114.3425
3	1105288	SWANSON AVE	Btwn LAKE HAVASU AVE & CAPRI BLVD	EB	SPD	72	12/6/2011	0:00	3865	11:45	359	0.9293	12:30	402	0.9306	0.9663	42.3%	0.3%	0.3%	29.4	29.5	34.1	34.4745	-114.3408
3	1105289	SWANSON AVE	Btwn LAKE HAVASU AVE & CAPRI BLVD	WB	SPD	72	12/6/2011	0:00	5267	11:45	556	0.9419	12:00	524	0.8978	0.9729	57.7%	4.3%	2.6%	29.1	29.1	33.6	34.4746	-114.3440
4	1105290	ACOMA BLVD	Btwn MESQUITE AVE & SOTOL LN	NB	SPD	72	12/6/2011	0:00	5924	7:15	456	0.8335	14:30	513	0.8691	0.9574	51.3%	4.6%	2.5%	34.1	34.0	38.6	34.4775	-114.3247
4	1105291	ACOMA BLVD	Btwn MESQUITE AVE & SOTOL LN	SB	SPD	72	12/6/2011	0:00	5626	7:30	498	0.7372	14:30	539	0.8188	0.9392	48.7%	1.7%	0.6%	36.5	36.6	41.2	34.4775	-114.3246
5	1105292	MCCULLOCH BLVD	Btwn ACOMA BLVD & AGAVE DR	EB	SPD	72	12/6/2011	0:00	5371	11:45	420	0.9844	16:30	547	0.8650	0.9787	46.3%	1.3%	0.8%	32.4	33.5	38.9	34.4765	-114.3213
5	1105293	MCCULLOCH BLVD	Btwn ACOMA BLVD & AGAVE DR	WB	SPD	72	12/6/2011	0:00	6219	7:30	538	0.7779	12:00	496	0.9317	0.9671	53.7%	2.8%	1.5%	33.5	33.7	39.2	34.4767	-114.3213
6	1105294	ACOMA BLVD	S of SWANSON AVE	NB	SPD	72	12/6/2011	0:00	8199	7:30	824	0.7977	13:00	656	0.9671	0.9660	51.7%	1.9%	0.8%	31.6	31.7	34.9	34.4741	-114.3203
6	1105295	ACOMA BLVD	S of SWANSON AVE	SB	SPD	72	12/6/2011	0:00	7675	11:45	582	0.9132	16:30	770	0.8455	0.9690	48.3%	1.2%	0.6%	27.7	27.7	31.6	34.4741	-114.3203

Traffic Research & Analysis, Inc.
3844 E. Indian School Rd.
Phoenix, AZ 85018
(602) 840-1500 FAX (602) 840-1577

JOB #	File ID	N/S Sts	E/W Sts	Start Date/Time	End Date/Time	Int	Total	Pk Hour	Pk Hr Ttl
11107	1100599	QUERIO DR	MESQUITE AVE	12/6/2011 7:00	12/6/2011 8:45	15	795	7:45:00 AM	467
11107	1100599	QUERIO DR	MESQUITE AVE	12/6/2011 16:00	12/6/2011 17:45	15	1084	4:15:00 PM	602
11107	1100600	MULBERRY AVE	SWANSON AVE	12/6/2011 7:00	12/6/2011 8:45	15	941	7:45:00 AM	570
11107	1100600	MULBERRY AVE	SWANSON AVE	12/6/2011 16:00	12/6/2011 17:45	15	1535	4:30:00 PM	863
11107	1100601	QUERIO DR	MCCULLOCH BLVD	12/6/2011 7:00	12/6/2011 8:45	15	1063	8:00:00 AM	601
11107	1100601	QUERIO DR	MCCULLOCH BLVD	12/6/2011 16:00	12/6/2011 17:45	15	1758	4:00:00 PM	944
11107	1100602	NONE / MULBERRY AVE	MCCULLOCH BLVD	12/6/2011 7:00	12/6/2011 8:45	15	1134	8:00:00 AM	634
11107	1100602	NONE / MULBERRY AVE	MCCULLOCH BLVD	12/6/2011 16:00	12/6/2011 17:45	15	1769	4:15:00 PM	954
11107	1100603	ACOMA BLVD	MESQUITE AVE	12/6/2011 7:00	12/6/2011 8:45	15	2191	7:30:00 AM	1262
11107	1100603	ACOMA BLVD	MESQUITE AVE	12/6/2011 16:00	12/6/2011 17:45	15	2735	4:15:00 PM	1479
11107	1100604	ACOMA BLVD	MCCULLOCH BLVD	12/6/2011 7:00	12/6/2011 8:45	15	2901	7:30:00 AM	1665
11107	1100604	ACOMA BLVD	MCCULLOCH BLVD	12/6/2011 16:00	12/6/2011 17:45	15	3648	4:15:00 PM	1925
11107	1100605	ACOMA BLVD	SWANSON AVE	12/6/2011 7:00	12/6/2011 8:45	15	2110	7:30:00 AM	1239
11107	1100605	ACOMA BLVD	SWANSON AVE	12/6/2011 16:00	12/6/2011 17:45	15	2703	4:30:00 PM	1433
11107	1100606	CIVIC CENTER LN	MESQUITE AVE	12/7/2011 7:00	12/7/2011 8:45	15	1343	7:45:00 AM	754
11107	1100606	CIVIC CENTER LN	MESQUITE AVE	12/7/2011 16:00	12/7/2011 17:45	15	1631	4:15:00 PM	882
11107	1100607	RIVIERA DR	MESQUITE AVE	12/7/2011 7:00	12/7/2011 8:45	15	1760	8:00:00 AM	994
11107	1100607	RIVIERA DR	MESQUITE AVE	12/7/2011 16:00	12/7/2011 17:45	15	2378	4:30:00 PM	1272
11107	1100608	RIVIERA DR	MCCULLOCH BLVD	12/7/2011 7:00	12/7/2011 8:45	15	1212	8:00:00 AM	735
11107	1100608	RIVIERA DR	MCCULLOCH BLVD	12/7/2011 16:00	12/7/2011 17:45	15	2317	4:00:00 PM	1270
11107	1100609	RIVIERA DR	SWANSON AVE	12/7/2011 7:00	12/7/2011 8:45	15	835	7:45:00 AM	502
11107	1100609	RIVIERA DR	SWANSON AVE	12/7/2011 16:00	12/7/2011 17:45	15	1587	4:00:00 PM	926
11107	1100610	SMOKETREE AVE	MCCULLOCH BLVD	12/7/2011 7:00	12/7/2011 8:45	15	1548	8:00:00 AM	876
11107	1100610	SMOKETREE AVE	MCCULLOCH BLVD	12/7/2011 16:00	12/7/2011 17:45	15	2531	4:00:00 PM	1401
11107	1100611	SMOKETREE AVE	MESQUITE AVE	12/7/2011 7:00	12/7/2011 8:45	15	1567	7:45:00 AM	905
11107	1100611	SMOKETREE AVE	MESQUITE AVE	12/7/2011 16:00	12/7/2011 17:45	15	1981	4:15:00 PM	1088
11107	1100612	SMOKETREE AVE	SWANSON AVE	12/7/2011 7:00	12/7/2011 8:45	15	1342	7:45:00 AM	794
11107	1100612	SMOKETREE AVE	SWANSON AVE	12/7/2011 16:00	12/7/2011 17:45	15	2226	4:00:00 PM	1280
11107	1100613	CAPRI BLVD	MESQUITE AVE	12/8/2011 7:00	12/8/2011 8:45	15	1185	8:00:00 AM	696
11107	1100613	CAPRI BLVD	MESQUITE AVE	12/8/2011 16:00	12/8/2011 17:45	15	1754	4:15:00 PM	961
11107	1100614	CAPRI BLVD	SWANSON AVE	12/8/2011 7:00	12/8/2011 8:45	15	933	8:00:00 AM	571
11107	1100614	CAPRI BLVD	SWANSON AVE	12/8/2011 16:00	12/8/2011 17:45	15	1624	4:15:00 PM	895
11107	1100615	CAPRI BLVD	MCCULLOCH BLVD	12/8/2011 7:00	12/8/2011 8:45	15	1135	8:00:00 AM	709
11107	1100615	CAPRI BLVD	MCCULLOCH BLVD	12/8/2011 16:00	12/8/2011 17:45	15	2048	4:15:00 PM	1152
11107	1100616	LAKE HAVASU AVE	MCCULLOCH BLVD	12/8/2011 7:00	12/8/2011 8:45	15	1782	8:00:00 AM	1076
11107	1100616	LAKE HAVASU AVE	MCCULLOCH BLVD	12/8/2011 16:00	12/8/2011 17:45	15	3183	4:15:00 PM	1659
11107	1100617	LAKE HAVASU AVE	MESQUITE AVE	12/8/2011 7:00	12/8/2011 8:45	15	2088	8:00:00 AM	1242
11107	1100617	LAKE HAVASU AVE	MESQUITE AVE	12/8/2011 16:00	12/8/2011 17:45	15	3646	4:15:00 PM	1964
11107	1100618	LAKE HAVASU AVE	SWANSON AVE	12/8/2011 7:00	12/8/2011 8:45	15	1579	8:00:00 AM	919
11107	1100618	LAKE HAVASU AVE	SWANSON AVE	12/8/2011 16:00	12/8/2011 17:45	15	2790	4:00:00 PM	1463

Appendix B: Bicycle and Pedestrian Level of Service Analysis Reports

McCulloch east of Smoketree BLOS

BLOS and BCI for the following road segment

Lanes per direction:	1
Outside lane width:	16 ft
Paved shoulder/bikelane width:	9 ft
Bidirectional ADT traffic volume:	14150 (veh/day)
Posted speed limit:	25 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	66%
Parking time-limit:	0 minutes

	Score	Level-of-service	Compatibility Level
BLOS:	2.15	B (1.51-2.50)	Very High
BCI:	2.7	C (2.31-3.40)	Moderately High

McCulloch east of Smoketree PLOS

BLOS and PLOS for the following road segment

Lanes per direction:	1
Outside lane width:	16 ft
Paved shoulder/bike lane/marked parking width:	9 ft
Bidirectional ADT traffic volume:	14150 (veh/day)
Posted speed limit:	25 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	4
% of segment with occupied parking:	66%
% of segment with sidewalks:	100%
Sidewalk width:	10 ft
Sidewalk buffer/parkway width:	0 ft
Buffer/parkway avg tree spacing:	25 ft

	Score	Level-of-service	Compatibility Level
BLOS:	2.15	B (1.51-2.50)	Very High
PLOS:	2.75	C (2.51-3.50)	Moderately High

McCulloch west of Smoketree BLOS

BLOS and BCI for the following road segment

Lanes per direction:	2
Outside lane width:	15 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	11544 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.24	C (2.51-3.50)	Moderately High
BCI:	3.05	C (2.31-3.40)	Moderately High

McCulloch west of Smoketree PLOS

BLOS and PLOS for the following road segment

Lanes per direction:	2
Outside lane width:	15 ft
Paved shoulder/bike lane/marked parking width:	0 ft
Bidirectional ADT traffic volume:	11544 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	4
% of segment with occupied parking:	0%
% of segment with sidewalks:	100%
Sidewalk width:	6 ft
Sidewalk buffer/parkway width:	0 ft
Buffer/parkway avg tree spacing:	100 ft

	Score	Level-of-service	Compatibility Level
BLOS:	3.24	C (2.51-3.50)	Moderately High
PLOS:	2.54	C (2.51-3.50)	Moderately High

Mesquite BLOS

BLOS and BCI for the following road segment

Lanes per direction:	1
Outside lane width:	16 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	7464 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.22	C (2.51-3.50)	Moderately High
BCI:	3.07	C (2.31-3.40)	Moderately High

Mesquite PLOS

BLOS and PLOS for the following road segment

Lanes per direction:	1
Outside lane width:	16 ft
Paved shoulder/bike lane/marked parking width:	0 ft
Bidirectional ADT traffic volume:	7464 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	4
% of segment with occupied parking:	0%
% of segment with sidewalks:	95%
Sidewalk width:	6 ft
Sidewalk buffer/parkway width:	0 ft
Buffer/parkway avg tree spacing:	100 ft

	Score	Level-of-service	Compatibility Level
BLOS:	3.22	C (2.51-3.50)	Moderately High
PLOS:	2.76	C (2.51-3.50)	Moderately High

Swanson BLOS

BLOS and BCI for the following road segment

Lanes per direction:	1
Outside lane width:	16 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	8733 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.3	C (2.51-3.50)	Moderately High
BCI:	3.2	C (2.31-3.40)	Moderately High

Swanson PLOS

BLOS and PLOS for the following road segment

Lanes per direction:	1
Outside lane width:	16 ft
Paved shoulder/bike lane/marked parking width:	0 ft
Bidirectional ADT traffic volume:	8733 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	4
% of segment with occupied parking:	0%
% of segment with sidewalks:	100%
Sidewalk width:	6 ft
Sidewalk buffer/parkway width:	0 ft
Buffer/parkway avg tree spacing:	100 ft

	Score	Level-of-service	Compatibility Level
BLOS:	3.3	C (2.51-3.50)	Moderately High
PLOS:	2.85	C (2.51-3.50)	Moderately High

Appendix C: April 19, 2012, Public Meeting Summary

Arizona Department of Transportation
City of Lake Havasu City
McCulloch Corridor Improvement Study
Public Meeting #1 Summary
May 14, 2012

Study Background

The Arizona Department of Transportation (ADOT) is working with the City of Lake Havasu City to study corridor improvements through the uptown area. Transportation improvements to be evaluated will include roadways, pedestrian, bicycle and public transit. The study will recommend corridor improvements and will serve as a guide for future community development, project funding, and project implementation.

A public meeting was held on Thursday, April 19, 2012 between 6:00 p.m. and 7:30 p.m. at the City of Lake Havasu City Council Chambers. The purpose of the meeting was to present transportation improvement concepts, including parking, transit, roadway, and pedestrian, to the community and stakeholders and to discuss the issues, concerns, and opportunities.

A second public meeting will be held in the summer of 2012.

Meeting Notification

Several outlets were used to help disseminate information regarding the Public Workshop throughout the community. Notification material can be found in *Appendix A: Notification Material*. ADOT did the following:

- Mailed approximately 400 postcard notices to property owners between Mesquite Avenue and Swanson Avenue and S. Lake Havasu Avenue and N. Acoma Avenue.
- Placed an advertisement in the *Today's News Herald* on Wednesday, April 11, 2012.
- Distributed media release the week of April 9 to local media outlets.
- Posted notification posters and stacks of fliers to the following locations:
    - Albertsons
    - Black Bear Diner
    - Daily Grind Coffee
    - Denny's
    - Golf USA
    - Havasu Lanes Bowling Alley
    - Kmart
    - Lake Havasu Aquatic Center
    - Lake Havasu City Hall
    - Lake Havasu Chamber of Commerce
    - Lake Havasu Police Department and Council Chambers
    - Lake Havasu Post Office
    - London Bridge Golf Resort
    - Mail and Business Center (McCulloch Boulevard and Smoketree Avenue)
    - Mohave County Library
    - Mohave County Senior Center

- Safeway
- Subway
- Walgreens

Meeting Summary

Matt Carpenter, ADOT Multimodal Planning Division Project Manager, welcomed and thanked attendees for their participation in the study. He briefly introduced the study team, explained the Planning Assistance for Rural Areas (PARA) program. Michael Gorton, HDR Engineering Project Manager, presented the background leading to this study, the study area, purpose, process, existing and future conditions. Ben Spargo and Laura Paty, both with HDR Engineering, presented the developed alternatives for parking, transit, pedestrian, bicycle, and roadway configuration. Mr. Gorton concluded the presentation by opening up to a question and answer session. The following is a summary of that discussion. All material from the public meeting can be found in *Appendix B: Public Meeting Material*.

Question and Answer Session

Q: *Does this study have a website with all the information presented here this evening?*

A: Yes, the website is www.azdot.gov/mcculloch

Q: *Has this study team worked on projects recently that faced unique challenges similar to those here?*

A: Yes, HDR Engineering worked on a similar study in Tempe, Arizona that included the evaluation of parking, medians, and bicycle/pedestrian traffic.

Q: *Couldn't McCulloch Boulevard safety be improved by decreasing the angle of the parking spots to something less than 45 degrees?*

A: McCulloch Boulevard runs through a residential area in addition to the business area, as a result there is a lot of vehicular traffic. Improving safety would greatly depend on the design of the roadway in addition to changes to parking. Changing the angle of the parking spaces will not improve driver ability to park in the spaces correctly or make reversing out of the space safer.

Q: *How can you slow down traffic on McCulloch Boulevard?*

A: Traffic can be naturally slowed down by narrowing the width of the lanes. However, when doing so there needs to be a balance between the width of vehicular lanes and the width of bicycle lanes. If the vehicular lane is too narrow, it increases the width of the bicycle lane and visa versa. It is important to design bicycle lanes narrower than vehicular lanes to keep non-bicycle traffic out of the bicycle lanes.

Comment: *The angled parking is on the wrong side of McCulloch Boulevard. It needs to be on the other side.*

Response: Thank you for your comment.

Comment Form Responses

Transit

1. Do you use the existing transit system?

	Response	Percentage
Yes	0	0
No	9	100
Total:	9	100

2. In general, where does your trip originate and what is your destination?
   - It originates at 1905 S. Palo Verde and ends at 1695 Mesquite Avenue.
   - Home and all over town.
   - 1695 Mesquite Avenue – use either Swanson Avenue or Mesquite Avenue.
   - Home to work.

3. Do you have any comments regarding the recommended transit system alternatives?
   - I agree that moving transit lane to uptown is a smart effective move.
   - Like the idea of transit hub moved from present location to property at Pima Wash off McCulloch Boulevard. Current location is hidden and kind of scary.
   - We need to keep what we have and find a way to expand it.
   - If you go one way on Mesquite Avenue and Swanson Avenue to keep Capri, Riviera, and Smoketree open to cut through.
   - I am in favor of relocating bus terminal to uptown. Either Alternative 2 or 4.

Parking

4. Do you have general comments regarding parking in the corridor?
    - Parallel parking in uptown McCulloch would be a big benefit to the area as long as the "parking" in rear was improved upon.
    - Remove parking on McCulloch between Smoketree and Acoma. Add center medians and more trees to create a full canopy over the street. Have parking behind businesses.
    - Should be public, two-level parking structures instead of parking in common. The alley ways should be secondary streets, with no traffic on McCulloch between Smoketree and Acoma, a hard rail street car should run from the west side to the city buildings. McCulloch should be pedestrian only.
    - Limit parking on McCulloch.
    - The public is well aware of public transfer service. No need to change location. Personally don't think mainstreet needs anymore congestion or that type of traffic.
    - Trees in parking in common areas with well defined pedestrian access from street to buildings.
    - We will be losing 2 to 3 parking spaces on Swanson in front of our business, which we don't like. However, we would prefer Alternative 2, bike focus. This would allow for curbside deliveries.

Alternatives

5. The recommended Alternative may be a mixture of each alternative scenario. Responses on the following pages.

Other

6. Do you have any other comments?
    - Cannot remove stop signs. Residents and visitors cannot work four-way stops let alone a two way stop. One way couplet to start and end at Acoma and Lake Havasu Avenue is a great idea!
    - Accommodate ASU and provide bicycle and pedestrian access to Main Street. Swanson is very bleak add more landscaping and trees for shade with benches.
    - Businesses will lose money with Alternative 1. Drivers will only go down/up the streets they need to. This will stop spontaneous stop and shop.

Alternatives

5. The recommended Alternative may be a mixture of each alternative scenario.

Road	One-Way Couplet	Bicycle Focus	Medians and Roundabouts
Mesquite Avenue	• Favor • Alternative 3 • No • Mesquite is fully developed, not much we can do with it . Encourage more through traffic flow through this area • Too much congestion with events on/near the bridge with one-way traffic • No one way • No	• Favor • Alternative 3 • Needed • Yes • Favor • Yes • Yes	• Alternative 3 and roundabouts with medians • Not necessary • Okay to use • No median - cut access to small businesses at lower area • No medians • Yes
McCulloch Boulevard (west)	• Alternative 3 • No • Too much congestion with events on/near the bridge with one-way traffic. • No	• Favor • Alternative 3 • Needed • Yes • Favor • Yes • Yes	• Favor • Alternative 3 and roundabouts with medians • Could be great here • Okay to use • Favor • Already exists • Yes

Road	One-Way Couplet	Bicycle Focus	Medians and Roundabouts
McCulloch Boulevard (east)	• Alternative 3 • No • Too much congestion with events on/near the bridge with one-way traffic • No	• Favor • Alternative 3 • Needed • Yes • Favor • Yes to light at Smoketree. Love bike and parallel from Swanson via Pima. Good bike flow for students and tourists • Not necessary per Alternative • Yes	• Favor • Alternative 3 and roundabouts with medians and parking changes • Could be great here • Okay to use • Favor • Smoketree to Acoma – Eliminate parking and add center median to have full canopy of shade over street for year round use • Love roundabout and like parallel. • Extend sidewalks and slow traffic • Yes
Swanson Avenue	• Favor • Alternative 3 • No • Too much congestion with events on/near the bridge with one-way traffic • No one way • No	• Favor • Alternative 3 • Needed • Yes • Develop area to be very bicycle and pedestrian friendly between Smoketree and Acoma • Love bike access • Yes • Yes, first choice	• Alternative 3 • Not necessary • Okay to use • Favor • Love roundabout at Swanson. No roundabout at Mulberry. Love bike. • Possible roundabout at Swanson and Smoketree. No median • Yes, second choice

Emailed Comments Received

The following pages contain email comments received in response to the public meeting.

1. April 12, 2012 – Sent from Roger and Debra Fike
2. April 18, 2012 – Sent from Sean
3. April 19, 2012 – Sent from Paul and Sharon
4. April 20, 2012 – Sent from Bruce Hinman
5. May 3, 2012 – Sent from Alex Ross

Amy Rosar

From: Michele E. Beggs [MBeggs@azdot.gov]
Sent: Thursday, April 12, 2012 1:02 PM
To: Debra Fike
Cc: Amy Rosar
Subject: RE: McCulloch Corridor

Good afternoon, Debbie –
Thank you for your email regarding the McCulloch Corridor Study. We will have the study meeting materials posted to the website the week of April 23 (following our April 19 meeting): http://azdot.gov/mcculloch/ (the visioning workshop material is posted).

As you are aware, the study will serve as a guide for future community development, project funding, and project implementation. The study area includes Mesquite Avenue, McCulloch Boulevard, and Swanson Avenue between Lake Havasu Avenue and Acoma Boulevard. Transportation improvements to be evaluated include roadways, pedestrian, bicycle, parking and public transit. The final report is expected to be completed in fall 2012, and submitted to the City of Lake Havasu City for future implementation.

I will need to check with the City regarding your inquiry about a new bridge, as I'm not aware of that possible project discussion.

Also, for your information, here is a link to the news article about the upcoming meeting and study:
http://havasunews.com/articles/2012/04/12/news/doc4f865ccd29cd9304685321.txt

Sincerely,
Michele

Michele E. Beggs
ADOT Kingman District Senior Community Relations Officer
928.681.6054

From: Debra Fike [mailto:drrfike@aol.com]
Sent: Thursday, April 12, 2012 12:43 PM
To: Michele E. Beggs
Subject: McCulloch Corridor

Hi Michele,

We are property owners who own within the Study Area of the McCulloch Corridor. The property is located in the Sherlock Homes Condo area, corner of Swanson and Magnolia. We have received the postcards as to the Visioning Workshop and the Public Meeting. We live in Alaska and are travel dates are limited.

If you could please send us any info regarding this area. We are interested in the proposed traffic patterns of the streets involved.
A typical section and an overview plan sheet would be great. I realize this is all preliminary and might change. Also we have heard about a bridge that will eventually be built at the north end of the channel. Any info on that or is that way in the future?

Thank You so much for your time and effort on this project.

Debbie

Roger and Debra Fike
3311 Evergreen St.

Anchorage, Alaska 99504

drrfike@aol.com

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Amy Rosar

From: Michele E. Beggs [MBeggs@azdot.gov]
Sent: Wednesday, April 18, 2012 11:54 AM
To: Amy Rosar
Subject: Fw: Don't like one way street

From: Michele E. Beggs
Sent: Wednesday, April 18, 2012 11:49 AM
To: Ryan Harding; Bill Pederson
Cc: Teresa Welborn
Subject: Re: Don't like one way street

Thanks, Ryan - will be sure this comment is included in the PARA study team information.

From: Ryan Harding
Sent: Wednesday, April 18, 2012 11:40 AM
To: Michele E. Beggs; Bill Pederson
Cc: Teresa Welborn
Subject: FW: Don't like one way street

Hey guys, we received this email from a citizen regarding the McCulloch study in the Lake Havasu area. Wanted to bring it to your attention.

Thanks, Ryan

From: HINMAN [mailto:blhinman@citlink.net]
Sent: Wednesday, April 18, 2012 11:32 AM
To: ADOT News
Subject: Don't like one way street

I heard on the radio today that there was going to be a town hall this Thursday, pertaining to changing the direction of the streets on Swanson and Mesquite. I'm unable to attend so I'm writing instead.

Why do we need one way streets in a small town where there is little traffic? I like being able to go to McCulloch to do business, and then going left or right to either Swanson from McCulloch or Mesquite to the different business then down to the freeway. If there is one way street going east, I would have to go around the block to head west.

Please consider.

Sean

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Amy Rosar

From: Michele E. Beggs [MBeggs@azdot.gov]
Sent: Thursday, April 19, 2012 4:52 PM
To: Amy Rosar
Subject: Fw: McCulloch/Main Street

From: Charlie Cassens [mailto:CassensC@lhcaz.gov]
Sent: Thursday, April 19, 2012 04:45 PM
To: Michele E. Beggs
Subject: FW: McCulloch/Main Street

FYI

From: Mark Nexsen
Sent: Thursday, April 19, 2012 4:31 PM
To: 'dqhavasu@frontiernet.net'
Cc: Charlie Cassens
Subject: Fw: McCulloch/Main Street

Fyi

Mark S. Nexsen
Mayor, Lake Havasu City

From: psdietrich <psdietrich@msn.com>
To: Mark Nexsen
Sent: Thu Apr 19 15:32:05 2012
Subject: McCulloch/Main Street

We are full time residents but cannot make the meeting tonight regarding McCulloch/Main Street.

We feel that parallel parking from Smoketree to Acoma together with left turn lanes marked at all cross streets or intersecting streets would resolve the traffic issue. The ridiculous bumpouts are a hazzard and a waste of our taxes. A center median is ridiculous as well. We will always have j-walkers and center medians would just give them something to trip over. As for the speed, I feel that the speed limits are adhered to on McCulloch from Smoketree to Acoma better than anywhere else in the City, or the nation for that matter.

Strategically positioned pedestrian controlled red lights would resolve the pedestrian problem to some extent.

Closing the street and laying cobblestone is also ridiculous...here we are in April and are going to experience our 1st 100 this weekend. How many money spending pedestrians are going to be walking from Smoketree to Acoma for our 5 to 6 summer heat months?

You will loose what little spending there is if we have to go one way on Mesquite and the other on Swanson, especially with the gas prices as they are. Who wants to circle the entire area to get to one store or restaurant. We want to drive the shortest distance and park as close as we can to a business, whether it be on McCulloch or in the rear parking area, go into the business and move on to

*the next. People have mentioned misters...what good have they done in our **grand** Shopping Mall? They either make your hair friz or are blown away by the wind.*

I've heard of how quaint "closed to traffic Main Streets'"are in other areas. I wonder how many of those who think they are quaint really shop those quaint areas. Also, how many of those towns have the extreme long summer months and the winds that we have.

Parallel parking, left turn lanes and pedestrian controlled red lights are the answer.

Paul & Sharon

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Amy Rosar

From: Michele E. Beggs [MBeggs@azdot.gov]
Sent: Friday, April 20, 2012 10:06 AM
To: Amy Rosar
Subject: Fw: Lake Havasu city

For comments, I will send him an email to direct future comments to me.

From: Ryan Harding
Sent: Friday, April 20, 2012 08:38 AM
To: Michele E. Beggs
Cc: ADOT PIO; Bill Pederson
Subject: FW: Lake Havasu city

Michele,

Another comment on the McCulloch study in Lake Havasu. This is from the same gentleman who wrote in the other day. Perhaps you could contact him and let him know where he can send his comments so he will stop sending them to the news account.

Thanks, Ryan

From: HINMAN [mailto:blhinman@citlink.net]
Sent: Friday, April 20, 2012 8:31 AM
To: ADOT News
Subject: Lake Havasu city

I do not understand the need to change any streets in the downtown district to one way only.

I see no advantage yet many disadvantages:

- The plan will severely hinder public safety police and fire from having the most direct route to provide emergency services in the area.
- Heavy truck traffic servicing Safeway, Albertson's and food service multiple axel vehicles servicing the restaurant trade will need to make long circular routes thru the district to service their clients and exit the area.
- Customers seeking parking lot access to many stores larger retail stores (K Mart, Ross, supermarkets, banks, etc.) will need to make unnecessary circular diversions to gain access and exit the area on their way to and from their shopping locations.
- It will encumber any new college traffic going to and from classes and their residences.
- Access to the Hospital will be more difficult and take longer for ambulance and public traffic.

I see no advantages. We are a small town with limited traffic. We are not NYC or LA. One way streets in the down town area are not justified. Bad idea.

Bruce Hinman

Amy Rosar

From: Michele E. Beggs [MBeggs@azdot.gov]
Sent: Thursday, May 03, 2012 7:17 AM
To: Alex Ross
Cc: Amy Rosar
Subject: RE: McCulloch

Hello Alex,
Thanks for contacting us and providing input for the McCulloch Corridor Improvement Study. They will be taken into consideration as the study proceeds. The public meeting materials have been posted to the study website.
http://azdot.gov/MPD/Systems_Planning/McCulloch.asp

Thank you,
Michele Beggs
ADOT Kingman District Community Relations
928.681.6054

From: Alex Ross [mailto:alex.ross.b794@statefarm.com]
Sent: Wednesday, May 02, 2012 6:59 PM
To: Michele E. Beggs
Cc: don & donna callahan (dqhavasu@frontiernet.net); Regan Ross (rookiesllc@hotmail.com)
Subject: McCulloch

My thoughts regarding McCulloch Blvd.
In going to the ADOT web page – I do not see a comments area for this project.
So I hope this gets to the people necessary to evaluate my input.
I have attended the meetings and have had a business in this district of almost 40 years.

- A round about at Querio would be beneficial for people in need of doing a "u-turn" – especially if we go to parallel parking only – if going one way down the street and you see a parking space on the other, you would like the ability to turn around and go back – this is good for business. Currently with diagonal parking you can "u-turen" into a diagonal spot across the street – I still support diagonal parking with steeper angles.
- If we go to parallel parking only, we need to address parking limits – I suggest two hours – self regulated – start with a courtesy request and then move to parking meters

- The posted speed needs to be reduced to 20 – I would even go with 15.
- We need pedestrian signs – stop for pedestrians etc
- Flashing speed signs posting the speed people drive
- Round about traffic control at Swanson and Mesquite at Smoketree would help move cars during Main Street closures during special events as well as every day traffic
- If we continue to be successful in slowing down the traffic, we don't need medians
- No left turns at Mulberry or Media center at McCulloch
- Bollards along McCulloch to easily "block off" the street during events – this would save on city employees having to set up barriers and take them down

Thank you for your consideration.

Alex Ross

Alex Ross Insurance Agency Inc.
State Farm Insurance
2138 McCulloch Blvd.
Lake Havasu City, AZ 86403
Phone 928-855-7677
Fax 928-855-2539
web www.855ROSS.com
Email 855ROSS@855ross.com

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Appendix A: Notification Material

McCULLOCH CORRIDOR IMPROVEMENT STUDY

PUBLIC MEETING

Thursday, April 19, 2012
6:00 pm to 7:30 pm

The community is encouraged to get involved!

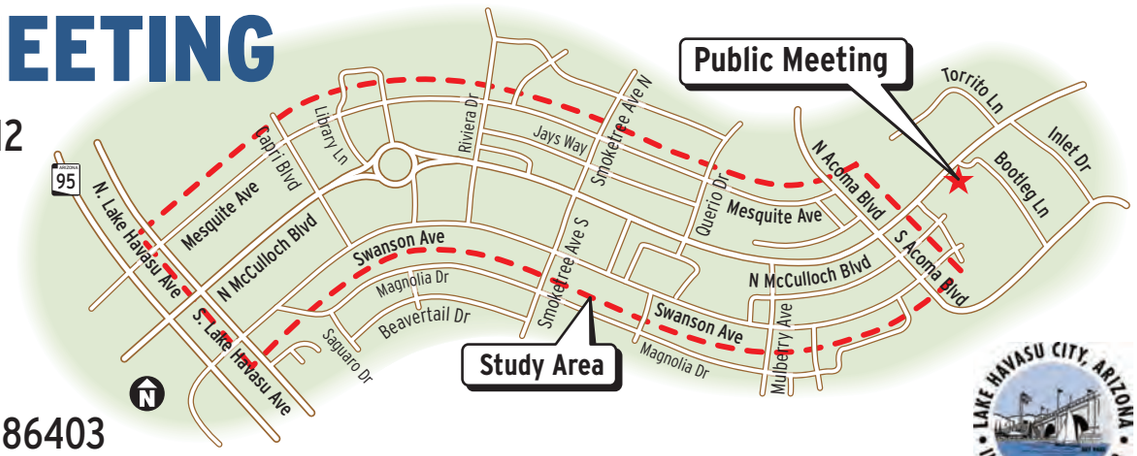
Attend the public meeting to learn about the study, provide your input, and discuss opportunities with project team members.

The Arizona Department of Transportation is working with the City of Lake Havasu City to study corridor improvements through the uptown area. Transportation improvements to be evaluated will include roadways, pedestrian, bicycle, parking, and public transit. The study will recommend corridor improvements and will serve as a guide for future community development, project funding, and project implementation.

PUBLIC MEETING

Thursday, April 19, 2012
6:00 pm to 7:30 pm

Lake Havasu City Council Chambers
2360 McCulloch Blvd.
Lake Havasu City, AZ 86403



For more information regarding this study, please contact Michele Beggs, ADOT Senior Community Relations Officer at mbeggs@azdot.gov or 928.681.6054. Persons with a disability may request a reasonable accommodation, such as sign language interpreter, by contacting Amy Rosar at amy@kdacreative.com or 602.368.9644.

LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978

ADOT
ARIZONA DEPARTMENT OF TRANSPORTATION

BE INVOLVED. ATTEND THE PUBLIC MEETING. PROVIDE YOUR THOUGHTS. PLAN FOR THE FUTURE.

Lay-KDA-LHCCorridor-Flyer.indd 1 4/2/12 11:01 AM

ARIZONA DEPARTMENT OF TRANSPORTATION AND THE CITY OF LAKE HAVASU CITY

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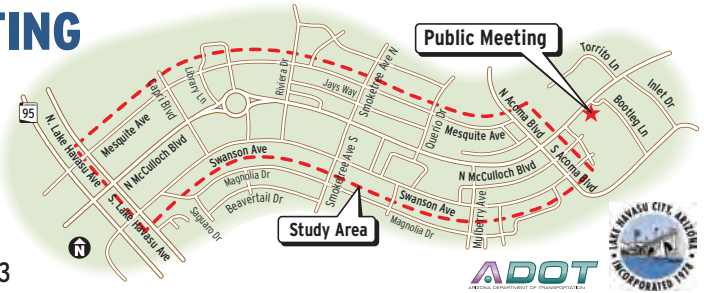

BE INVOLVED. ATTEND THE PUBLIC MEETING. PROVIDE YOUR THOUGHTS. PLAN FOR THE FUTURE.

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ARIZONA DEPARTMENT OF TRANSPORTATION AND THE CITY OF LAKE HAVASU CITY

McCULLOCH CORRIDOR IMPROVEMENT STUDY

PUBLIC MEETING

Thursday, April 19, 2012 · 6:00 pm to 7:30 pm

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LAKE HAVASU CITY COUNCIL CHAMBERS

Thursday, April 19, 2012 • 6:00 pm to 7:30 pm

2360 McCulloch Blvd. • Lake Havasu City, AZ 86403

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BE INVOLVED. ATTEND THE PUBLIC MEETING.
PROVIDE YOUR THOUGHTS. PLAN FOR THE FUTURE.

McCulloch Corridor
Improvement Study
c/o KDA Creative
4545 E. Shea Blvd., Ste. 210
Phoenix, AZ 85028

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ARIZONA DEPARTMENT OF TRANSPORTATION AND THE CITY OF LAKE HAVASU CITY

McCULLOCH CORRIDOR IMPROVEMENT STUDY
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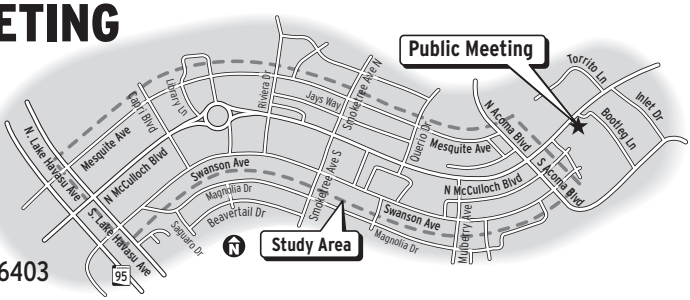

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ADOT
ARIZONA DEPARTMENT OF TRANSPORTATION

BE INVOLVED. ATTEND THE PUBLIC MEETING. PROVIDE YOUR THOUGHTS. PLAN FOR THE FUTURE.

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Appendix B: Public Meeting Material

McCulloch Corridor Improvement Study
Public Meeting #1: Comment Form

Thank you for your participation in the McCulloch Corridor Improvement Study. This comment form can be completed and submitted at the end of this meeting or sent in at a later date (information on reverse side). Please submit all comments by Friday, May 11, 2012.

TRANSIT

1. Do you use the existing transit system?

☐ Yes ☐ No

2. In general, where does your trip originate and what is your destination?

3. Do you have any comments regarding the recommended transit system alternatives? (See Transit Board)

PARKING

4. Do you have general comments regarding parking in the corridor?

TURN OVER FOR OPPORTUNITIES TO COMMENT ON ALTERNATIVES

Name:_____

Address:_____

Email Address: _____

Completion of this comment form is completely voluntary. Under state law, any identifying information provided will become part of the public record, and as such, must be released to any individual upon request.

McCulloch Corridor Improvement Study
Public Meeting #1: Comment Form

ALTERNATIVES

5. The Recommended Alternative may be a mixture of each alternative scenario. Please view the appropriate alternative map for details regarding the alternatives and provide your comments in the table below.

ROAD	ONE-WAY COUPLET	BICYCLE FOCUS	MEDIANS AND ROUNDABOUTS
Mesquite Avenue			
McCulloch Boulevard (west)			
McCulloch Boulevard (east)			
Swanson Avenue			

6. Do you have any other comments?

Completed comment forms can be submitted to the project team at the completion of the public meeting or mailed/faxed/emailed to the project team no later than Friday, May 11, 2012.

Mail: McCulloch Corridor
c/o KDA Creative
4545 E. Shea Blvd., Ste 210
Phoenix, AZ 85028

Fax: 602-368-9645
Email: mbeggs@azdot.gov

Completion of this comment form is completely voluntary. Under state law, any identifying information provided will become part of the public record, and as such, must be released to any individual upon request.

Lake Havasu City McCulloch Corridor Improvement Study

Public Meeting
April 19, 2012

Introductions

Study Team

ADOT Multimodal Planning Division

Matt Carpenter, Project Manager

ADOT Communication and Community Partnerships

Michele Beggs, Senior Community Relations Officer

Lake Havasu City

Jeff LeMire, Project Manager

Introductions, continued

Consultant Team

HDR Engineering, Inc.
Michael Gorton, Project Manager

Ben Spargo, Traffic Engineer

Laura Paty, Landscape Architect

KDA Creative
Amy Rosar, Public Involvement Specialist

Study overview

ADOT Planning Assistance for Rural Areas (PARA) Study

– study is funded by an ADOT grant

Today's agenda

Project Overview

Existing and Future Conditions

Recap Visioning Workshop

Roadway Alternatives

Developing a Recommended Alternative

What has led up to this study?

General Plan, 2002

- long-range vision for the city

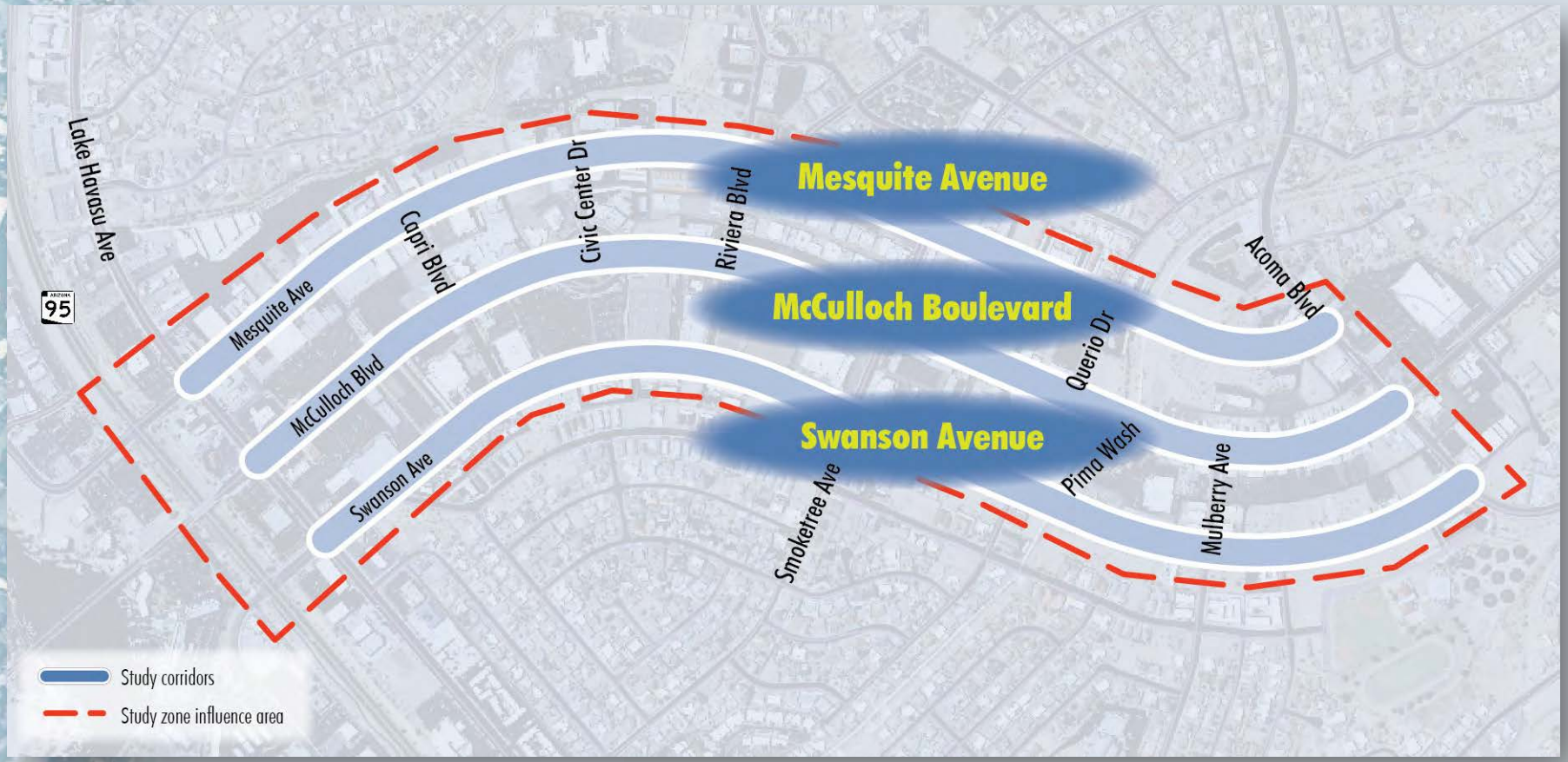
Small Area Transportation Study, 2005

- recommended a corridor study be completed for Mesquite/Swanson

Regional Urban Design Action Team Plan (R/UDAT), 2007

- community drive, design-oriented plan

Study area


Lake Havasu Ave
95
Mesquite Ave
Capri Blvd
Civic Center Dr
Riviera Blvd
Mesquite Avenue
McCulloch Blvd
McCulloch Boulevard
Swanson Ave
Swanson Avenue
Smoketree Ave
Pima Wash
Mulberry Ave
Querio Dr
Acoma Blvd
Study corridors
Study zone influence area

Purpose of the study

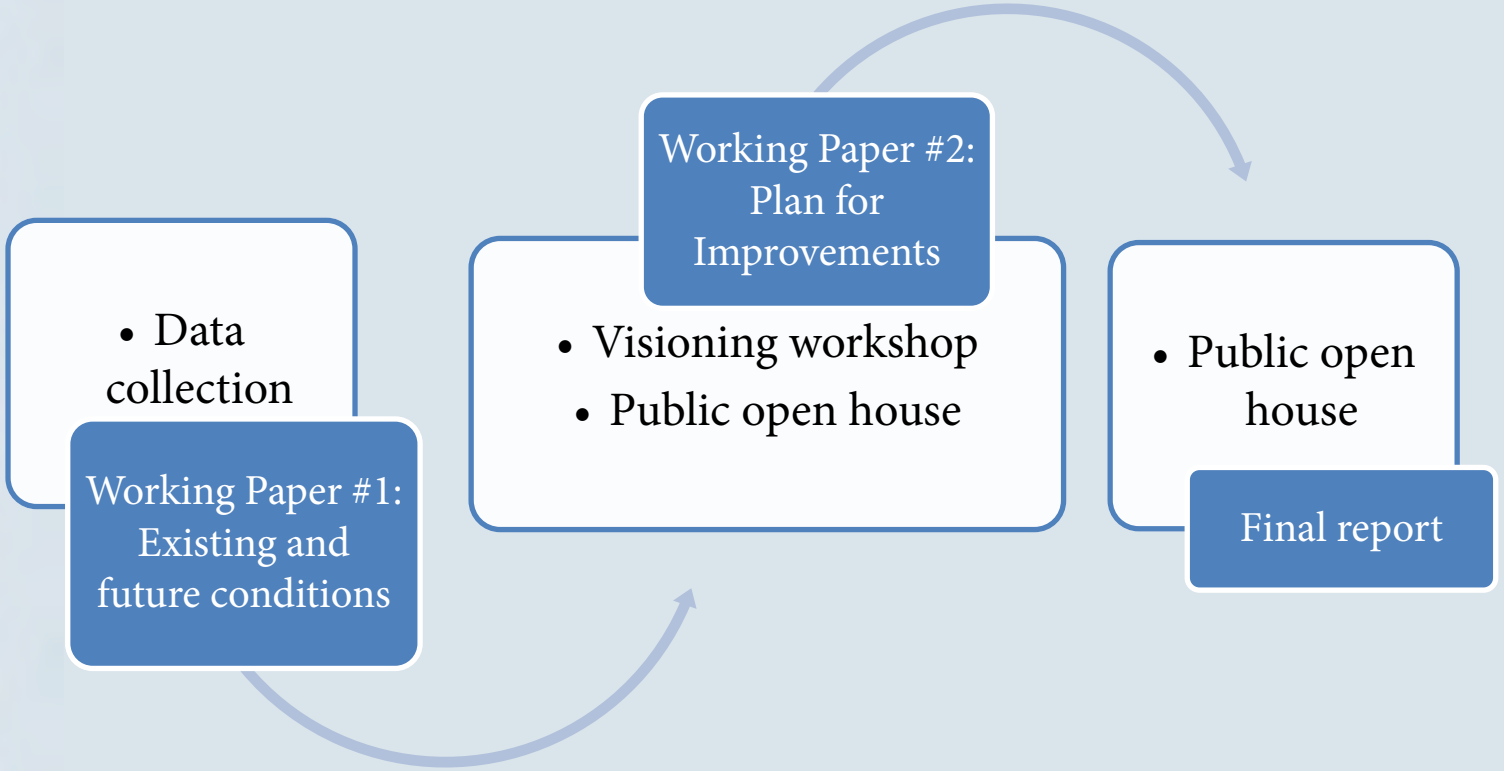
The purpose of the *McCulloch Corridor Improvement Study* is to:

- Validate recommendations in R/UDAT
- Identify priorities and projects to realize the vision

The study examines:

- Vehicular traffic
- Parking
- Public transit
- Streetscapes
- Pedestrian options
- Bicycle mobility

Study process



Existing and future conditions

Data collection:

- Traffic counts and transit ridership counts
- Parking and sidewalk inventory
- Socioeconomic and traffic/transit projections

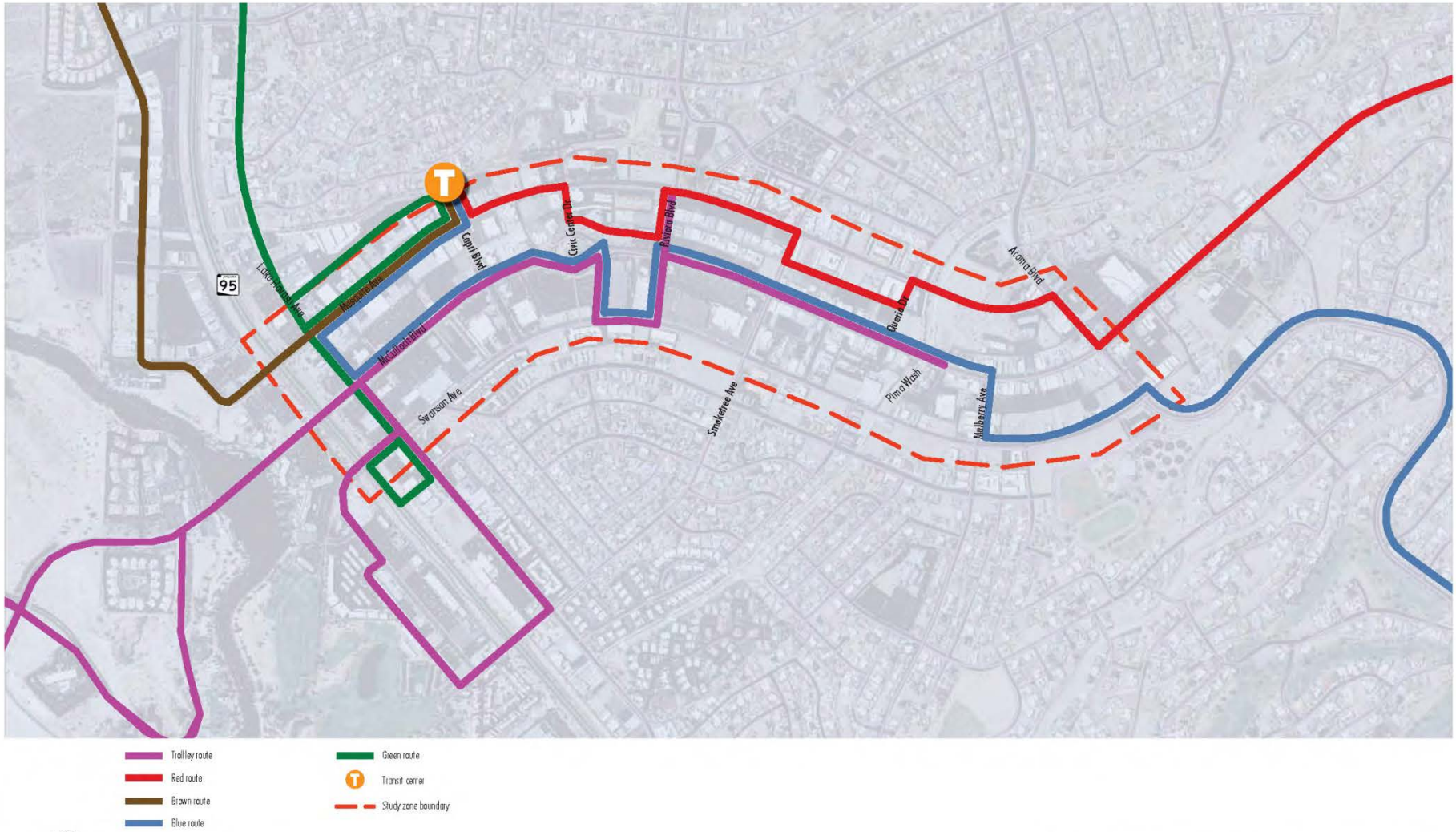
Assessment of existing and future conditions:

- Intersection, bicycle, pedestrian level of service

Results summarized in Working Paper #1:
http://www.azdot.gov/McCulloch

Fixed route transit service area

Figure 11 | Existing HAT System



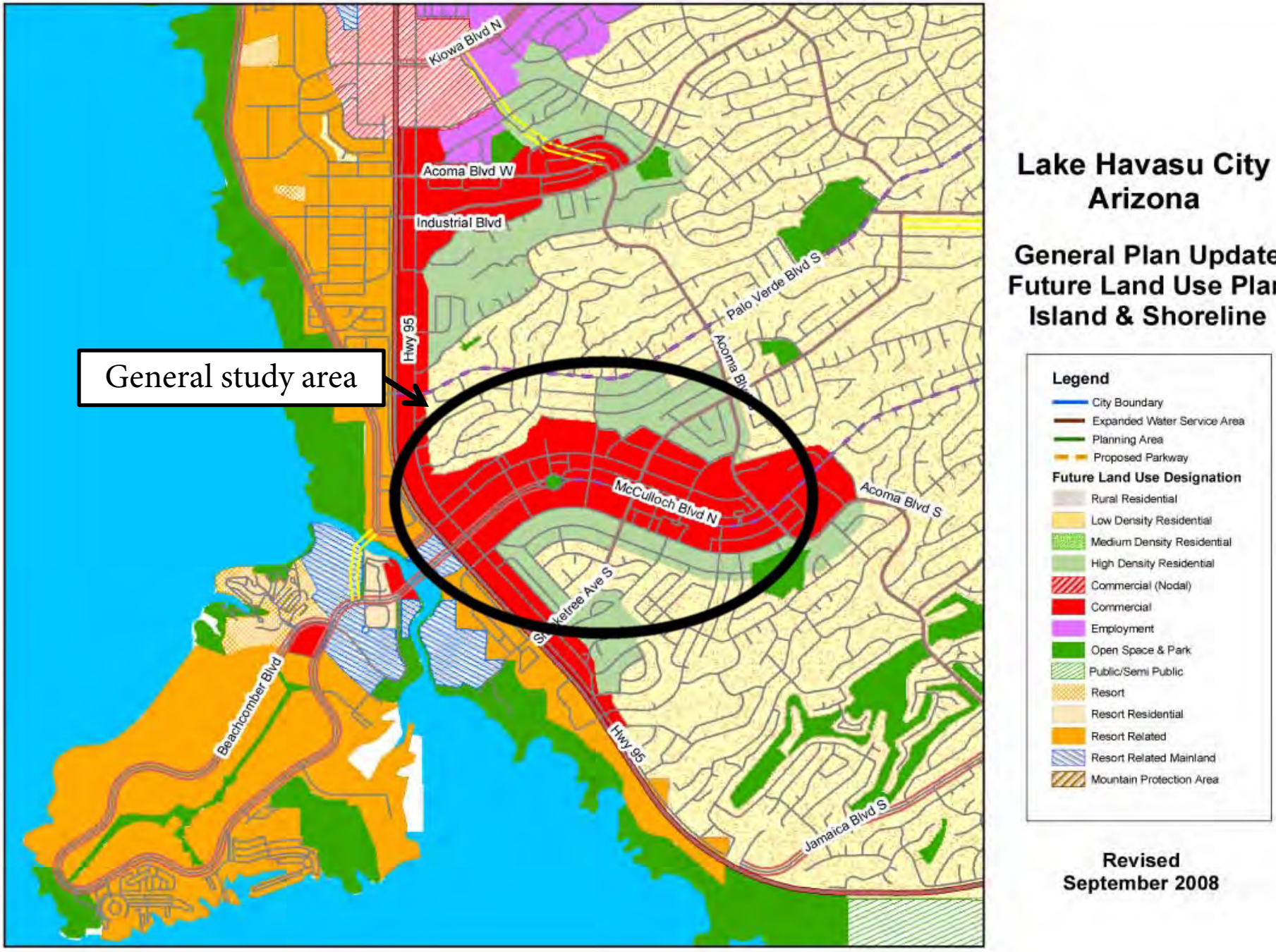
Transit conditions

Pedestrian and Bicycle Amenities

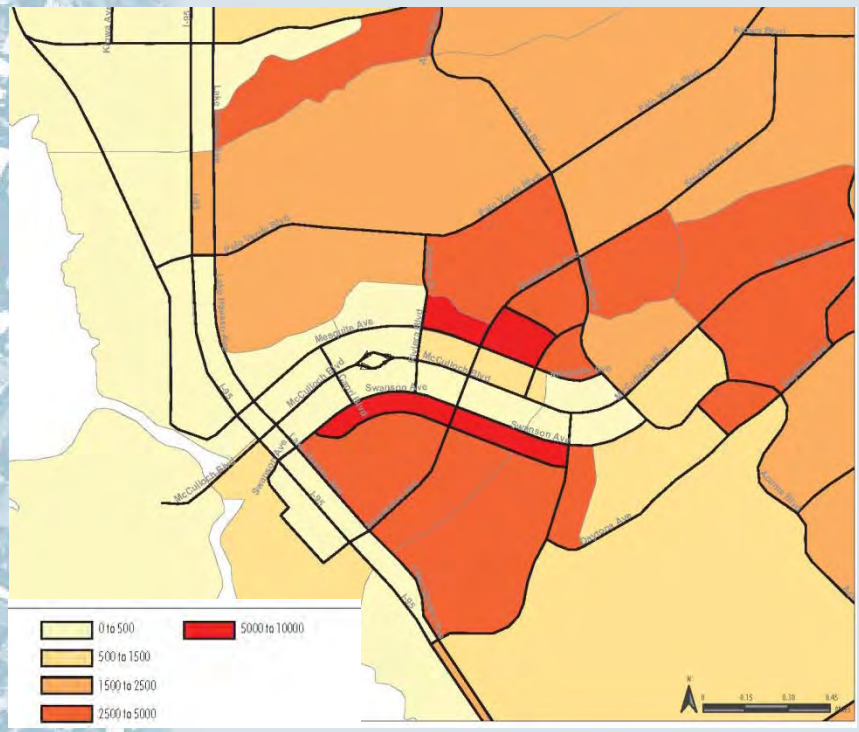
Existing Parking Conditions

Existing parking capacity and pedestrian access (Uptown)

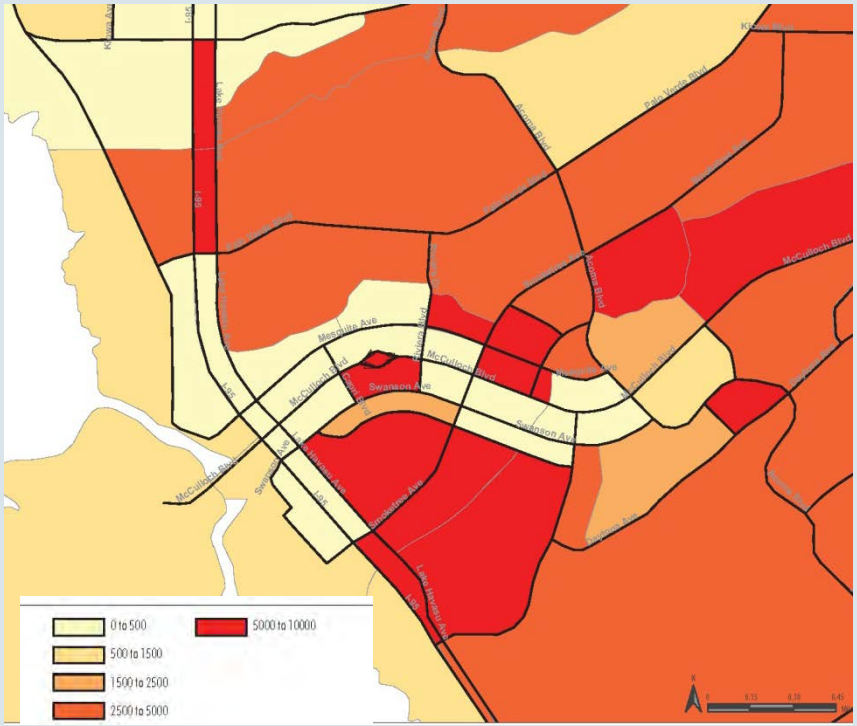
| Existing Parking Capacity and Pedestrian Access (Uptown)


General study area
Kiowa Blvd N
Acoma Blvd W
Industrial Blvd
Hwy 95
Palo Verde Blvd S
Acoma Blvd
McCulloch Blvd N
Acoma Blvd S
Beachcomber Blvd
Hwy 95
Jamaica Blvd S
Lake Havasu City
Arizona
General Plan Update
Future Land Use Plan
Island & Shoreline
Legend
City Boundary
Expanded Water Service Area
Planning Area
Proposed Parkway
Future Land Use Designation
Rural Residential
Low Density Residential
Medium Density Residential
High Density Residential
Commercial (Nodal)
Commercial
Employment
Open Space & Park
Public/Semi Public
Resort
Resort Residential
Resort Related
Resort Related Mainland
Mountain Protection Area
Revised
September 2008

Population density

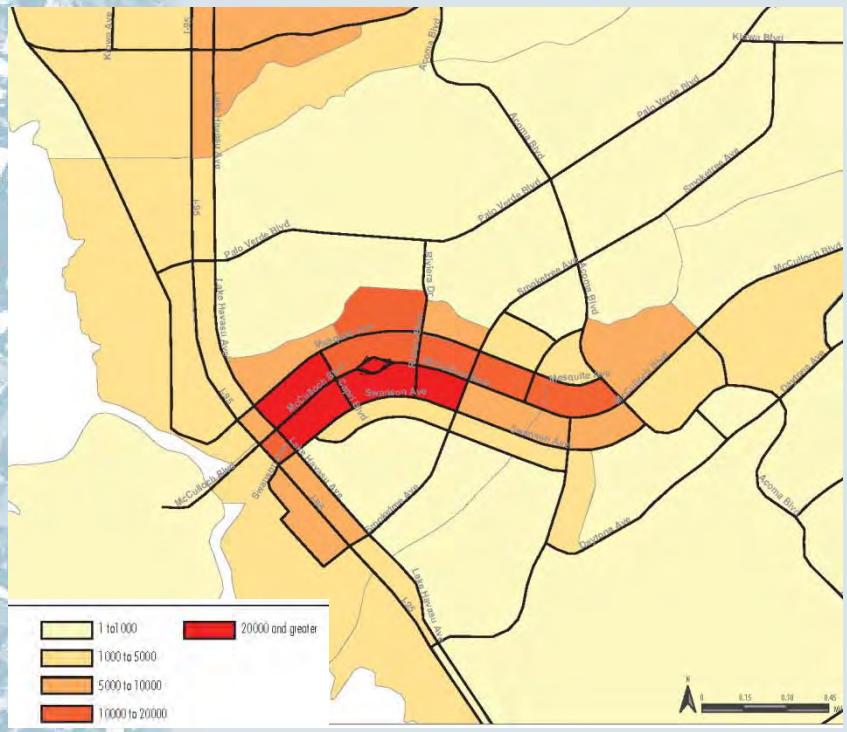


Existing population density

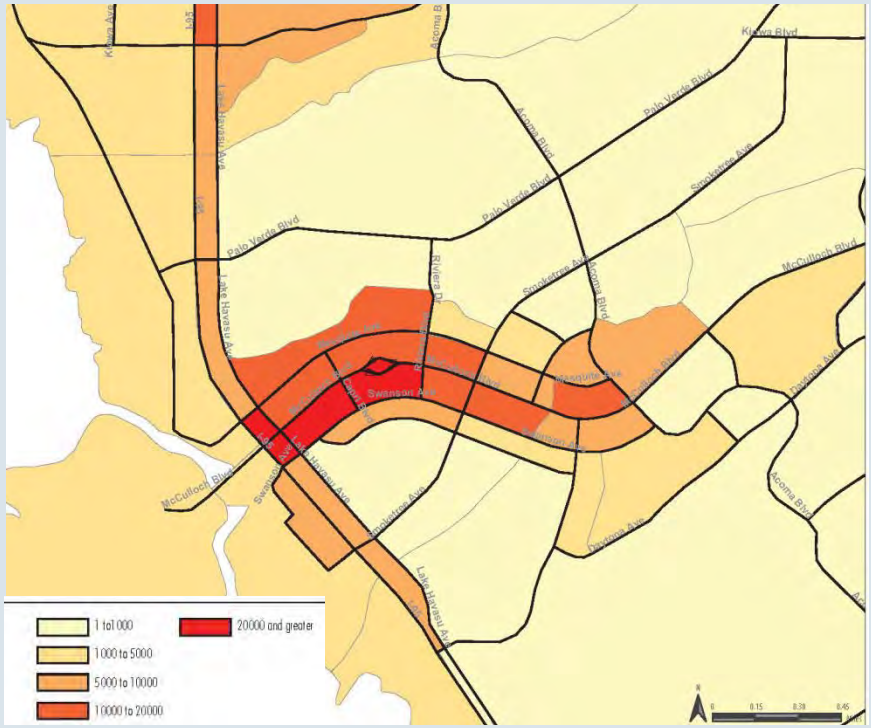


Future population density

Employment density



Existing employment density



Future employment density

Future traffic conditions

Failing intersections
Mesquite Avenue at Capri Boulevard
Mesquite Avenue at Civic Center Lane
Mesquite Avenue at Riviera Drive
Mesquite Avenue at Smoketree Avenue
Swanson Avenue at Smoketree Avenue
Swanson Avenue at Mulberry Avenue
Swanson Avenue at Acoma Boulevard

Visioning workshop

Held February 17, 2012

Breakout groups focused on:

- Getting to the corridor
- Getting through the corridor
- Getting around the corridor

Vision Statement:

Develop an aesthetically pleasing corridor that projects a sense of community in the downtown business area, as well as promoting multimodal transportation and addressing concerns related to property and business ownership, traffic flow, parking, and the new ASU population.

Corridor Characteristics

Mesquite Avenue

- Commercial corridor with hospital and medical offices

McCulloch Boulevard West

- Access to shopping, gateway to Uptown District

McCulloch Avenue East

- Uptown District, emphasis on pedestrian environment, slower traffic

Swanson Avenue

- Residential corridor with access to ASU

Three Themed Alternatives

- Three alternatives presented for each road section
- Final recommendation will be a hybrid of the alternatives
- Alternatives were developed to work within the existing road area
- Space tradeoffs include width of roadway, for travel lanes, bicycle lanes, sidewalks, landscaping

Lane Widths

- Alternative use consistent lane widths
  - Vehicle lanes: 11 to 13 feet
  - Bicycle lanes : 4 to 6 feet
- Standard vehicle lane is 12 feet wide
  - Too wide (> 14 feet) and speeds increase; too narrow (< 10 feet) and drivers don't use the lane reducing its capacity

Lane Widths

- Standard bicycle lane is 4 to 6 feet wide
  - Too wide (> 6 feet) and vehicles tend to use it as a lane or for on-street parking; too narrow (< 4 feet) and bicycles don't feel comfortable due to crowding with vehicles
- Existing lanes in the corridor vary greatly from road to road and section to section from 9 feet to as much as 18 feet.

Roadway Alternatives

Road	One-way Couplet	Bicycle Focus	Medians and Roundabouts	No Build
Mesquite Avenue	Bicycle lanes, two lanes westbound only	Bicycle lanes, one lane each direction, center turning lane	Two lanes east, one lane west, raised median divider	No change
McCulloch Boulevard (west)	No change	Bicycle lanes	No change	No change
McCulloch Boulevard (east)	North side landscaping	Bicycle lanes	Median landscaping	No change
Swanson Avenue	Bicycle lanes, two lanes eastbound only	Bicycle lanes, one lane each direction, landscape buffer	Bicycle lanes, one lane each direction, roundabout at Smoketree and Mulberry	No change

The Recommended Alternative will be a mixture of each alternative scenario

McCulloch Boulvard - Uptown

- All alternatives convert on-street parking to parallel parking throughout
  - Clean and consistent roadway section for visitors
  - Facilitates “Uptown” branding
  - Signify to drivers that slow speeds and attention to business patrons are expected

McCulloch Boulvard - Uptown

- Wider landscaping
  - Shifts the parking and lanes away from one side of the road and adds a wide area (8 to 10 feet) of new landscaping.
- Bicycle lanes throughout the area
- Landscaped median
  - raised median with landscaping (similar to the west end of McCulloch Boulevard) throughout the area

One-way couplet

Benefits

– Friendly streets with room for landscaped sidewalks and bicycle lanes
– Fewer traffic signals

Concerns

– Traffic operations at SR 95 and Lake Havasu Avenue intersections
– Circulation during major events

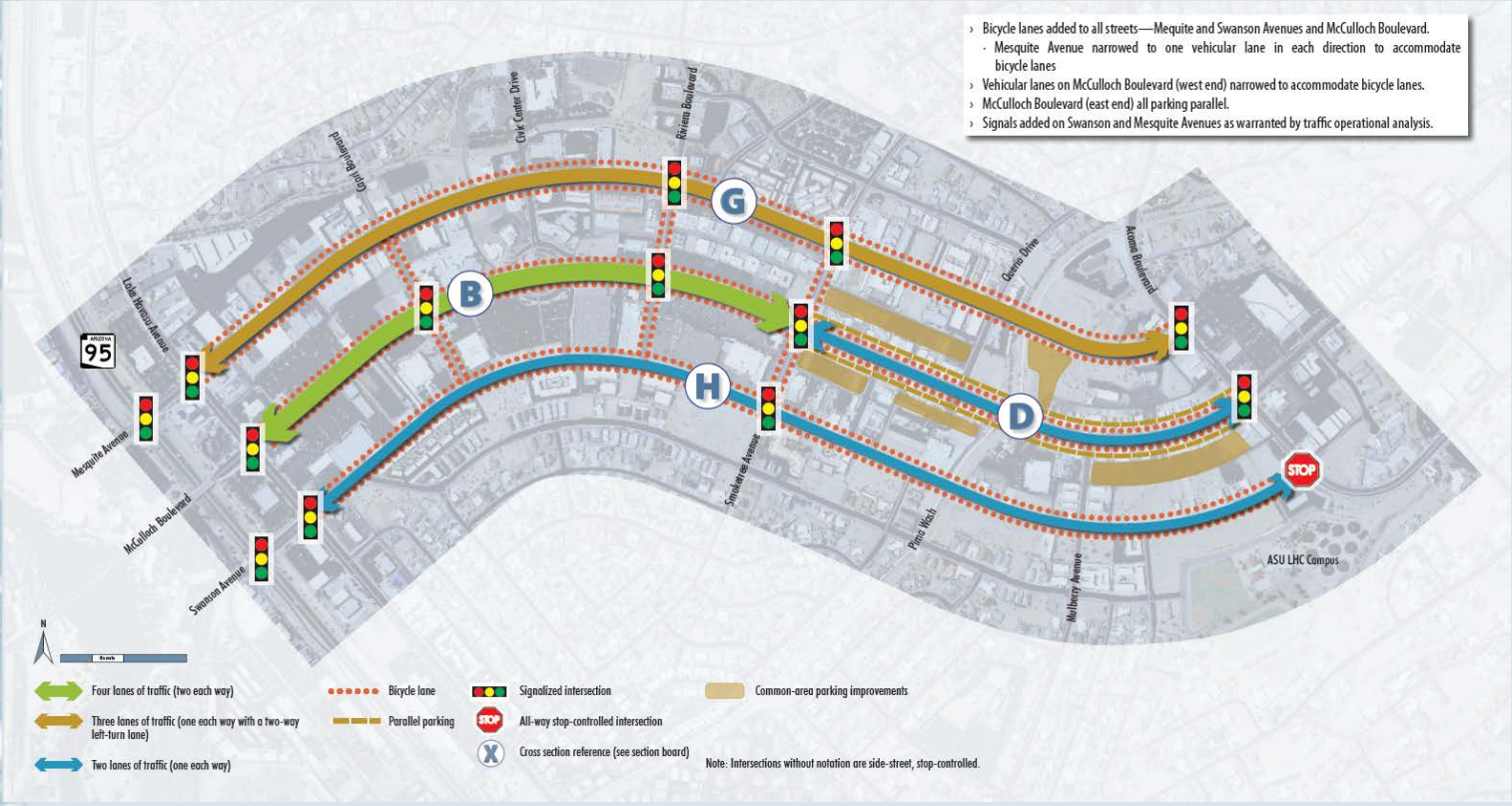
One-way Couplet

- Previous studies proposed converting Swanson and Mesquite avenues into one-way roads
- Benefits
  - Conversion of four-way intersections to three-way intersections improves operations, even with stop signs (eliminates the need for some signals)
  - Pedestrian safety is improved because of fewer conflicts (only from one direction)

One-way Couplet

- Concerns
  - Circulation could be hampered by a lack of through connections between the couplet
  - Traffic operations at Lake Havasu Avenue and SR 95 are extremely poor (LOS F)
  - Access to businesses would be modified and could require additional travel distance

Bicycle Focus



Benefits

- Comprehensive network of bike lanes from Acoma to Lake Havasu Avenue
- Narrower lanes can mean slower travel speeds

Concerns

- Reduces lanes along Mesquite Avenue to one in each direction
- Reduces lane widths on McCulloch Boulevard (west) from 14 to 11 feet

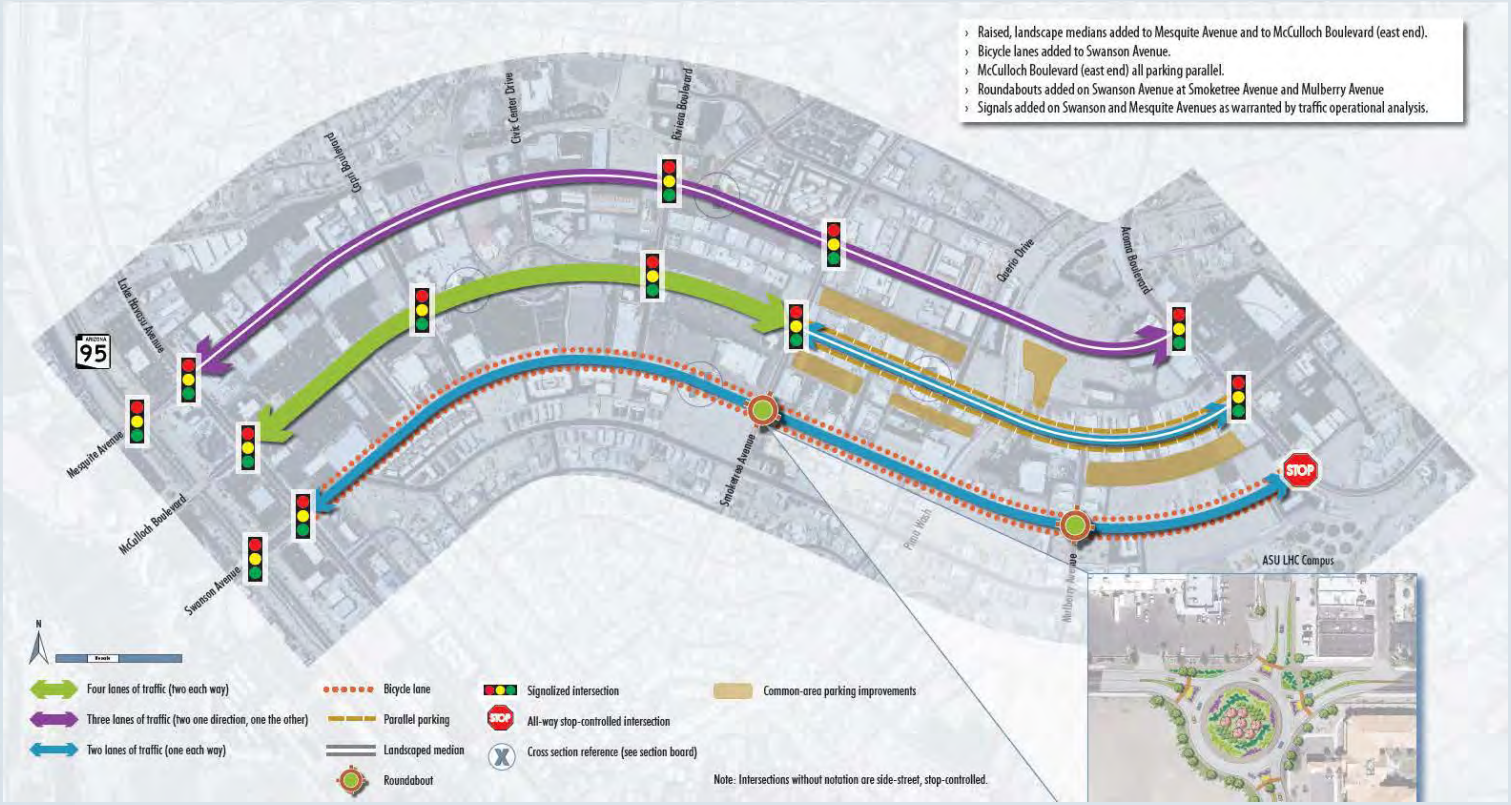
Bicycle Focus

- Adds bicycle lanes to almost every road in the study area.
- Tradeoff for the bicycle lanes is sometimes a vehicular lane, on-street parking, or narrower lanes
- Bicycle lanes improve pedestrian safety and comfort because they provide a buffer between the sidewalk and vehicular lanes

Bicycle Focus

- Modifies the intersection control to maximize traffic flow
- Converts some four-way stops to traffic signals
- Two-way stops to improve movement along the main roads (Swanson or Mesquite) and others are converted to signals.
- Traffic operations at good levels of service.

Medians and Roundabouts



Benefits

- Access control along Mesquite Avenue provided by raised medians
- Improved streetscape

Concerns

- Reduces lanes along Mesquite Avenue to one in each direction
- Roundabout traffic operations at Swanson and Smoketree Avenues

Medians and Roundabouts

- Mesquite Avenue
  - Converts the existing center two-way left-turn lane into a raised median similar to McCulloch Boulevard between Lake Havasu Avenue and Smoketree Avenue
  - Raised median provides aesthetics, but also controls the access into adjacent businesses.
  - Limiting the left-turning in and out of traffic, improves overall flow

Medians and Roundabouts

- Swanson Avenue
  - Very similar to the Bicycle Focus
  - Signalized intersections at Smoketree and Mulberry Avenues have been converted to modern roundabouts.
  - Roundabouts provide greater free flow movements and reduce delay during all times of the day

Transit Alternatives

- Stagger schedules to improve frequency on McCulloch
- Optimize trolley route to improve efficiency
- Relocate transit center to Uptown increasing public visibility
- Benefits to ASU campus

Uptown Transit Center

- Uptown Transit Center
  - Transit hub closer to the ASU campus
  - Nexus with Uptown shopping, Pima Wash trail
  - More visible to residents and tourists
  - Combine it with public parking and potential tranit-user retail options

Pedestrian/Bicycle Level of Service

- Factors include
  - width of sidewalk
  - Presence of buffer between the sidewalk and traffic lanes
  - Speed and volume of the vehicular traffic; and the frequency of trees (specific to pedestrians)
- Existing condition for most portions of the corridors is an acceptable C.

Parking in Common

- Provide city easements to maintain parking in common areas
- Redesign layouts for more efficient parking and to maximize number of spaces
- Add landscape and lighting
- Define pedestrian circulation routes to stores or pass-throughs to McCulloch
- Define loading areas

Non-Motorized Improvements

- Paint bicycle lanes (typically either blue or green) to differentiate them from the vehicular lanes
- Add bicycle amenities such as secure bick racks or lockers to encourage cycling
- Create landscape buffers between the sidewalk and travel lanes to increase pedestrian level of service

Streetscape Considerations

- Alternatives work within the confines of the existing curbs
  - did not want to rebuild streets
- Landscaped medians are visually nicer for the overall street appearance and vehicular drivers
  - control access if desired
  - do not improve the pedestrian and bicyclist levels of service

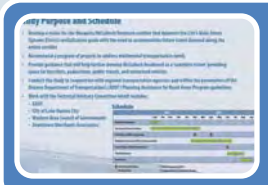
Streetscape Considerations

- Additional landscape (in particular trees) is recommended for all corridors on the back side of the sidewalks (other than Uptown McCulloch)
- Curb extensions were added at all intersections in the Uptown area
  - shorter crossing distance for pedestrians

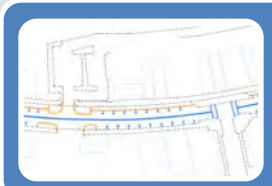
Next steps

- Menu of corridor options
- Develop evaluation criteria
  - Traffic operational performance
  - Agency and public support
- Identify the recommended alternative
- Prioritize projects to reach recommended alternative

Open house materials



Boards

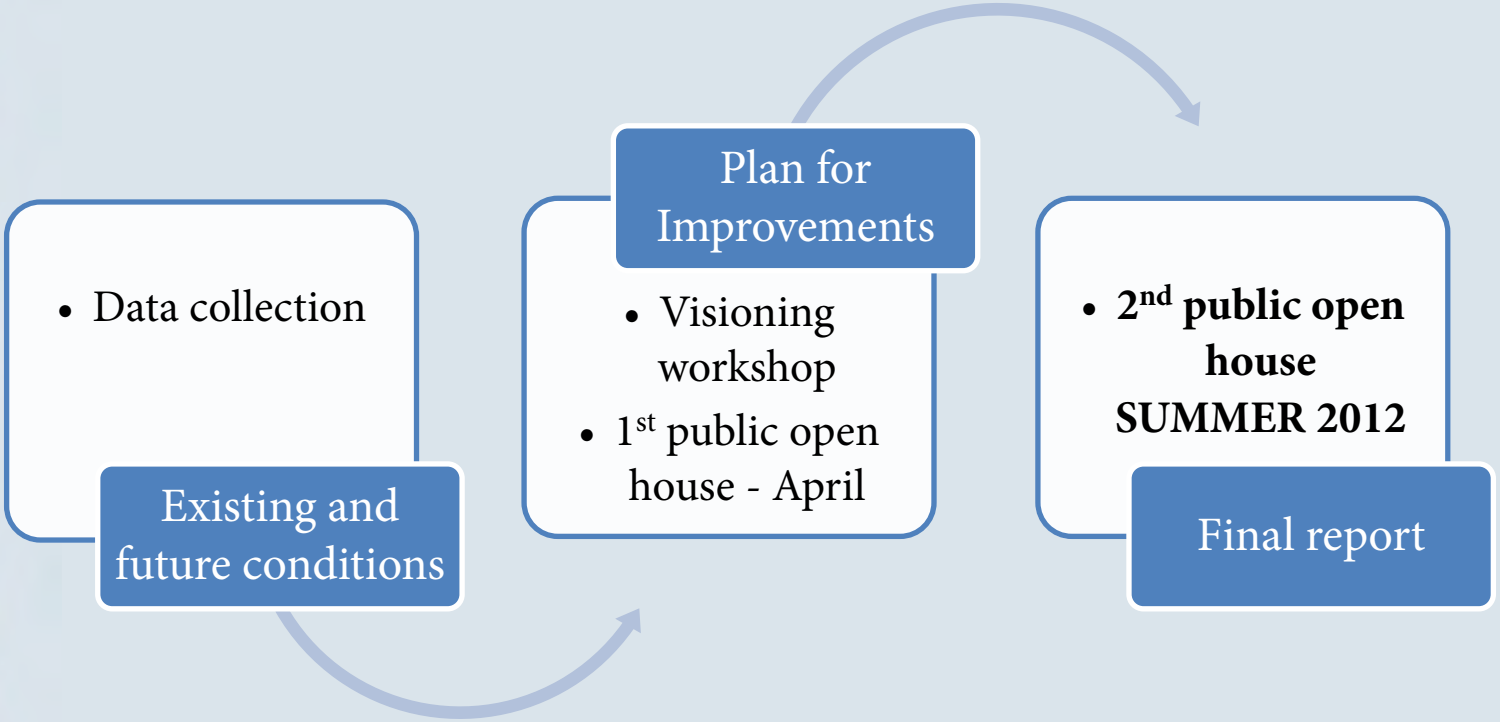


Alternative roll plots

Comment cards

Thank you!

Please plan to stay involved in the study.



WWW.AZDOT.GOV/MCCULLOCH

Appendix D: August 13, 2012, Public Meeting Summary

Arizona Department of Transportation
City of Lake Havasu City
McCulloch Corridor Improvement Study
Public Meeting #2 Summary
September 10, 2012

Study Background

The Arizona Department of Transportation (ADOT) is working with the City of Lake Havasu City to study corridor improvements through the uptown area. Transportation improvements evaluated included roadways, pedestrian, parking, bicycle and public transit. The study will recommend corridor improvements and will serve as a guide for future community development, project funding, and project implementation.

A public meeting was held on Monday, August 3, 2012 between 6:00 p.m. and 7:30 p.m. at the Red Onion Restaurant on McCulloch Boulevard. The purpose of the meeting was to present transportation improvement recommendations, including parking, transit, roadway, and pedestrian, to the community and stakeholders and to receive feedback.

Meeting Notification

Several outlets were used to help disseminate information regarding the Public Meeting throughout the community. Notification material can be found in *Appendix A: Notification Material*. ADOT did the following:

- Mailed approximately 400 postcard notices to property owners between Mesquite Avenue and Swanson Avenue and S. Lake Havasu Avenue and N. Acoma Avenue.
- Placed an advertisement in the *Today's News Herald* on Wednesday, August 8, 2012.
- Distributed media release the week of August 6 to local media outlets.
- Posted notification posters and stacks of fliers to the following locations:
    - Albertsons
    - Black Bear Diner
    - Daily Grind Coffee
    - Denny's
    - Golf USA
    - Havasu Lanes Bowling Alley
    - Kmart
    - Lake Havasu Aquatic Center
    - Lake Havasu City Hall
    - Lake Havasu Chamber of Commerce
    - Lake Havasu Police Department and Council Chambers
    - Lake Havasu Post Office
    - London Bridge Golf Resort
    - Mail and Business Center (McCulloch Boulevard and Smoketree Avenue)
    - Mohave County Library
    - Mohave County Senior Center
    - Safeway

- Subway
- Walgreens

Meeting Summary

Matt Carpenter, ADOT Multimodal Planning Division Project Manager, welcomed and thanked attendees for their participation in the study. He briefly introduced the study team, explained the Planning Assistance for Rural Areas (PARA) program. Michael Gorton, HDR Engineering Project Manager, presented the study area, purpose, process, corridor characteristics and roadway alternatives. Ben Spargo with HDR Engineering, presented the corridor recommendations for parking, signing and branding, transit, nonmotorized, and traffic operations. He presented the recommendations for short-, mid-, and long-range improvements. Mr. Gorton concluded the presentation by opening up to a question and answer session. The following is a summary of that discussion. All material from the public meeting can be found in *Appendix B: Public Meeting Material*.

Question and Answer Session

Q: *Are bicycle lanes used only cyclists? There does not appear to be a great need for bicycle lanes.*

A: Bicycle lanes do provide a route for cyclists, as well as providing an buffer between motorized traffic and pedestrians. Bicycle lanes allow the corridor to be more pedestrian friendly.

Q: *Would on street parking be eliminated along McCulloch?*

A: Yes, some parking would be eliminated to utilize the existing pavement for bicycle lanes.

Q: *Will the information presented this evening be posted online?*

A: Yes, all information presented will be published on the study website at www.azdot.gov/mcculloch.

Q: *In previous meetings, roundabouts were presented as options. What happened to the roundabouts? They are not included in the recommendations.*

A: Roundabouts were considered for the intersections of Mulberry Avenue and Smoketree Avenue on Swanson Avenue. After further analysis, the roundabout presented at Mulberry Avenue and Swanson Avenue would not operate efficiently and the roundabout at Smoketree Avenue and Swanson Avenue did not have enough traffic to warrant this type of intersection. Therefore the roundabouts are not included in the recommendations.

Q: Will there be a raised median on McCulloch Boulevard between Lake Havasu Avenue and Acoma Boulevard?

A: A median is recommended on McCulloch Boulevard between Smoketree Avenue and Acoma Boulevard in the long-range improvements.

Q: Where is the City owned parking lot located?

A: At this time the City owns a vacant lot adjacent to Mesquite Avenue and the wash. This could potentially become a parking lot.

Q: Why are bicycle lanes being considered? What previous studies have suggested bicycle lanes?

A: This study builds upon previous study recommendations including the Regional/Urban Design Assistance Team (R/UDAT). The R/UDAT looked at shaping the uptown into a multimodal corridor. Multimodal encourages pedestrian, bicycle, and other nonmotorized mobility, in addition to motorized modes of transportation.

Q: Does this study assume that the new Arizona State University (ASU) campus will bring more pedestrian traffic?

A: Students attending ASU may change the dynamic of the uptown area. It can also have an impact on the demand for public transit.

Q: All the common parking areas are currently privately owned. How do you anticipate encouraging participation from those owners who do not wish to participate?

A: That cannot be answered at this time. It will be a challenge that the City staff will need to work on individually with the owners if and when this plan is adopted implemented.

Q: Has the relocation of the transit transfer center been discussed with the City?

A: Yes.

Q: If you remove parking along McCulloch Boulevard, where will people park?

A: Not all parking would be eliminated on McCulloch. The existing diagonal parking would become parallel parking. There will also be parking located behind buildings and businesses. This would allow customers to park closer to the businesses and provide easier access.

Q: At what point would diagonal parking be removed on McCulloch Boulevard?

A: At this time, funding and implementation of the recommendations has not been identified.

Q: Where do you anticipate funding to come from for the long-range improvements?

A: Acquiring funding has not been addressed at this stage of the study. There are many opportunities to acquire funding through different programs and organizations. These options will need to be considered at a later date.

Q: *How do we solve the parking in common issue?*

A: At this time, the solution is unknown. The completion of this study will help guide future decisions regarding the in common parking.

Q: *Can the City use this study to prepare for grant applications and funding opportunities?*

A: Yes.

Q: *Does this study only provide recommendations and associated costs?*

A: Yes, this study will provide recommendations and costs for these recommendations at the planning level. The actual costs would need to be calculated at a later date when more detailed designs and plans have been completed.

Q: *Will costs to make the improvements be passed onto the owners of the businesses?*

A: That is unknown at this time as funding sources have not yet been identified.

Q: *I worry about bicycles competing for space with motorized traffic and cars parking parallel on McCulloch Boulevard.*

A: The design of McCulloch Boulevard will naturally slow down traffic because the width of vehicle lanes will be narrowed. This helps to protect pedestrians.

The following are comments provided during the Question and Answer Session.

Comment: *I do not see a benefit to the businesses by adding bicycle lanes. It is too hot in Lake Havasu City and there are not a lot of bicycles in the summer.*

Comment: *There are several multiuse paths located throughout the City that interconnect. I think that these recommendations would complement the existing system.*

Comment: *There was an article written by the Arizona Republic that describes a trend with younger generations and their preference for nonmotorized transportation.*

Comment: *There are three new bicycle shops opening on Swanson in the upcoming months. This shows that there is a greater demand for nonmotorized transportation.*

Comment: *There should be more focus on constructing bike lanes along Swanson Avenue instead of McCulloch Boulevard.*

Comment: *The recommendations presented in this study have been excellent. It has addressed all of my concerns.*

Comment: *In the short-range, traffic signals should be adjusted so that they are properly synced with one another.*

Comment Form Responses

1. Please provide your comments regarding the **roadway** recommendations.
    - No center medians near Lake Havasu Avenue. Boat trailers prove to be dangerous and accident prone.
    - Great plan!
    - Good for very long term planning.
    - The clientele of Sharon Medical Supply is 90% senior citizens with mobility limitations. On-street parking in front of our store is vital to our business.
    - I worry about the safety of the bikers as vehicles cross over the bike lane going to and from parking spaces. Maybe widen sidewalks to incorporate a bike lane that won't conflict with vehicles.
    - Looks good. Very glad there are no roundabouts.
    - Looks and sounds good. Parking looks improved – great public parking. No roundabouts are good.

2. Please provide your comments regarding the **nonmotorized** recommendations.
    - Provide more shade to encourage more nonmotorized activities. Improve Pima Wash multiuse path, more space for landscaping, rest stops, tables, benches, and more opportunities for events.
    - Great plan!
    - Maybe on a limited basis on Swanson. Let's see what happens with ASU.
    - Very important for now and future. Excellent on planning bike lanes and connectors to existing non-motorized pathways.
    - Excellent on bike lanes and improved pedestrian walkways.

3. Please provide your comments regarding the **transit** recommendations.
    - Ok.
    - Transit at parking lot.
    - Great plan to move location of hub.
    - Plans look good. Moving hub to uptown area makes sense.

4. Do you have any additional comments you would like to share with the project team?
    - Storm water runoff.

- Provide plenty of room for landscaping at mature size. Desert species, planting medians, and shade on all avenues. Landscape alleys more presentable.
- I agree that the city can no longer have a "hands off" policy regarding downtown parking.
- Cleaning up and landscaping the area is vital.
- The wayfinding signage plans need to be coordinated with the Lake Havasu Convention and Visitor's Bureau which now has a wayfinding signage initiative underway. It will be going out for bid to contractors in September or October.
- Overall good work on plans.
- From the first meeting and plans it appears that a lot of work has gone into this project.

Emailed Comments Received

The following pages contain email comments received in response to the public meeting.

1. August 14, 2012 – Sent from Holly Dove
2. August 14, 2012 – Sent from Janet Fotino
3. August 26, 2012 – Sent from Jean Burns

Amy Rosar

From: Amy Rosar
Sent: Wednesday, August 29, 2012 2:11 PM
To: 'phdove@yahoo.com'
Cc: 'Michele E. Beggs'
Subject: FW: McCulloch Upgrade

Ms. Dove –

Thank you for your interest in the McCulloch Corridor Study. The study team has received your comment and is considering all comments submitted.

Amy Rosar
KDA Creative
Please note our new mailing address:
3217 E. Shea Blvd., #620
Phoenix, AZ 85028
602-318-9332 (cell)
602-368-9644 (office)

From: Michele E. Beggs [mailto:MBeggs@azdot.gov]
Sent: Tuesday, August 14, 2012 9:16 AM
To: Amy Rosar
Subject: Fw: McCulloch Upgrade

From: Holly Dove [mailto:phdove@yahoo.com]
Sent: Tuesday, August 14, 2012 09:09 AM
To: Michele E. Beggs
Subject: McCulloch Upgrade

Dear ADOT Rep;

It was tooo hot to go to the Red Onion meeting Monday so here are my concerns.

I live on Swanson and benefit from having it as a two way street and would like it to remain as such.
Also, with all the Main Street Fairs; Car shows, Bike shows, Boat shows, Big Boy Toy Shows, Winter Fest, Halloween, New Year's Night Out, etc. and my new proposal to the Main Street Association of having a Wes Humphrey Night (a non-profit/Free music night for the city) we need to

keep Swanson and Mesquite two way streets to ease traffic flow. It may mean Swanson will carry most of that burden with ASU up and running.

And, please, add two STOP signs on Swanson at the intersection with Riviera so driveway drivers can get out more safely. It needs them NOW. I've seen a couple of near misses.

Thank you for listening.

Many Blessings,
Holly Dove, 928-302-1405 phone/fax.

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Amy Rosar

From: Amy Rosar
Sent: Thursday, August 30, 2012 2:10 PM
To: 'azfotinos@frontiernet.net'
Cc: 'Michele E. Beggs'
Subject: FW: McCulloch Corridor

Ms. Fotino –

Thank you for your interest in the McCulloch Corridor study. The study is recommending to extend all left turn bays at intersections along McCulloch Boulevard between Lake Havasu Avenue and Smoketree Avenue. We appreciate your comments.

Amy Rosar, on behalf of ADOT Communication and Community Partnerships Division
KDA Creative

From: Michele E. Beggs [mailto:MBeggs@azdot.gov]
Sent: Tuesday, August 14, 2012 8:08 AM
To: Amy Rosar
Subject: Fw: McCulloch Corridor

From: Janet Fotino [mailto:azfotinos@frontiernet.net]
Sent: Tuesday, August 14, 2012 07:52 AM
To: Michele E. Beggs
Subject: McCulloch Corridor

I just read the article in the Today's NewsHerald about improving McCulloch Blvd in Lake Havasu City. I would like to add to the list. The left-hand turning lane bay going up McCulloch at Smoketree (East? Heading toward Mesquite) really needs to be extended. I don't know if this has been mentioned in the past, but I have noticed for years this needs to be done. It isn't as noticeable in the summer months, but when the snow birds arrive, I some times have to wait for 3 green lights to even get into the left turn lane. (I live in that direction). My thinking in the past was maybe they didn't want folks to turn left, but to go straight up McCulloch, but it really is a problematic area. There are a couple of palm trees that may have to be moved/ removed if the lane is extended. I think this would help the flow of traffic in that area.

Thank you,

Janet Fotino

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Amy Rosar

From: Amy Rosar
Sent: Wednesday, August 29, 2012 2:20 PM
To: 'ganjburns@gmail.com'
Cc: 'Michele E. Beggs'
Subject: FW: Re:

Ms. Burns –

Thank you for your interest in the McCulloch Corridor Study. The study team has received your comment and is considering all submitted. All information from the recent August 13 public meeting has been posted to the study website at www.azdot.gov/mcculloch.

The ADOT representative for Lake Havasu City is Michele Beggs, ADOT Senior Community Relations Officer. She can be contacted directly at mbeggs@azdot.gov or 928.681.6054.

Please do not hesitate to contact us with any additional questions.

Amy Rosar, on behalf of ADOT Communication and Community Partnerships
602-368-9644

From: Michele E. Beggs [mailto:MBeggs@azdot.gov]
Sent: Wednesday, August 29, 2012 12:21 PM
To: gmoberly@havasunews.com
Cc: Amy Rosar
Subject: Re:

Thank you Greg.
Michele

From: Gregory Moberly [mailto:gmoberly@havasunews.com]
Sent: Wednesday, August 29, 2012 10:47 AM
To: Michele E. Beggs
Subject: FW:

These folks sent their comments on the McCulloch Corridor to me. Here they are.

Thanks,

Greg Moberly
gmoberly@havasunews.com
453-4237 ext. 241

From: Gene & Jean Burns [mailto:ganjburns@gmail.com]
Sent: Sunday, August 26, 2012 6:27 PM
To: Gregory Moberly
Subject:

TO WHOM IT MAY CONCERN !

I hope our views on the improvement of McCulloch will be considered because my husband and I will be out of town until September 5, 2012. Its my understanding that we can't send in our views until after the town meetings. Will I be heard?

I was unable to get any information via email because of my limited computer savvy. We will not be leaving town until Friday, August 30, so is there any way I could get some guidance, or any helpful information.

I was very pleased to see the ideas that DOT put forth last week. That is:

1. Widen the streets to provide room for the bikers. (Brilliant idea to accommodate ASU students.)

2. Extra exits for cars is a novel idea from McCulloch to accommodate the older people.

3 To stop all automobile traffic on McCulloch is a SURE way to see the street dry up. (We have transferred around from CA., Idaho, back to CA., to Colo, finally settling in AZ. and have seen downtown areas die out, and move to the malls because of NO TRAFFIC being allowed on the main drag. Who would ever see the new businesses that you're trying to promote.)

4. Slow the traffic down by posting 25 MPH signs. (I have not seen the traffic speeding through; however, if it occurs, that does not enable people to locate the store they want.)

Is there a chance that you would call to let know if there's another way, or person, whom I could approach. I've heard other suggestions over the past 25 years, but most of them were to have something like they left in CA. rather than the slower pace, less speed, less traffic, more events on OUR boulevard, rather than loose the charm it can have with the proper decisions.

My phone #: 855-0189 A reply would be so special. Thanks for your "ear". God bless.

Jean Burns

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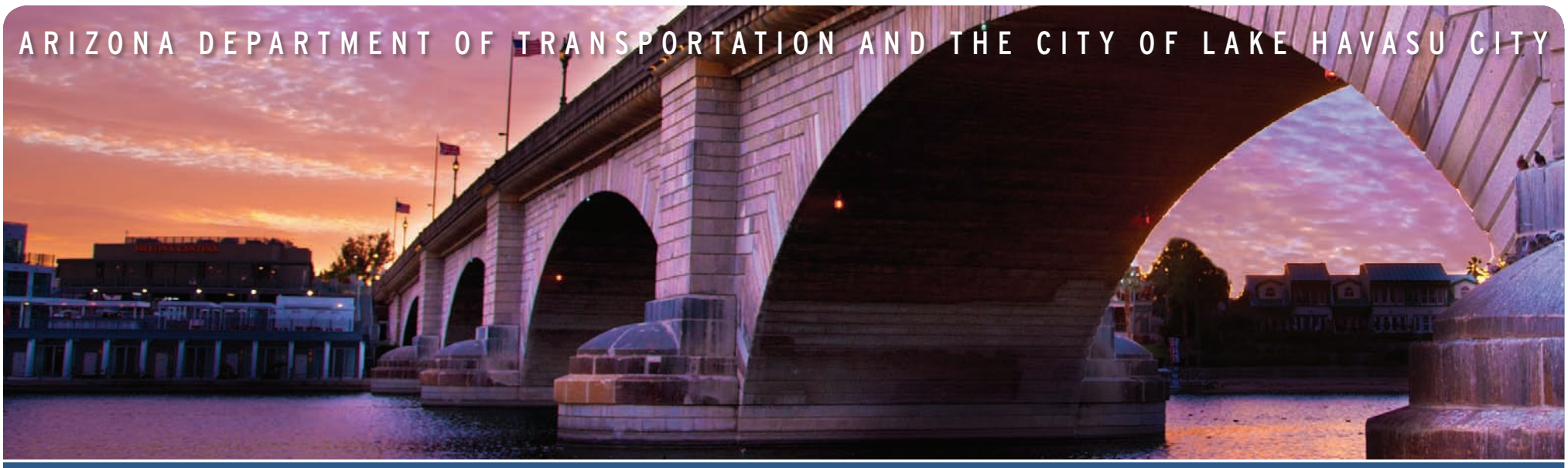
Appendix A: Notification Material



McCULLOCH CORRIDOR IMPROVEMENT STUDY

PUBLIC MEETING

Monday, August 13, 2012 **6:00 pm to 7:30 pm**

The community is encouraged to get involved!

Attend the public meeting to review corridor recommendations, provide input, and discuss opportunities with project team members.

The Arizona Department of Transportation is working with the City of Lake Havasu City to study corridor improvements through the Uptown District. Transportation improvements to be evaluated will include roadways, pedestrian, bicycle, parking, and public transit. The study will recommend corridor improvements and will serve as a guide for future community development, project funding, and project information.

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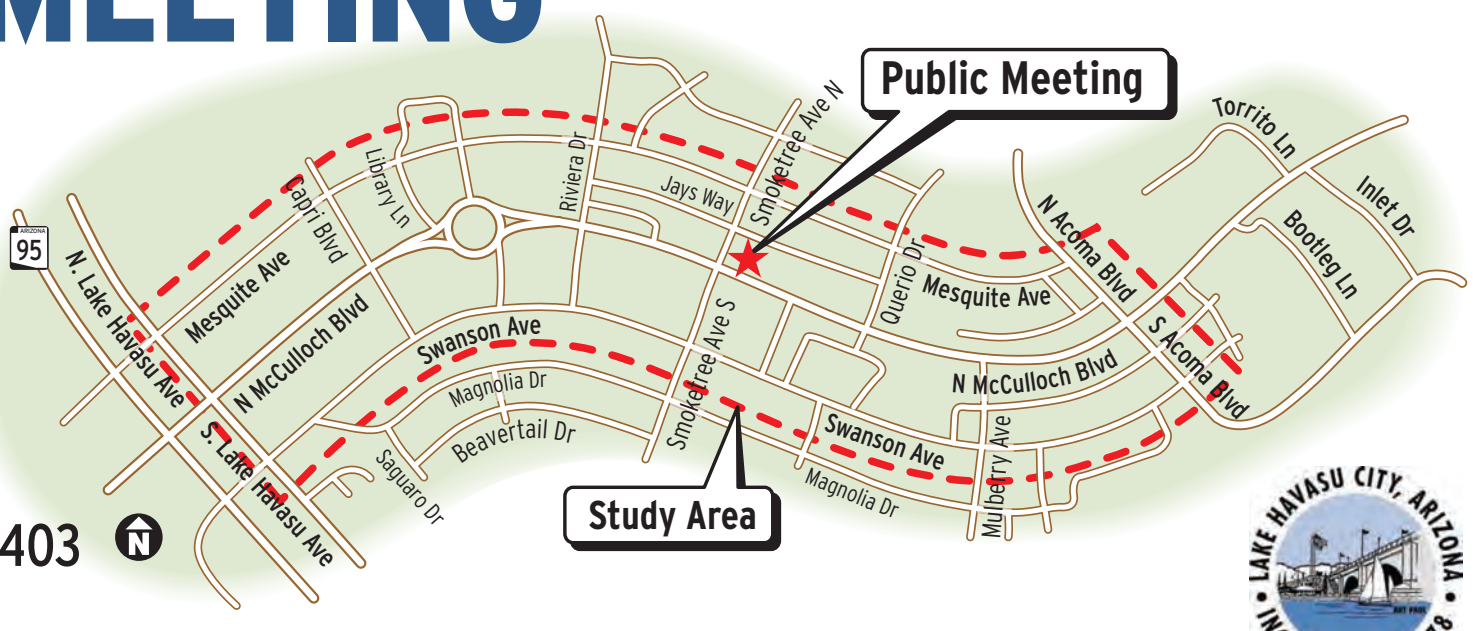
The Red Onion Restaurant
2013 McCulloch Blvd. N.
Lake Havasu City, AZ 86403
www.azdot.gov/mcculloch



For more information regarding this study, please contact Michele Beggs, ADOT Senior Community Relations Officer at mbeggs@azdot.gov or 928.681.6054. Persons with a disability may request a reasonable accommodation, such as sign language interpreter, by contacting Amy Rosar at amy@kdacreative.com or 602.368.9644.

ADOT
ARIZONA DEPARTMENT OF TRANSPORTATION

BE INVOLVED. ATTEND THE PUBLIC MEETING. PROVIDE YOUR THOUGHTS. PLAN FOR THE FUTURE.

ARIZONA DEPARTMENT OF TRANSPORTATION AND THE CITY OF LAKE HAVASU CITY

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THE RED ONION RESTAURANT

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www.azdot.gov/mcculloch

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McCulloch Corridor
Improvement Study
c/o KDA Creative
4545 E. Shea Blvd., Ste. 210
Phoenix, AZ 85028

ARIZONA DEPARTMENT OF TRANSPORTATION AND THE CITY OF LAKE HAVASU CITY

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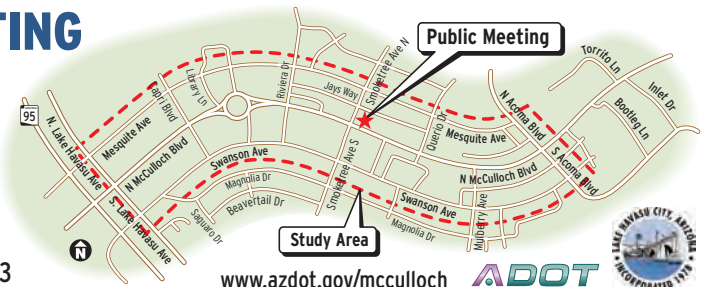

www.azdot.gov/mcculloch

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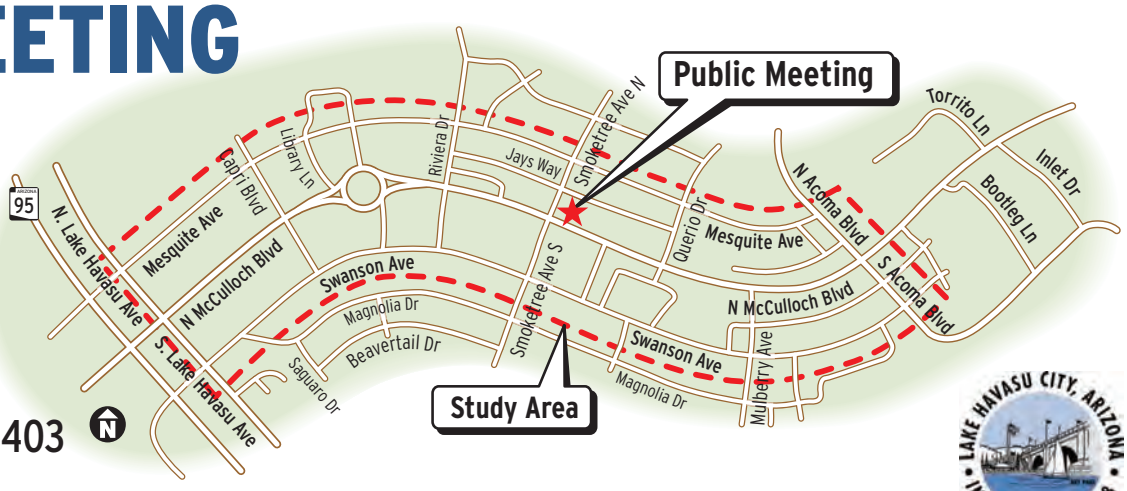

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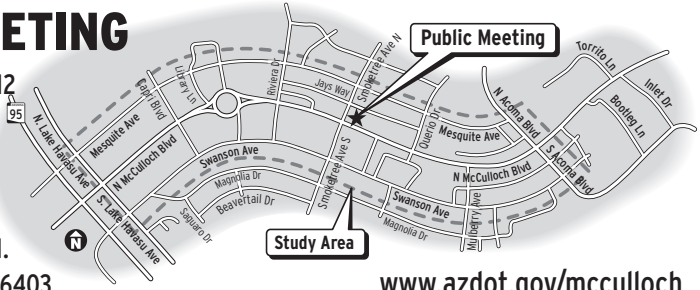

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Appendix B: Public Meeting Material

McCulloch Corridor Improvement Study
Public Meeting #2: Comment Form

Thank you for your participation in the McCulloch Corridor Improvement Study. This comment form can be completed and submitted at the end of this meeting or sent in at a later date (information on reverse side). Please submit all comments by Friday, August 31, 2012. For more information visit www.azdot.gov/mcculloch.

1. Please provide your comments regarding the **roadway** recommendations.

2. Please provide your comments regarding the **nonmotorized** recommendations.

- OVER -

Name:_____

Address:_____

Email Address: _____

Completion of this comment form is completely voluntary. Under state law, any identifying information provided will become part of the public record, and as such, must be released to any individual upon request.

McCulloch Corridor Improvement Study
Public Meeting #2: Comment Form

3. Please provide your comments regarding the **transit** recommendations.

4. Do you have any additional comments you would like to share with the project team?

Completed comment forms can be submitted to the project team at the completion of the public meeting or mailed/faxed/emailed to the project team no later than Friday, August 31, 2012. For more information visit www.azdot.gov/mcculloch.

Mail: McCulloch Corridor
c/o KDA Creative
3217 E. Shea Blvd., Ste 620
Phoenix, AZ 85028

Fax: 602-368-9645
Email: mbeggs@azdot.gov

Completion of this comment form is completely voluntary. Under state law, any identifying information provided will become part of the public record, and as such, must be released to any individual upon request.

Lake Havasu City
McCulloch Corridor
Improvement Study

Public Meeting
August 13, 2012

Introductions

Study Team

ADOT Multimodal Planning Division

Matt Carpenter, Project Manager

ADOT Communication and Community Partnerships

Michele Beggs, Senior Community Relations Officer

Lake Havasu City

Jeff LeMire, Project Manager

Introductions, continued

Consultant Team

HDR Engineering, Inc.

Michael Gorton, Project Manager

Ben Spargo, Traffic Engineer

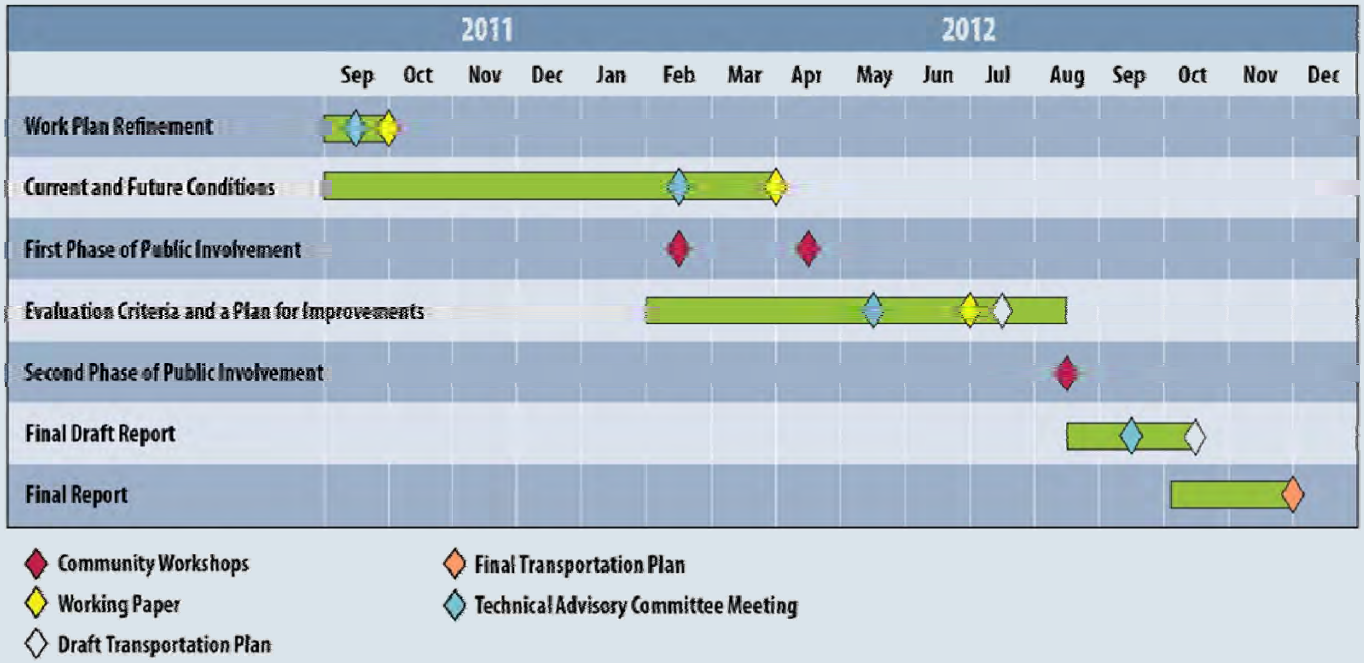
KDA Creative

Amy Rosar, Public Involvement Specialist

Study overview

ADOT Planning Assistance for Rural Areas (PARA) Study

– study is funded by an ADOT grant



Today's agenda

Project Overview

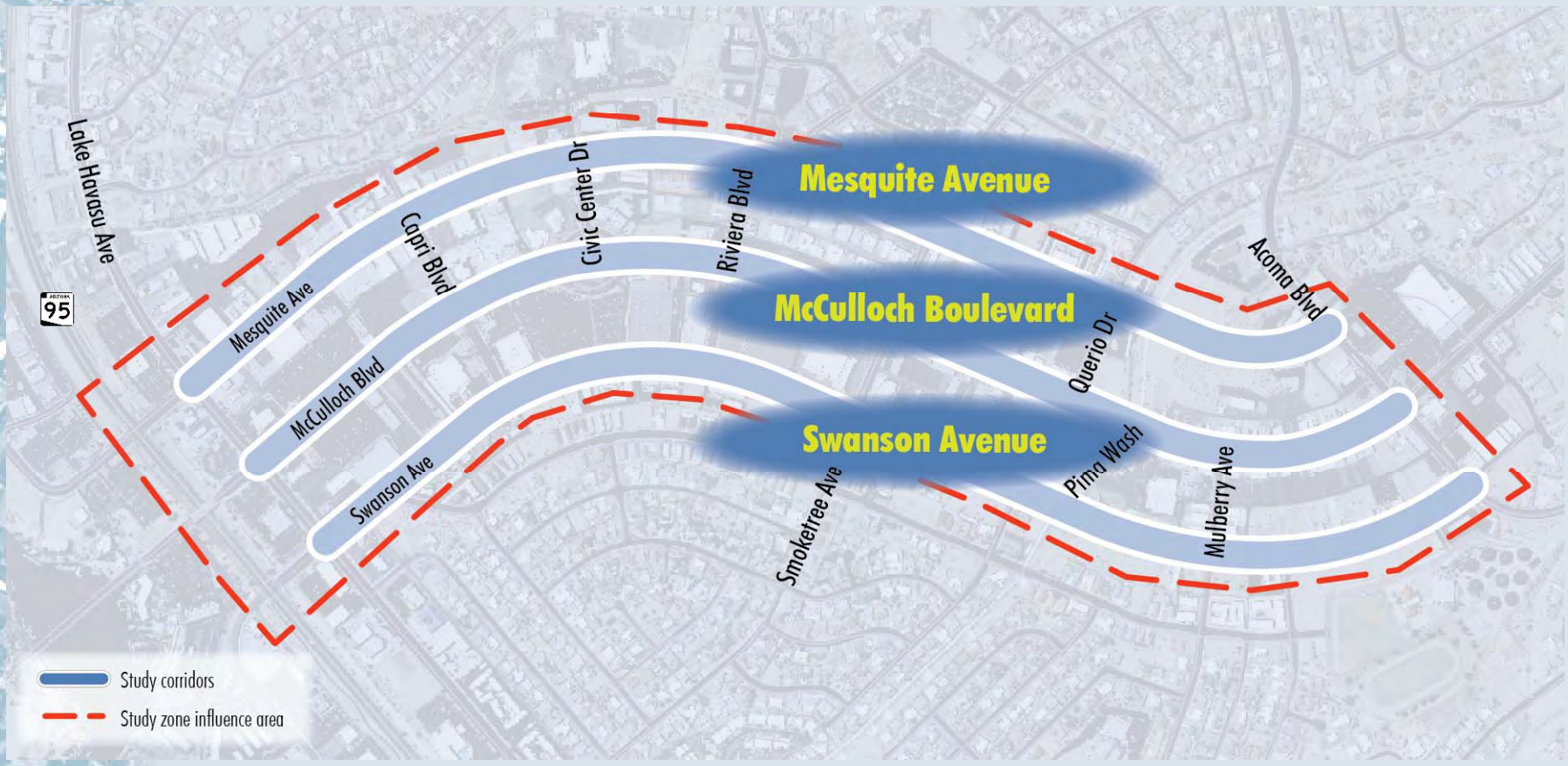
Recap Roadway Alternatives

Describe Recommended Alternative

- Roadway
- Transit
- Nonmotorized

Comments /Feedback

Study area


Lake Havasu Ave
95
Mesquite Ave
Capri Blvd
Civic Center Dr
Riviera Blvd
Mesquite Avenue
McCulloch Blvd
McCulloch Boulevard
Swanson Ave
Swanson Avenue
Smoketree Ave
Pima Wash
Mulberry Ave
Querio Dr
Acoma Blvd
Study corridors
Study zone influence area

Purpose of the study

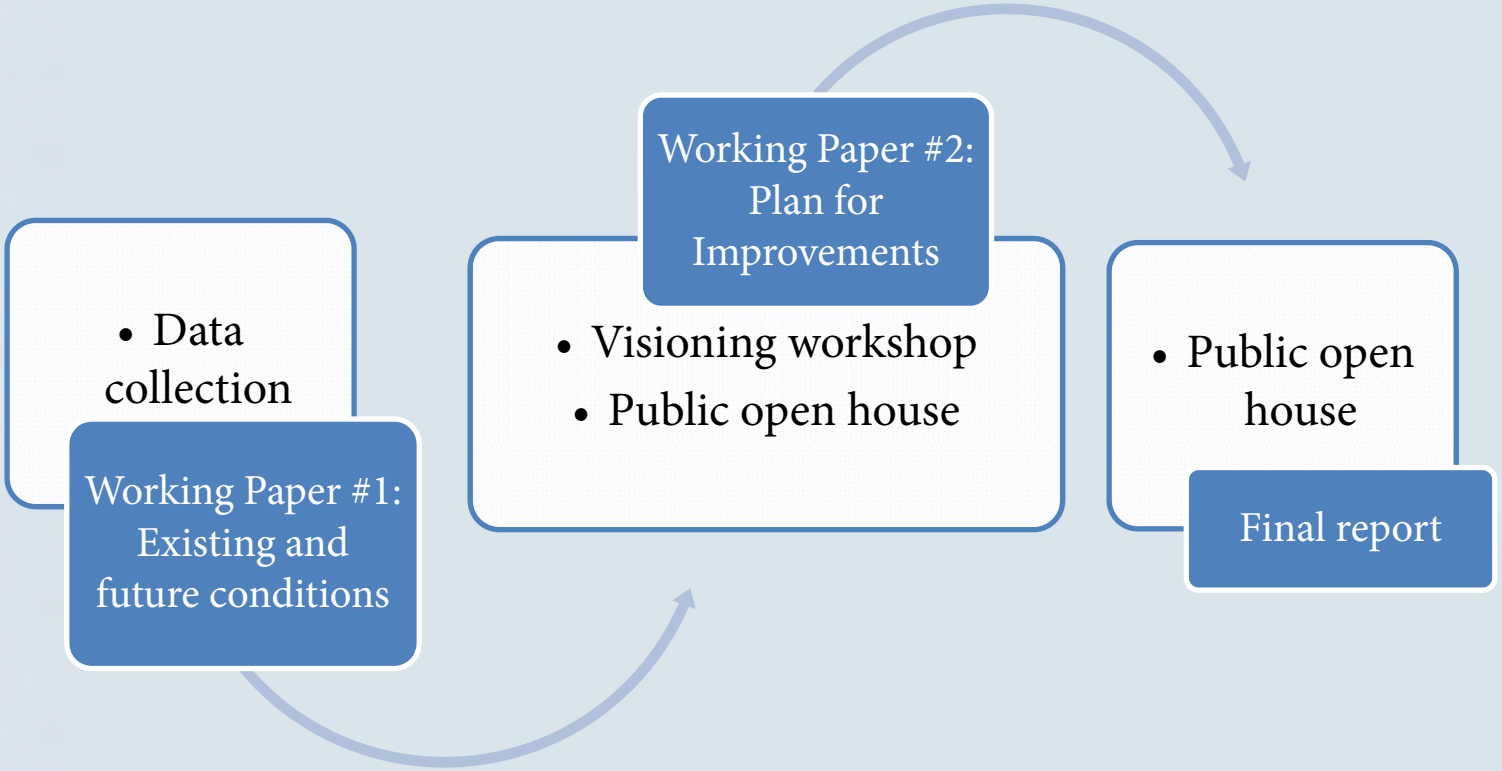
The purpose of the *McCulloch Corridor Improvement Study* is to:

- Validate recommendations in R/UDAT
- Identify priorities and projects to realize the vision

The study examines:

- Vehicular traffic
- Parking
- Public transit
- Streetscapes
- Pedestrian options
- Bicycle mobility

Study process



Corridor Characteristics

Mesquite Avenue

- Commercial corridor with hospital and medical offices

McCulloch Boulevard West

- Access to shopping, gateway to Uptown District

McCulloch Avenue East

- Uptown District, emphasis on pedestrian environment, slower traffic

Swanson Avenue

- Residential corridor with access to ASU

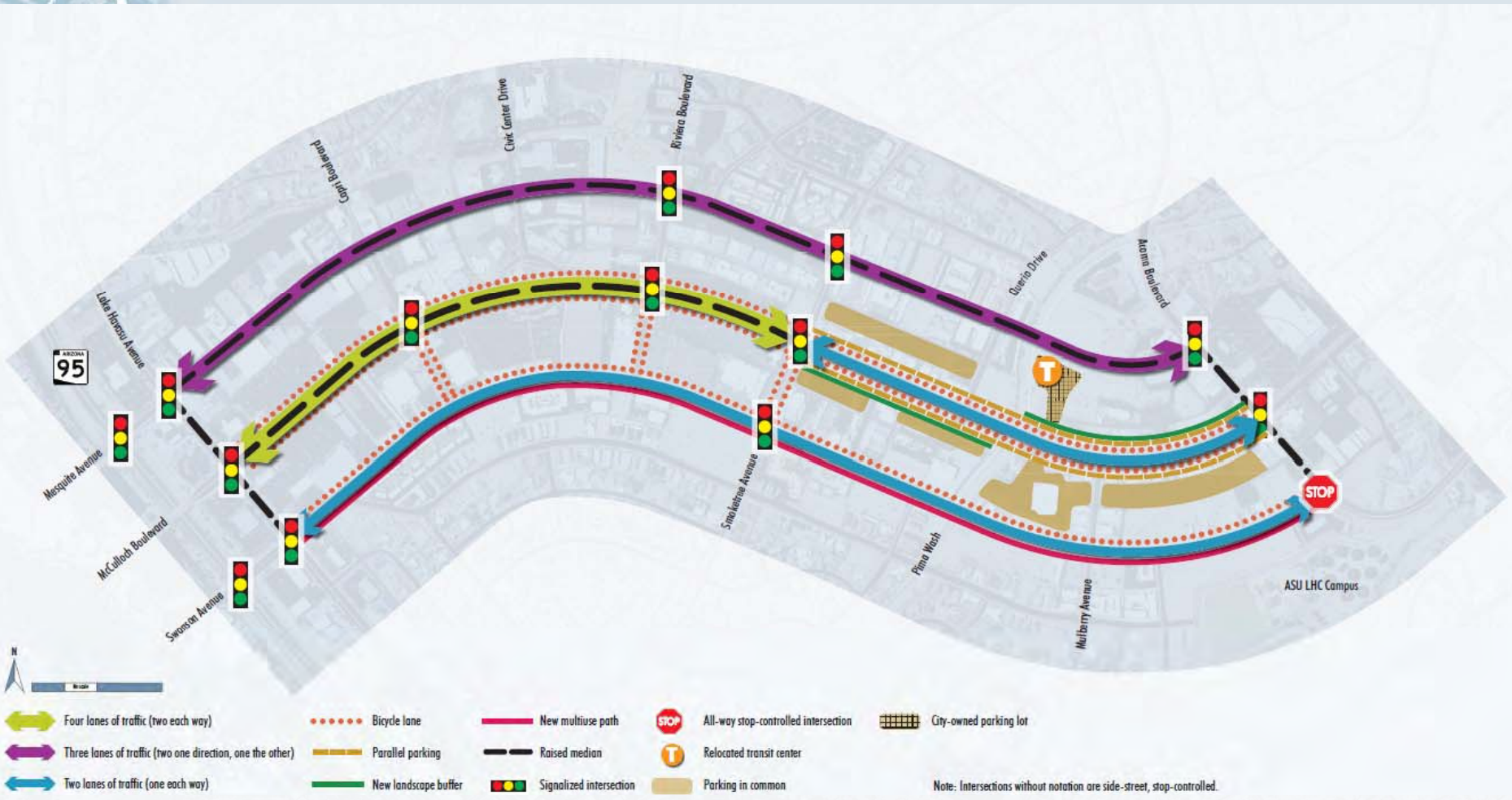
Roadway Alternatives

Road	One-way Couplet	Bicycle Focus	Medians and Roundabouts	No Build
Mesquite Avenue	Bicycle lanes, two lanes westbound only	Bicycle lanes, one lane each direction, center turning lane	Two lanes east, one lane west, raised median divider	No change
McCulloch Boulevard (west)	No change	Bicycle lanes	No change	No change
McCulloch Boulevard (east)	North side landscaping	Bicycle lanes	Median landscaping	No change
Swanson Avenue	Bicycle lanes, two lanes eastbound only	Bicycle lanes, one lane each direction, landscape buffer	Bicycle lanes, one lane each direction, roundabout at Smoketree and Mulberry	No change

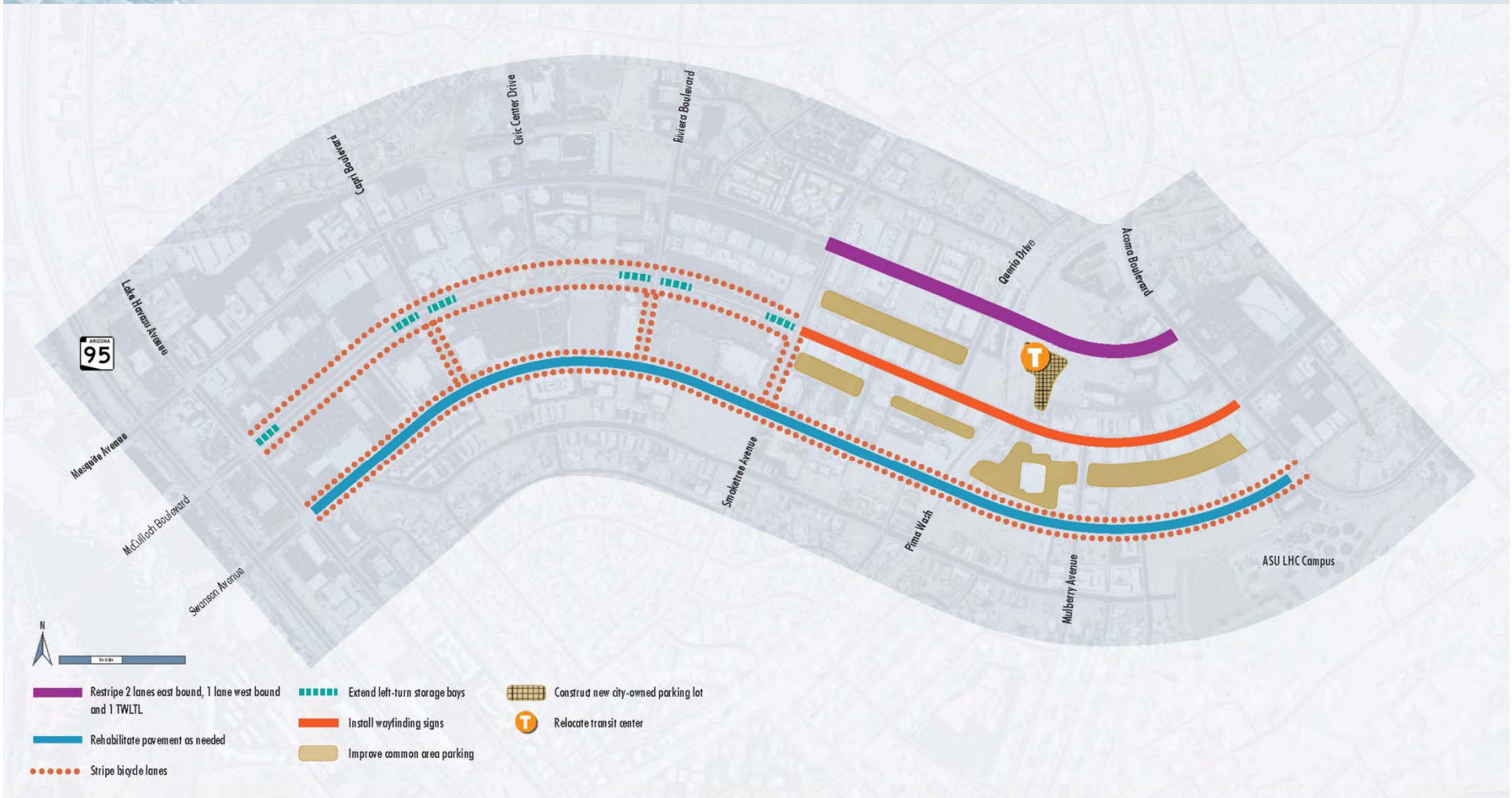
Recommended Alternative

- Parking
- Signing and Branding
- Transit
- Nonmotorized
- Traffic Operations

Recommended Alternative



Short-range improvements



Parking in Common

Improve common area parking

Parking in Common

Parking in Common

- Current city policy is hands-off
- Proactive city involvement required for recommended parking-in-common improvements
- Policy shift is priority for implementation

Signing and Branding

Enhance uptown area signing for parking and other amenities

Uptown Transit Center

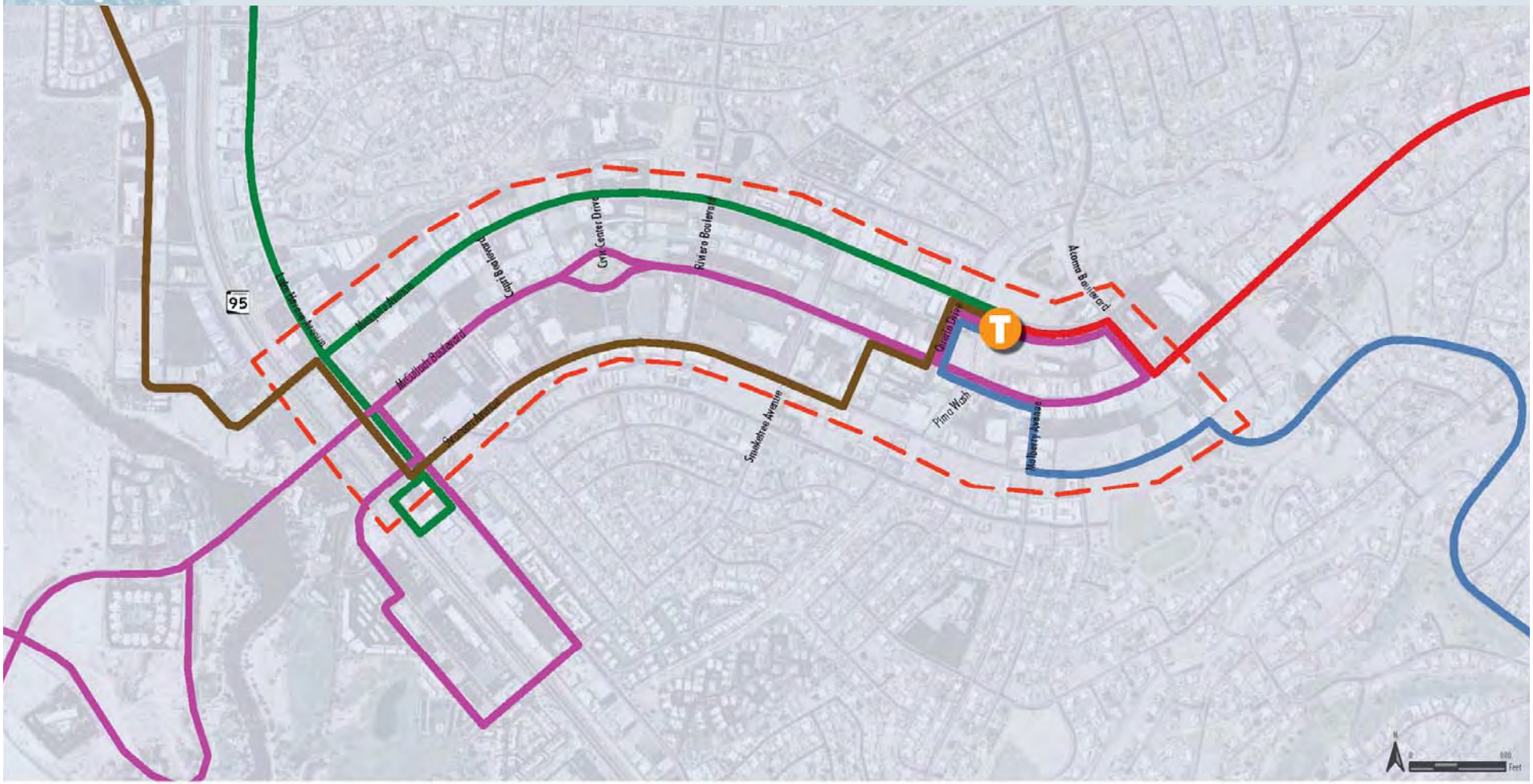
- Uptown Transit Center
  - Transit hub closer to the ASU campus
  - Nexus with Uptown shopping, Pima Wash trail
  - More visible to residents and tourists
  - Combine it with public parking and potential transit-user retail options

Uptown Transit Center

Phase 1

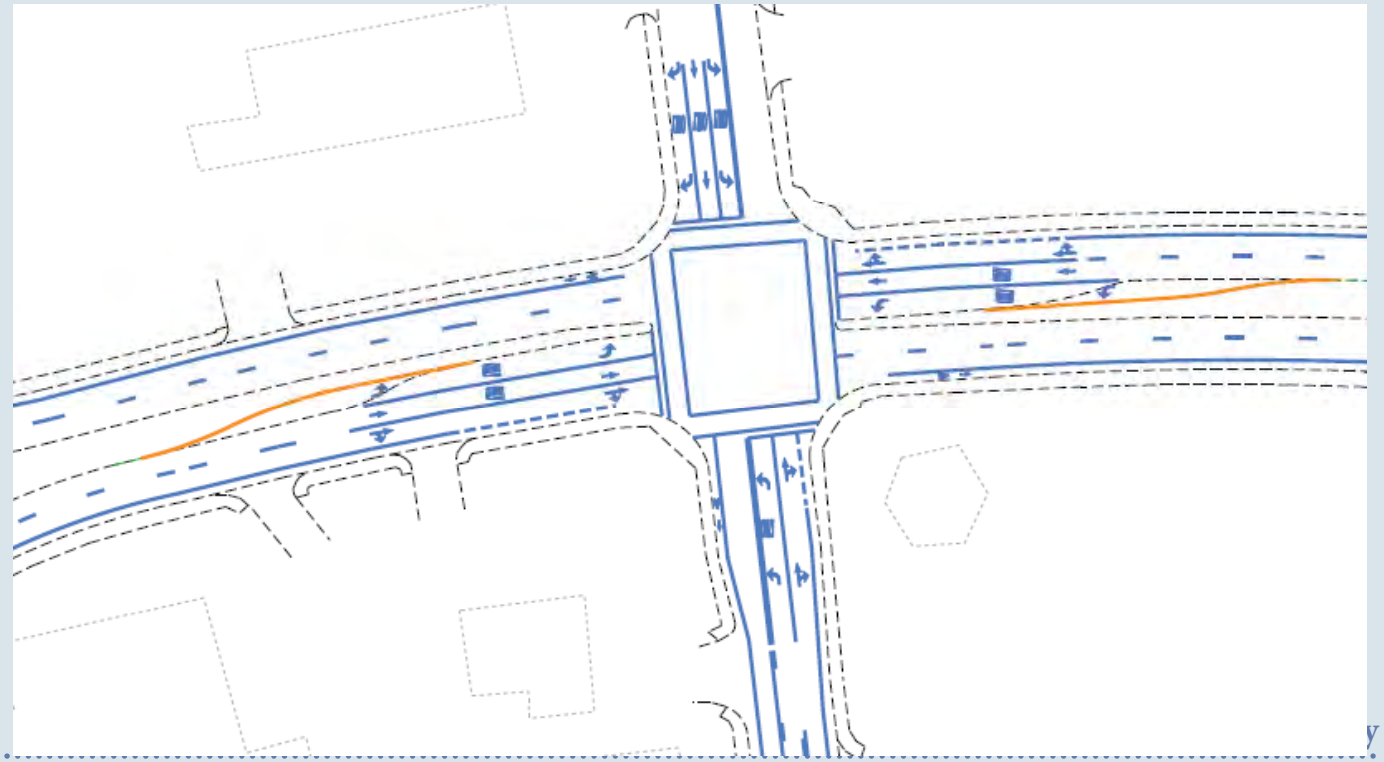
Phase 2

Potential Transit Routes

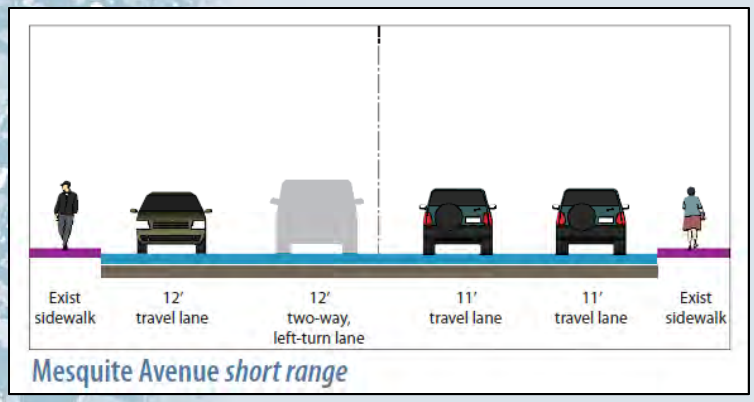


Left turn storage bays

- Increases efficiency at intersections during peak periods

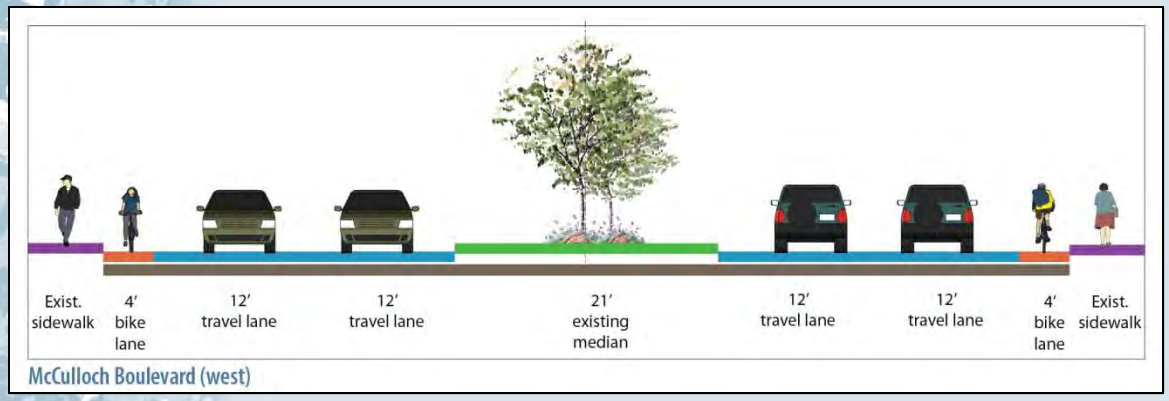


Pavement rehab and striping



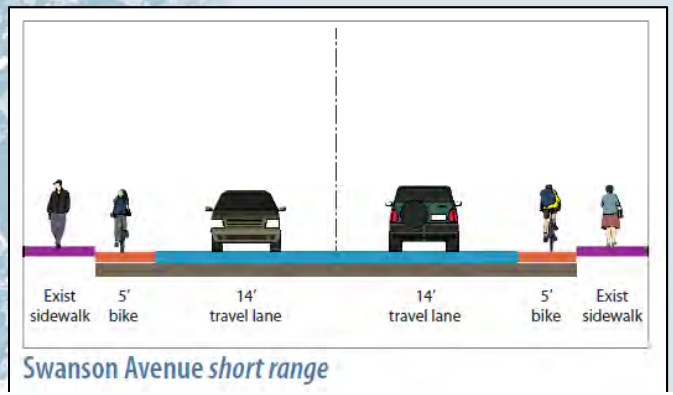
Mesquite Avenue *short range*

Mesquite Avenue (short range)



McCulloch Boulevard (west)

McCulloch Boulevard (west)

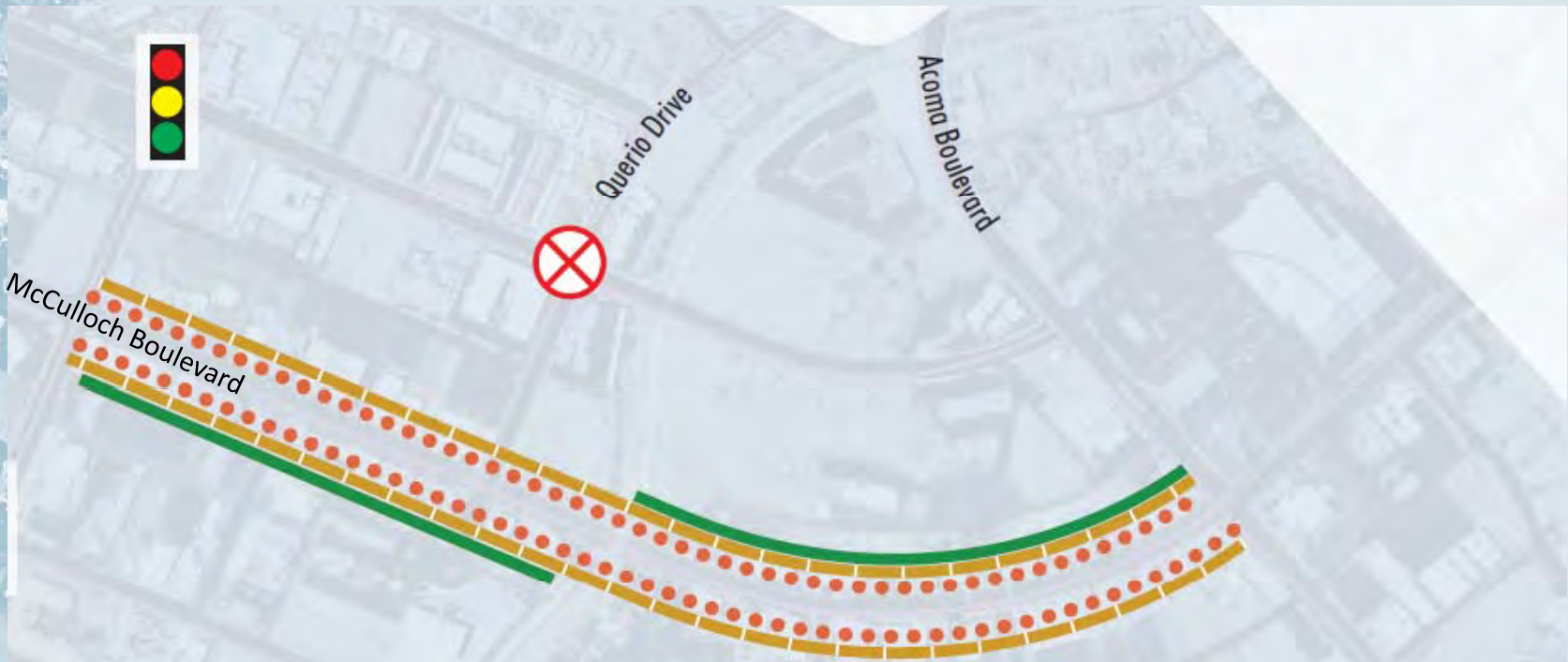


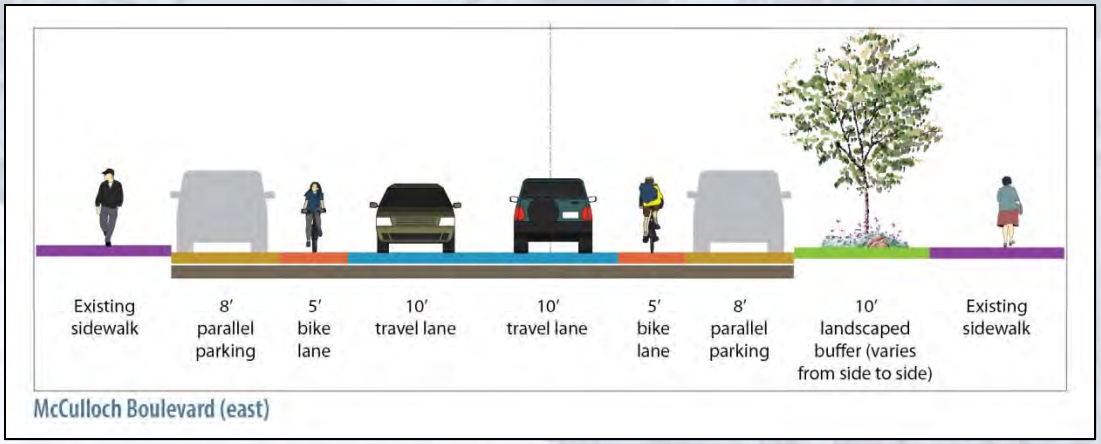
Swanson Avenue *short range*

Swanson Avenue (short range)

Mid-range improvements

McCulloch Boulevard - Uptown





Signalized intersections

- Add signals
  - Mesquite intersections: Riviera Boulevard and Smoketree Avenue
  - Swanson Avenue intersections: Smoketree Avenue

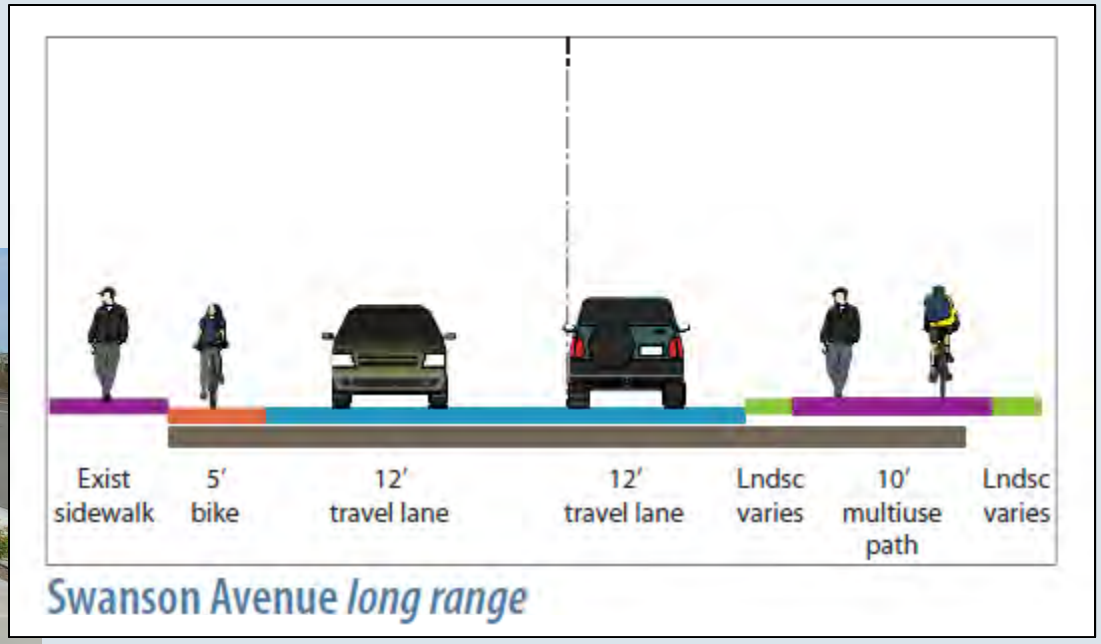
Intersection control changes

- Change four-way stop control to two-way or side-street stop control
- Mesquite intersections: Capri Boulevard, Civic Center Drive, and Querio Drive
- Swanson Avenue intersections: Capri Boulevard and Mulberry Avenue

Long-range improvements

Swanson Avenue multiuse path

- Reconstruct south side of road to include new curb and gutter, 10-foot meandering multiuse path with new landscaping



Swanson Avenue *long range*

Raised medians

- Raised medians would help control weaving movements and turbulence from adjacent properties
  - Mesquite Avenue – Lake Havasu Avenue to Acoma Boulevard
  - Lake Havasu Avenue – Mesquite to Swanson Avenues
  - Acoma Boulevard – Mesquite to Swanson Avenues

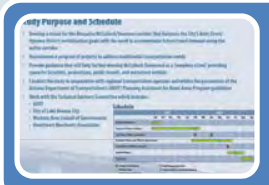
City Parking Garage

- Build out city parking lot property to include a multi-story garage and connection to McCulloch Boulevard

Recommended Alternative

- Parking
- Signing and Branding
- Relocated Transit Center
- Nonmotorized
- Traffic Operations

Open house materials



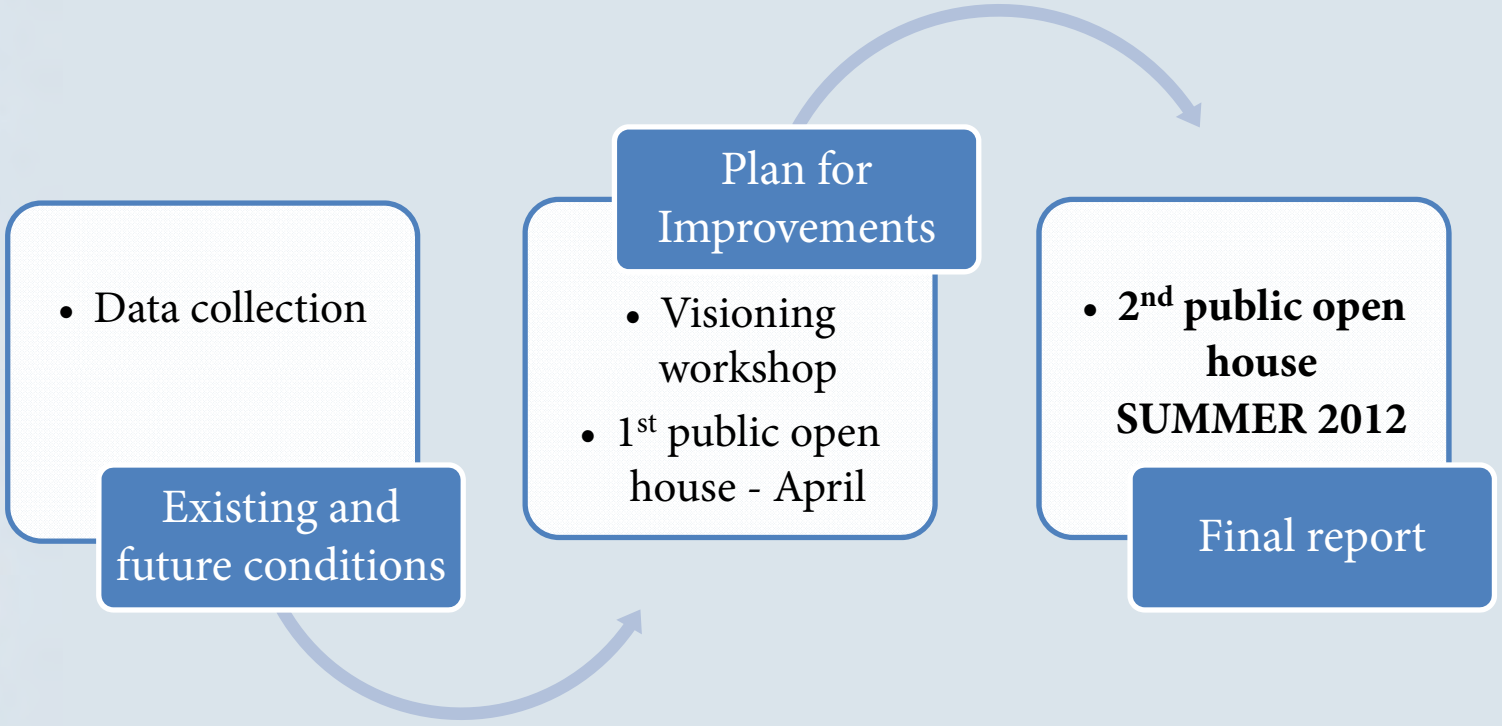
Boards

Alternative roll plots

Comment cards

Thank you!

Please plan to stay involved in the study.



Submit Comments

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Phoenix, AZ 85028

Email: mbeggs@azdot.gov

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Comment deadline: Friday, August 31


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