ADOT

# US 60X Sossaman Road to Meridian Road

## Comprehensive Transportation Study

Final Report

February 2018

JACOBS

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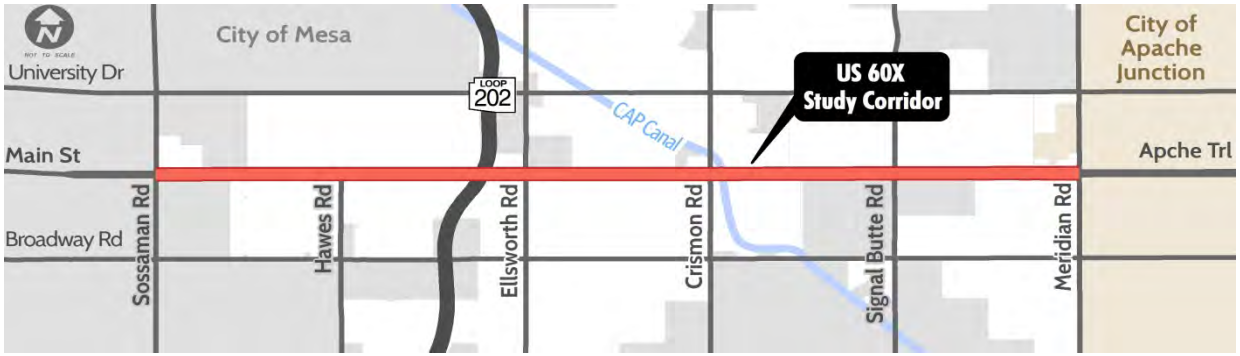
# Executive Summary




The *US 60X Sossaman Road to Meridian Road Comprehensive Transportation Study* was initiated to develop a planning strategy to improve the mobility and safety along the US 60X corridor from Sossaman Road to Meridian Road. Located in the eastern portion of Maricopa County, US 60X (locally referred to as *Main Street* west of 80th Street and *Apache Trail* east of 80th Street) is the final section of the Old US 60 Highway still on the Arizona State Highway System. The ultimate goal of the study was to develop a shared vision for the corridor and a defined path to facilitate the eventual reconstruction and transfer to either the City of Mesa or to Maricopa County. The study served as a forum for stakeholder input and inter-agency communication, collaboration, and final agreement regarding the long-term safety, mobility, access control, and drainage needs in the corridor.

## Study Process

The development of a comprehensive transportation plan is a technical, collaborative process that involves affected parties along the US 60X corridor, including local jurisdictions, regional agencies, stakeholders, and the general public. For this study, five key stages were followed to ultimately develop a regionally cohesive, fiscally constrained improvement plan. The study included extensive public and stakeholder outreach to gain insight into the needs of the corridors and develop consensus of improvements. A Core Study Team was also developed to provide technical guidance, support, advice, recommendations, and to perform document reviews throughout the study process. The Core Study Team included key representatives from ADOT, Maricopa Association of Governments (MAG), the City of Mesa, and Maricopa County Department of Transportation (MCDOT).

## Summary of Current and Future Conditions

*Working Paper 1: Existing and Future Conditions* inventoried and analyzed the existing and future conditions in the study area, including existing transportation system deficiencies, issues, and needs. The following section provides a summary of issues and deficiencies along the corridor. These issues and deficiencies form the basis for the next phase of the study, which is the development of the long range corridor plan.

### Congestion and Mobility

**Traffic Signals:** Traffic signals along the corridor are not coordinated; therefore, motorists experience poor progression between traffic signals and congestion approaching signals

- By 2040, signalized intersections will operate at LOS D or worse
- At most intersections, pedestrians cannot cross US 60X during the allotted green phase
- At Meridian Road, there is no pedestrian refuge area and the median curb cuts into the crosswalk

**Stop-Controlled Crossovers:**

- Stop-controlled crossovers, located approximately every 1/8$^{th}$ to 1/4$^{th}$ mile, are largely utilized by motorists making U-turns to access businesses and residential areas
- 77$^{th}$ Street, 80$^{th}$ Street, 81$^{st}$ Street, Hawes Road, 96$^{th}$ Street, 102$^{nd}$ Street, and Mountain Road will primarily operate at LOS D or worse by the year 2040
- Crossovers only accommodate one vehicle at a time, which may cause backups in the short left-turn storage areas

### Multimodal

**Sidewalks:** Sidewalks are only available at major intersections and the SR 202 overpass. The majority of the sidewalks are in fair to poor condition

**Bike Lanes:** Bike lanes are only available at SR 202 overpass and on select side streets

**Mid-block Crossings:** Crosswalks are only available at Sossaman Road, SR 202 SB, Ellsworth Road, Cheshire, Crismon Road, Signal Butte Road, and Meridian Road

- Since there are limited crossing opportunities, pedestrians and bicyclists often run or bike across US 60X travel lanes and the median

**ADA compliance:** Curb ramps and sidewalks are not ADA compliant at all intersections. The location of the southbound pedestrian call button at Cheshire is inaccessible for most users

### Safety and Infrastructure

**Crossovers:** Historic crash records illustrate that at crossovers, motorists often do not properly yield to the right-of-way

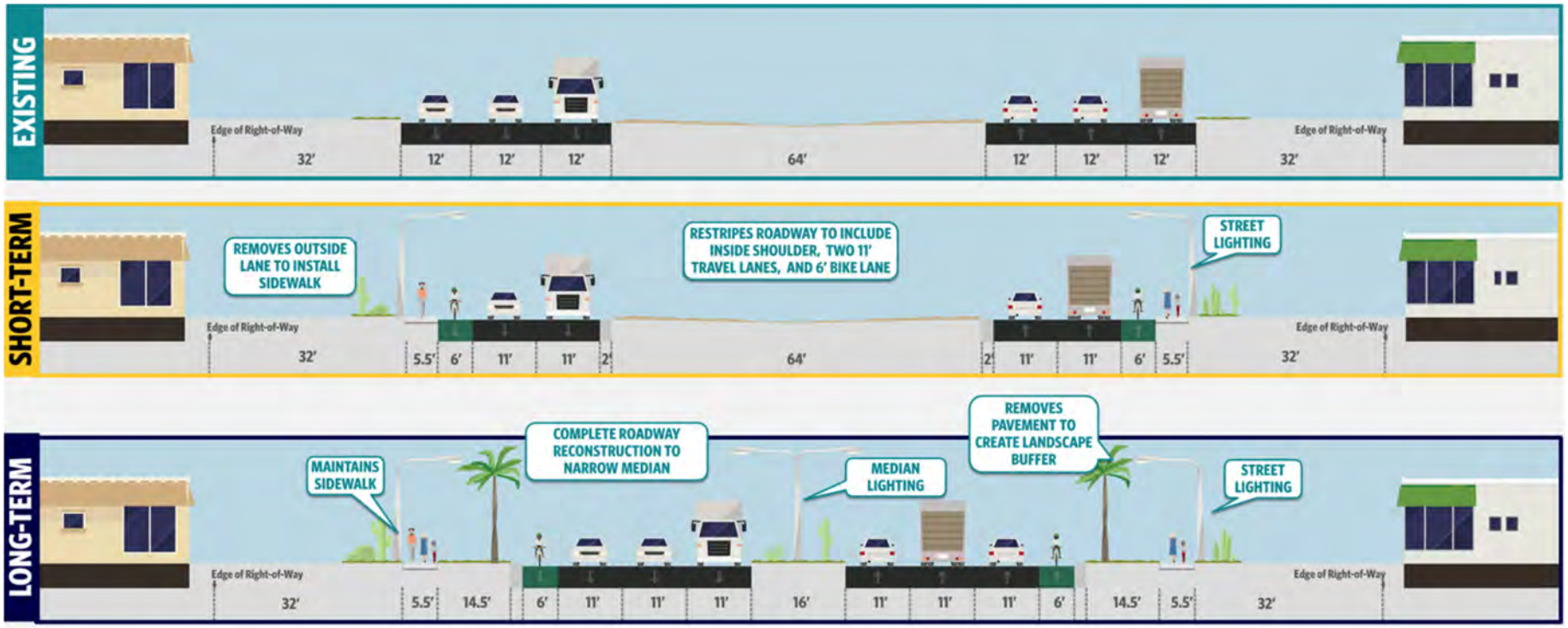
- Crossovers are narrow with a tight turning radius, forcing large trucks and RVs to encroach into adjacent lanes
- Left-turn storage lanes at crossovers are short and may not give motorists ample time to decelerate

**Sight Distance Issues:** There is a vertical grade difference between US 60X and lower cross streets, which limit motorist's sight distance when turning onto the US 60X corridor

- Vehicles parked in front of businesses along the shoulder of the corridor limit a motorist's sight distance
- **80$^{th}$ Street crossover**: Southbound lane is not aligned to the corridor. Additionally, for northbound motorists the straight sight distance is visually distracting making stop bars in the median more prominent than those at the intersection (the visual distance can cause drivers to miss the intersection stop bar)
- **Ellsworth Road**: Due to the vertical grade difference and width of the median, north and southbound motorists have limited sight distance

## Plan for Improvements

Based on findings of the existing and future deficiency analysis from Working Paper 1 and Working Paper 2, input from the TAC and Core Study Team, and input received during stakeholder and public open house meetings an ultimate corridor vision for the US 60X corridor was developed. The preferred design concept includes a transitional design that progressively narrows the corridor to include three travel lanes with a raised median.




### Short-Term Improvements

- Re-stripe existing pavement to include two 11 FT travel lanes, bike lanes, and 2 FT inside shoulder in each direction
- Maintain 64 FT drainage swale median
- Install 5.5 FT concrete sidewalk with sidewalk lighting
- Install mid-block pedestrian crossings and upgrade existing facilities to comply to ADA standards
- Intersection operational improvements
- Access management improvements throughout the corridor

### Long-Term Improvements

- Roadway reconstruction to widen the corridor to three 11 FT travel lanes in each direction with a 16 FT raised median with lighting
- Maintain 6 FT on-street bike lanes in each direction
- Maintain 5.5 FT sidewalk with sidewalk lighting
- Remove existing pavement to create 14.5 FT landscape buffer between roadway and the sidewalk
- Major drainage reconstruction
- Intersection operational improvements

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# 1. Study Overview

US 60X, from Sossaman Road to Meridian Road, has been cited by numerous reports as a high crash corridor that requires operational and infrastructure improvements to meet the safety, access, mobility, and multimodal needs of the corridor.

## Corridor Overview

Located in the eastern portion of Maricopa County, US 60X (locally referred to as *Main Street* west of 80th Street and *Apache Trail* east of 80th Street) is the final section of the Old US 60 Highway still on the Arizona State Highway System. Originally constructed in 1932, US 60 is an east-west highway that connects Interstate 10 near Quartzsite to Springerville, near the New Mexico border. Due to the extensive growth of the Phoenix metropolitan area, ADOT realigned US 60 to its present day freeway location. Figure 1.1 illustrates the location of the US 60X corridor in relation to the current US 60 corridor alignment and the Phoenix metropolitan area.

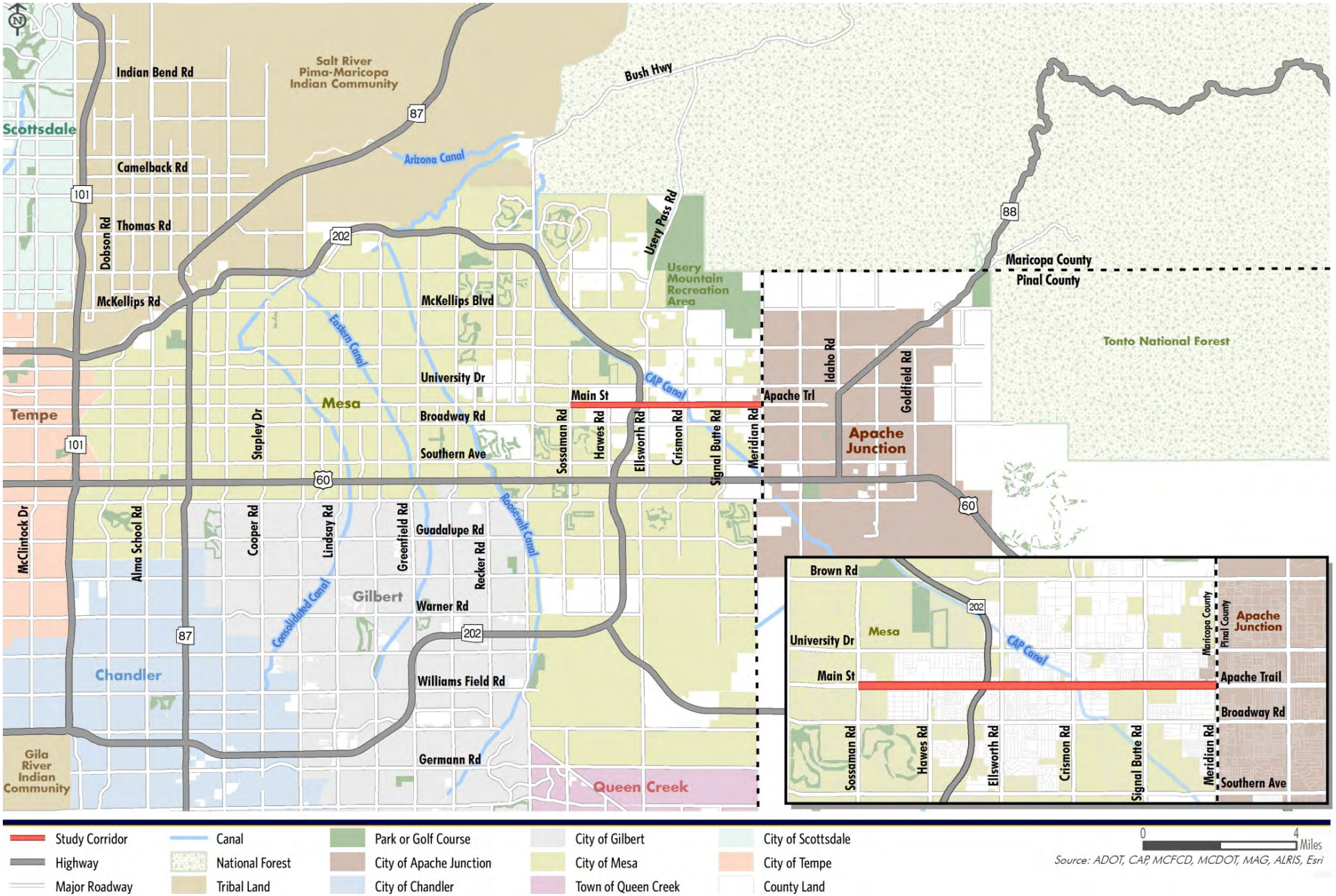
While the original US 60 route was designed as a rural highway, urban growth and development has significantly altered the surrounding land uses. Today, the corridor is located in an urban environment surrounded by commercial businesses, shopping centers, and residential developments. State Route 202, a freeway loop connecting eastern Maricopa County to downtown Phoenix, intersects the study corridor. Due to substantial change in land use, numerous safety, access, and multimodal improvements are needed.


*Photograph taken of the US 60X corridor west of Apache Junction in 1966. Photo courtesy of the Arizona State Library History and Archives Division*

### Study Corridor

As illustrated in Figure 1.1, the study corridor consists of US 60X from Sossaman Road to Meridian Road.

## Figure 1.1: Study Corridor



## Study Purpose and Need

The *US 60X Sossaman Road to Meridian Road Comprehensive Transportation Study* was initiated to develop a planning strategy to improve the mobility and safety along the US 60X corridor from Sossaman Road to Meridian Road. Identified by the *2013* and *2016 Bicycle and Pedestrian Plan Update* as a high crash corridor on the state highway system, the need for this study stemmed directly from ADOT's desire to improve safety and mobility along the corridor for all users.

As the final section of the Old US 60 Highway still in the State Highway System, the ultimate goal of the study was to develop a shared vision for the corridor and a defined path to facilitate the eventual reconstruction and transfer either to the City of Mesa or to Maricopa County. The study served as a forum for stakeholder input and inter-agency communication, collaboration, and final agreement regarding the long-term safety, mobility, access control, and drainage needs in the corridor.

## WHY IS THIS PLAN NEEDED?

**DEVELOP A SHARED VISION**
Establish a common, long-term vision for the corridor that meets the future needs of local jurisdictions

**PROVIDE PEDESTRIAN, BICYCLE, AND TRANSIT OPTIONS**
Sidewalks and bike paths are limited within the study area and are necessary to provide continuous connections between business and activity centers for residents and for recreational purposes

**ADDRESS SAFETY AND OPERATIONAL NEEDS**
The roadway network needs to be evaluated to identify solutions to improve safety, mobility, drainage, and to optimize traffic operations

**PROMOTE ECONOMIC GROWTH AND LIVABILITY**
Develop a plan for investments that strengthens local businesses, spurs business growth, and encourages activities

## Goals and Objectives

At the first kick-off meeting with the Technical Advisory Committee (TAC), a visioning exercise was conducted to discuss the study area issues, community values, and study expectations. The process resulted in the following objectives for the study:

### IDENTIFY EXISTING AND FUTURE NEEDS AND DEFICIENCES

Analyze existing roadway conditions to determine areas in need of improvements

### INCREASE MULTIMODAL OPTIONS

Identify areas that need sidewalks, multi-use paths, and bike routes

Enhance non-automobile modes for travel and recreation

### ENHANCE SAFETY FOR ALL MODES

Conduct traffic analysis to determine future traffic conditions

Recommend roadway safety elements

Improve access management

### FOSTER LIVABILITY, QUALITY OF LIFE, AND SUSTAINABLE DEVELOPMENT

Coordinate with partners and other jurisdictional plans and objectives

Support area economic developments

### CREATE A LIVING PLAN

Prepare pre-scoping documentation for short-term improvements to push projects forward

Build consensus with local agencies through open and inclusive inter-governmental cooperation

### PRIOIRTIZE INVESTMENT STRATEGIES

Preserve and maximize the utilization of existing infrastructure

Consider cost-effectiveness and constructability

## Technical Advisory Committee (TAC)

The study is guided by a Technical Advisory Committee (TAC). The role of the TAC is to provide technical guidance, support, advice, recommendations, and to perform document reviews throughout the study process. TAC members include representatives from:

- ADOT Multimodal Planning Division
- ADOT Communications
- ADOT Phoenix Maintenance District
- ADOT Transportation Engineering
- ADOT Transportations Systems Management and Operations
- Maricopa Association of Governments (MAG)
- Maricopa County Department of Transportation (MCDOT)
- City of Mesa

## Public Outreach

Public involvement is essential to the broad acceptance and successful implementation of any transportation improvement plan. The goal of community outreach is to educate the public about the study, provide opportunities for input, and to create a process to build consensus in support of study recommendations. For this study, the study team conducted a two-phase public outreach process to discuss the study area's issues and concerns, and obtain public input. Each step of the public involvement process included informational materials such as presentation boards and handouts. A project website was also created to distribute project information to the public and stakeholders.

## Study Process

The development of a comprehensive transportation plan is a technical, collaborative process that involves affected parties along the US 60X corridor, including local jurisdictions, regional agencies, stakeholders, and the public. For this study, five key stages were followed to ultimately develop a regionally cohesive, fiscally constrained improvement plan. *Working Paper 1: Existing and Future Conditions* inventoried and analyzed the existing and future conditions in the study area, including existing transportation system deficiencies, issues, and needs. *Working Paper 2: Draft Plan for Improvements* identified and evaluated improvement projects to address the needs and deficiencies identified in Working Paper 1. Figure 1.2 illustrates the process that is utilized for this study.

**Figure 1.2: Study Process**

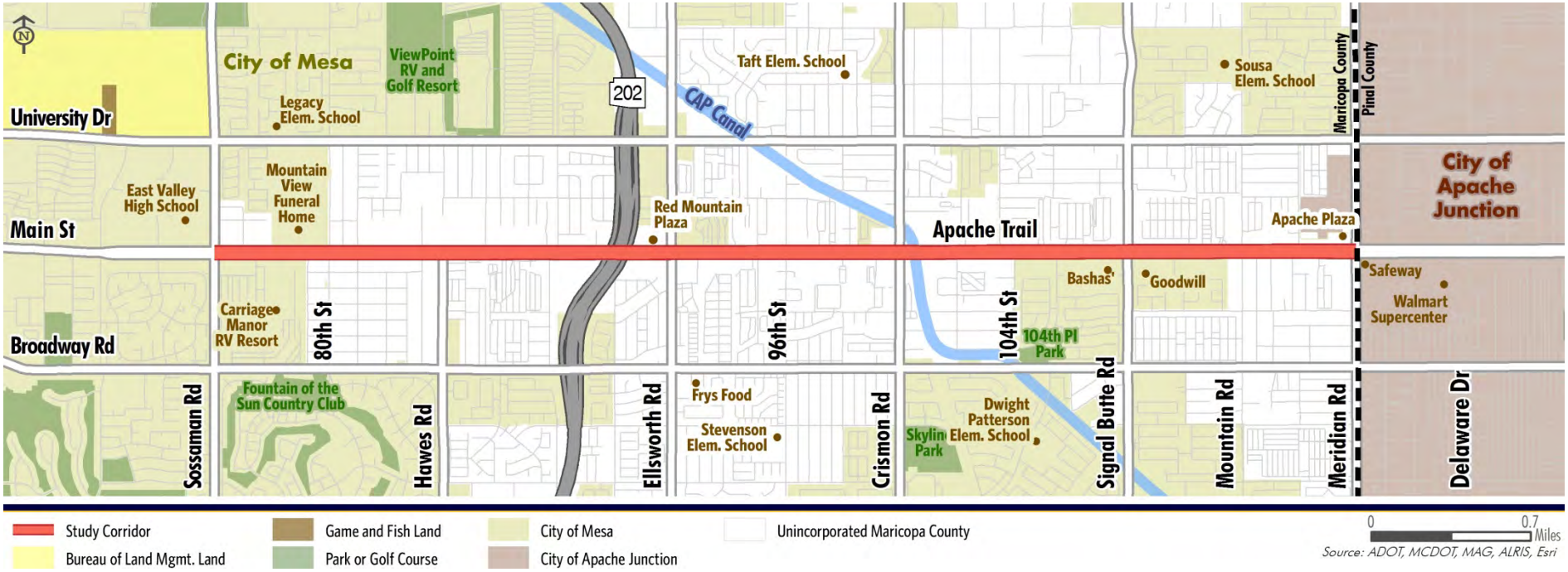
# 2. Current and Future Conditions

To document and understand existing and future land use and demographics along the corridor, an analysis of conditions was conducted adjacent to and surrounding the study corridor. The following section presents findings of the analysis.

## Land Ownership

The US 60X corridor lies completely within Maricopa County; however, Pinal County is adjacent to the eastern boundary of the study area. The corridor is also completely within the Maricopa Association of Governments (MAG) planning area. Figure 2.1 illustrates land ownership within the general vicinity of the study corridor. Northwest of the study area, the Bureau of Land Management (BLM), and the Arizona Game and Fish Department (AGFD) own land along University Drive.

**Figure 2.1: Land Ownership**



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## Existing Land Use

The US 60X corridor is a blend of commercial services and residential housing allowing residents' easy access to local commercial and shopping amenities as well as access to SR 202 and other major arterial corridors. Figure 2.2 illustrates the existing land use along the study corridor.

In total, there are 289 parcels located immediately adjacent to the study corridor. As illustrated in Figure 2.2, the corridor is comprised of primarily residential and commercial land use. Approximately 39 percent of parcels along the corridor are identified as Single Family High Density, with more than four dwelling units per acre. This type of land use is primarily mobile home parks, which are located throughout the corridor and in neighboring areas. Another 34 percent of parcels along the corridor are listed as Commercial Low, which include neighborhood retail and specialty retail. The corridor has a variety of commercial uses including the Bashas' supermarket, retail stores (Big Lots, Walgreens, and Dollar General), food services (Pizza Hut, Burger King, McDonalds, and Papa Johns), several automotive repair and part stores, and a variety of local retail and service shops.

## Zoning

Current zoning classifications along the study corridor place commercially zoned properties along the US 60X roadway and single and multiple-family subdivisions offset behind the commercial uses. Approximately 65 percent of parcels along the corridor are classified by Maricopa County as C-3 (General Commercial). According to Maricopa County's zoning ordinance, areas zoned C-3 are less restrictive and include retail and whole commerce. In addition to C-3 zoning, pockets of C-2 (Intermediate Commercial) are located along the corridor. Commercial zoned properties include automobile sales, hotels and motels, trailer parks, and other services that provide the sale of commodities.

**Table 2.1: Existing Land Use**

| Land Use | Parcels | Sq. Mile | Area |
|---|---|---|---|
| Cemetery | 4 | 0.07 | 8.0% |
| Commercial High | 1 | 0.02 | 2.1% |
| Commercial Low | 172 | 0.31 | 33.9% |
| Industrial | 14 | 0.03 | 3.0% |
| Single Family High Density *(greater than 4 du/ac)* | 38 | 0.36 | 38.9% |
| Single Family Low Density *(less than 1 du/ac)* | 5 | 0.01 | 0.9% |
| Tourist Accommodations | 5 | 0.01 | 1.3% |
| Transportation | 3 | 0.01 | 1.2% |
| Vacant | 26 | 0.08 | 8.5% |
| Other | 21 | 0.02 | 2.3% |

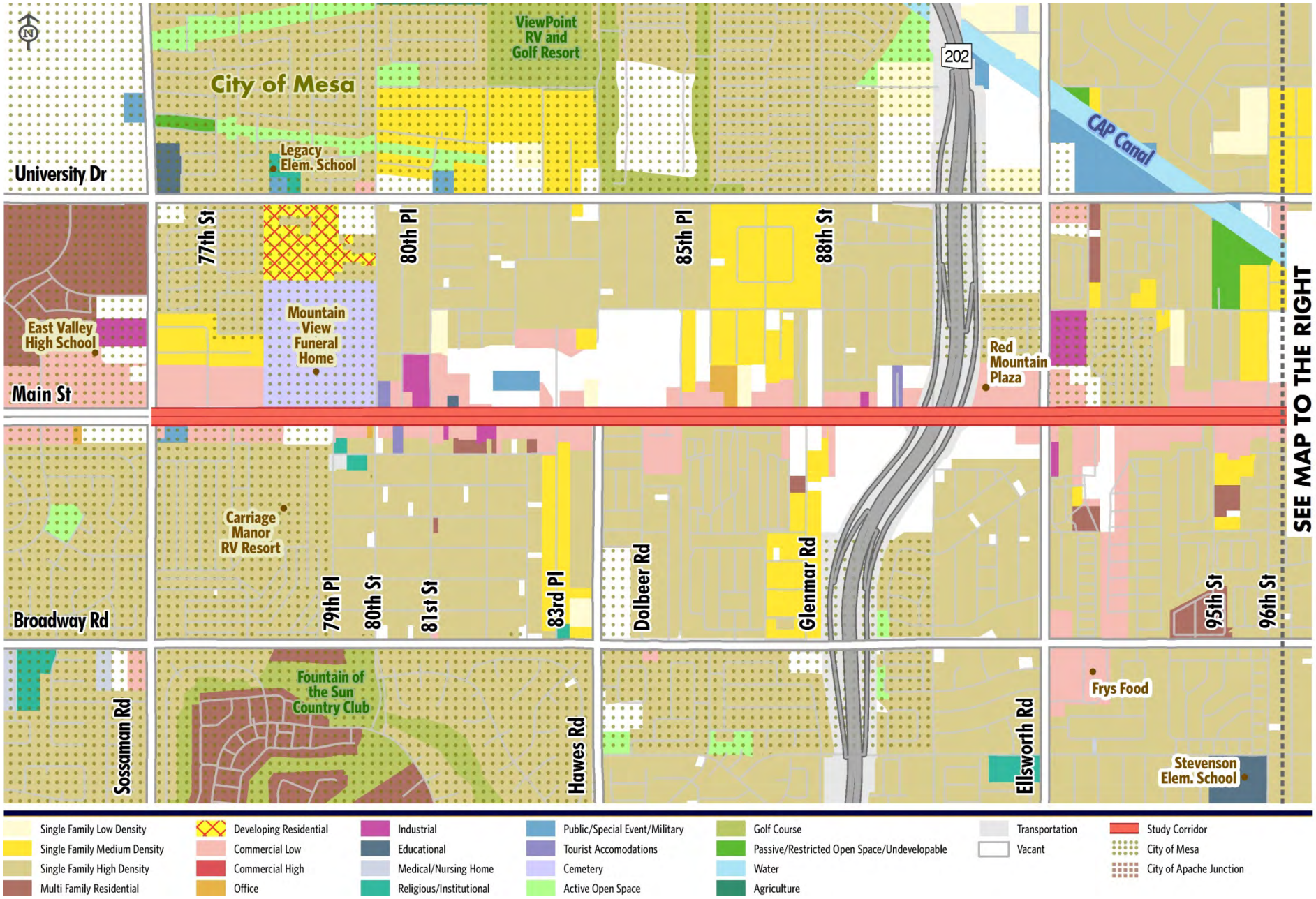
*Source: MAG Existing Land Use*

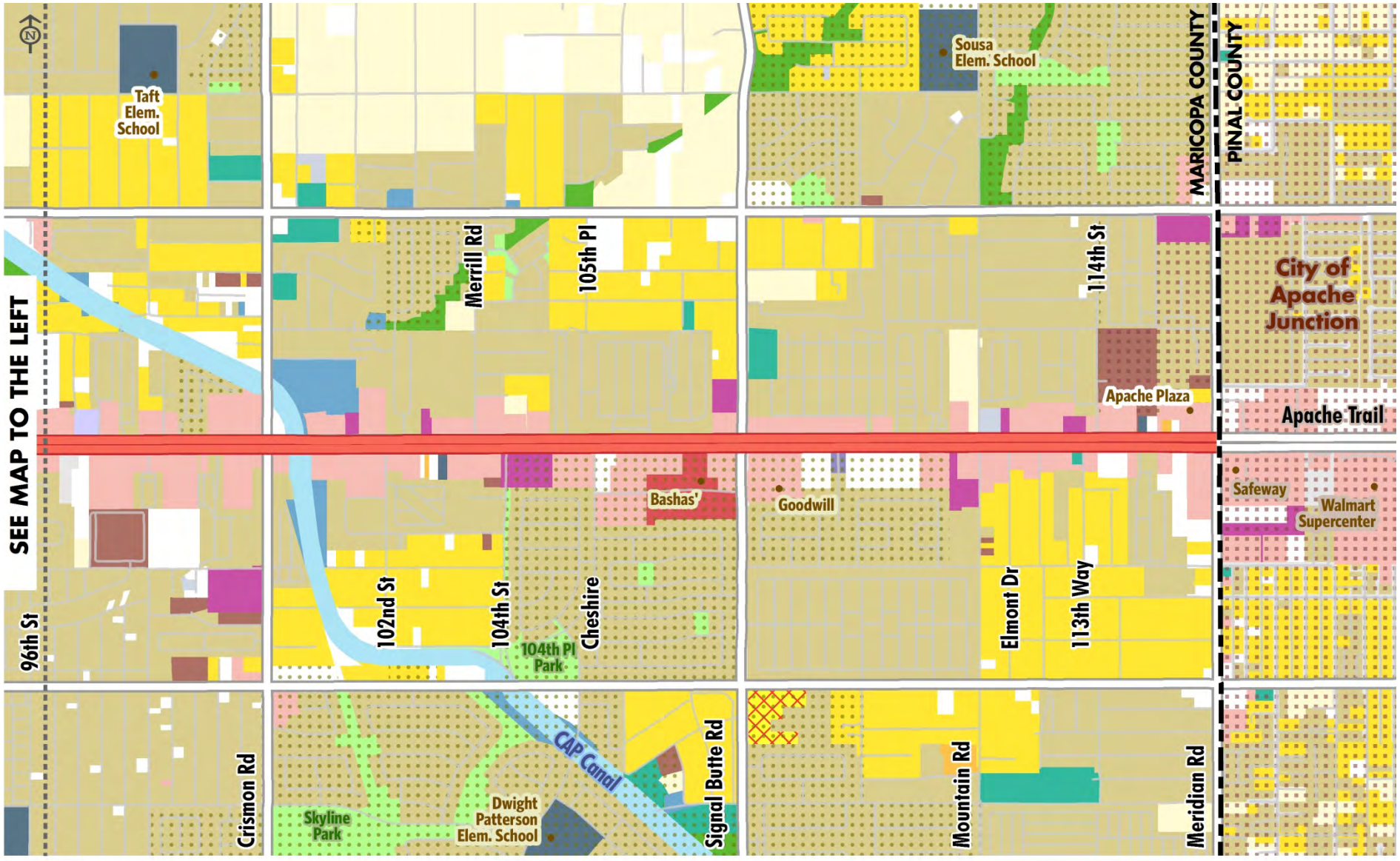
**Table 2.2: Existing Zoning**

| Zoning | Parcels | Sq. Mile | % of Area |
|---|---|---|---|
| Agriculture | 1 | 0.06 | 6.5% |
| General Commercial | 239 | 0.64 | 69.6% |
| Industrial | 3 | 0 | 0.3% |
| Intermediate Commercial | 31 | 0.14 | 15.2% |
| Multiple Family Residential | 14 | 0.07 | 7.8% |
| Single Family Residential | 1 | 0.01 | 0.6% |

*Source: Maricopa County and City of Mesa*

## Figure 2.2: Existing Land Use and Major Activity Centers






*Source: MAG Existing Land Use 2016, CAG Existing Land Use 2016, ADOT, MCDOT, ALRIS, Esri*

## Existing Socioeconomic Conditions

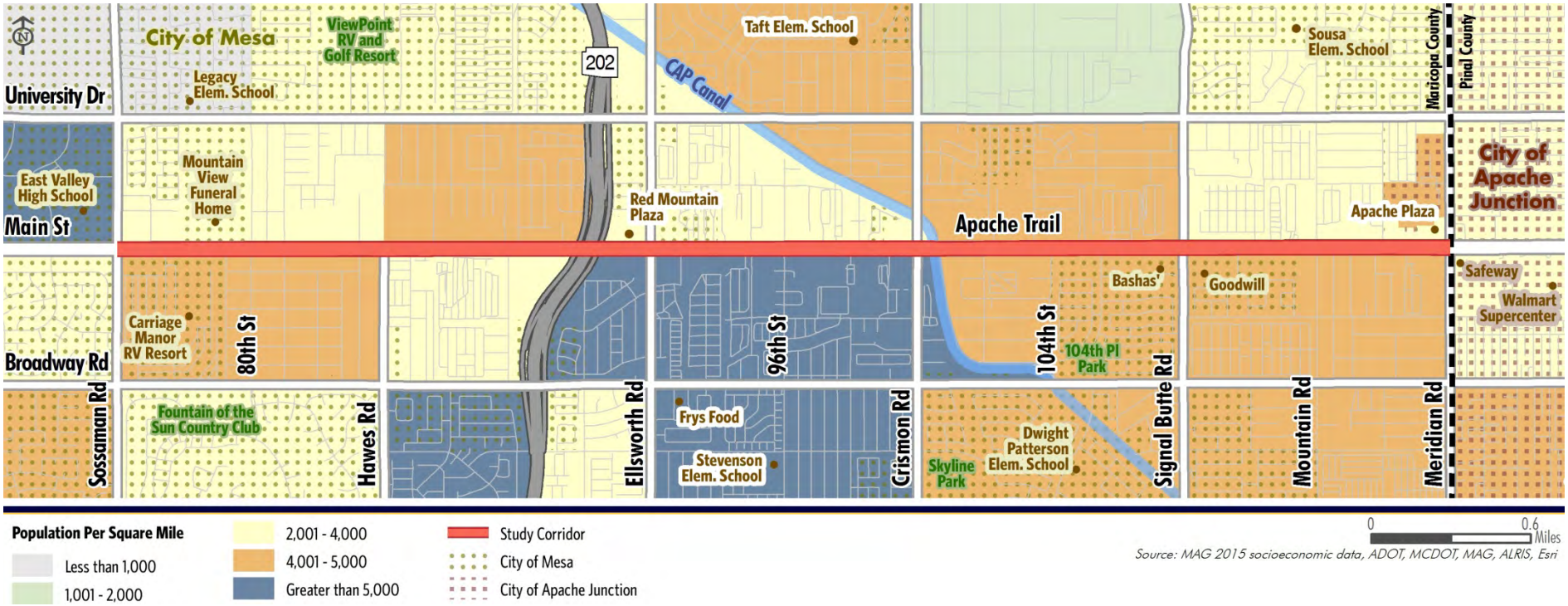
A review of existing population and employment information was conducted to understand the demographic characteristics of the study corridor and surrounding area. To determine current population characteristics, socioeconomic data was compiled from the MAG 2015 Travel Demand Model. The MAG model estimates population and employment data at the Traffic Analysis Zone (TAZ) level. TAZs are geographic subdivisions of the study area bounded by roads, political boundaries, natural and man-made geographical constraints (such as rivers, washes, etc.). Table 2.3 summarizes the existing socioeconomic conditions along the study corridor and within one-mile of the corridor, while Figure 2.3 illustrates the total population per square mile. As illustrated in the Figure, high population densities are located along the entire length of the corridor, particularly along the southern portion of the corridor between SR 202 and the CAP Canal. This high population density is primarily attributed to the large number of mobile home parks adjacent and setback from the corridor.

**Table 2.3: Existing Socioeconomic Conditions**

| | Total |
|---|---|
| **Adjacent to Study Corridor** | |
| Total Population | 21,337 |
| Transient and Seasonal Population | 4,989 |
| Housing Units | 11,490 |
| **Within One-Mile of Study Corridor** | |
| Total Population | 83,112 |
| Transient and Seasonal Population | 15,693 |
| Housing Units | 42,650 |

*Source: MAG 2015 Socioeconomic Data*

**Figure 2.3: Existing Population Density**

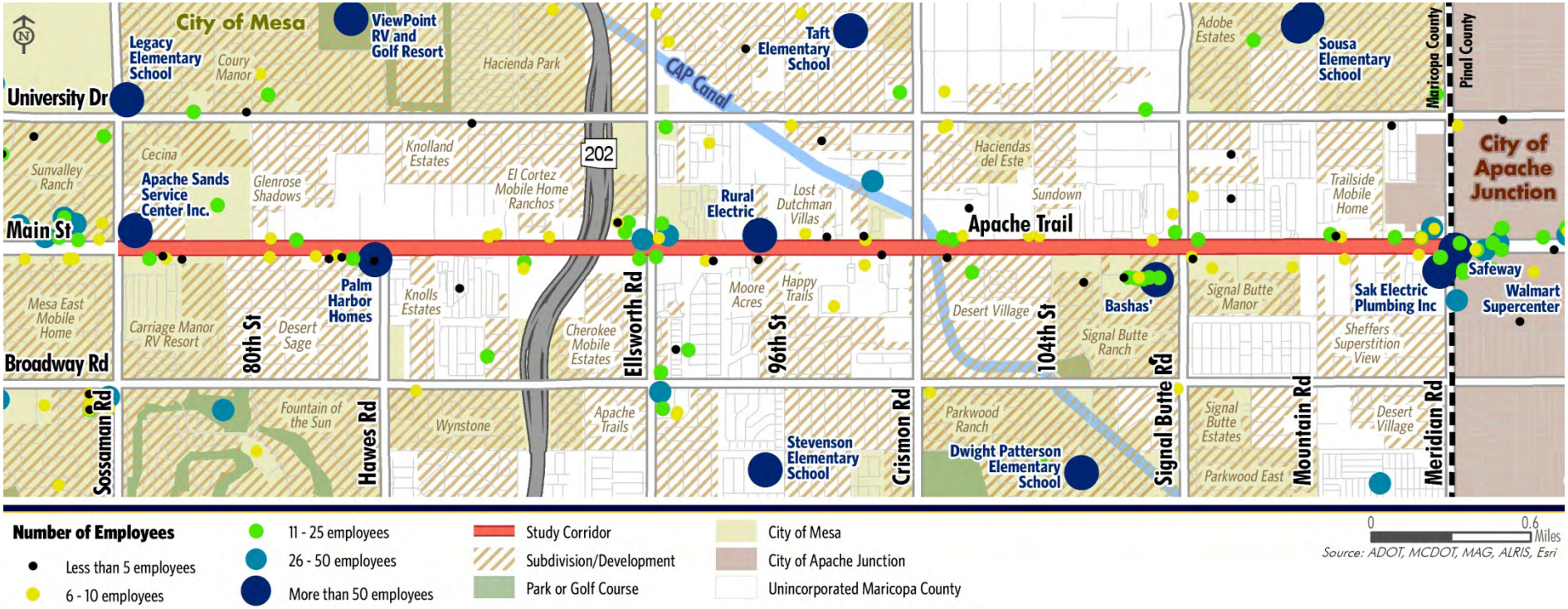


## Major Developments and Employers

Employer and development databases from MAG and Maricopa County were reviewed to identify primary employment industries and major developments along the corridor. There are numerous residential subdivisions and developments immediately adjacent to the corridor and in the surrounding area. The subdivisions range from mobile home and RV parks to single-family houses. Figure 2.5 illustrates the location of subdivisions and employers along the US 60X study corridor.

Based on MAG data, there are approximately 1,500 employees that work along the study corridor. As illustrated in Figure 2.4, additional employment centers are also located immediately west and east of the study area. The largest employers on the corridor include Palm Harbor Homes (99 employees), Apache Sands Service Centers (94 employees), Rural Electric (80 employees), and Bashas' Supermarket (58 employees).

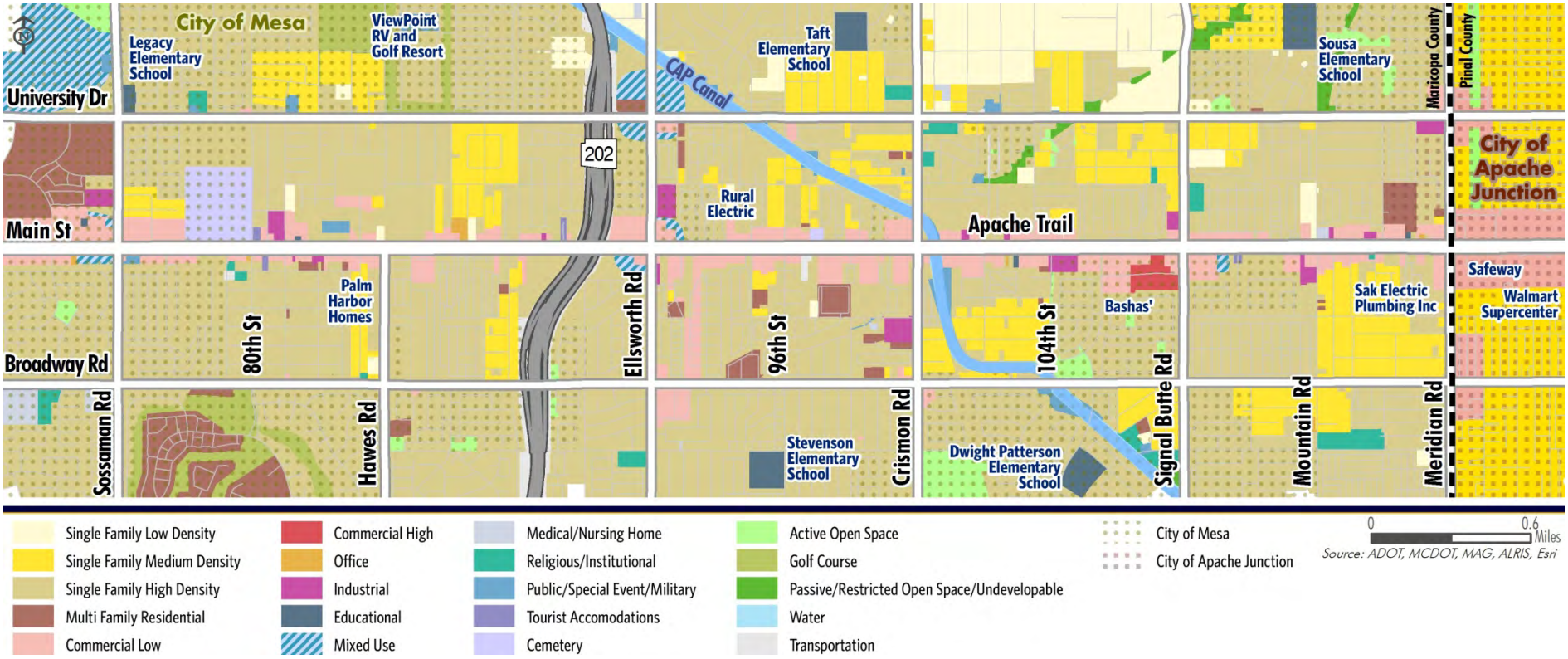
**Figure 2.4: Major Developments and Employers**



## Planned Developments

As illustrated in Figure 2.5, the US 60X corridor is expected to experience infill development where existing vacant lots are zoned for development of single family residential. Projected land use data shows that Single Family High Density (greater than four dwelling units per acre) is expected to grow from 38.9 percent of adjacent parcel land to 47.5 percent.

**Figure 2.5: Future Land Use and Planned Developments**



## Projected Socioeconomic Conditions

Forecasting future socioeconomic conditions allows us to anticipate changes in future travel demand and to envision potential solutions. Development of rational projections for population, housing units, and employment for each horizon year is vital to the process of forecasting realistic traffic volumes. The MAG model projects future population, housing units, and various types of employment categories by Traffic Analysis Zones (TAZ). Table 2.4 shows a tabular summary of the projected population, employment, and the number of occupied housing units along the study corridor. By 2040, population and housing unit projects are reflective of build-out conditions. Increased population is expected south of US 60X between Sossaman Road and Hawes Road, north of US 60X from Hawes Road to SR 202, and northwest of the US 60X/Meridian Road intersection. Additionally, increased development is projected to occur south of the study corridor along Broadway Road.

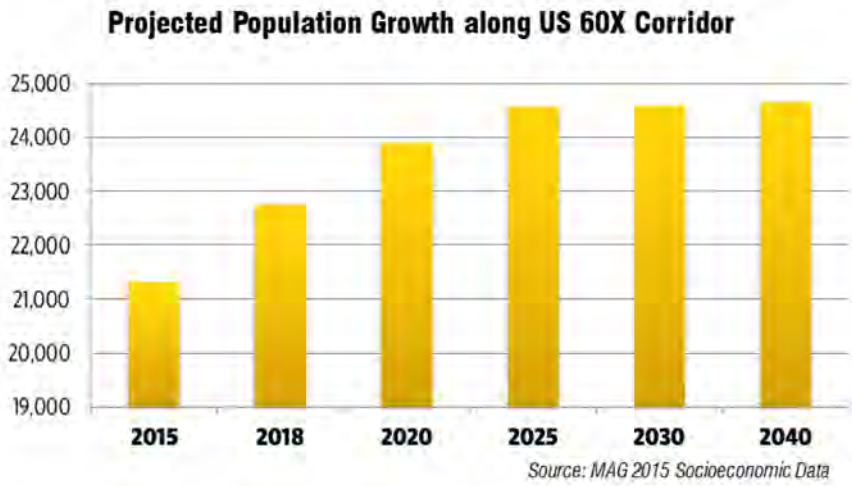



**Table 2.4: Projected Socioeconomic Conditions**

| | Current | Short-Term (year 2025) | Mid-Term (year 2030) | Long-Term (year 2040) |
|---|---|---|---|---|
| **Adjacent to Study Corridor** | | | | |
| Total Population[1] | 21,337 | 24,578 | 24,604 | 24,660 |
| Transient and Seasonal Population | 4,989 | 5,874 | 5,941 | 5,965 |
| Housing Units | 11,490 | 13,144 | 13,182 | 13,208 |
| Total Employment | 1,525 | 1,953 | 2,198 | 2,500 |
| **Within One-Mile of Study Corridor** | | | | |
| Total Population[1] | 83,112 | 92,198 | 93,165 | 94,582 |
| Transient and Seasonal Population | 15,693 | 18,307 | 18,522 | 18,594 |
| Housing Units | 42,650 | 47,418 | 47,767 | 48,108 |
| Total Employment | 16,211 | 19,127 | 20,348 | 21,839 |

*Source: MAG 2017 Socioeconomic Data*

*[1] includes resident population and group quarter (correction, institutional, and military) population*

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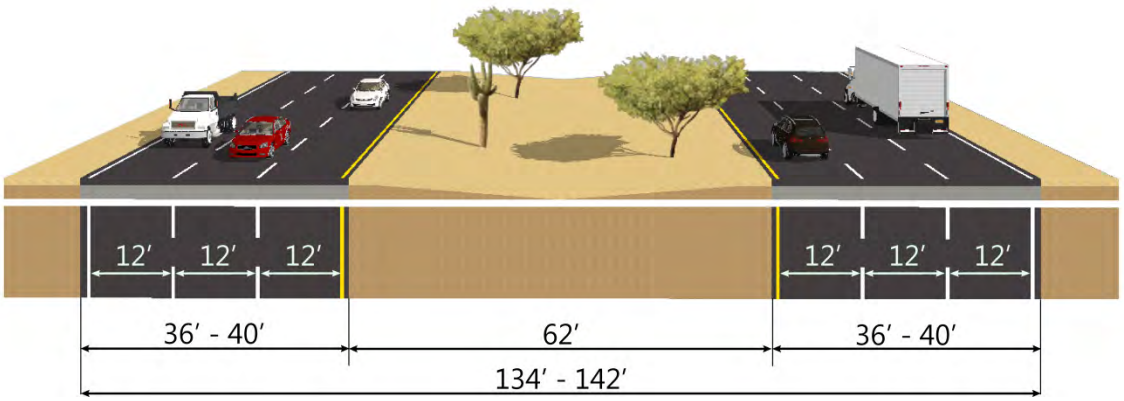
# 3. Roadway Conditions

The following section outlines key roadway characteristics of the five-mile study corridor of US 60X, locally known as Apache Trail and Main Street. Roadway characteristics are based on available data as well as findings from a comprehensive field review conducted in February 2017.Major elements inventoried include bridges, pavement condition, crashes, traffic conditions, roadway performance, and other modes of transportation in the study area. Working Paper 1 and 2 provide additional information on existing and future roadway conditions.

## Roadway Characteristics

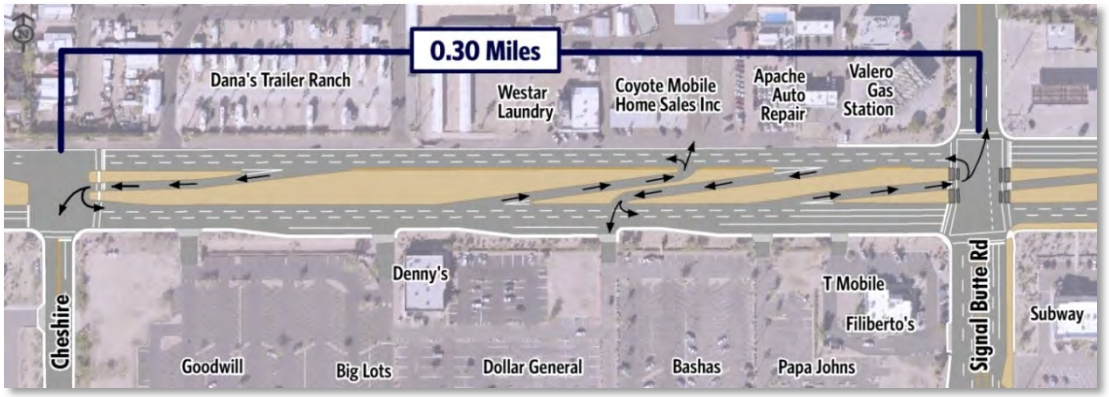
Figure 3.2 illustrates the typical cross section of the corridor. As previously noted, the study corridor is primarily a six-lane corridor with three lanes in each direction and a 62-foot drainage swale separating the east and westbound travel lanes. Portions of the corridor also have a significant centerline crown, an angle to the road's cross-section, which aids drainage. The corridor predominantly has one-foot paved shoulders with stop-controlled crossovers every 1/8$^{th}$ to 1/4$^{th}$ mile. Curb and gutter are only located at select locations along the corridor, primarily at intersections and generally spanning from the intersection at Cheshire to Signal Butte.

**Figure 3.1: US 60X Typical Cross-Section**



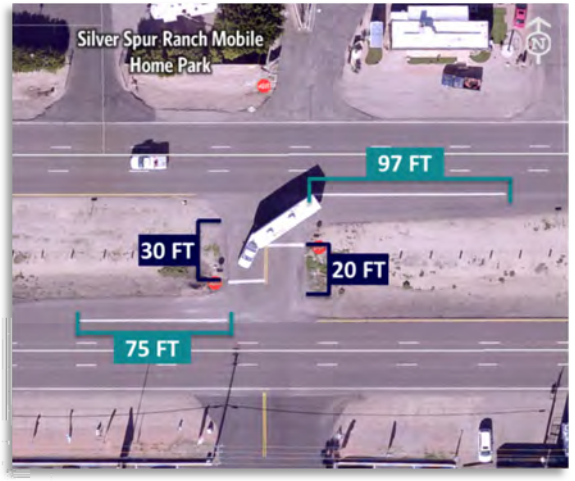

### *Cheshire to Signal Butte Road*

Between Cheshire and Signal Butte Road, the corridor has a unique configuration of three lanes in each direction with curb, gutter, and a sidewalk in the eastbound direction. In addition, this section of the US 60X corridor has two median crossover left-turn lanes; one for eastbound and one for westbound traffic. These turn lanes are only 160-feet west of the signalized Signal Butte Road intersection and may be confusing for motorists



## Shoulder Conditions

Roadside shoulders provide safe locations for disabled vehicles to stop, allow vehicles to pull over for emergency service vehicles, and provide bicyclists and pedestrians with a buffer zone from vehicular traffic. The corridor generally has narrow shoulders, with several locations having edge drop-offs.




## Traffic Control

Figure 3.2 illustrates the location of the eight traffic signals located along the study corridor. Several of the traffic signals operate with a Quad-Sequential phasing that allows the inside of the intersection to clear prior to signaling for the northbound and southbound turning lanes to move. In addition to the traffic signals, there are 18 stop-controlled crossovers located approximately every 1/8 to 1 /4 mile along the corridor. As shown on right, many left-turn storage lanes are short causing backups on US 60X. Crashes that have occurred at the crossovers are typically angle (front to side); many of these crashes are from motorists trying to cross US 60X and pulling out in front of traffic in attempt to enter the crossover.

**Figure 3.2: Traffic Control**

## Drainage Structures

The regional offsite drainage flows are from northeast to southwest and are conveyed through a series of existing washes and cross culverts where roadways are intercepted. Roadway drainage flows are generally captured in roadside ditches and carried to the outfall. Maricopa County Flood Control District (MCFCD) is currently conducting the *North Mesa Area Drainage Master Study* to investigate, identify, and assess existing flooding problems. As improvements move into the design phase, results of this study should be used to determine what structures need to be improved and how potential improvements will impact drainage in the area.

There are 11 structures listed in the National Bridge Inventory (NBI) and 241 culvert inlets and outlets along the study corridor. Table 3.1 provides a summary of the NBI listed structures and their sufficiency ratings. A structure's sufficiency rating is calculated based on an evaluation of the structure's conditions by inspectors and is utilized to determine a bridge's sufficiency to remain in service. These ratings are expressed as a percentage, in which 100 percent means a bridge is entirely sufficient and zero percent represents an entirely insufficient bridge. A low sufficiency rating may be attributed to structural defects, narrow lanes, low vertical clearance, or other issues. Structures with a sufficiency rating of 80 or less should be analyzed to determine potential improvement and cost estimates.

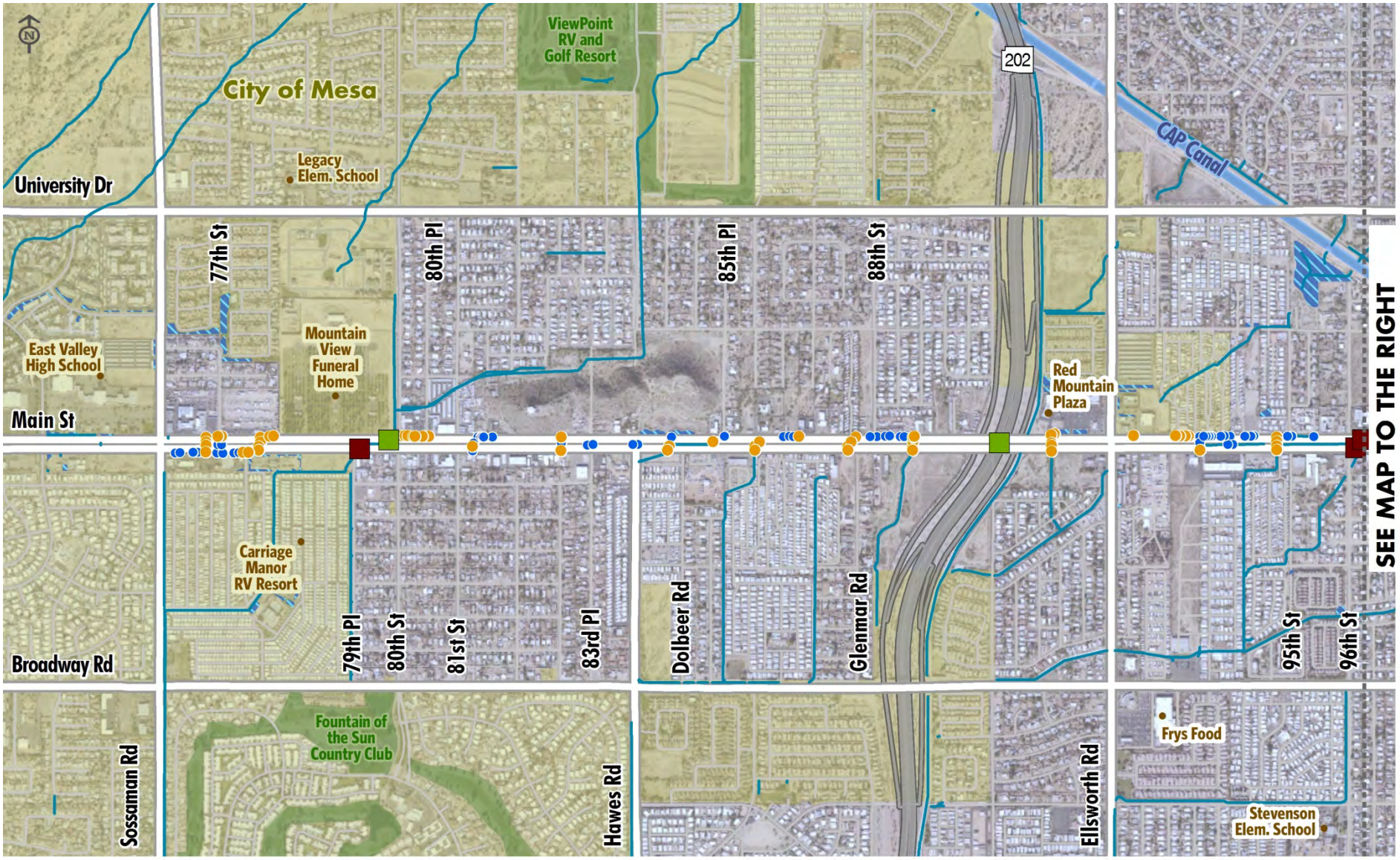
Figure 3.3 illustrates the locations of structures and culvert inlets/outlets along the study corridor. As shown in the Figure, numerous culverts have headwalls immediately adjacent to the study corridor. While the majority of the headwalls are delineated with a retroreflective object marker, fixed objects such these are safety concerns that need to be addressed.

**Table 3.1: Structure Summary**

| Number | Location | Yr Built | Length (m) | Material | Design | Sufficiency Rating |
|---|---|---|---|---|---|---|
| 01417 | CAP Canal (EB) | 1984 | 27 | Prestressed concrete | Stringer/Multi-beam or Girder | 82.1 |
| 01418 | CAP Canal (WB) | 1984 | 27 | Prestressed concrete | Stringer/Multi-beam or Girder | 93.3 |
| 02843 | SR 202 Overpass Bridge | 2008 | 80 | Prestressed concrete continuous | Box Beam or Girders | 91.4 |
| 04111 | East of 79th Pl (EB) | 1930 | 7 | Concrete continuous | Culvert | 78.3 |
| 04112 | West of 80th St (WB) | 1961 | 9 | Concrete continuous | Culvert | 95.5 |
| 04113 | East of 96th St (EB) | 1930 | 6 | Concrete continuous | Culvert | 79.3 |
| 04114 | East of 96th St (WB) | 1961 | 9 | Concrete continuous | Culvert | 79.3 |
| 04115 | West of Western Acres (WB) | 1930 | 7 | Concrete continuous | Culvert | 82.3 |
| 04116 | West of Western Acres (EB) | 1961 | 10 | Concrete continuous | Culvert | 98.4 |
| 04119 | East of Cheshire (EB) | 1930 | 7 | Concrete continuous | Culvert | 84.3 |
| 04120 | East of Cheshire (WB) | 1961 | 7 | Concrete continuous | Culvert | 99.5 |

*Source: ADOT Arizona State Highway Bridge Inventory*

## Figure 3.3: Structures and Culverts



*Source: Maricopa County, City of Mesa, ADOT, MCDOT, ALRIS, NHD, Esri*

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## Right-of-Way

Right-of-way (ROW) data was obtained from the Maricopa County Assessor's parcel database. Table 3.2 summarizes the ROW conditions along the corridor. While the US 60X ROW is wide, local businesses often encroach on it with driveways and for parking. Signs and parked vehicles located in the ROW may block sight lines and limit errant vehicle recovery. Locations where encroachment issues have been identified are provided in Appendix A.

### *Clear Zones*

Clear zones are unobstructed, traversable areas located adjacent to the roadway that allow drivers to regain control of a vehicle that has left the travel lane. Clear zones can reduce the severity of crashes and provide a safe recovery area. Along the corridor, a total of 129 headwalls were found to be within a 30-foot clear zone, of which 79 are located immediately adjacent to the roadway. Barrier posts are also located in the center median; however, several sections of the median barrier were missing during the field review as seen in the image on the bottom right.

## Signage

There is an abundance of regulatory and warning signs located along the corridor. In total there are 579 signs located on, or immediately adjacent to, the study corridor. In addition to roadway signs, there are numerous private signs advertising local businesses. Signs may cause sensory overload or confuse drivers, particularly at crossovers. Mountain Road has the highest number of signs, with 22 signs at the intersection. The summary of existing issues maps in Appendix A illustrates all signage along the corridor.

**Table 3.2: Right-of-Way (ROW) Width**

| Section | Total ROW Width |
|---|---|
| Sossaman Road – Hawes Road | 200' – 225' |
| Hawes Road – Ellsworth Road | 200' – 212' |
| Ellsworth Road – Crismon Road | 200' |
| Crismon Road – Signal Butte Road | 200' |
| Signal Butte Road – Meridian Road | 200' – 225' |

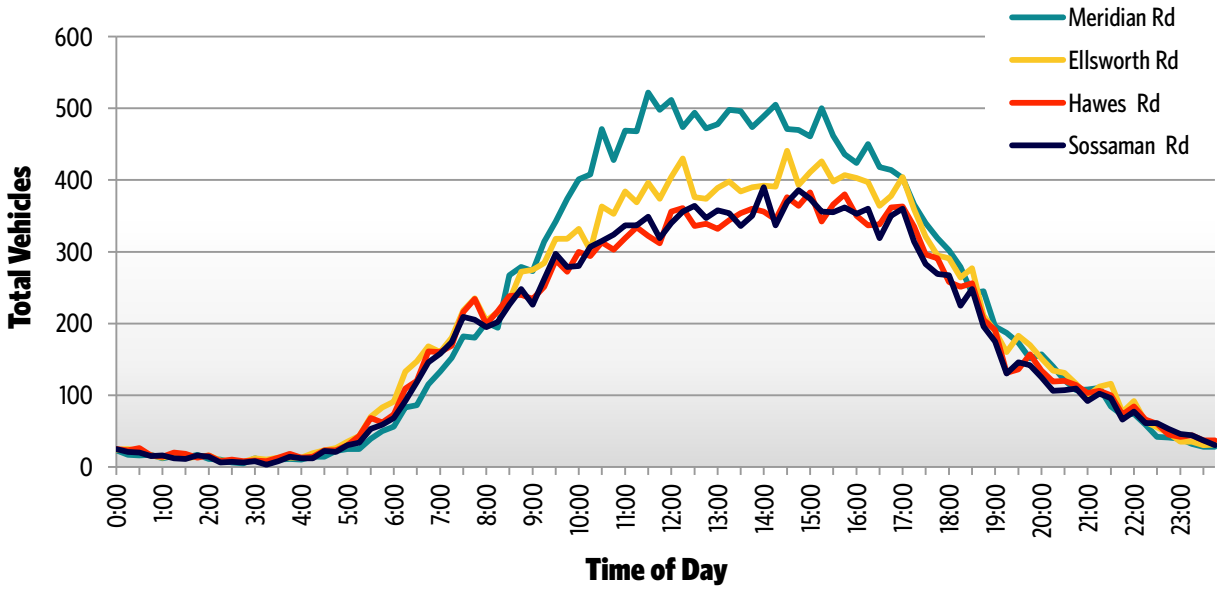
*Example of a culvert headwall located adjacent to travel lanes (east of 85th Place)*

*Example of large drainage swale (west of State Route 202)*

## Existing Traffic Conditions and Congestion

Forty-eight-hour traffic counts were collected at four locations along the study roadway, and turn movement counts for the AM/Midday/PM peak periods were collected for 15 critical intersections. In addition to the number of vehicles, the daily traffic counts also provided vehicle classification distribution and average travel speeds at each location. Table 3.5 displays the existing daily traffic volumes, truck/RV percentages, and average travel speeds along the study corridor.

**Figure 3.4: 24-Hour Traffic Volumes**




This data was compared to ADOT's traffic counts for validation purposes and then analyzed to determine the peak periods along the corridor in which turning movement counts could be collected. Figure 3.4 shows the traffic volumes on US60X near major cross-streets throughout a 24-hour period. It is important to note that the corridor does not have a traditional AM and PM peak, but rather has a significant midday peak; therefore, turning movement counts were collected for the AM (6 – 9 AM), Midday (11 AM – 2 PM), and PM (3 – 7 PM) peak periods at 15 critical intersections.

**Table 3.3: Existing Traffic Conditions**

| Count Location | Volume | | Truck and RV % | | Average Travel Speed | |
|---|---|---|---|---|---|---|
| | Eastbound | Westbound | Eastbound | Westbound | Eastbound | Westbound |
| East of Sossaman Road | 8,804 | 8,397 | 15% | 22% | 46 MPH | 48 MPH |
| East of Hawes Road | 9,365 | 8,069 | 5% | 16% | 48 MPH | 47 MPH |
| East of Ellsworth Road | 9,504 | 9,757 | 6% | 8% | 45 MPH | 49 MPH |
| West of Meridian Road | 10,728 | 10,413 | 6% | 17% | 44 MPH | 43 MPH |

## Current Intersection Operational Analysis

Figure 3.5 illustrates existing intersection volumes and lane configurations. Analysis of intersection operations was conducted using the nationally accepted methodology set forth in the Transportation Research Board's (TRB) Highway Capacity Manual (HCM). The computer software Synchro version 9.1 was used to calculate the level of service for individual movements and for each intersection as a whole. The criteria for LOS at signalized and unsignalized intersections is shown in Table 3.4.

**Table 3.4: Level of Service Criteria**

| LOS | Delay (sec/veh) | |
|---|---|---|
| | Signalized Intersections | Unsignalized Intersections |
| A | ≤ 10 | ≤ 10 |
| B | > 10 – 20 | > 10 – 15 |
| C | > 20 – 35 | > 15 – 25 |
| D | > 35 – 55 | > 25 – 35 |
| E | > 55 – 80 | > 35 – 50 |
| F | > 80 | > 50 |

*Source: Highway Capacity Manual*

The existing traffic signal timings were obtained from the operating agencies and used in the model to best represent existing conditions. Figure 3.6 displays the results of the operational analysis with LOS for the AM, Midday, and PM peak hours for each intersection movement and the intersection as a whole. All signalized intersections currently operate at LOS C or better except:

- Midday Period: Signal Butte Road(D)
- PM Period: Signal Butte Road(D), and Meridian Road (D)

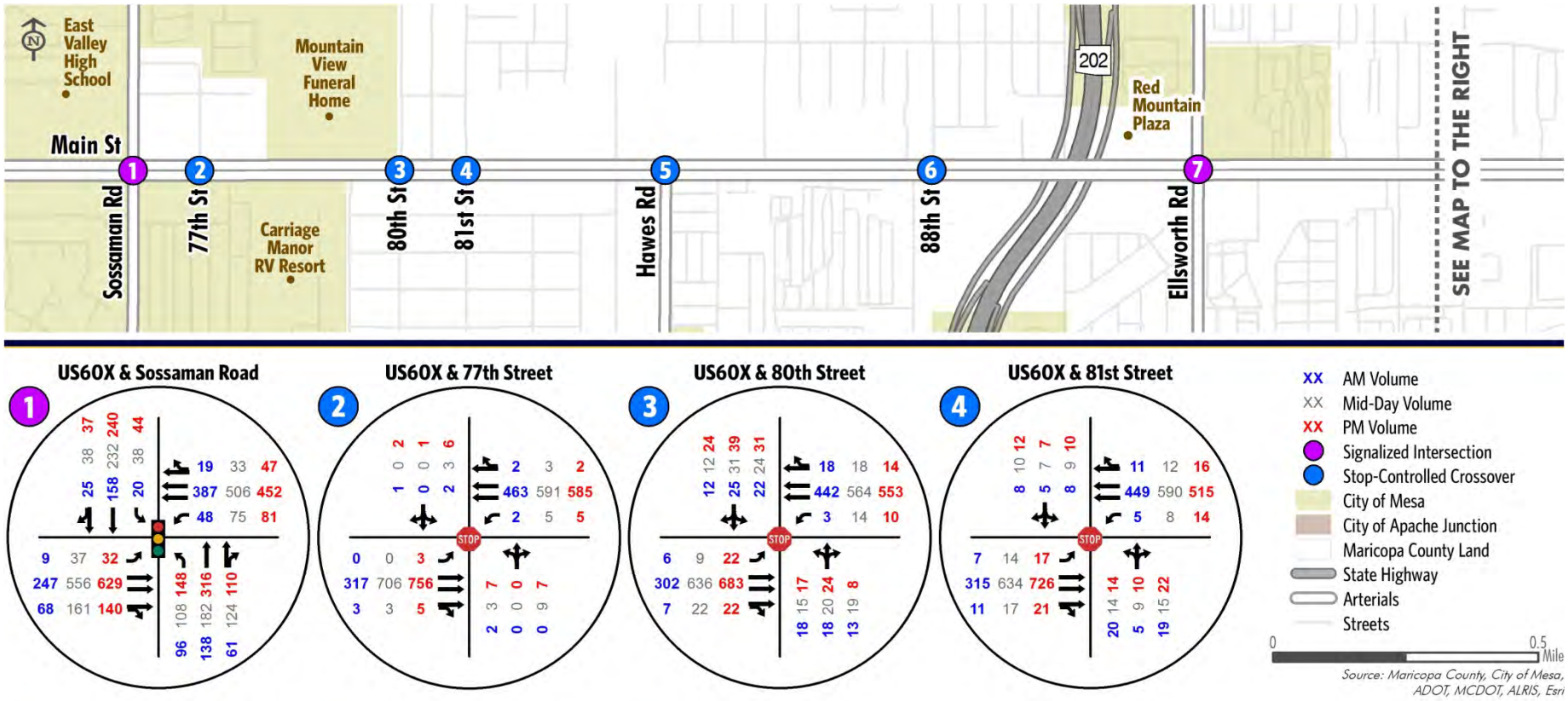
All unsignalized intersections on US 60X are stop-controlled on the cross-street while US 60X traffic does not stop at those intersections. Hence, LOS is determined only for the cross-streets at these intersections. Cross-streets at the following unsignalized intersections operate at a LOS worse than C:

- Midday Period: 80th Street (E), 81st Street (D), 96th Street(D), and Mountain Road (F)
- PM Period: 80th Street (F), 81st Street (D), 96th Street (E), and Mountain Road (F)

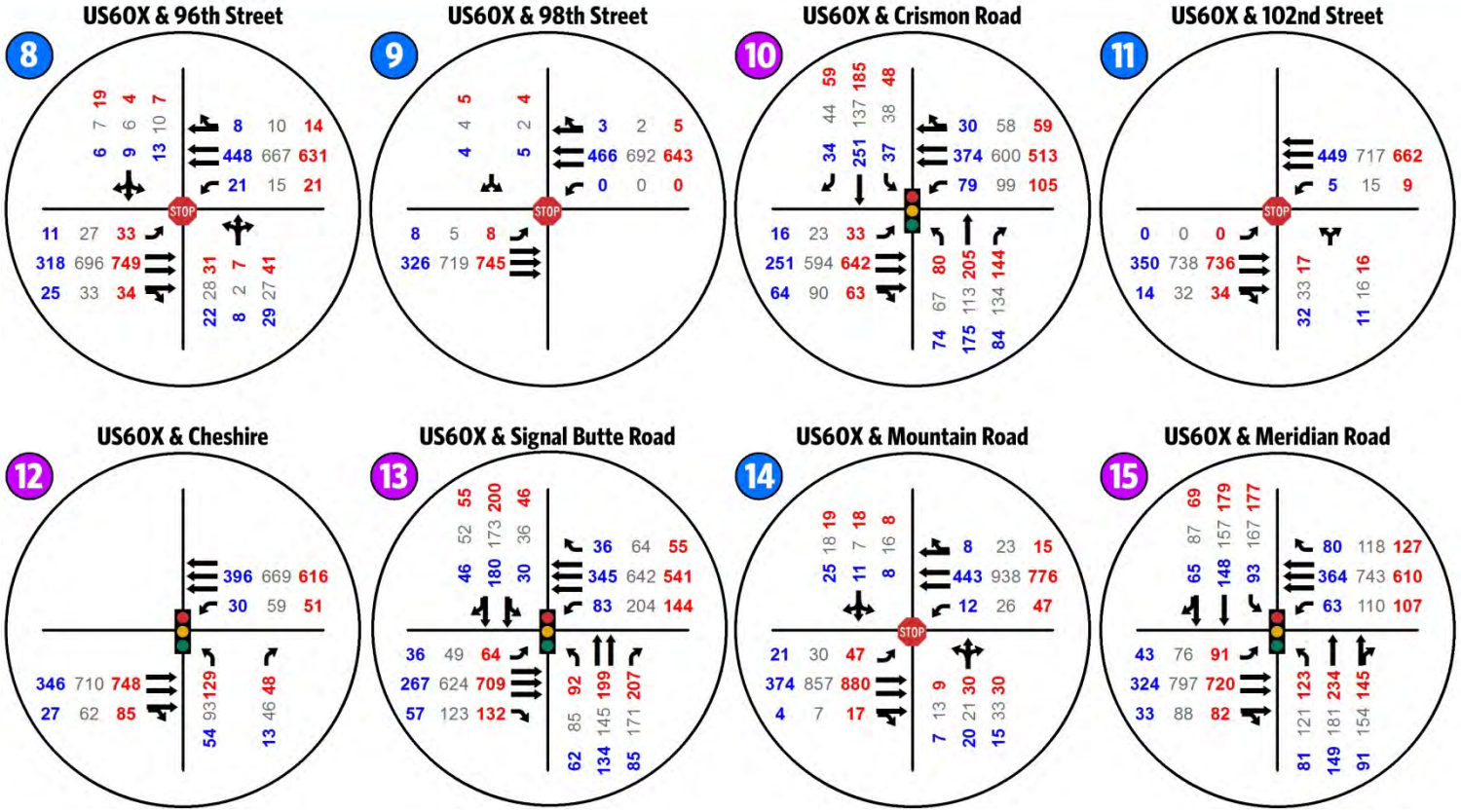
Turning movements that operate at a LOS E or worse include:

- 80th Street: northbound and southbound during the Midday and PM periods
- 96th Street: northbound during the PM period
- Crismon Road: westbound left-turn lane during the PM period
- Signal Butte Road: westbound left-turn lane during the Midday and PM periods, southbound left and through lanes during the PM period
- Mountain Road: northbound and southbound during the Midday and PM periods
- Meridian Road: southbound left-turn lane during the Midday and PM periods, eastbound and westbound left-turn lanes at the Midday and PM periods

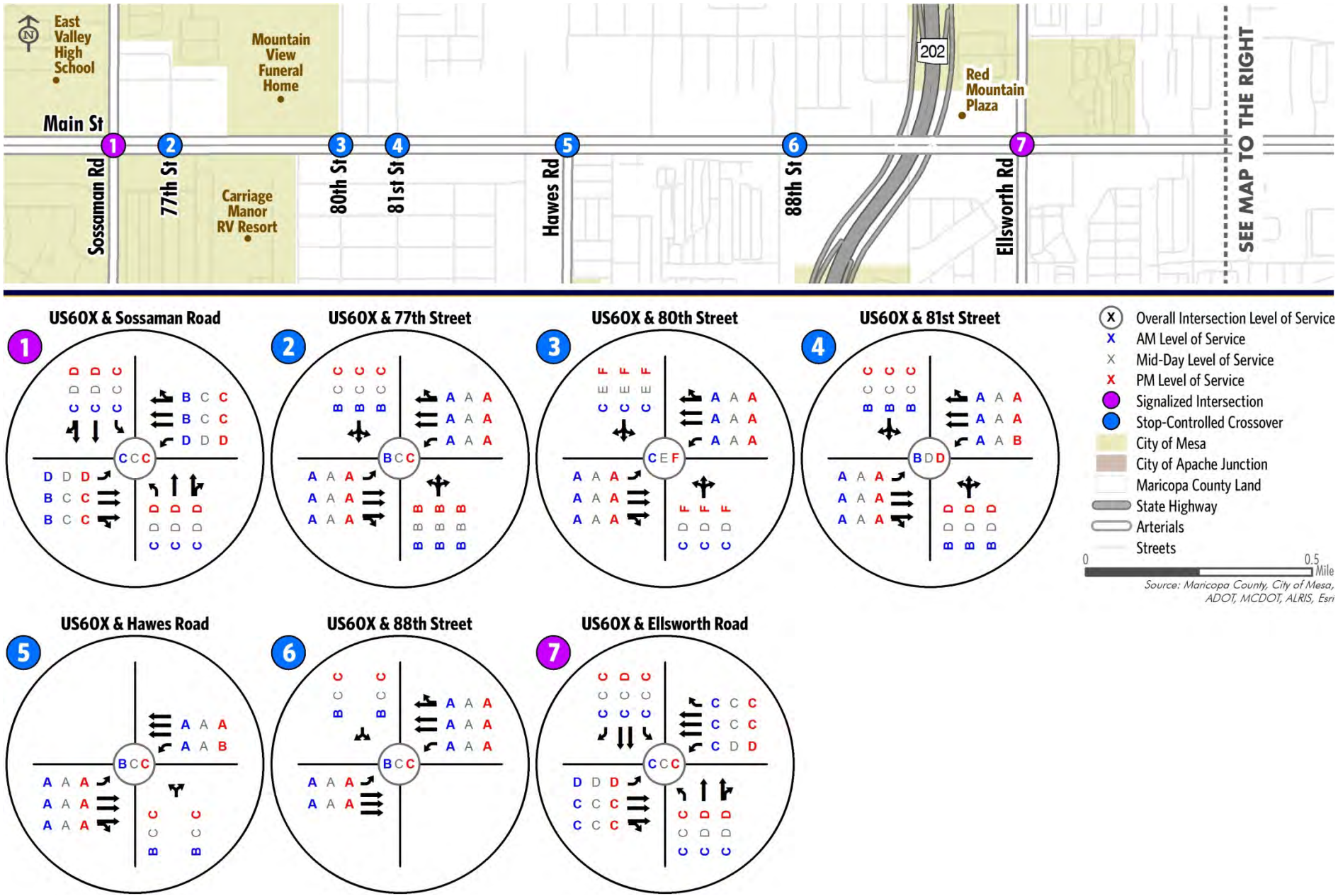
## Figure 3.5: Existing Intersection Volumes and Lane Configurations

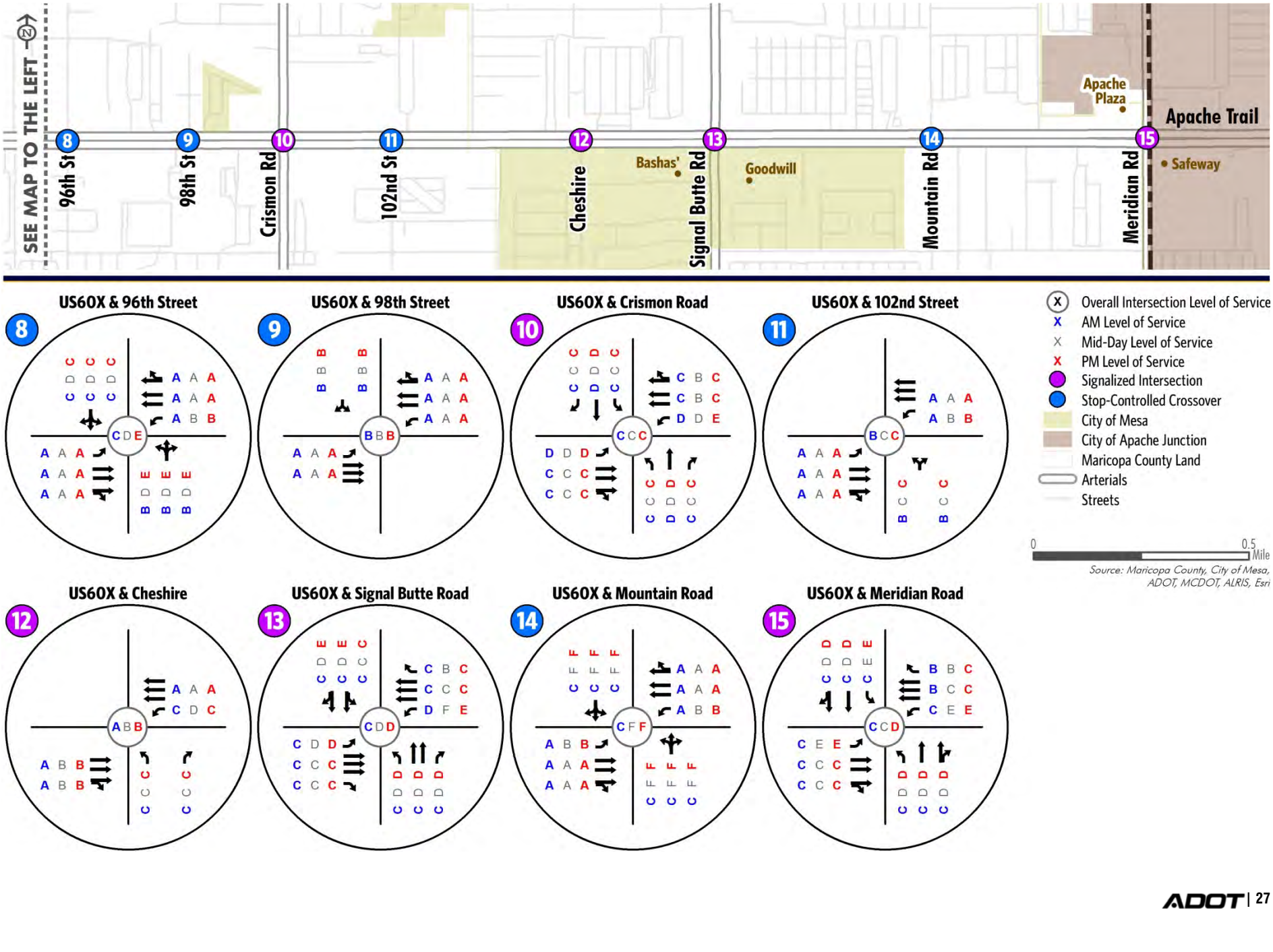



SEE MAP TO THE LEFT (2)
8
96th St
9
98th St
10
Crismon Rd
11
102nd St
12
Cheshire
Bashas'
13
Signal Butte Rd
Goodwill
14
Mountain Rd
15
Meridian Rd
Apache Plaza
Apache Trail
Safeway


US60X & 96th Street
8
6 7 19
6 9 6 4
13 10 7
8 10 14
448 667 631
21 15 21
11 27 33
318 696 749
25 33 34
22 28 31
8 2 7
29 27 41
US60X & 98th Street
9
4 4 5
5 2 4
3 2 5
466 692 643
0 0 0
8 5 8
326 719 745
US60X & Crismon Road
10
59 44 185 48
34 251 137 37 38
30 58 59
374 600 513
79 99 105
16 23 33
251 594 642
64 90 63
74 67 80 205
175 113 144
84 134
US60X & 102nd Street
11
449 717 662
5 15 9
0 0 0
350 738 736
14 32 34
32 33 17
11 16 16
US60X & Cheshire
12
396 669 616
30 59 51
346 710 748
27 62 85
54 93 129
13 46 48
US60X & Signal Butte Road
13
55 52 173 200 46
46 180 30 36
36 64 55
345 642 541
83 204 144
36 49 64
267 624 709
57 123 132
62 85 92 199
134 145 207
85 171
US60X & Mountain Road
14
25 18 19 7 18 8
11 16 8
8 23 15
443 938 776
12 26 47
21 30 47
374 857 880
4 7 17
7 13 9
20 21 30
15 33 30
US60X & Meridian Road
15
65 87 69 148 157 179 93 167 177
80 118 127
364 743 610
63 110 107
43 76 91
324 797 720
33 88 82
81 121 123 149 181 234 91 154 145
XX AM Volume
XX Mid-Day Volume
XX PM Volume
Signalized Intersection
Stop-Controlled Crossover
City of Mesa
City of Apache Junction
Maricopa County Land
Arterials
Streets
0
0.5
Mile
Source: Maricopa County, City of Mesa, ADOT, MCDOT, ALRIS, Esri

## Figure 3.6: Existing Intersection Level of Service




SEE MAP TO THE LEFT
8
96th St
9
98th St
10
Crismon Rd
11
102nd St
12
Cheshire
13
Signal Butte Rd
14
Mountain Rd
15
Meridian Rd
Bashas'
Goodwill
Apache Plaza
Apache Trail
Safeway
US60X & 96th Street
US60X & 98th Street
US60X & Crismon Road
US60X & 102nd Street
US60X & Cheshire
US60X & Signal Butte Road
US60X & Mountain Road
US60X & Meridian Road
Overall Intersection Level of Service
AM Level of Service
Mid-Day Level of Service
PM Level of Service
Signalized Intersection
Stop-Controlled Crossover
City of Mesa
City of Apache Junction
Maricopa County Land
Arterials
Streets
0
0.5
Mile
Source: Maricopa County, City of Mesa, ADOT, MCDOT, ALRIS, Esri

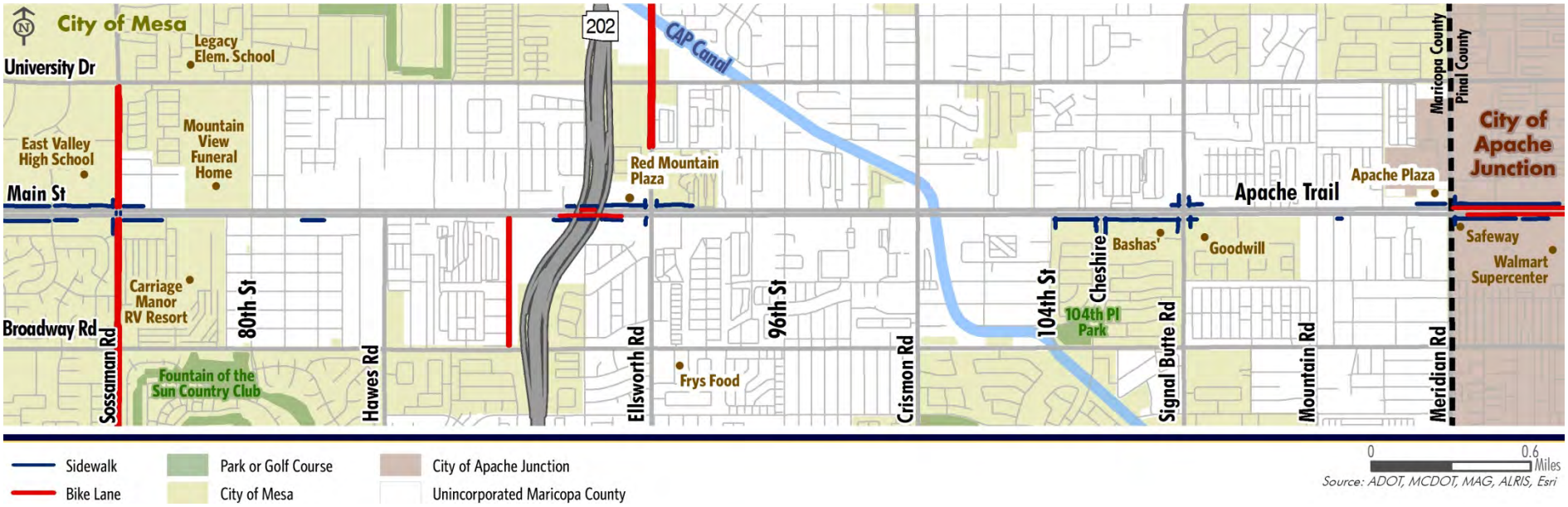
### Truck, RV, and Freight Usage

The percentage of vehicles that are classified as trucks/RVs traveling along the corridor range from five to 22 percent, with an average of 12 percent of traffic classified as a truck/RV. Trucks that exceed 14-feet in width, 120-feet in length, and 250,000 pounds of combined gross vehicle weight are required to obtain a Class C permit. According to the ADOT Maintenance Permit Services Department, the corridor experiences a very low volume of oversized loads. Between April 2016 and April 2017, there were four Class C permits issued for the corridor. Along the study corridor and its immediate vicinity, there are approximately 25 mobile home parks, and these areas experience higher seasonal RV traffic during the winter months.

## Non-Motorized Travel

There are limited pedestrian and bicycle facilities located along the corridor (see Figure 3.7 for locations). During field reviews, numerous pedestrians and bicyclists were witnessed walking/biking along the study corridor, crossing the corridor mid-block, and walking/biking in the travel lanes due to the poor shoulder conditions. Crosswalks are only provided approximately every mile at: Sossaman Road, Hawes Road, Ellsworth Road, Crismon Road, Cheshire, Signal Butte Road, and Meridian Road. Other than Meridian Road, signalized intersections all have pedestrian refuge areas.

**Figure 3.7: Existing Pedestrian and Bicycle Facilities**




## Existing Transit Services

No transit service exists on the study corridor. The closest bus stop to the corridor is located just west of the intersection of US 60X/Sossaman Road.

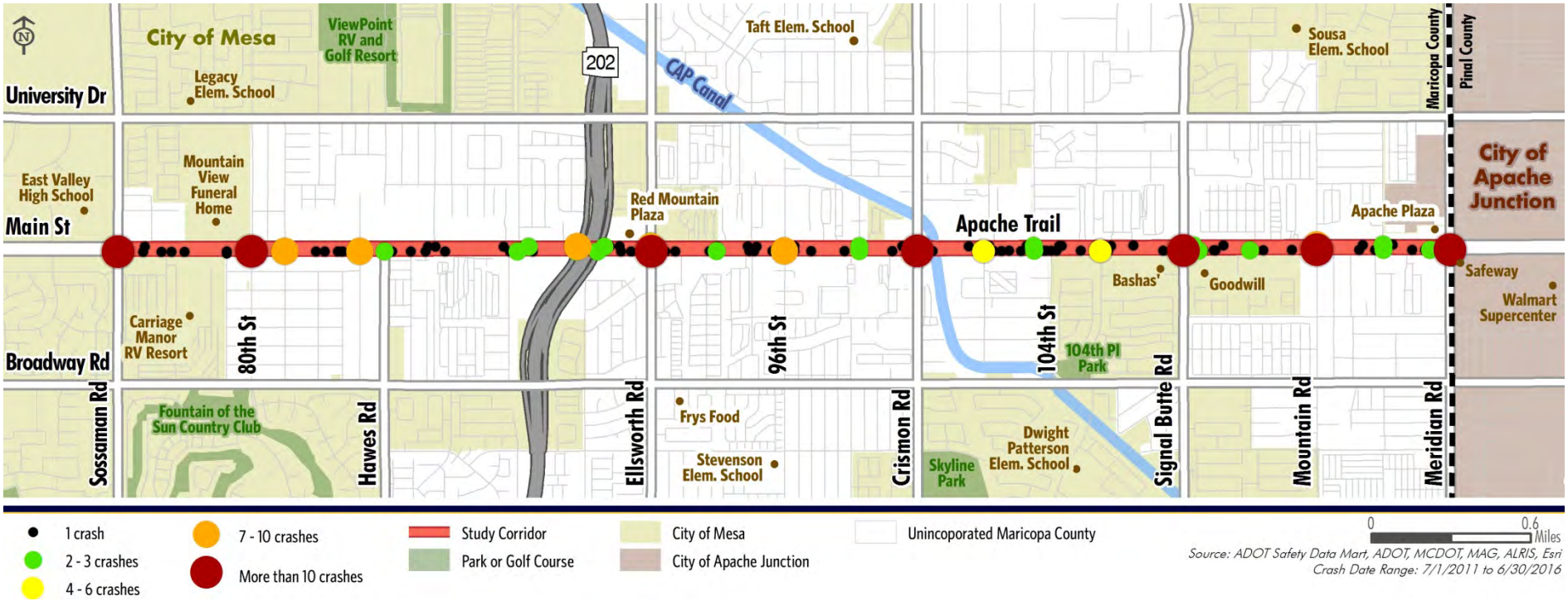
## Safety Assessment

A crash analysis was conducted for the study corridor to identify trends, patterns, predominant crash types, and high crash rate intersections and corridors. The purpose of the crash analysis is to discover safety hazard locations that need to be addressed to improve area safety. Crash data for a five-year analysis period, from July 1, 2011 through June 30, 2016, was obtained from ADOT's Safety Data Mart.

### General Corridor Crash Trends

During the five-year period a total of 474 incidents occurred along the study corridor and at study intersections. Figure 3.8 illustrates the location of crashes along the corridor. As shown in the Figure, crashes are dispersed throughout the corridor and largely occur at intersections and crossovers.

**Figure 3.8: Number of Crashes per Location**



### Crashes by Year

Figure 3.9 illustrates the total number of crashes that occurred along the corridor during the five-year study period. As shown in the Figure, the corridor experienced the highest number of crashes between July 2015 and June 2016 (with 117 total crashes). This trend is significantly higher than previous years.

### Crashes by Time of Year

Figure 3.10 illustrates the total number of crashes that occurred over the five-year period by month. As the Figure illustrates, the highest number of crashes occurred during the winter and spring months of January to April (43 percent of all crashes). This is probably related to the area having a high number of seasonal visitors that temporarily relocate to the surrounding area during the cooler winter months. During the warmer summer months of June, July, August, and September, a total of 130 crashes occurred (27 percent of all crashes). In 2016, 43 percent percent of the 66 reported crashes occurred in January and February, with the highest number of total crashes reported in January (18 crashes).

### Crashes by Day of Week and Hour

As shown in the table to the right, the majority of crashes along the study corridor occur on Friday and Saturdays. In addition, approximately 42 percent of crashes on Friday and Saturday occurred between the hours of 12pm – 6pm. In general, crashes occurred between 11:00 am – 6:00pm (56 percent of crashes), with crashes increasing during the lunch time (77 crashes between 11:00 am - 1:00 pm) and after school hours (84 crashes occurred between 2:00 - 4:00pm).

| Day | Crashes |
|---|---|
| Sunday | 51 |
| Monday | 60 |
| Tuesday | 69 |
| Wednesday | 50 |
| Thursday | 60 |
| Friday | 98 |
| Saturday | 86 |

**Figure 3.9: Total Crashes by Year**

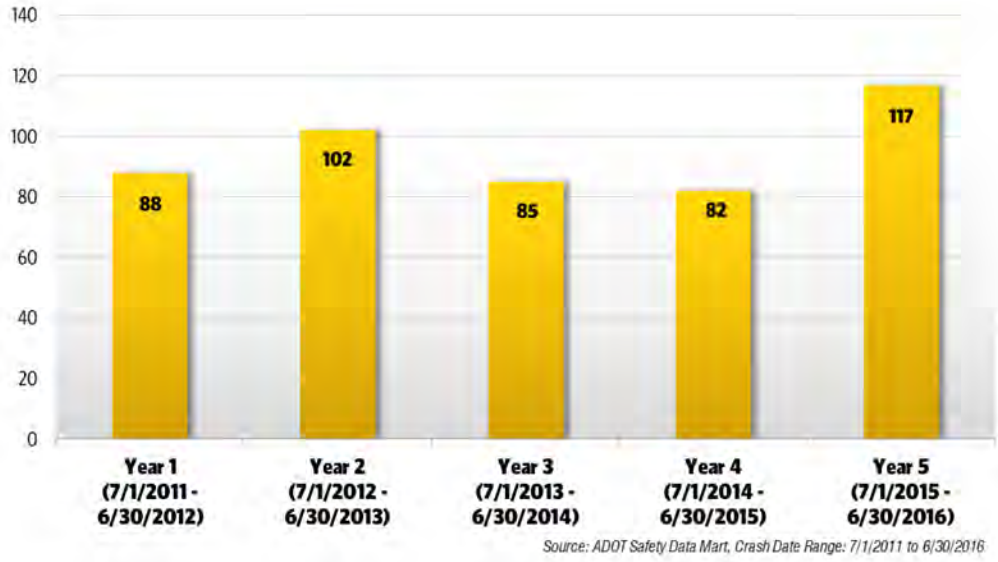
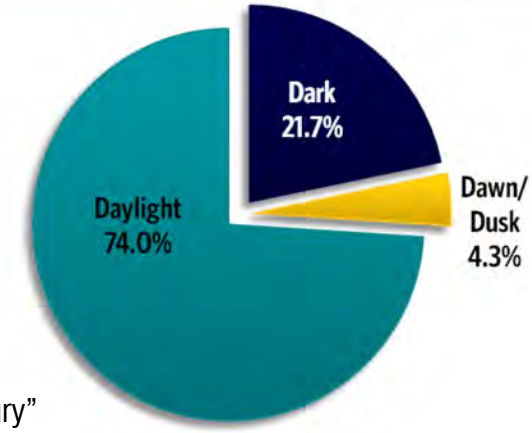



**Figure 3.10: Total Crashes by Month**

## Light Conditions

As previously noted, the majority of crashes occurred during the daylight hours. Approximately 22 percent of crashes were cited as occurring at night. Areas with the highest number of crashes occurring during the nighttime hours, with no street lighting available, include Signal Butte Road to Meridian Road (17%) and between Crismon Road and Signal Butte Road (12 percent).




## Injury Severity

The ADOT Safety Data Mart characterizes crash severity by the following categories: no injury, possible injury, non-incapacitating injury, incapacitating injury, fatal, and unknown. For this study, incapacitating injury crashes represent "severe injury" crashes and possible injury and non-incapacitating injury crashes represent "minor injury" crashes. Figure 3.11 provides an illustration of the locations of crashes by injury severity. During the analysis period, there were 12 fatal crashes and 26 severe injury crashes along the corridor. It is important to note that numerous non-roadway safety issues, such as not wearing a seatbelt or vehicle condition, may result in a crash fatality.

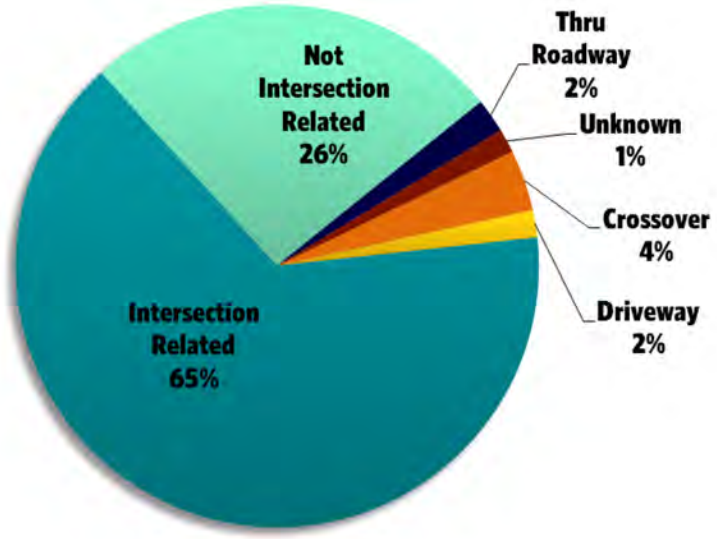
**Figure 3.11: Crashes by Injury Severity**

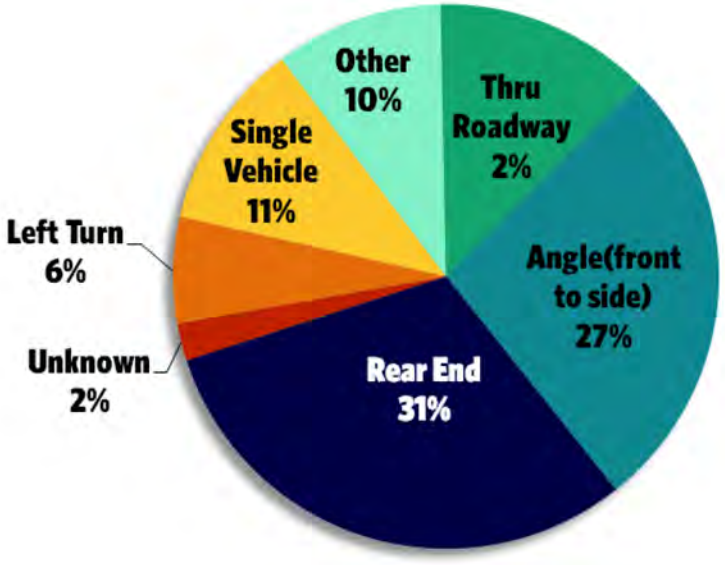
## Intersection Relation

Approximately 65 percent of crashes, or 308 out of 474 crashes, were identified as being intersection or interchange related. The highest number of intersection-related crashes occurred at:

- Ellsworth Road – 46 crashes
- Signal Butte Road – 40 crashes
- Meridian Road – 38 crashes
- Sossaman Road – 30 crashes

Further analysis shows that 34 percent of intersection related crashes were caused by rear-end collisions and another 34 percent were caused by angle (front to side) collisions. Traditionally, rear-end and angle crashes are often caused by driver inattention, high vehicle speeds, and failure to yield at intersections and driveways. Approximately 7.8 percent of angle (front to side) crashes occurred at the US 60X / 80th Street intersection, while the intersections of US60X/Ellsworth Road and US 60X/Signal Butte Road accounted for 20 percent of rear-end collisions.




## Leading Collision Manner

Of the 474 crashes within the study area, 31 percent were cited as rear-end crashes and 27% were angle (front to side) crashes. As previously noted, these crashes primarily occurred at intersections. The highest number of intersection related, rear-end crashes occurred in the eastbound direction at Ellsworth Road (14 crashes), Signal Butte Road (13 crashes), and Meridian Road (13 crashes). The highest number of non-intersection related, rear-end crashes occurred between Signal Butte Road and Meridian Road. The 80th Street intersection, which has the highest total number of angle (front to side) crashes, is a stop controlled cross-over.

## Leading Crash Cause

Analyzing the crash event assists in identifying hazards that cause safety issues along study roadways. Approximately 8 percent of crashes occurred with roadside objects, such as traffic sign support poles, traffic barrier, fences, and utility poles, this is the leading crash cause compared to other crashes that did not involve a motor vehicle in transport. Locations with a high number of roadside object crashes occurred at:

- Crismon Road to Signal Butte Road – 10 crashes. In the vicinity of the US 60X/102nd Street intersection, there were six crashes with roadside objects.
- Near the Meridian Road intersection – 5 crashes, one of which was a fatal collision with traffic signal pole.
- Sossaman Road intersection (eastbound direction) – 3 crashes with roadside objects

There were three crashes with vehicles parked adjacent to the road, 14 crashes with pedestrians, and 18 crashes with bicyclists.

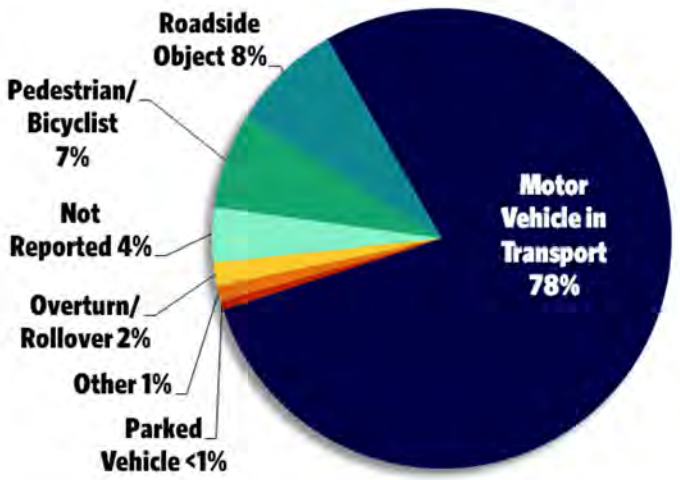
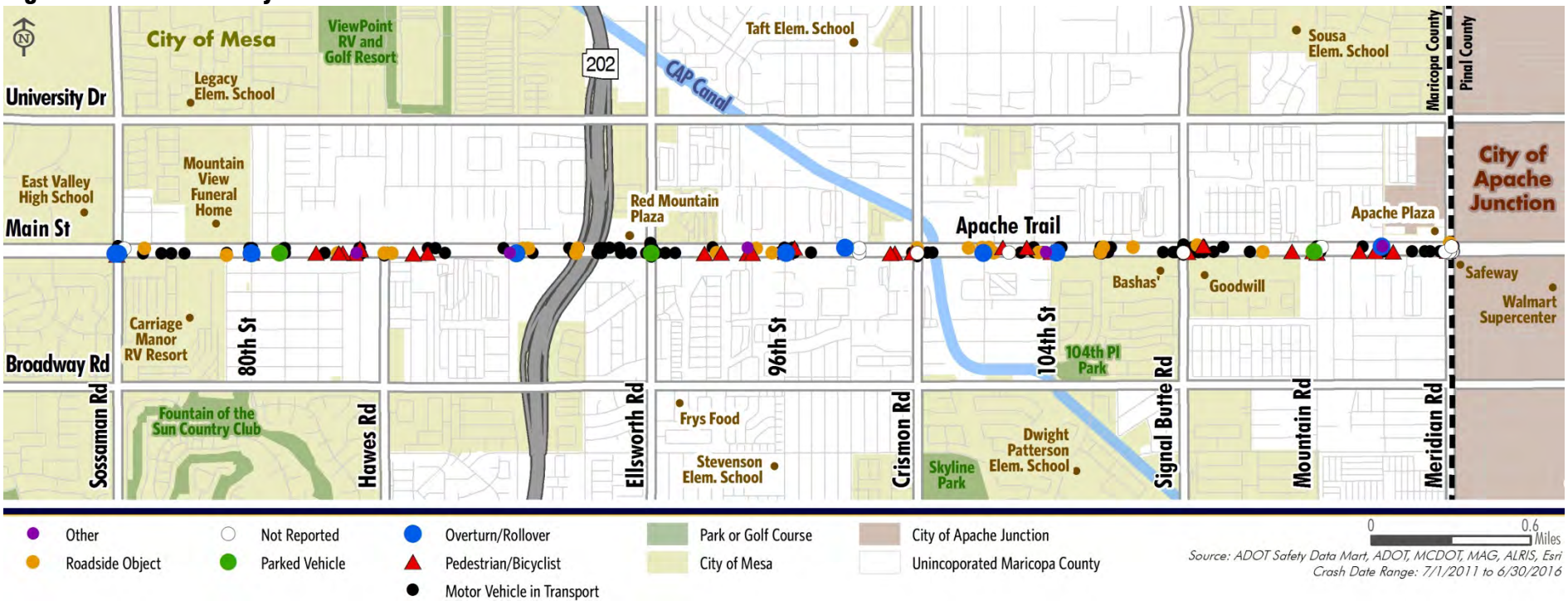



**Figure 3.12: Crashes by First Harmful Event**



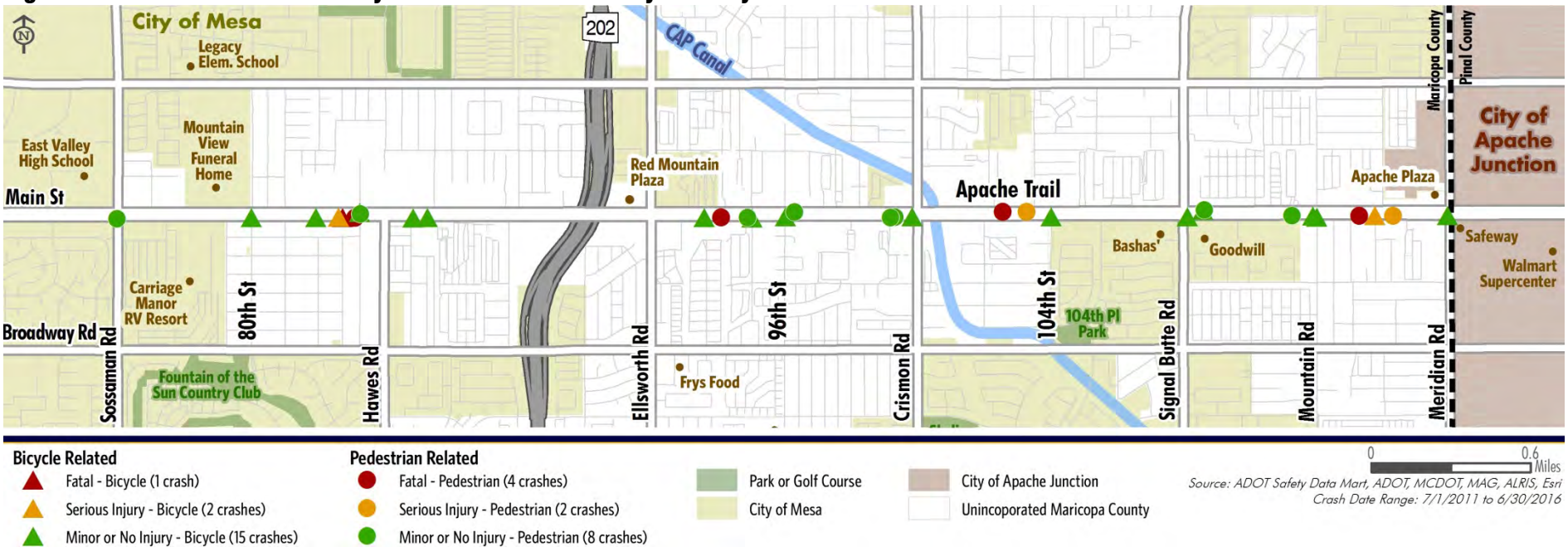
## Pedestrian and Bicycle Involved Crashes

Figure 3.13 illustrates the location of pedestrian and bicycle involved crashes along the study corridor. In total, pedestrians were involved in 14 crashes and bicyclists in 18 crashes. Key findings in regard to pedestrian and bicycle related crashes along the corridor include:

- 78 percent of bicyclist-related crashes occurred during the daylight hours, while 64 percent of pedestrian crashes occurred at night.
- 24 of 32 pedestrian- and bicyclist-related crashes occurred in the eastbound travel lanes. There were no fatal crashes and only two severe injury crashes that occurred in the westbound lanes.
- Four fatal and three severe injury pedestrian- and bicyclist-related crashes occurred in the eastbound direction. As shown in the table on the right, bicyclist-related crashes primarily occurred in the eastbound travel lanes.
- A large number of the pedestrian- and bicycle-related crashes were cited as the bicyclist traveling against traffic, pedestrian not utilizing a crosswalk, and the pedestrian/bicyclist failing to yield to right-of-way.

| | EB | WB |
|---|---|---|
| **Pedestrian Involved** | **9** | **5** |
| Fatal | 3 | 1 |
| Severe Injury | 1 | 1 |
| Minor or No Injury | 5 | 3 |
| **Bicyclist Involved** | **16** | **2** |
| Fatal | 1 | 0 |
| Severe Injury | 2 | 0 |
| Minor or No Injury | 13 | 2 |
| **Other** | **310** | **132** |
| Fatal | 5 | 2 |
| Severe Injury | 13 | 9 |
| Minor or No Injury | 292 | 121 |

**Figure 3.13: Pedestrian- and Bicyclist-Related Crashes by Severity**



## Current Access Conditions

Figure 3.15 illustrates the location of all driveways along the corridor. As previously noted, several of the driveways along the corridor exceed the 40' maximum width allowed by ADOT. Figure 3.14 illustrates driveway spacing and driveway widths of a typical section of the corridor. As noted in Figure 3.15, several full access driveways lack a stop sign. In addition, many motorists utilize the wide driveways as parking lots.

**Figure 3.14: Example of Driveway Spacing and Width**

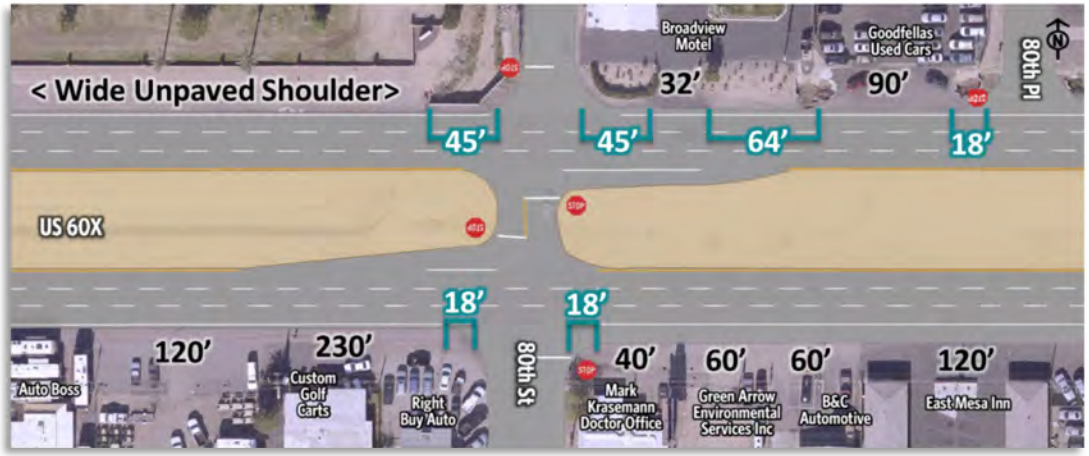
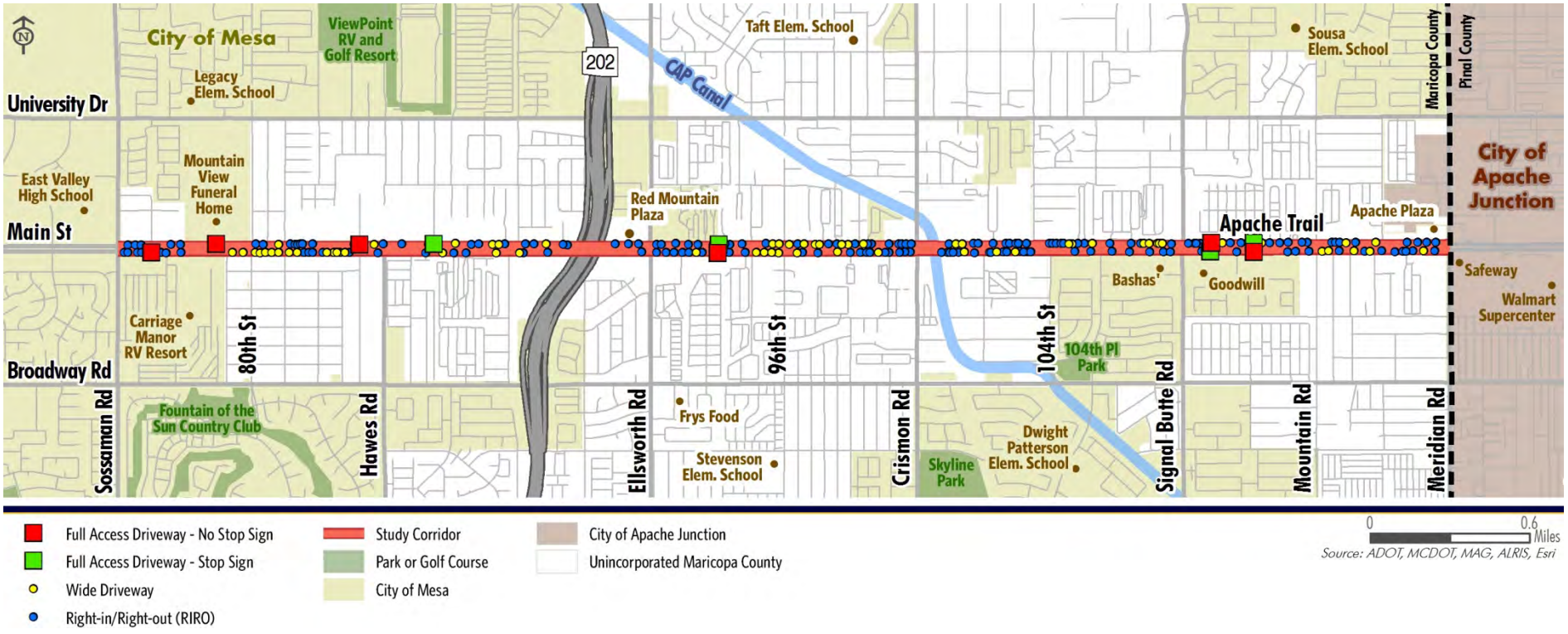



**Figure 3.15: Existing Access Points**



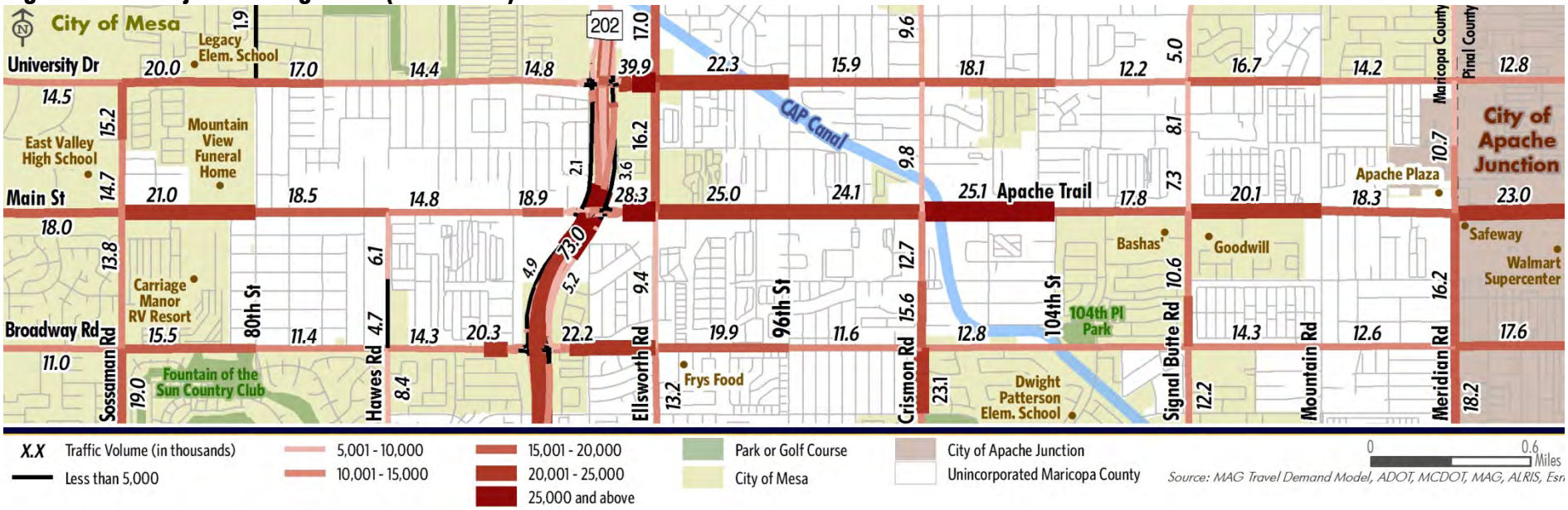
## Future Traffic Conditions and Congestion

The primary purpose of forecasting future traffic volumes is to estimate the additional travel demand added to existing roadways and to forecast congestion levels due to projected growth in population and employment. In addition, this analysis provides valuable insight into potential transportation solutions. The following section presents corridor and intersection traffic volumes and levels of congestion, *if no roadway improvements are made (No-Build).* Similar to existing conditions, US60X between SR 202 SB and Ellsworth Rd operates poorly in all the future horizon years. This can be attributed to three factors – 1) three signals within a span of a quarter mile; 2) lack of proper signal timing coordination; and 3) slower speeds due to shorter segment length. Working Paper 1 provides additional operational analysis information for years 2025 and 2030.

### Long-Term (Year 2040) Projected Traffic Conditions

Figure 3.16 displays the projected traffic volumes for the long-term planning horizon, *if no roadway improvements are made.* As illustrated, traffic volumes are the highest east of Sossaman Road, between SR 202 and 104th Street, and east of Signal Butte Road. Due to the signal progression and close proximity of the SR 202 ramp and Ellsworth Road intersection, east and westbound travel lanes experience congestion issues. Coordinating traffic signals along the corridor may help improve operations.

**Figure 3.16: Projected Long-Term (Year 2040) Traffic Volumes**



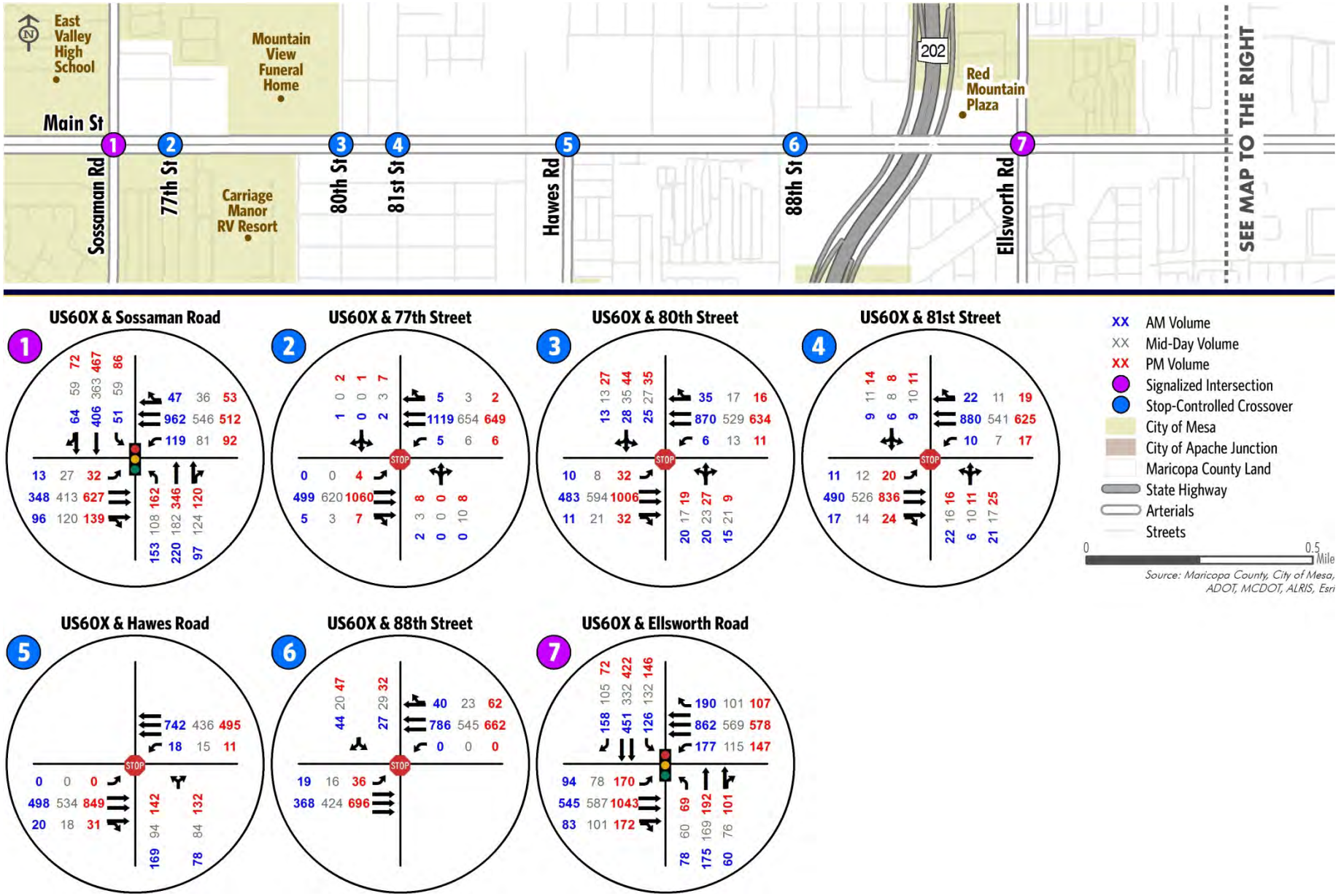
## Long-Term (Year 2040) Intersection Operations

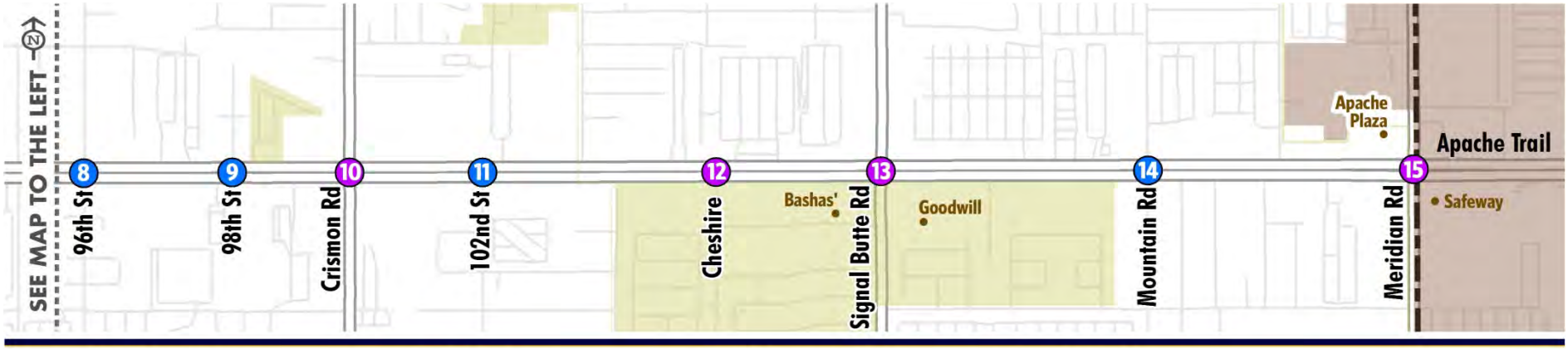
Figure 3.17 displays the projected AM, Midday, and PM peak hour turning movement volumes for the long-term planning horizon. Figure 3.18 illustrates the overall intersection LOS, and LOS at each turn movement for each leg/approach at each intersection. Table 3.5 lists the overall intersection LOS for the AM, Midday, and PM peak hours. As illustrated in the Figures and Table, all unsignalized intersections (except for 88th and 98th Street) operate at LOS D or worse during at least one peak period. The unsignalized intersections of 80th Street and 96th Street have the worst overall operations with LOS E or F for all periods. The signalized intersections of Sossaman Road, Ellsworth Road, and Crismon Road operate at a LOS D during the AM and PM periods, and Meridian Road operates at a LOS D in the PM period.

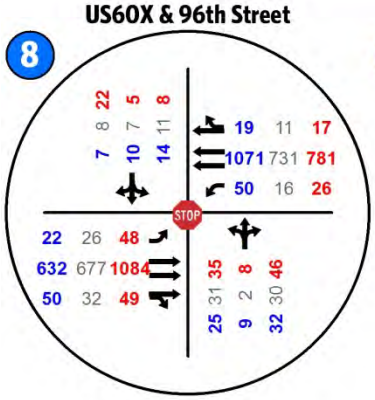
**Table 3.5: Projected Long-Term (Year 2040) Overall Intersection Level of Service**

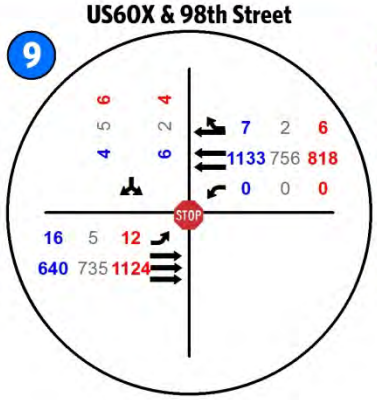
| Intersection | Existing | | | Long-Term (Year 2040) | | |
|---|---|---|---|---|---|---|
| | AM | MID | PM | AM | MID | PM |
| **Signalized Intersections** | | | | | | |
| US 60X/Sossaman Road | C | C | C | D | C | D |
| US 60X/Ellsworth Road | C | C | C | D | C | D |
| US 60X/Crismon Road | C | C | C | D | C | D |
| US 60X/Cheshire | A | B | B | A | B | B |
| US 60X/Signal Butte Road | C | D | D | C | C | C |
| US 60X/Meridian Road | C | C | D | C | C | D |
| **Unsignalized Intersections** | | | | | | |
| US 60X/77th Street | B | C | C | D | C | C |
| US 60X/80th Street | C | E | F | F | E | F |
| US 60X/81st Street | B | D | D | D | C | E |
| US 60X/Hawes Road | B | C | C | E | C | F |
| US 60X/88th Street | B | C | C | B | C | C |
| US 60X/96th Street | C | D | E | F | E | F |
| US 60X/98th Street | B | B | B | C | B | B |
| US 60X/102nd Street | B | C | C | D | D | E |
| US 60X/Mountain Road | C | F | F | E | D | F |

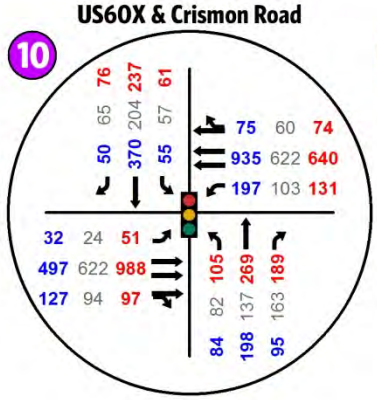
## Figure 3.17: Projected Long-Term (Year 2040) Intersection Traffic Volumes

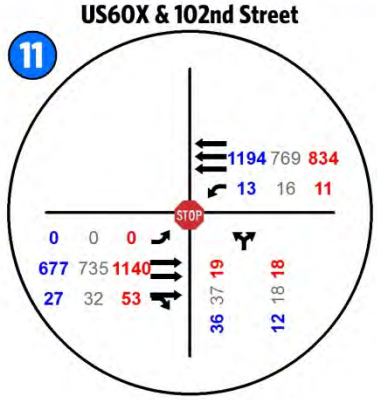


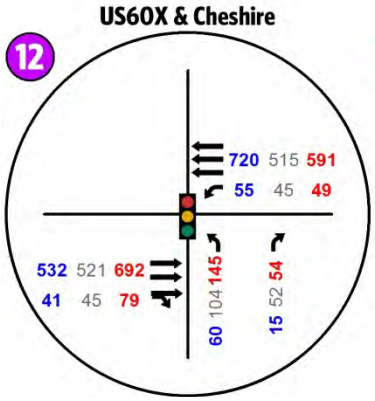


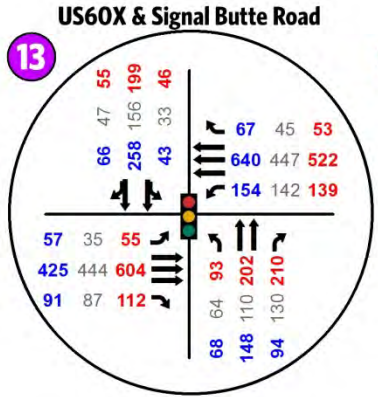



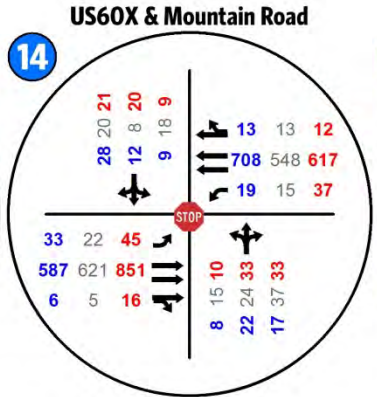



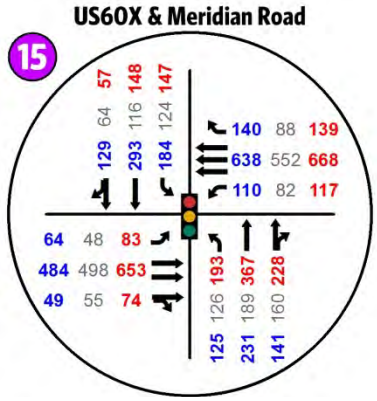



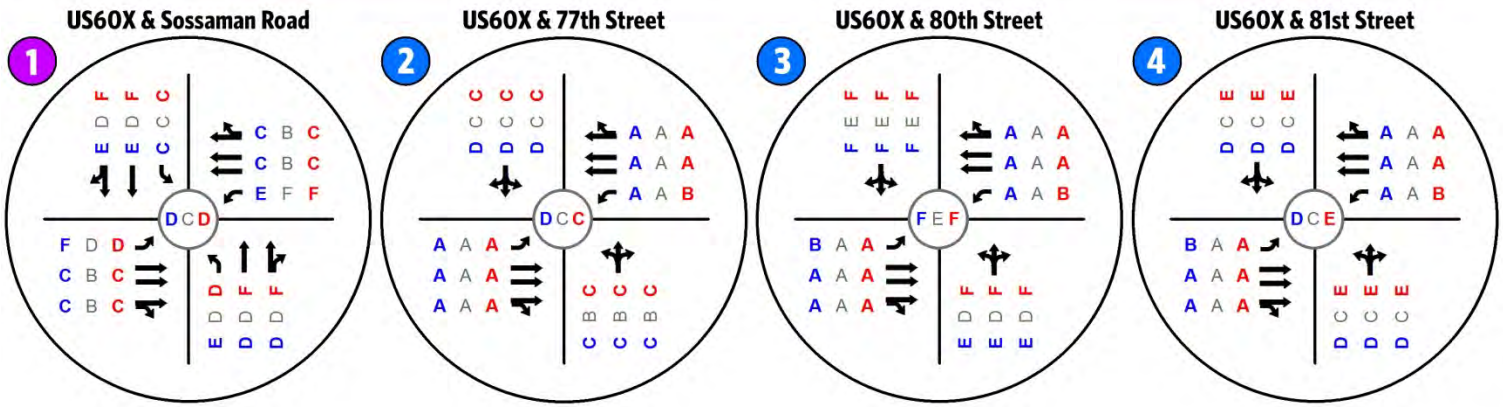



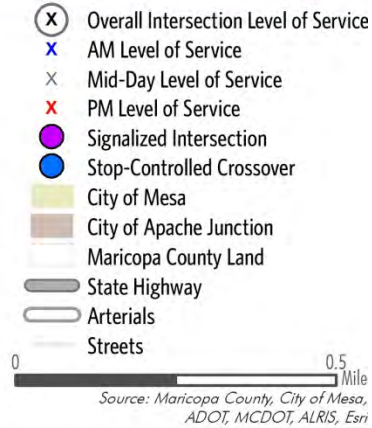

XX AM Volume
XX Mid-Day Volume
XX PM Volume
Signalized Intersection
Stop-Controlled Crossover
City of Mesa
City of Apache Junction
Maricopa County Land
Arterials
Streets

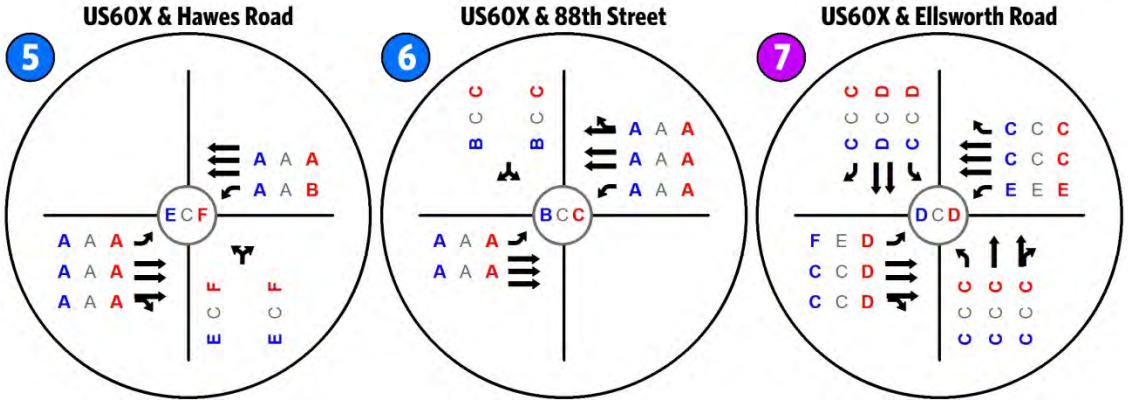
0 0.5 Mile

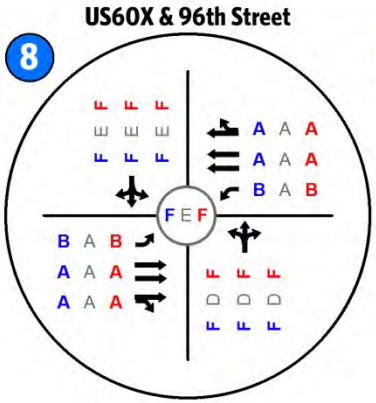
*Source: Maricopa County, City of Mesa, ADOT, MCDOT, ALRIS, Esri*

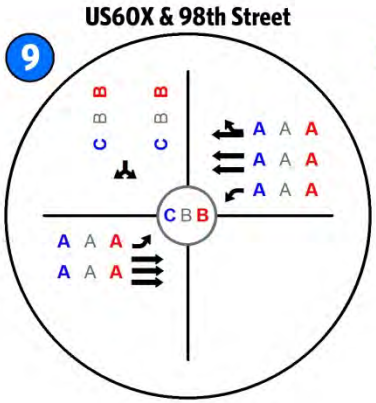
## Figure 3.18: Projected Long-Term (Year 2040) Level of Service

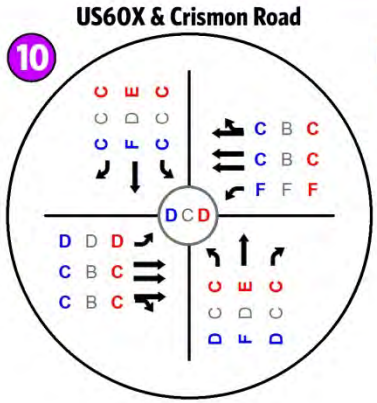



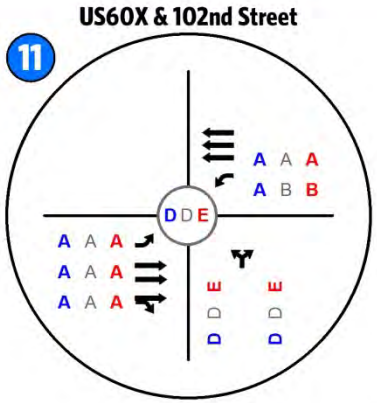



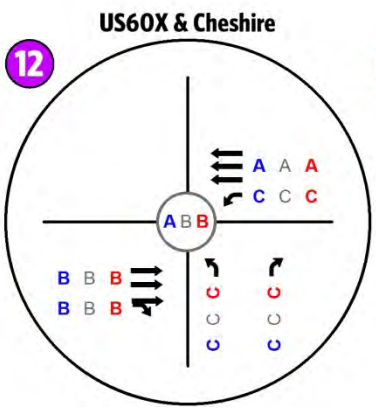



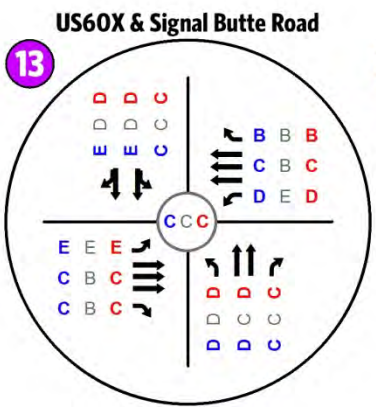



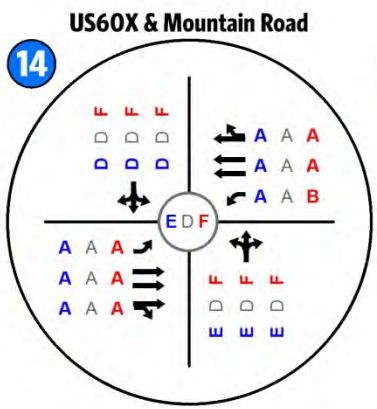



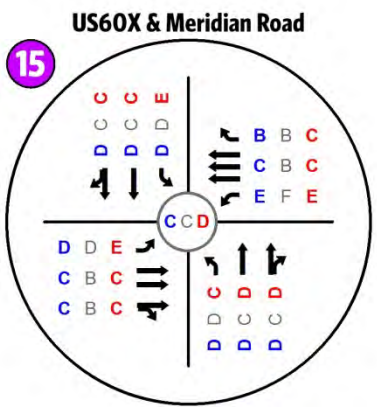



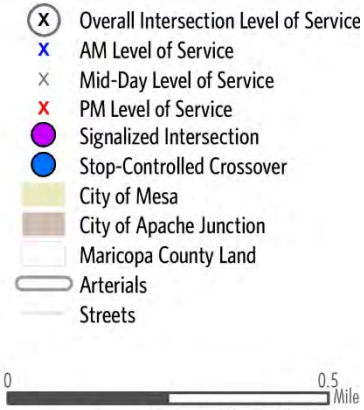




Source: Maricopa County, City of Mesa, ADOT, MCDOT, ALRIS, Esri

## Summary of Deficiencies and Needs

The following section provides a summary of issues and deficiencies along the corridor. These issues and deficiencies form the basis for the next phase of the study which is the development of the long range corridor plan.

### Congestion and Mobility

**Traffic Signals:** Traffic signals along the corridor are not coordinated; therefore, motorists experience poor progression between traffic signals and congestion approaching signals

- By 2040, signalized intersections will operate at LOS D or worse
- At most intersections, pedestrians cannot cross US 60X during the allotted green phase
- At Meridian Road, there is no pedestrian refuge area and the median curb cuts into the crosswalk

**Stop-Controlled Crossovers:**

- Stop-controlled crossovers, located approximately every 1/8th to 1/4th mile, are largely utilized by motorists making U-turns to access businesses and residential areas
- 77th Street, 80th Street, 81st Street, Hawes Road, 96th Street, 102nd Street, and Mountain Road will primarily operate at LOS D or worse by the year 2040
- Crossovers only accommodate one vehicle at a time, which may cause backups in the short left-turn storage areas

### Multimodal

**Sidewalks:** Sidewalks are only available at major intersections and the SR 202 overpass. The majority of the sidewalks are in fair to poor condition

**Bike Lanes:** Bike lanes are only available at SR 202 overpass and on select side streets

**Mid-block Crossings:** Crosswalks are only available at Sossaman Road, SR 202 SB, Ellsworth Road, Cheshire, Crismon Road, Signal Butte Road, and Meridian Road

- Since there are limited crossing opportunities, pedestrians and bicyclists often run or bike across US 60X travel lanes and the median

**ADA compliance:** Curb ramps and sidewalks are not ADA compliant at all intersections. The location of the southbound pedestrian call button at Cheshire is inaccessible for most users

### Safety and Infrastructure

**Crossovers:** Historic crash records illustrate that at crossovers, motorists often do not properly yield to the right-of-way

- Crossovers are narrow with a tight turning radius, forcing large trucks and RVs to encroach into adjacent lanes
- Left-turn storage lanes at crossovers are short and may not give motorists ample time to decelerate

**Sight Distance Issues:** There is a vertical grade difference between US 60X and lower cross streets, which limit motorist's sight distance when turning onto the US 60X corridor

- Vehicles parked in front of businesses along the shoulder of the corridor limit a motorist's sight distance
- **80th Street crossover**: Southbound lane is not aligned to the corridor. Additionally, for northbound motorists the straight sight distance is visually distracting making stop bars in the median more prominent than those at the intersection (the visual distance can cause drivers to miss the intersection stop bar)
- **Ellsworth Road**: Due to the vertical grade difference and width of the median, north and southbound motorists have limited sight distance
- **Street Lighting**: street lighting is only available at select locations along the corridor

# 4. Evaluation of Preliminary Improvement Concepts

This chapter presents the initial improvement concepts and the criteria used for evaluation of the US 60X corridor. Initial concepts were developed based on deficiencies and needs identified in the existing conditions analysis; future land use, socioeconomic, safety and access issues, traffic conditions, and the goals and objectives established by the TAC at the onset of the study.

## Design Guidelines

In order to address the needs and purpose of the US 60X corridor, a paramount task of this Study was to build consensus among ADOT, MCDOT, the City of Mesa, the City of Apache Junction, MAG, MCFCD, and stakeholders regarding the preferred short-term and ultimate corridor and access control design. With the ultimate goal of establishing a common, long-term vision for the US 60X corridor that meets the future needs of local jurisdictions, the Core Study Team discussed the design needs of local agencies and how improvements to the corridor can fit within local agencies design standards. Table 4.1 presents a side-by-side comparison of typical arterial design criteria.

**Table 4.1: Roadway Typical Cross-Section for Arterial**

| | City of Mesa | Maricopa County | City of Apache Junction | Pinal County |
|---|---|---|---|---|
| Function Classification | Arterial | Principal Arterial | Principal Arterial | Major Arterial |
| Number of Lanes | 6 | 6 | 6 | 6 |
| Right-of-Way Width | 130 FT | 130 FT | 150 FT | 150 FT |
| Median Width | 16 FT | 14 FT | 16 FT | 14 FT |
| Bike Lane Width | 4.5 FT – 6 FT | 5.5 FT | 5 FT | 6.5 FT |
| Sidewalk Width | 5 - 6 FT | 5 FT | 6 FT | 8 FT |

## Preliminary Improvement Alternatives

Based on the goals and objectives developed by the TAC, issues and needs identified through data analysis, the design standards of local agencies, and input received from stakeholders and the public, the preliminary corridor improvement alternatives were developed. The goals of the improvement alternatives were to:

- Create a long-term vision that meets the immediate and future travel needs of residents
- Propose short-term improvements that are compatible with long-term corridor objectives and maximize funding opportunities
- Address the most critical safety, access, pedestrian, bicycle, and drainage needs of the corridor

Five preliminary alternatives were developed, evaluated, and presented to the Core Study Team for consensus on preferred design concepts. Preliminary alternatives included:

- **Alternative 1: City of Mesa Standard** – narrows roadway to include 16 FT raised center median per City of Mesa design standards
- **Alternative 2: Converting Outside Lanes to Shared Use Paths** – converts outside lane to a shared use path and widens roadway towards the inside median
- **Alternative 3: Arizona Parkway** – implements the Arizona Parkway Concept by maintaining the wide median and eliminating left-turn movements at intersections by shifting traffic towards strategically placed turn-arounds.
- **Alternative 4A: Roundabout** – converts arterial intersections to an oval roundabout while maintaining westbound travel lanes and redistributing drainage to a channel located north of the corridor
- **Alternative 4B: Roundabout with Retaining Existing Median** – converts arterial intersections to an oval roundabout while maintaining the existing median and roadway

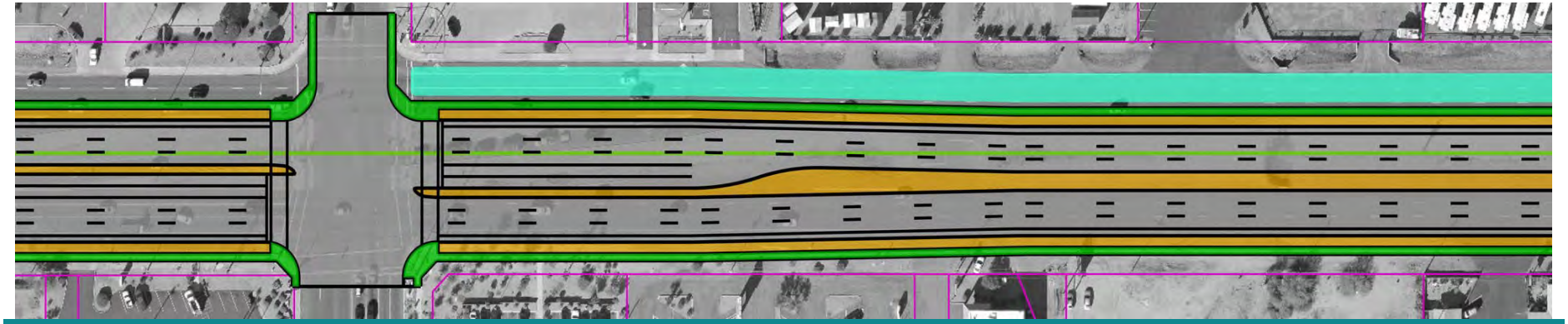
The following section provides detailed information on the preliminary improvement alternatives developed for this study.

## Alternative 1: City of Mesa Standard

Figure 4.1 illustrates the overall corridor design for Alternative 1. As illustrated in the figure, Alternative 1 improvements include:

- Three 11-FT travel lanes in each direction with 16-FT raised median
- On-street 6-FT bike lane and buffered 6-FT sidewalk
- Existing crossovers are removed, allowing motorists to U-turn at half-mile signalized intersections and designated turn bays in the median
- Drainage channelized to the north side of the corridor
- Optional: Symmetrical narrowing of the corridor and installation of storm drains

**Figure 4.1: Alternative 1: City of Mesa Standard**



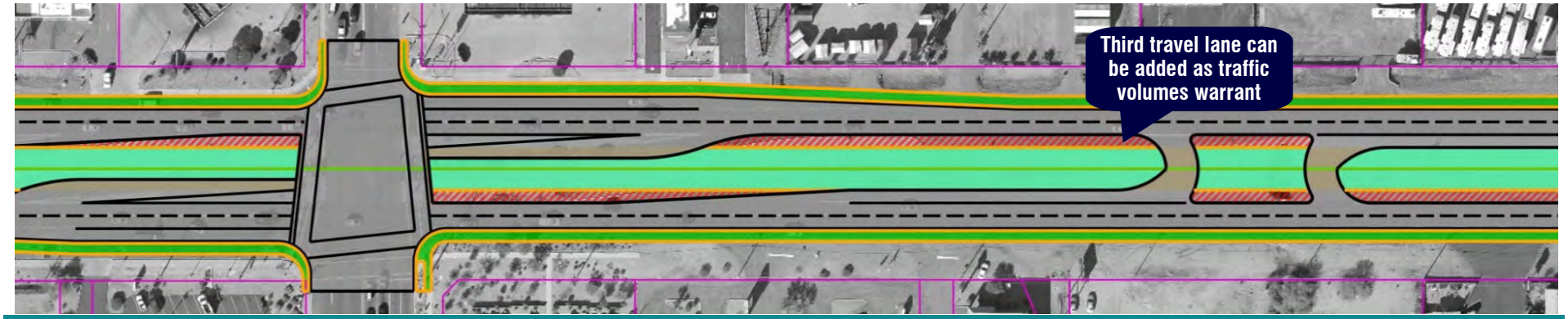
| Advantages | Disadvantages |
|---|---|
| • Continues City of Mesa street design | × Involves major roadway reconstruction which would be costly |
| • Utilizes existing eastbound travel lanes | × Crossovers would need to be either closed or signalized intersections installed |
| • Controls access to businesses, driveways, and intersections | × Major reconstruction needed if light rail were extended |
| • Improves pedestrian and bicycle safety through facilities and street lighting | × Requires major drainage improvements |
| • Provides opportunity to add bus bays | × Need mid-block crossings for emergency vehicles |
| • Alleviates most turning movement conflicts at crossovers | × Mid-block pedestrian hybrid beacon crossings needed |
| • Opportunity to create drainage channel on north | × Major drainage reconstruction needed |
| • Optimizing signal timing and traffic flow | × Creates large buffer between businesses and the roadway |

## Alternative 2: Re-use Existing Pavement

Figure 4.2 illustrates the overall corridor design for Alternative 2. As illustrated in the figure, Alternative 2 improvements include:

- Two 11-FT travel lanes in each direction, with the ability to easily add a third travel lane on the inside as traffic warrants
- Maintains existing 62-FT drainage swale median during the short-term
- Converts outside travel lanes to shared use path for bicyclists and pedestrians
- Existing crossovers are removed and indirect left-turn only crossovers installed
- Maintains existing drainage system with strategic improvements to structures along the corridor

**Figure 4.2: Alternative 2: Re-use Existing Pavement**



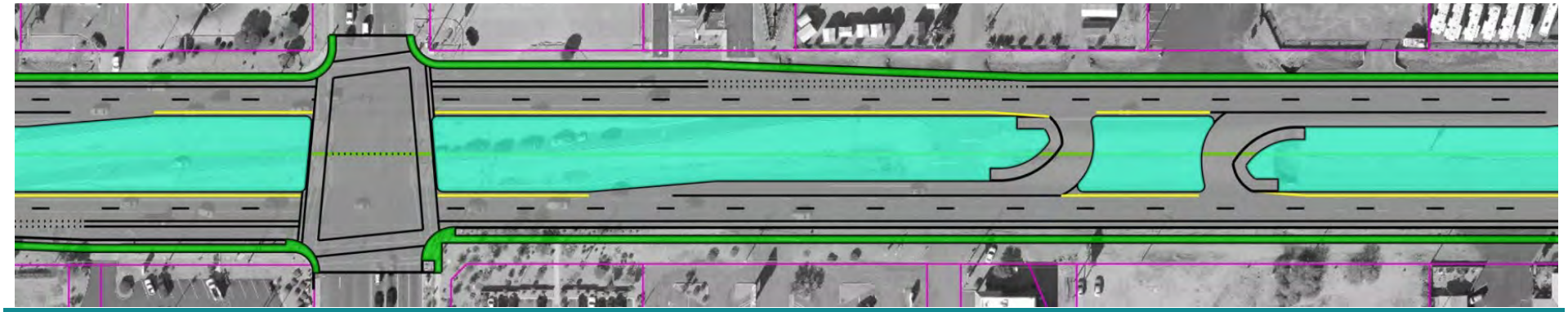

| Advantages | Disadvantages |
|---|---|
| • Minimizes throwaway of existing facilities | × Crossovers would need to be either closed or traffic lights installed |
| • Utilizes existing pavement to reduce costs | × Additional median street lighting would be required |
| • Flexible design can be expanded as traffic volumes warrant | × Need mid-block crossings for emergency vehicles |
| • No major drainage reconstruction needed | × Mid-block pedestrian hybrid beacon crossings needed |
| • Controls access to businesses, driveways, and intersections | |
| • Provides shared use path for pedestrians and cyclists | |
| • Alleviates most turning movement conflicts at crossovers | |
| • Median could be reconstructed to accommodate light rail | |

## Alternative 3: Arizona Parkway

Figure 4.3 illustrates the overall corridor design for Alternative 3. Alternative 3 improvements include eliminating left-turn movements at intersections and accommodating these movements at strategically place U-turn median crossovers. The U-turn crossovers can be signalized or stop controlled. The Arizona Parkway concept provides greater intersection capacity, typically reduces congestion, and aids in reducing turning movement conflicts at arterial intersections. As illustrated in the figure, Alternative 3 improvements include:

- Converts existing 6-phased traffic signals to a 4-phase signal, eliminating left-turn movements at intersections
- Two 11 FT travel lanes, U-turn median crossovers, and 6 FT on-street bike lanes in each direction
- 5 FT offset pedestrian sidewalk
- Maintains existing drainage system with strategic improvements to structures along the corridor

**Figure 4.3: Alternative 3: Arizona Parkway**



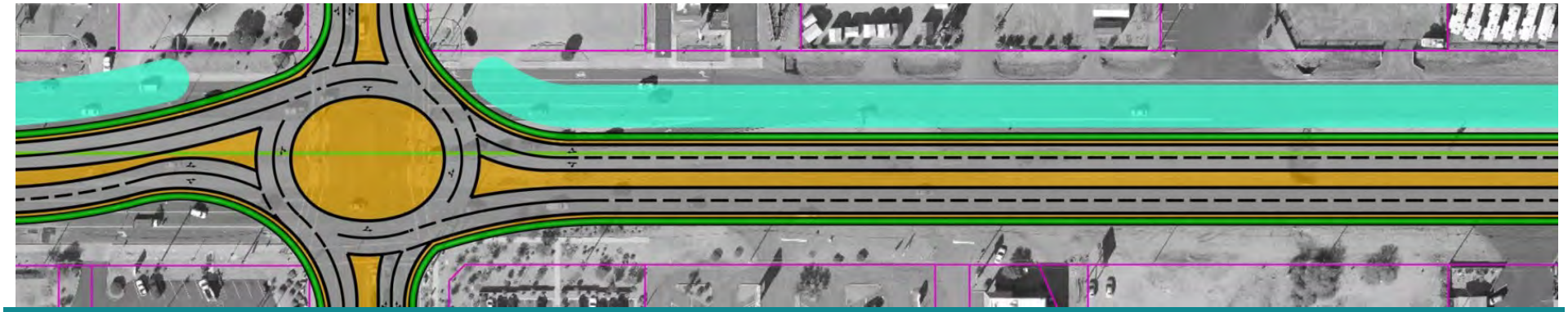
| Advantages | Disadvantages |
|---|---|
| • Utilizes existing pavement to reduce costs | × Eliminates left-turn lanes at intersections, which may be confusing to motorists |
| • Provides higher vehicle capacity and improves travel time along the corridor | × Concept is not cohesive with City of Mesa and City of Apache Junction traffic operations |
| • Reduces turning movement conflicts at arterial intersections | × May cause some motorists to drive further to reach their destination |
| • No major drainage reconstruction needed | × Mid-block pedestrian hybrid beacon crossings needed |
| • Controls access to businesses, driveways, and intersections | |
| • Improves pedestrian and bicycle safety through facilities and street lighting | |
| • Median can be rebuilt if light rail is extended | |

## Alternative 4A: Roundabout

Figure 4.4 illustrates the overall corridor design for Alternative 4A. As illustrated in the figure, Alternative 4A improvements include:

- Arterial intersections converted to a two-lane, oval roundabout
- Two 11 FT travel lanes in each direction with a shared use path for pedestrian and bicyclists
- Existing crossovers are removed, allowing motorists to U-turn at half-mile signalized intersections and designated turn bays
- Drainage channelized to the north side of the corridor

**Figure 4.4: Alternative 4A: Roundabout**



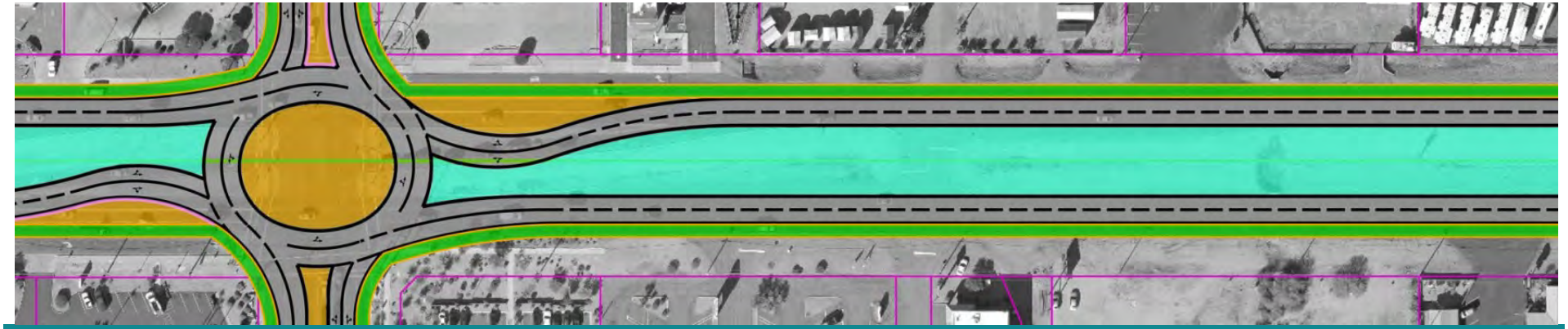
| Advantages | Disadvantages |
|---|---|
| • Oval roundabout provides preferential treatment for east-west traffic flow and accommodates emergency vehicles, RVs, and large trucks | × Concept is not cohesive with City of Mesa and City of Apache Junction traffic operations |
| • Provides pedestrian and bicycle facilities | × Reduces corridor to two lanes |
| • Controls access to businesses, driveways, and intersections | × Roundabout does not provide opportunity to add another travel lane, should it be warranted in the future |
| • Opportunities to enhance streetscaping | × Major drainage reconstruction needed |
| | × Mid-block pedestrian hybrid beacon crossings needed |
| | × Creates large buffer between businesses and the roadway along the north side of the corridor |

## Alternative 4B: Roundabout with Existing Median

Figure 4.5 illustrates the overall corridor design for Alternative 4B. As illustrated in the figure, Alternative 4B improvements include:

- Arterial intersections converted to a two-lane, oval roundabout
- Two 11 FT travel lanes in each direction with a shared use path for pedestrian and bicyclists
- Existing crossovers are removed, allowing motorists to U-turn at half-mile signalized intersections and designated turn bays
- Maintains existing drainage system with strategic improvements to structures along the corridor

**Figure 4.5: Alternative 4B: Roundabout**



| Advantages | Disadvantages |
|---|---|
| • Utilizes existing pavement and drainage to reduce costs | × Concept is not cohesive with City of Mesa and City of Apache Junction traffic operations |
| • Oval roundabout provides preferential treatment for east-west traffic flow and accommodates emergency vehicles, RVs, and large trucks | × Roundabout does not provide opportunity to increase travel lane capacity should they be warranted in the future |
| • Provides pedestrian and bicycle facilities | × Mid-block pedestrian hybrid beacon crossings needed |
| • Controls access to businesses, driveways, and intersections | × Creates large buffer between businesses and the roadway along the north side of the corridor |
| • Opportunities to enhance streetscaping | |
| • No major drainage reconstruction needed | |
| • Median can be reconstructed to accommodate light rail | |

## Evaluation of Preliminary Improvement Alternatives

An evaluation of the preliminary improvement alternatives is essential in identifying the potential benefits, impacts, and constraints of each improvement concept. Based on input received during the first phase of the Study, evaluation criteria were developed to determine the relative benefit of each concept. Table 4.2 summarizes the evaluation criteria for the US 60X corridor.

**Table 4.2. US 60X Corridor Evaluation Criteria**

| Evaluation Criteria | Measure | Benefit Scale* (High ← → Low) | | | |
|---|---|---|---|---|---|
| **Access** | Improvement concept provides adequate access to local residences, businesses, and activity centers along the corridor | High | Med | Low | N/A |
| **Safety** | How well the improvement concept addresses pedestrian or bicycle safety, mitigates turning moving conflicts, and improves overall safety of the corridor | High | Med | Low | N/A |
| **Multimodal** | Improvement concept provides facilities for pedestrian and bicyclists and accommodates transit service | High | Med | Low | N/A |
| **Mobility** | Improvement concept aids in reducing congestion and improving travel time along the corridor and to the regional transportation network | High | Med | Low | N/A |
| **Economic Vitality** | Proposed recommendations can be developed in a manner that minimizes the impacts to existing businesses and has a positive impact on Title VI population groups | High | Med | Low | N/A |
| **Efficiency** | Improvement concept supports low-cost/high benefit solutions, has no major right-of-way impacts, and minimizes throwaway | Low | Med | High | N/A |

The goal of the evaluation criteria is to reduce the number of alternatives, identify fatal flaws, and determine the feasibility of recommendations. Preliminary corridor improvements were evaluated against the evaluation criteria and presented to the Core Study Team for review and approval.

## Evaluation Results

Based on the evaluation results and input received from the Core Study Team, a general consensus was formed and two alternatives were selected for further analysis. Table 4.3 presents evaluation results for each preliminary improvement concept.

### Table 4.3. Alternatives Evaluation

| | Evaluation Criteria | Access | Safety | Multimodal | Mobility | Economic Vitality | Efficiency | Recommendation |
|---|---|---|---|---|---|---|---|---|
| Preliminary Improvement Concepts | **Alternative 1A** City of Mesa Standard | **Medium** Eliminates crossovers, making motorists to U-turn at major intersections | **High** Reduces turning movement conflicts and increases ped/bike safety | **High** Provides pedestrian and bicycle facilities | **High** Narrows median, improving intersection congestion | **Medium** Defines driveway access; however, creates large buffer zone | **High** Requires major roadway and drainage reconstruction | **Concept approved for further refinement** |
| | **Alternative 2** Re-Use Existing Pavement | **High** Defines business driveways and provides areas for motorists to U-turn | **High** Reduces turning movement conflicts and increases ped/bike safety | **High** Provides pedestrian and bicycle facilities | **High** Flexible design can be expanded as traffic volumes warrant | **High** Limited roadway reconstruction limits impacts to businesses | **Low** Utilizes existing pavement and has no major drainage reconstruction | **Concept approved for further refinement** |
| | **Alternative 3** Arizona Parkway | **High** Defines business driveways and provides areas for motorists to U-turn | **High** Reduces turning movement conflicts and increases ped/bike safety | **High** Provides pedestrian and bicycle facilities | **Medium** Improves east-west travel; however, some motorists may need to drive further to reach destination | **High** Limited roadway reconstruction limits impacts to businesses | **Low** Utilizes existing pavement and has no major drainage reconstruction | **Concept is not cohesive with Mesa and Apache Junction segments. Corridor not approved for further refinement** |
| | **Alternative 4A** Roundabout | **Medium** Eliminates crossovers, making motorists to U-turn at major intersections | **High** Reduces turning movement conflicts and increases ped/bike safety | **High** Provides pedestrian and bicycle facilities | **Medium** Improves east-west travel; however, some motorists may need to drive further to reach destination | **Low** Creates large buffer zone and reduces access to businesses | **High** Requires major roadway and drainage reconstruction | **Future third travel lane cannot be accommodated if traffic volumes warrant additional travel lane; resulting in significant reconstruction and throwaway** |
| | **Alternative 4B** Roundabout | **Medium** Eliminates crossovers, making motorists to U-turn at major intersections | **High** Reduces turning movement conflicts and increases ped/bike safety | **High** Provides pedestrian and bicycle facilities | **Medium** Improves east-west travel; however, some motorists may need to drive further to reach destination | **Medium** Reduces access to businesses | **Medium** Utilizes existing pavement; however, requires major intersection reconstruction | |

Based on the preliminary evaluation described above, Alternatives 1 and 2 were carried forward for more detailed evaluation and are discussed in the later chapters of this report.

## Ultimate Corridor Improvement Configuration Concepts

Based on feedback received from the Core Study team on the preliminary improvement alternatives, two alternatives were selected for further analysis. Both alternative were acceptable to City of Mesa design standards, met the short- and long-term needs of the corridor, and have flexible designs to accommodate immediate and long-term improvements. Alternatives identified for further refinement include:

- Alternative 1: City of Mesa Standard
- Alternative 2: Re-use Existing Pavement

To accommodate existing and future traffic demand, the two alternatives were refined to include a transitional "complete streets" phased design that allows ADOT to develop the corridor in two stages – short-term, immediate improvements and the long-term, ultimate configuration. Current traffic volumes along the corridor range from 17,000 to 21,000 vehicles per day and requires only two travel lanes in each direction Based on projected 2040 traffic volumes, two lanes meet future travel demand; therefore, US 60X is an excellent candidate for a road diet that would utilize the outside lane for bikes and pedestrians. Future travel demand should be monitored to determine if the corridor once again requires three lanes.

This chapter presents a detailed analysis of the two ultimate improvement alternatives and their transitional designs for the short- and long-term phases.

### Ultimate Configuration – Alternative 1

In this concept, the corridor is narrowed to meet the current City of Mesa design standards. Alternative 1 includes a transitional design that progressively narrows the corridor to include three travel lanes with a raised median. Key elements include:

**Short-Term Design Concept**

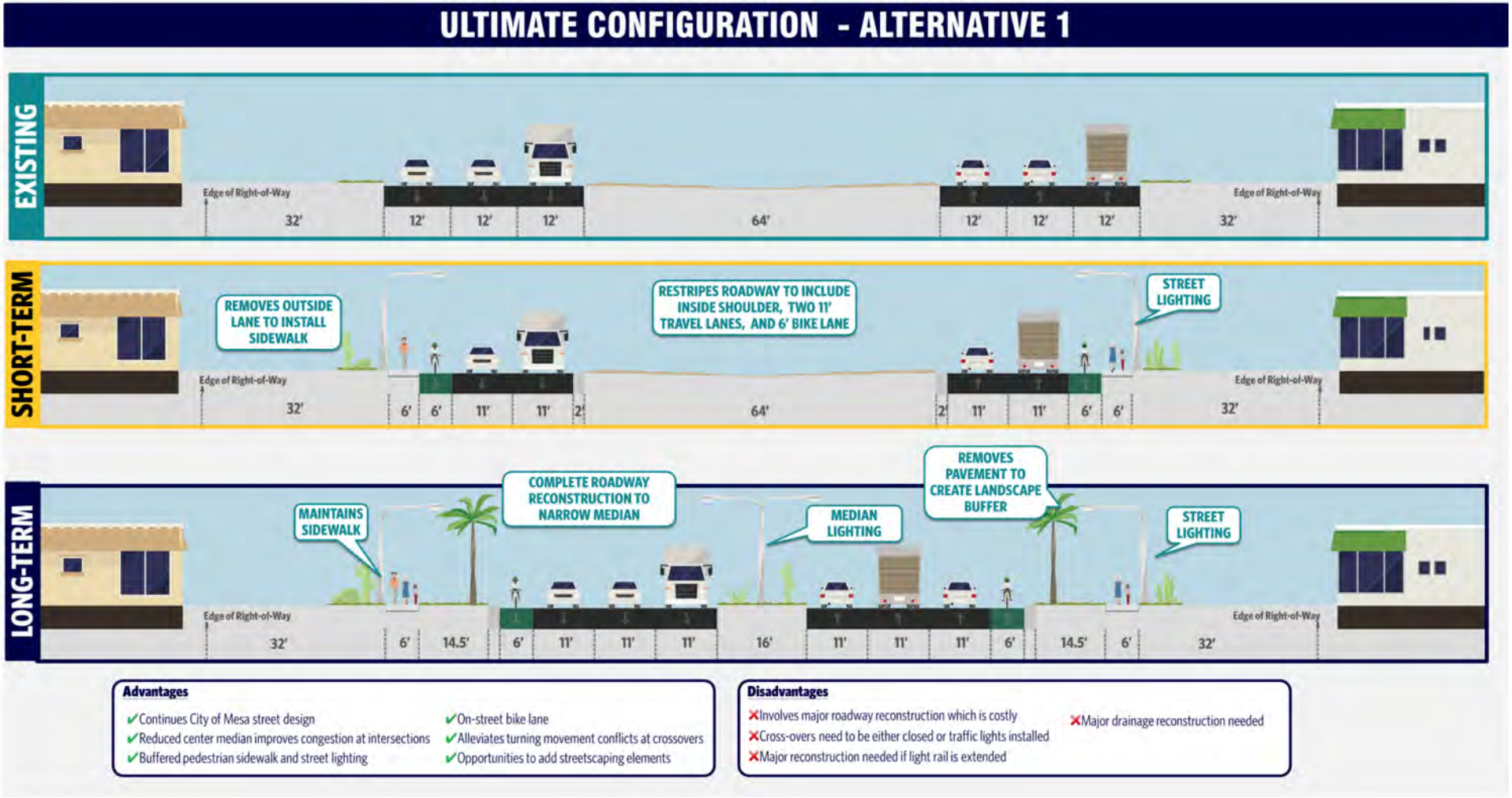
- Two 11 FT travel lanes in each direction with 2 FT inside shoulder
- Maintains 64 FT drainage swale median
- 6 FT on-street bike lanes in each direction
- 6 FT sidewalk with sidewalk lighting
- Minor structural improvements to drainage facilities
- Mid-block pedestrian crosswalks at appropriate intervals

**Long-Term Design Concept**

- Roadway reconstruction to widen corridor to three 11 FT travel lanes in each direction with a 16 FT raised median with lighting
- Maintains 6 FT on-street bike lanes in each direction
- Maintains 6 FT sidewalk with sidewalk lighting
- Removes existing pavement to create 14.5 FT landscape buffer between roadway and the sidewalk
- Major drainage reconstruction to install storm drains

Figure 4.6 illustrates the proposed design for Ultimate Configuration - Alternative 1 for the short- and long-term.

**Figure 4.6: Ultimate Configuration – Alternative 1**



### *Short- Term (Year 2025) Intersection Operations*

Based on current traffic operations and safety issues at Mountain Road, a traffic signal warrant analysis was conducted by ADOT and found that the intersection met one warrant for the installation of a signal (Warrant 2: Coordinated Signal System). To determine the benefits/impacts of signalizing Mountain Road, the intersection was modeled as a signalized intersection for results shown henceforth. Figure 4.7 illustrates the current overall intersection LOS, and LOS for each turn movement for each leg/approach at each intersection. Table 4.4 lists the overall intersection LOS for the AM, Midday, and PM peak hours.

**Table 4.4: Ultimate Configuration Alternative 1 - Projected Short-Term (Year 2025) Overall Intersection Level of Service**

| Intersection | Existing | | | Short-Term (Year 2025) | | |
|---|---|---|---|---|---|---|
| | AM | MID | PM | AM | MID | PM |
| **Signalized Intersections** | | | | | | |
| US 60X/Sossaman Road | C | C | C | D | C | D |
| US 60X/Ellsworth Road | C | C | C | D | C | D |
| US 60X/Crismon Road | C | C | C | C | C | C |
| US 60X/Cheshire | A | B | B | A | A | B |
| US 60X/Signal Butte Road | C | D | D | C | C | C |
| US 60X/Mountain Road | C | F | F | B | B | B |
| US 60X/Meridian Road | C | C | D | C | C | C |
| **Unsignalized Intersections** | | | | | | |
| US 60X/77th Street | B | C | C | B | D | D |
| US 60X/80th Street | C | E | F | C | C | E |
| US 60X/81st Street | B | D | D | C | C | D |
| US 60X/Hawes Road | B | C | C | C | B | D |
| US 60X/88th Street | B | C | C | B | A | C |
| US 60X/96th Street | C | D | E | F | C | F |
| US 60X/98th Street | B | B | B | D | A | D |
| US 60X/102nd Street | B | C | C | C | C | C |

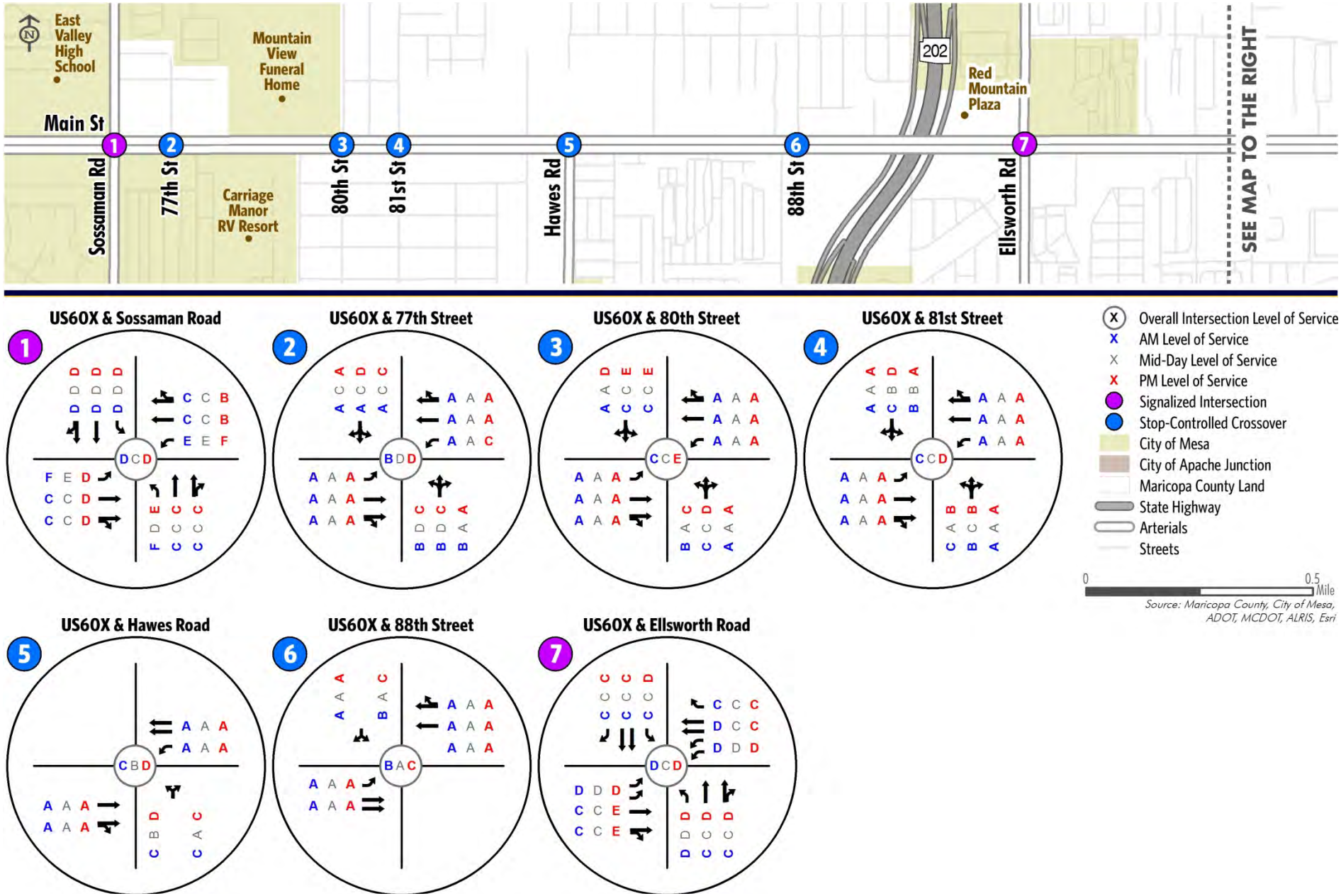
### *Long-Term (Year 2040) Intersection Operations*

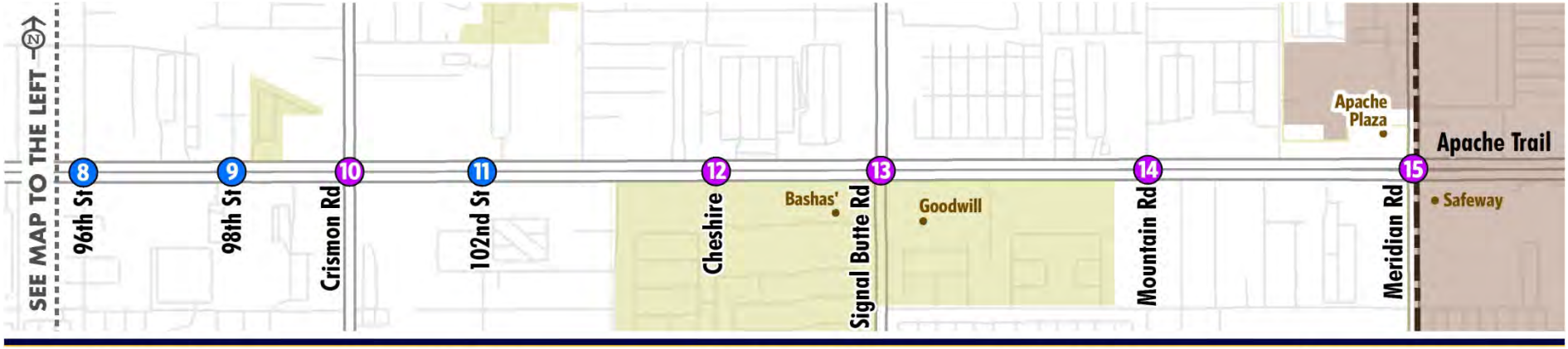
Figure 4.8 illustrates the current overall intersection LOS, and LOS for each turn movement for each leg/approach at each intersection. Table 4.5 lists the overall intersection LOS for the AM, Midday, and PM peak hours.

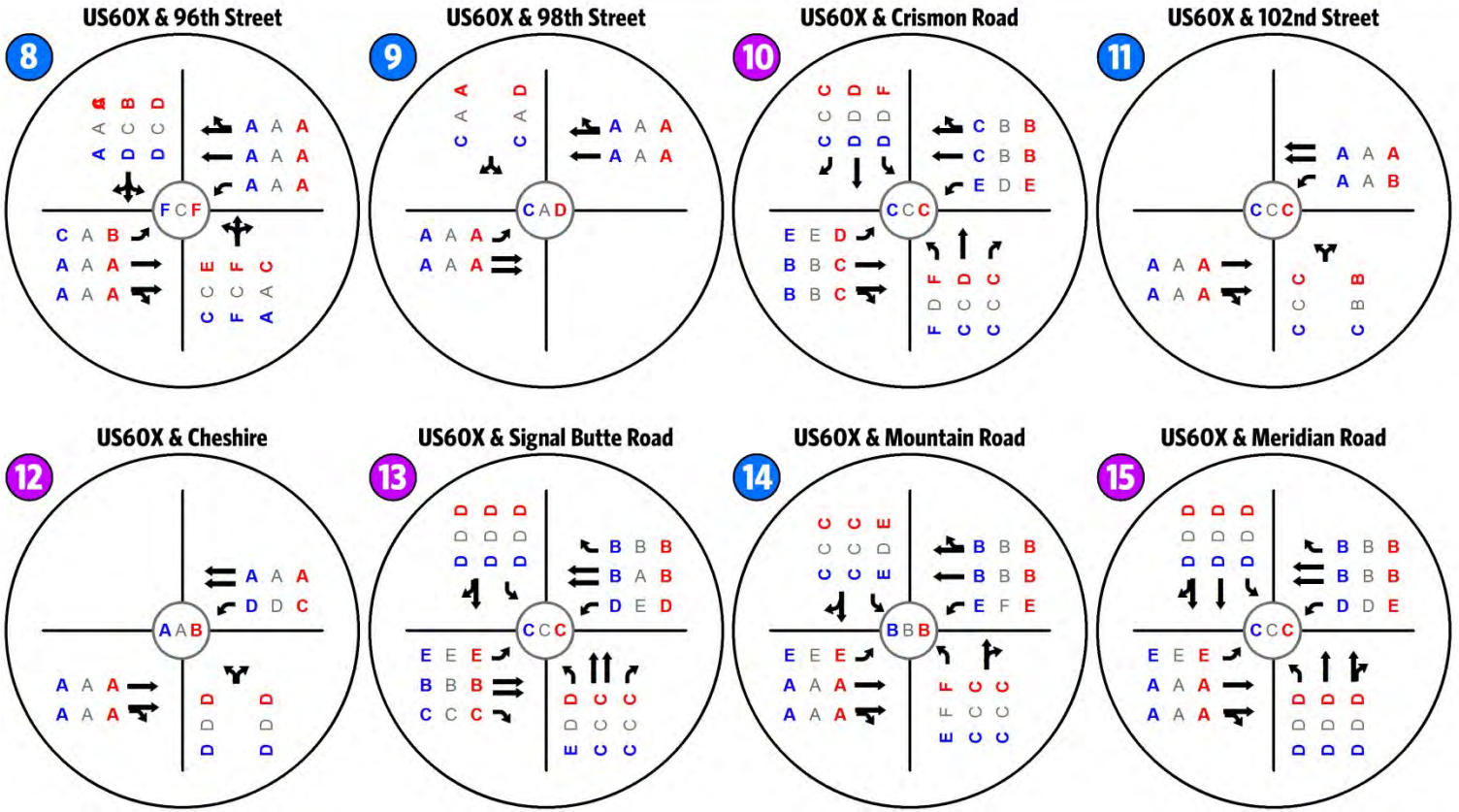
**Table 4.5: Ultimate Configuration Alternative 1 - Projected Long-Term (Year 2040) Overall Intersection Level of Service**

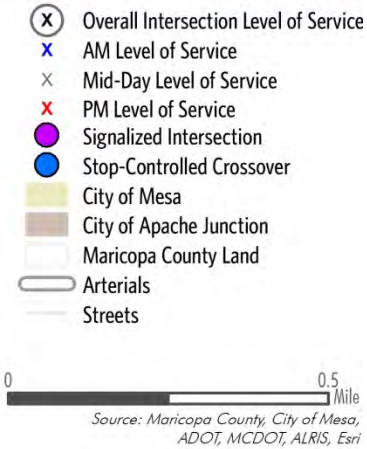
| Intersection | Existing | | | Long-Term (Year 2040) | | |
|---|---|---|---|---|---|---|
| | AM | MID | PM | AM | MID | PM |
| **Signalized Intersections** | | | | | | |
| US 60X/Sossaman Road | C | C | C | C | C | C |
| US 60X/Ellsworth Road | C | C | C | C | C | C |
| US 60X/Crismon Road | C | C | C | C | B | C |
| US 60X/Cheshire | A | B | B | A | B | B |
| US 60X/Signal Butte Road | C | D | D | C | C | B |
| US 60X/Mountain Road | C | F | F | A | A | A |
| US 60X/Meridian Road | C | C | D | C | C | C |
| **Unsignalized Intersections** | | | | | | |
| US 60X/77th Street | B | C | C | B | C | C |
| US 60X/80th Street | C | E | F | E | D | D |
| US 60X/81st Street | B | D | D | D | C | D |
| US 60X/Hawes Road | B | C | C | C | B | D |
| US 60X/88th Street | B | C | C | C | A | C |
| US 60X/96th Street | C | D | E | E | C | D |
| US 60X/98th Street | B | B | B | C | A | C |
| US 60X/102nd Street | B | C | C | D | C | C |

## Figure 4.7: Ultimate Configuration Alternative 1 - Projected Short-Term (Year 2025) Intersection Level of Service



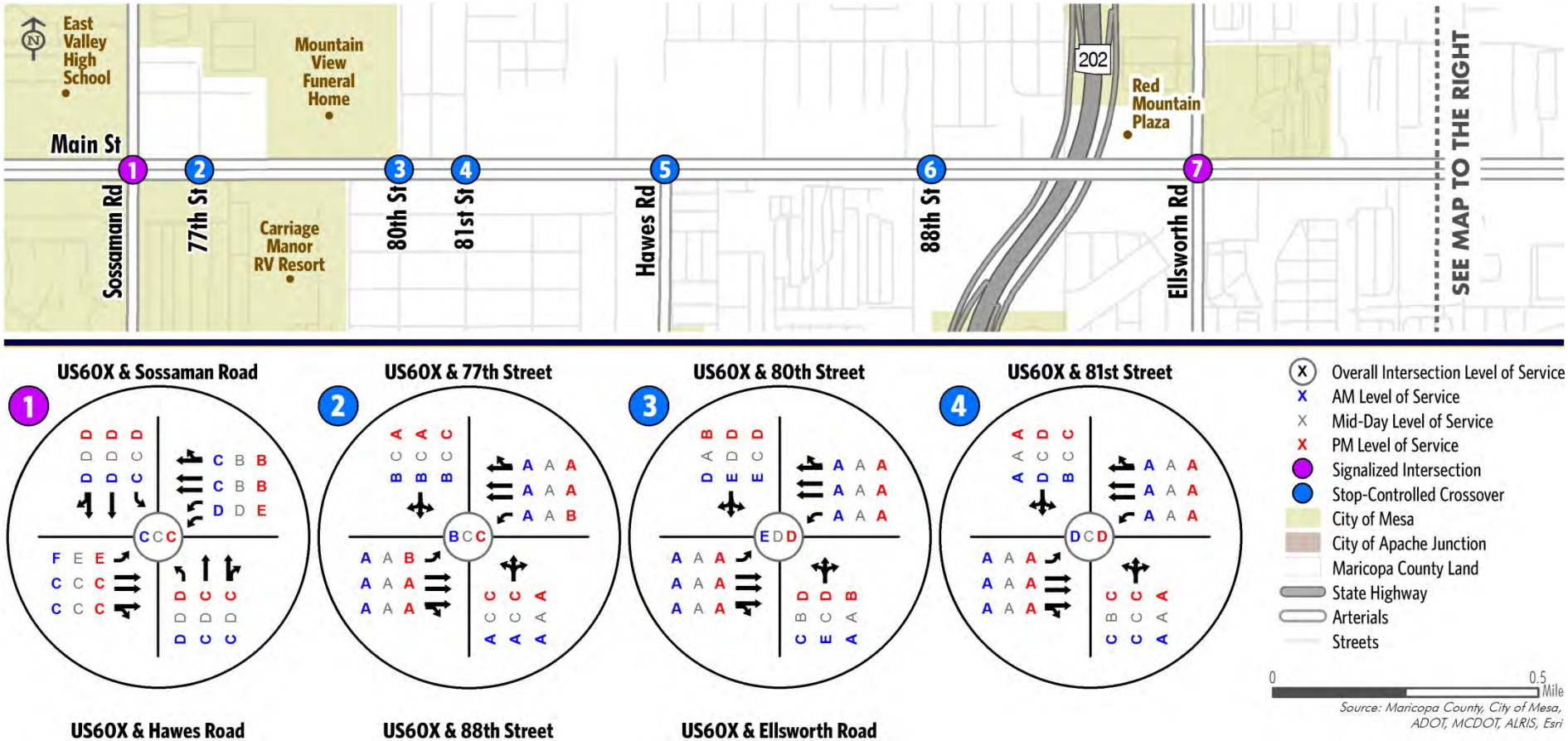


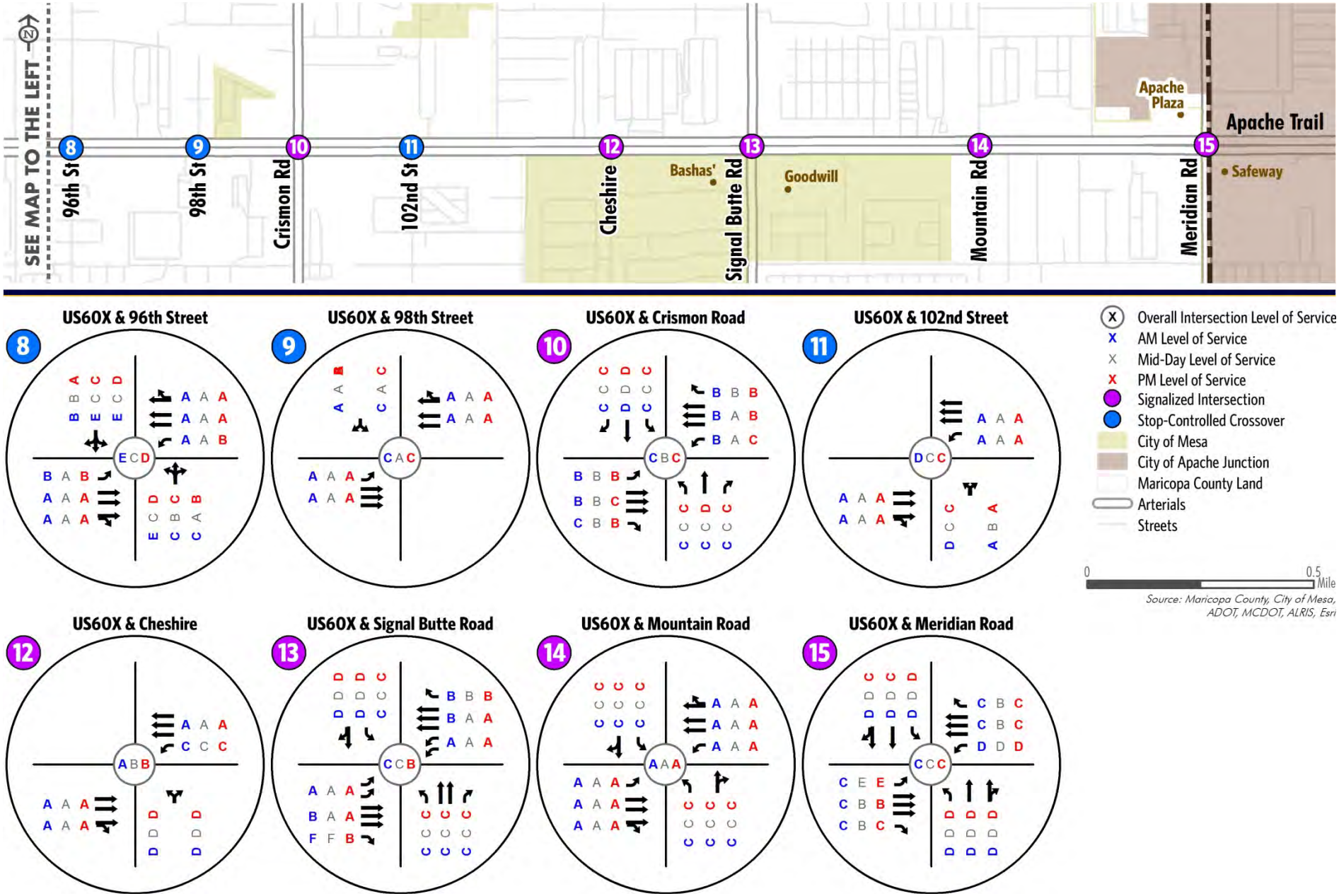




*Source: Maricopa County, City of Mesa, ADOT, MCDOT, ALRIS, Esri*

## Figure 4.8: Ultimate Configuration Alternative 1 - Projected Long-Term (Year 2040) Intersection Level of Service




SEE MAP TO THE LEFT
8
96th St
9
98th St
10
Crismon Rd
11
102nd St
12
Cheshire
13
Signal Butte Rd
14
Mountain Rd
15
Meridian Rd
Bashas'
Goodwill
Apache Plaza
Apache Trail
Safeway
US60X & 96th Street
US60X & 98th Street
US60X & Crismon Road
US60X & 102nd Street
US60X & Cheshire
US60X & Signal Butte Road
US60X & Mountain Road
US60X & Meridian Road
Overall Intersection Level of Service
AM Level of Service
Mid-Day Level of Service
PM Level of Service
Signalized Intersection
Stop-Controlled Crossover
City of Mesa
City of Apache Junction
Maricopa County Land
Arterials
Streets
0
0.5
Mile
Source: Maricopa County, City of Mesa, ADOT, MCDOT, ALRIS, Esri

## Discussion of Ultimate Configuration – Alternative 1

The following is a list of identified issues, challenges, and considerations for this alternative. Working Paper 2 provides a detailed illustration of short- and long-term corridor configurations for the Ultimate Configuration – Alternative 1.

### Traffic Operations

The analysis indicates all signalized intersections operate at LOS C or better during the AM, Midday, and PM peak hours for year 2040; however, unsignalized intersections may experience significant delays in the short- and long-term planning horizons. These unsignalized intersections were not modeled to show any improvements such as widening or signalization. These intersections may need to be signalized in the future, but this should not be done until a signal warrant analysis recommends the installation. Signalizing and providing northbound and southbound turn lanes at these intersections would likely improve the LOS and this should be evaluated in the future as demand increases. Based on the results from the operational analysis, recommended intersection improvements for the US 60X corridor are presented in Table 4.6.

**Table 4.6: Ultimate Configuration – Alternative 1 Traffic Operational Improvements**

| | Short-Term Recommendations | Long-Term Recommendations |
|---|---|---|
| Corridor-wide | • Install curb and gutter and restripe corridor to include two thru lanes, inside shoulder, and bike lane<br>• Reconstruct aging traffic signals to meet current design standards and accommodate future roadway improvements<br>• Update traffic signal timing plans to accommodate adequate pedestrian crossing times and better coordinate traffic flow along US 60X<br>• Eliminate vertical grade difference with cross-streets<br>• Evaluate driveways immediately adjacent to intersections for consolidation | • Convert corridor to include three thru lanes, dual left-turn lanes at arterial intersections, on-street bike lanes, and raised median<br>• Re-evaluate traffic signal timing plans based on actual traffic counts and updated lane configurations to ensure optimum coordination |
| Crossovers | • Extend left-turn storage bays to provide adequate storage capacity and deceleration distance<br>• Evaluate crossovers for installation of signalized pedestrian crossing facilities<br>• Evaluate the need for additional turn lanes on north/south streets | • Evaluate the option of either closing crossovers or signalizing intersections<br>• Re-evaluate the need for additional turn lanes on north/south streets |

### Impacts to Businesses and Right-of-Way

- Existing right-of-way accommodates the short and ultimate design configuration.
- The long-term, ultimate configuration creates a wide sidewalk buffer that provides the opportunity to install streetscaping elements, such as trees and landscaping, to bring additional character and interest to the corridor. The addition of streetscaping elements may help in beautifying the corridor and attracting new customers to businesses.
- Pedestrian sidewalks and bike lanes will further increase access to businesses, particularly for local residents that don't have access to a vehicle or choose to walk/bike instead of drive.

### Pedestrian and Bicycle Accommodations

- The corridor design accommodates on-street bike lanes and off-street pedestrian sidewalks in both the short- and long-term phases. The buffered sidewalk recommended in the long-term phase further increases a pedestrian's sense of comfort and safety.
- Signalized intersections along the corridor are spaced at one-mile intervals, creating inconvenient crossing opportunities for pedestrians and cyclists. Mid-block crossings should be evaluated in the final design, regardless of what alternative configuration is selected.
- Sidewalks should be constructed to properly comply with City of Mesa, MCDOT, ADOT, and Americans with of Disabilities Act (ADA) design standards. Intersections should be upgraded to include ADA compliant sidewalk ramps, upgraded pedestrian refuge areas, and accessible pedestrian signal pushbuttons.

### Impact on Drainage

The Flood Control District of Maricopa County (FCDMC) conducted an initial drainage analysis to assess off-site drainage impacts from the proposed designs for the 1-percent annual chance (100-year) flood scenario. Key findings show:

- The alternative increases off-site impacts and flooding. Mitigation of upstream flooding impacts may require a regional flooding solution due to the built-out, urban nature of the watershed and lack of downstream drainage infrastructure.
- The alternative provides no areas for stormwater detention in the ROW; therefore, underground or off-site detention is necessary.
- Short-term improvements will have impacts to drainage structures located on the outside of the corridor. Because a new curb line is being developed, the stormwater drainage inlet facilities along the existing curb line may need to be relocated.
- During the design phase, a complete drainage assessment will be necessary to determine exact drainage requirements.

### Alignment and Cross Slope

- Minor improvements are needed to the existing roadway profiles and cross-slopes during the short-term phase; however, major earthwork is anticipated during the long-term phase to narrow the median to 16-feet.

### Signage

- Existing traffic signs along the corridor should be reviewed during final design for compliance with the most current Manual on Uniform Traffic Control Devices (MUTCD).
- During the design phase, an assessment should also be conducted to identify business signage that has encroached within the public right-of-way.

### Cost Estimate

Table 4.7 outlines planning-level cost estimate for the Ultimate Configuration – Alternative 1.The cost estimate provides planning-level contingency estimates for drainage improvement, traffic control, lighting, signage, mobilization, and design costs.

**Table 4.7: Ultimate Configuration – Alternative 1 Planning-Level Cost Estimates**

| | Short-Term Recommendations | Long-Term Recommendations |
|---|---|---|
| Roadway Construction | $3,700,000 | $17,800,000 |
| Street and Intersection Lighting | $1,200,000 | $410,000 |
| Traffic Signal Improvements | $2,900,000 | 3% |
| Traffic Control | 10% | 3% |
| Signing and Marking | 5% | 3% |
| Drainage | 10% | 10% |
| Miscellaneous Elements | 10% | 10% |
| Engineering and Contingencies | 25% | 25% |
| Mobilization | 10% | 10% |
| ICAP | 10.3% | 10.3% |
| Design Costs | 10% | 10% |
| **Total Costs** | **$15,100,000** | **$27,000,000** |

### Stakeholder and Public Comments

Two Stakeholder/Public Open House meetings were held on November 6, 2017 to provide information about the study process to the general public and to provide an opportunity to gather public input on the ultimate configurations developed for this study. Thirty people attended the meetings. Comments and questions submitted did not show a preference for this alternative, due to high reconstruction costs and the lack of light rail accommodation. Furthermore, businesses were also concerned that the limited crossing locations, due to the installation of the raised median, would prohibit access to their businesses.

## Ultimate Configuration – Alternative 2

In this alternative, existing pavement is reused and the outside travel lanes are removed and converted into a buffered sidewalk. The modified version of Alternative 2 includes a transition design that progressively develops the corridor towards the median. The short- and long-term design concepts include:

### Short-Term Design Concept

- Restripes existing roadway to include 11 FT travel lanes in each direction with 2 FT inside shoulder
- Maintains 64 FT drainage swale median
- 6 FT on-street bike lanes in each direction
- Removes outside travel lanes to create a 6 FT concrete sidewalk with 5 FT buffer zone
- Street lighting installed
- Minor structural improvements to drainage facilities
- Mid-block pedestrian crosswalks at appropriate intervals

### Long-Term Design Concept

- Three 11 FT travel lanes in each direction *(narrows median to add additional 11 FT travel lane from the short-term)*
- Converts crossovers to indirect left-turn only crossovers
- Maintains 6 FT on-street bike lanes in each direction
- Maintains 6 FT concrete sidewalk with 5 FT buffer zone
- Maintains outside street lighting
- Minor structural improvements to drainage facilities

Figure 4.9 illustrates the proposed design for Ultimate Configuration - Alternative 2 for the short- and long-term.

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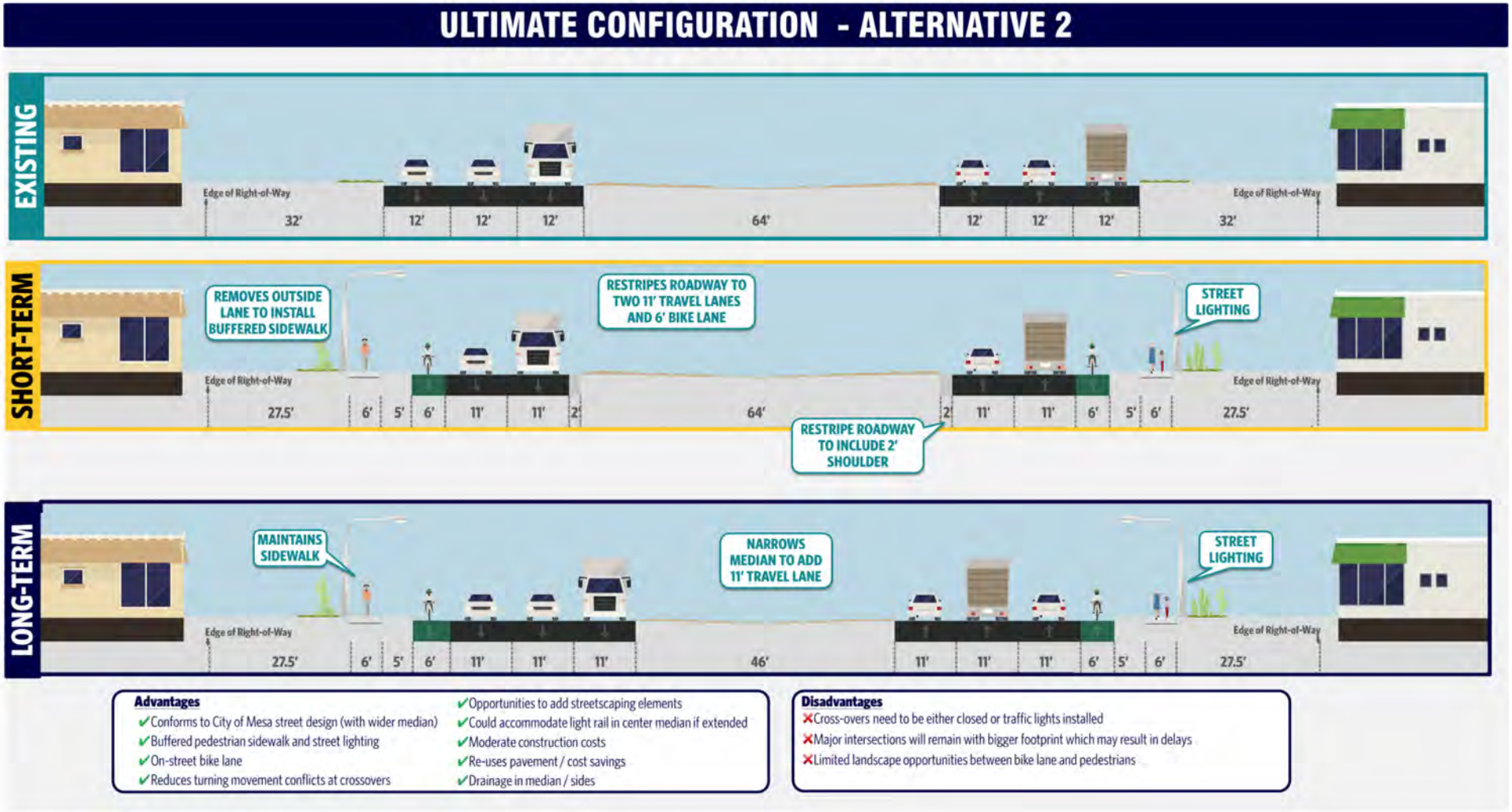
**Figure 4.9: Ultimate Configuration – Alternative 2**



### *Short-Term (Year 2025) Intersection Operations*

Based on current traffic operations and safety issues at Mountain Road, a traffic signal warrant analysis was conducted by ADOT and found that the intersection met one warrant for the installation of a signal (Warrant 2: Coordinated Signal System). To determine the benefits/impacts of signalizing Mountain Road, the intersection was modeled as a signalized intersection for results shown henceforth.

Figure 4.10 illustrates the current overall intersection LOS, and LOS for each turn movement for each leg/approach at each intersection. Table 4.8 lists the overall intersection LOS for the AM, Midday, and PM peak hours.

**Table 4.8: Ultimate Configuration Alternative 2 - Projected Short-Term (Year 2025) Overall Intersection Level of Service**

| Intersection | Existing | | | Short-Term (Year 2025) | | |
|---|---|---|---|---|---|---|
| | AM | MID | PM | AM | MID | PM |
| **Signalized Intersections** | | | | | | |
| US 60X/Sossaman Road | C | C | C | D | C | D |
| US 60X/Ellsworth Road | C | C | C | D | C | D |
| US 60X/Crismon Road | C | C | C | C | C | C |
| US 60X/Cheshire | A | B | B | A | A | B |
| US 60X/Signal Butte Road | C | D | D | C | C | C |
| US 60X/Mountain Road | C | F | F | B | B | B |
| US 60X/Meridian Road | C | C | D | C | C | C |
| **Unsignalized Intersections** | | | | | | |
| US 60X/77th Street | B | C | C | B | D | D |
| US 60X/80th Street | C | E | F | C | C | E |
| US 60X/81st Street | B | D | D | C | C | D |
| US 60X/Hawes Road | B | C | C | C | B | D |
| US 60X/88th Street | B | C | C | B | A | C |
| US 60X/96th Street | C | D | E | F | C | F |
| US 60X/98th Street | B | B | B | D | A | D |
| US 60X/102nd Street | B | C | C | C | C | C |

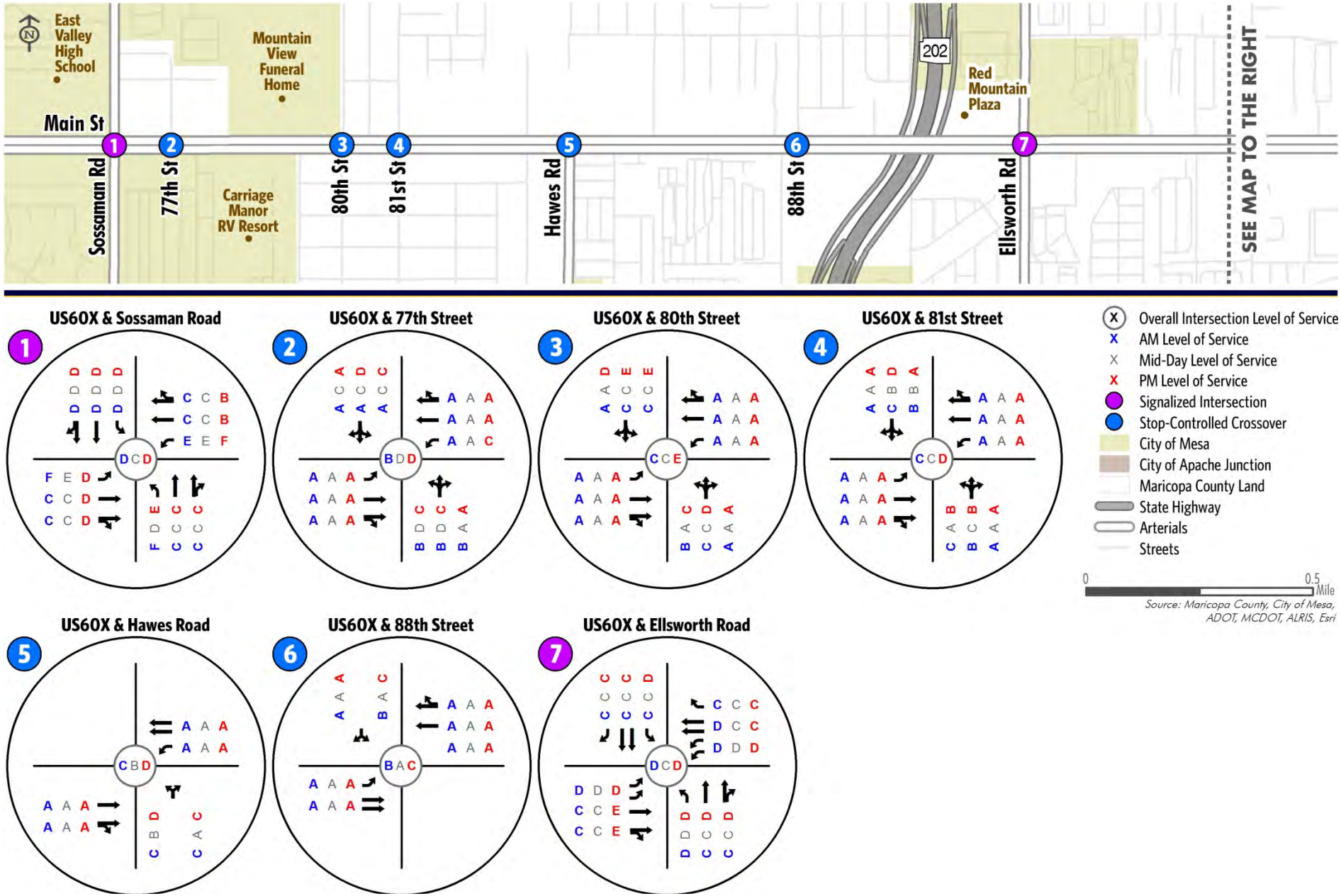
### *Long-Term (Year 2040) Intersection Operations*

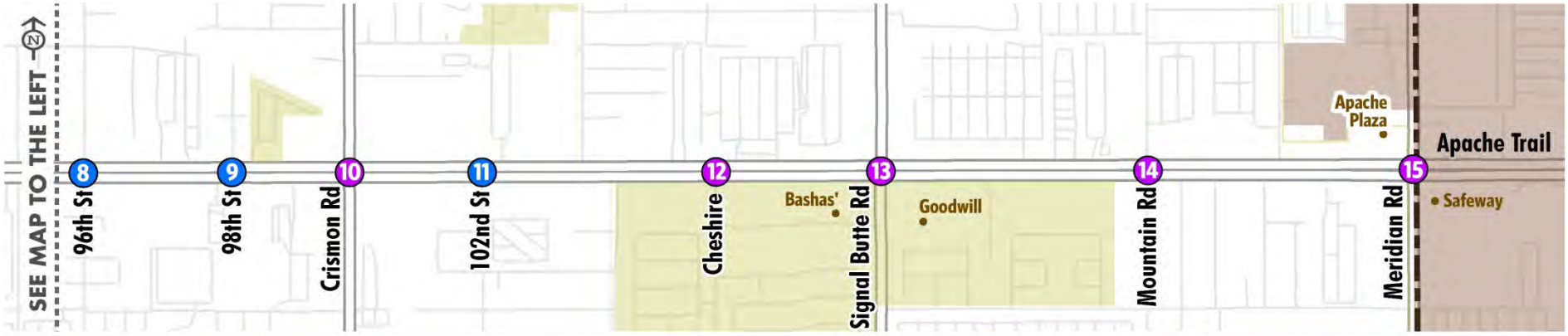
Figure 4.11 illustrates the current overall intersection LOS, and LOS for each turn movement for each leg/approach at each intersection. Table 4.9 lists the overall intersection LOS for the AM, Midday, and PM peak hours.

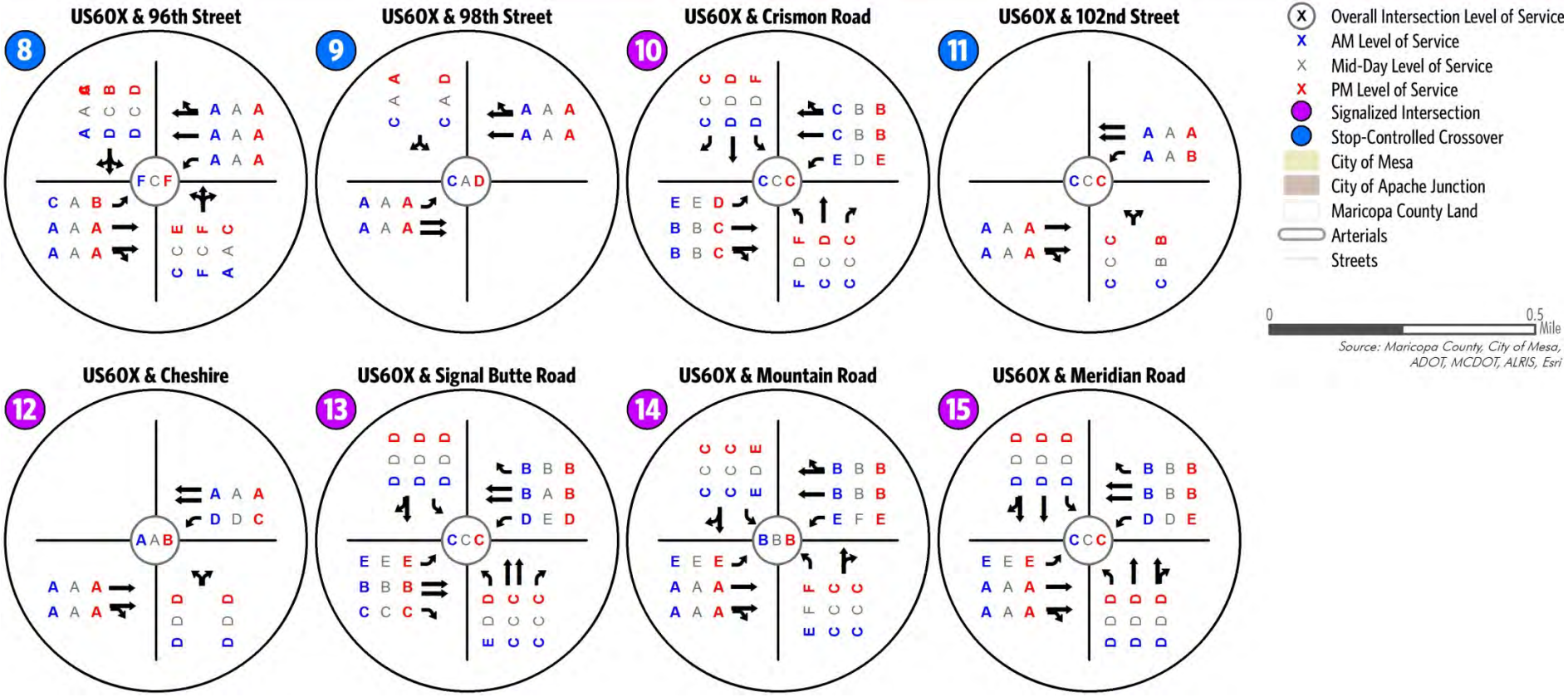
**Table 4.9: Ultimate Configuration Alternative 2 - Projected Long-Term (Year 2040) Overall Intersection Level of Service**

| Intersection | Existing | | | Long-Term (Year 2040) | | |
|---|---|---|---|---|---|---|
| | AM | MID | PM | AM | MID | PM |
| **Signalized Intersections** | | | | | | |
| US 60X/Sossaman Road | C | C | C | D | C | D |
| US 60X/Ellsworth Road | C | C | C | D | C | D |
| US 60X/Crismon Road | C | C | C | C | C | C |
| US 60X/Cheshire | A | B | B | A | A | A |
| US 60X/Signal Butte Road | C | D | D | C | C | C |
| US 60X/Mountain Road | C | F | F | B | B | B |
| US 60X/Meridian Road | C | C | D | C | C | C |
| **Unsignalized Intersections** | | | | | | |
| US 60X/77th Street | B | C | C | A | B | B |
| US 60X/80th Street | C | E | F | C | C | D |
| US 60X/81st Street | B | D | D | C | C | D |
| US 60X/Hawes Road | B | C | C | A | A | B |
| US 60X/88th Street | B | C | C | A | A | A |
| US 60X/96th Street | C | D | E | D | C | D |
| US 60X/98th Street | B | B | B | C | C | A |
| US 60X/102nd Street | B | C | C | A | A | A |

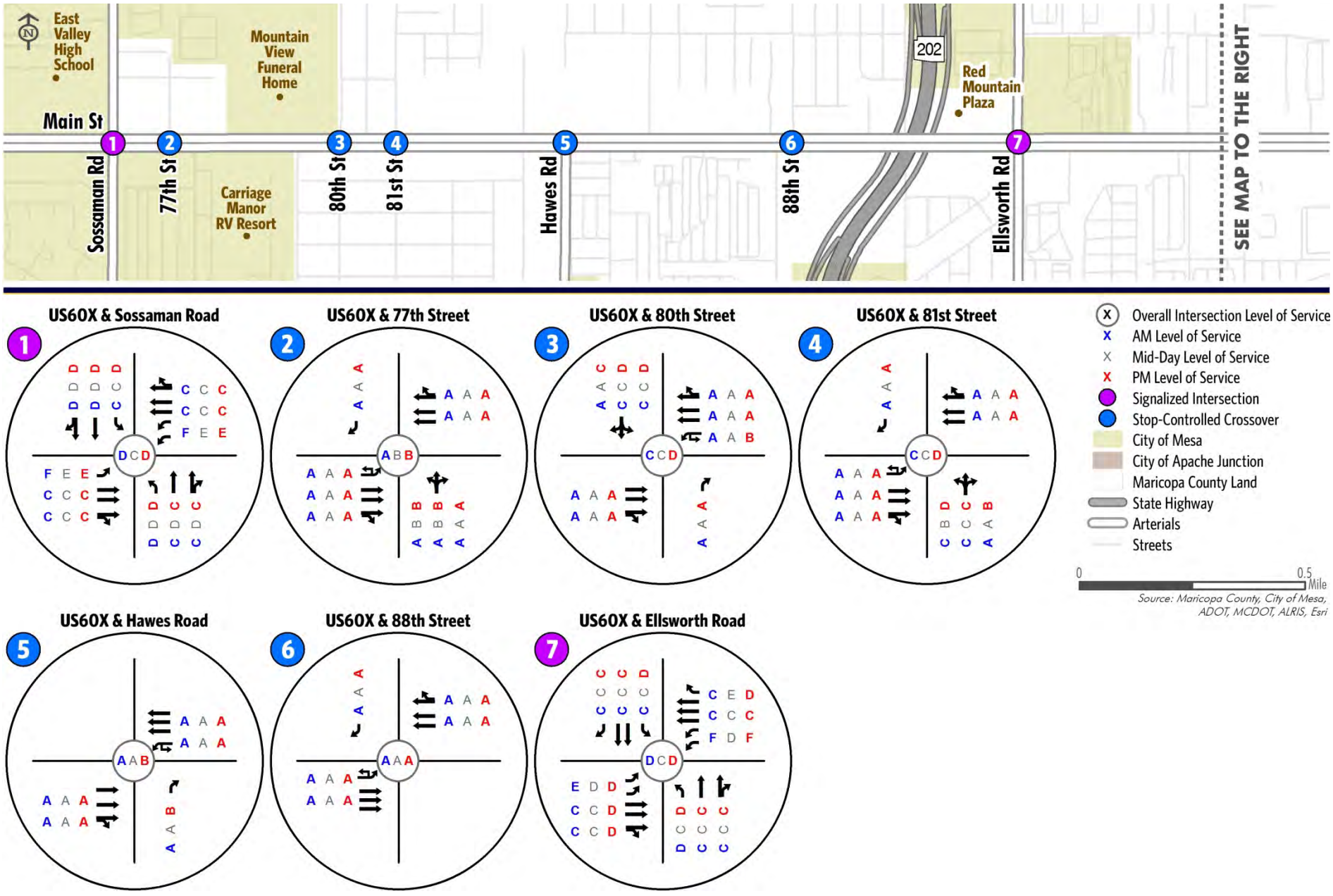
## Figure 4.10: Ultimate Configuration Alternative 2 - Projected Short-Term (Year 2025) Intersection Level of Service

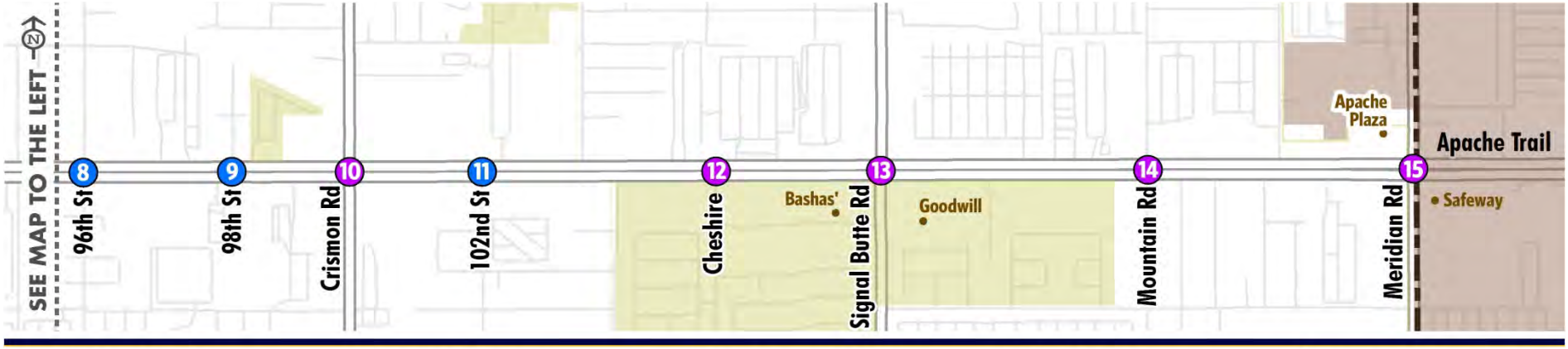


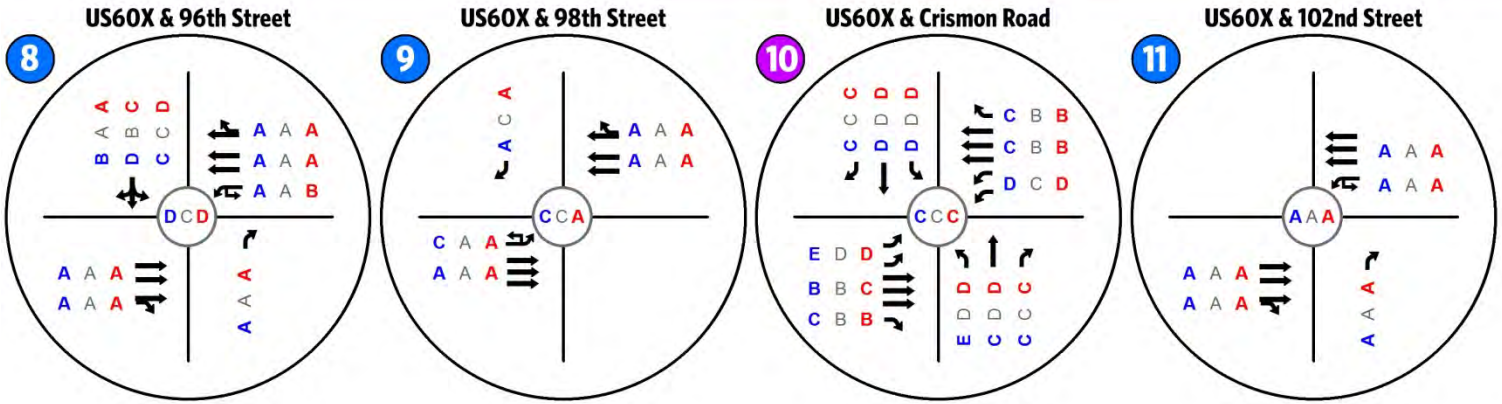

SEE MAP TO THE LEFT
8
96th St
9
98th St
10
Crismon Rd
11
102nd St
12
Cheshire
Bashas'
13
Signal Butte Rd
Goodwill
14
Mountain Rd
15
Meridian Rd
Apache Plaza
Apache Trail
Safeway

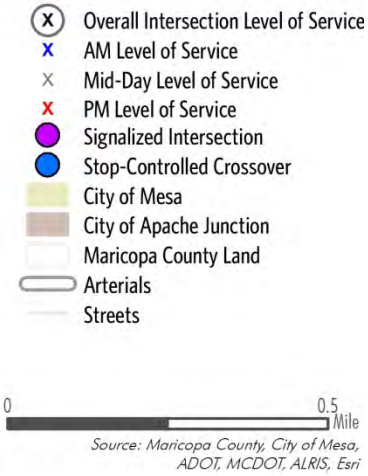

US60X & 96th Street
8
US60X & 98th Street
9
US60X & Crismon Road
10
US60X & 102nd Street
11
US60X & Cheshire
12
US60X & Signal Butte Road
13
US60X & Mountain Road
14
US60X & Meridian Road
15
Overall Intersection Level of Service
AM Level of Service
Mid-Day Level of Service
PM Level of Service
Signalized Intersection
Stop-Controlled Crossover
City of Mesa
City of Apache Junction
Maricopa County Land
Arterials
Streets
0
0.5
Mile
Source: Maricopa County, City of Mesa, ADOT, MCDOT, ALRIS, Esri

## Figure 4.11: Ultimate Configuration Alternative 2 - Projected Long-Term (Year 2040) Intersection Level of Service




SEE MAP TO THE LEFT
8
96th St
9
98th St
10
Crismon Rd
11
102nd St
12
Cheshire
Bashas'
13
Signal Butte Rd
Goodwill
14
Mountain Rd
Apache Plaza
15
Meridian Rd
Apache Trail
Safeway


US60X & 96th Street
8
DCD
US60X & 98th Street
9
CCA
US60X & Crismon Road
10
CCC
US60X & 102nd Street
11
AAA
US60X & Cheshire
12
AAA
US60X & Signal Butte Road
13
CCC
US60X & Mountain Road
14
BBB
US60X & Meridian Road
15
CCC


Overall Intersection Level of Service
AM Level of Service
Mid-Day Level of Service
PM Level of Service
Signalized Intersection
Stop-Controlled Crossover
City of Mesa
City of Apache Junction
Maricopa County Land
Arterials
Streets
0
0.5
Mile
Source: Maricopa County, City of Mesa, ADOT, MCDOT, ALRIS, Esri

### *Discussion of Ultimate Configuration – Alternative 2*

The following is a list of identified issues, challenges, and considerations for this alternative. Working Paper 2 provides a detailed illustration of short- and long-term corridor configurations for the Ultimate Configuration – Alternative 2.

#### Traffic Conditions

The analysis indicates all signalized intersections operate at LOS D or better during the AM, Midday, and PM peak hours for year 2040; however, unsignalized crossovers may experience significant delays in the short- and long-term planning horizons. These unsignalized cross streets were not modeled to show any improvements such as widening or signalization. These crossovers may need to be signalized in the future, but this should not be done until a signal warrant analysis recommends the installation. Signalizing and providing northbound and southbound turn lanes at these intersections would likely improve the LOS and this should be evaluated in the future as demand increases. Based on the results from the operational analysis, recommended intersection improvements for the US 60X corridor are presented in Table 4.10.

**Table 4.10: Ultimate Configuration – Alternative 2 Traffic Operational Improvements**

| | Short-Term Recommendations | Long-Term Recommendations |
|---|---|---|
| Corridor-wide | • Install curb and gutter and restripe corridor to include two thru lanes, inside shoulder, and bike lane<br>• Reconstruct aging traffic signals to meet current design standards and accommodate future roadway improvements<br>• Update traffic signal timing plans to accommodate adequate pedestrian crossing times and better coordinate traffic flow along US 60X<br>• Eliminate vertical grade difference with cross-street<br>• Driveways immediately adjacent to intersections need to be evaluated and consolidated | • Convert corridor to three thru lanes; dual left-turn lanes at intersections, and on-street bike lanes<br>• Re-evaluate traffic signal timing plans based on actual traffic counts and updated lane configurations to ensure optimum coordination |
| Crossovers | • Extend left-turn storage bays to provide adequate storage capacity and deceleration distance<br>• Evaluate crossovers for installation of signalized pedestrian crossing facilities | • Close existing crossovers and reconfigure intersections to include indirect left-turn only crossovers |

### Impacts to Businesses and Right-of-Way

- Existing right-of-way accommodates the short and ultimate design configuration.
- Short-term improvements may require some disruption to business; however, long-term improvements are made to the center median and therefore limiting long-term construction impacts. The addition of streetscaping elements may help in beautifying the corridor and attracting new customers to businesses.
- Pedestrian sidewalks and bike lanes will further increase access to businesses, particularly for local residents that don't have access to a vehicle or choose to walk/bike instead of drive.

### Pedestrian and Bicycle Accommodations

- The corridor design accommodates on-street bike lanes and off-street pedestrian sidewalks in both the short- and long-term phases. The buffered sidewalk recommended in the long-term phase further increases a pedestrian's sense of comfort and safety.
- Signalized intersections along the corridor are spaced at one-mile intervals, creating inconvenient crossing opportunities for pedestrians and cyclists. Mid-block crossings should be evaluated in the final design, regardless of what alternative configuration is selected.
- Sidewalks should be constructed to properly comply with City of Mesa, MCDOT, ADOT, and Americans with of Disabilities Act (ADA) design standards. Intersections should be upgraded to include ADA compliant sidewalk ramps, upgraded pedestrian refuge areas, and accessible pedestrian signal pushbuttons.

### Impact on Drainage

The Flood Control District of Maricopa County (FCDMC) conducted an initial drainage analysis to assess off-site drainage impacts from the proposed designs for the 1-percent annual chance (100-year) flood scenario. Key findings show:

- The alternative increases off-site impacts and flooding; however, the alternative has lesser off-site flooding impacts than Alternative 1. It would be possible to further lessen impacts by mimicking existing "broken crown" conditions.
- Short-term improvements will have impacts to drainage structures located on the outside of the corridor. Because a new curb line is being developed, the stormwater drainage inlet facilities along the existing curb line curb line may need to be relocated.
- Long-term improvements will require additional upgrade to drainage structures located in the drainage swale median. As with short-term recommendations, a complete drainage analysis, in close coordination with MCFCD, should be conducted during the design phase to determine exact drainage requirements.

### Alignment and Cross Slope

Minor improvements are needed to the existing roadway profiles and cross-slopes during the short-term phase; however, additional earthwork is anticipated during the long-term phase to narrow the center median to include an additional travel lane.

### Signage

- Existing traffic signs along the corridor should be reviewed during final design for compliance with the most current Manual on Uniform Traffic Control Devices (MUTCD).
- During the design phase, an assessment should also be conducted to identify business signage that has encroached within the public right-of-way.

### Cost Estimate

Planning-level cost estimates were developed for the short- and long-term phases. The cost estimates planning-level contingency estimates for drainage improvement, traffic control, lighting, signage, mobilization, and design costs. Table 5.8 outlines planning-level cost estimate for the Ultimate Configuration – Alternative 2.

**Table 4.11: Ultimate Configuration – Alternative 2 Planning-Level Cost Estimates**

| | Short-Term Recommendations | Long-Term Recommendations |
|---|---|---|
| Roadway Construction | $3,700,000 | $11,500,000 |
| Street and Intersection Lighting | $1,200,000 | $815,000 |
| Traffic Signal Improvements | $2,900,000 | 3% |
| Traffic Control | 10% | 3% |
| Signing and Marking | 5% | 3% |
| Drainage | 10% | 10% |
| Miscellaneous Elements | 10% | 10% |
| Engineering and Contingencies | 25% | 25% |
| Mobilization | 10% | 10% |
| ICAP | 10.3% | 10.3% |
| Design Costs | 10% | 10% |
| **Total Costs** | **$15,100,000** | **$17,000,000** |

### Stakeholder and Public Comments

Two Stakeholder/Public Open House meetings were held on November 6, 2017 to provide information about the study process to the public and to provide an opportunity to gather public input on the ultimate configurations developed for this study. Thirty people attended the meetings. Comments and questions submitted by the public showed a general favor for implementing corridor Alternative 2.

# 5. Environmental Overview

When environmental conditions and concerns are reviewed in the early stages of the transportation planning process, transportation solutions can be developed to lessen the negative impacts on the natural environment. This chapter presents a review of environmental conditions within the study area.

## Topography and Geology

The study area is located along fairly flat terrain with slight variations in elevation ranging between 1450 to 1600 feet above sea level traversing from west to east respectively. Geological formations along the corridor are primarily Holocene Surficial Deposits (0-10 ka); however, a small area west of SR 202 is Early Proterozoic Granitic Rocks (1600-1800 Ma). Figure 6.1 illustrates current topographic and geologic conditions along the study corridor.

### Faults

Faults are defined by the United States Geological Society (USGS) as a fracture or zone of fractures between two blocks of rock that allow the blocks to move relative to each other. Faults are associated with earth displacement and seismic activity, which can negatively impact infrastructure. There are no faults within the study corridor.

### Fissures and Land Subsidence

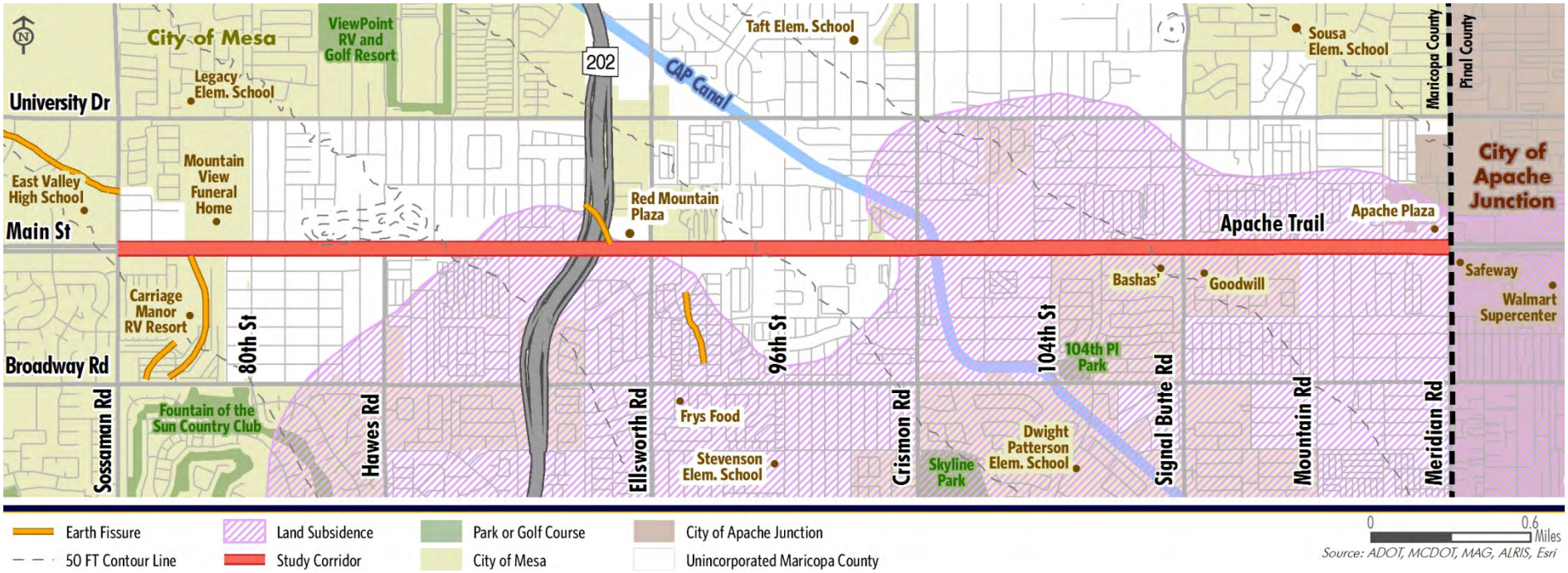
Land subsidence and earth fissure formation is typically the result of substantial groundwater withdrawal from aquifers in sedimentary basins. There are many consequences of land subsidence and earth fissures, including changes in elevation and slope that may impact the natural flow of drainage, damage to existing roadways and infrastructure, and damage to private properties. There are seven earth fissures identified by the Arizona Geological Survey (AZGS) along the study corridor. These fissures transverse south of US 60X, between Sossaman Road and 80th Street, and near Ellsworth Road.

The study area is located at the northern limits of the Hawk Rock land subsidence feature. According to the Arizona Department of Water Resources (ADWR), the portions of the study area just west of SR 202 and between Crismon Road and Meridian Road have subsided at a rate of 0-1 centimeter in the last two years. Subsidence is occurring at a faster rate south of the study corridor.

#### Recommendations for Further Analysis

During design, geotechnical evaluations of the soil are recommended to inform the appropriate pavement and structural needs of the new pavement associated with roadway reconstruction and widening. Ground disturbance associated with increased road/sidewalk areas, clearing of vegetation, and construction staging and stockpiling would occur. A drainage study would be needed to identify suitable solutions and adequate volume and storage. During design, consideration should be given to avoiding steeper slopes and accommodating/planning for areas of subsidence and where known fissures occur.

**Figure 5.1: Topographic and Geologic Conditions**




## Natural Resources

The study corridor is within the Lower Colorado River Subdivision – Sonoran Desertscrub vegetation community, characterized by valley and lower mountains where rainfall is generally less than 7.9 in/year. The corridor is located within a developed, urban environment surrounded by low to mid-density residential housing and numerous commercial properties.

### Prime and Unique Farmlands

The study area is located in the Natural Resources Conservation Service's (NRCS) Soil Survey Geographic (SSURGO) Database soil survey area AZ 645. According to the Soil Survey and based on soil characteristics, there are areas designated as 'Prime farmland if irrigated" within the survey AZ 645 that cross over the eastern end of the study corridor. However, since the area is identified as "urban" within the 2010 census[1] and no active agriculture is occurring, the areas adjacent to US 60X would not be considered prime or unique farmland. Figure 5.2 illustrates the location of prime and unique farmland.

[1] U.S. Census Bureau. 2010. 2010 Census – Urbanized Area Reference Map: Phoenix-Mesa, AZ. https://www2.census.gov/geo/maps/dc10map/UAUC_RefMap/ua/ua69184_phoenix--mesa_az/DC10UA69184.pdf

## Figure 5.2: Prime and Unique Farmlands


### Recommendations for Further Analysis

No further analysis is warranted.

## Threatened, Endangered, and Sensitive Species

The Arizona Game and Fish Department (AZGFD) Heritage Data Management System (HDMS) was accessed to determine special status state species and federally listed threatened, endangered, and candidate species that could occur in the study area based on predictive modeling. Table 5.1 outlines the special status species and critical habitats identified utilizing the HDMS online retrieval system for approximately three miles around the study area.

### Threatened and Endangered Species

Due to the delisting of the bald eagle from the List of Threatened and Endangered Wildlife under the Endangered Species Act (ESA), the U.S. Fish and Wildlife Service enacted the Bald and Golden Eagle Protection Act (Eagle Act). The Act prohibits the obstruction or harassment on Bald Eagles and prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. According to AZGFD data, Bald Eagles could occur within three miles of the study corridor.

Based on predictive modeling ESA-listed species have potential to occur within the study area: the ocelot, lesser long-nosed bat, and jaguar. No habitat for these species occurs within the study corridor. No federally designated or proposed critical habitat for any ESA-listed species occurs within the study corridor. Columnar cactus and agave plants in the vicinity of the corridor could provide marginal habitat for bats.

### Protected Arizona Native Plants

Native vegetation helps prevent erosion, provides food and shelter for desert wildlife, and acts to shade the desert floor and reflects urban heat. To protect species from being over harvested, the Arizona Native Plant Law was enacted. Per the Arizona Native Plant Law, protected plants may not be removed from any lands, whether private or public, without the permission of the land owner and a permit from the Arizona Department of Agriculture. No formal inventory of native plants was conducted; however, native plants may occur in the study area, typically as landscape vegetation and within undeveloped parcels adjacent to the road.

### Wildlife Movements

Wildlife movement through the study area depends on the availability of preferred habitat, foraging range, migration, and dispersal patterns. Often, altered habitat and developed areas pose a barrier to movement of resident wildlife species. The Arizona Wildlife Linkages Workgroup (AWLW), a collaboration effort between ADOT and nine public and non-profit organizations identified large blocks of protected habitat, potential wildlife movement corridors, and factors that may disrupt these linkage zones and documented these areas in the Arizona Wildlife Linkages Assessment. This information allows land managers and transportation planners to integrate wildlife needs into developments and land use plans. No potential wildlife linkage zones or habitat blocks intersect the study corridor.

## Wilderness Areas

Wilderness areas are federal lands set aside by an act of Congress where the land is in a natural state and human impact is minimal. The study corridor does not intersect any wilderness areas.

## Riparian Habitats

Riparian habitats are ecologically diverse areas typically found along the banks of rivers, lakes, or other bodies of water with unique soil and plant characteristics. These riparian areas provide a transition zone between dry and wet ecosystems and are among the most biologically rich habitats. No riparian habitats are present within the study corridor.

**Recommendations for further analysis:**

Very little vegetation occurs in the right-of-way; however, some native plants associated with landscaping and undeveloped parcels do occur. Native plants are protected under the Arizona Native Plant Law. Prior to construction a survey should be undertaken to identify plants that would be affected; their removal could warrant notification to the Arizona Department of Agriculture. Migratory birds are protected under the Migratory Bird Treaty Act. Prior to construction, if bushes or trees will be trimmed or removed, a survey for active nests should be conducted prior to disturbing the vegetation. If migratory birds are present, appropriate measures to minimize impact to them would be needed. During design, consideration should be given to the protection, salvage, and use of native vegetation in reseeding and revegetating the project.

## Table 5.1: Special Status Species and Species of Greatest Conservation Need within the Project Vicinity

| Common Name | FWS | USFS | BLM | NPL | SGCN |
|---|---|---|---|---|---|
| Bald Eagle - Sonoran Desert Population | SC,BGA | S | S | | 1A |
| Wood Duck | | | | | 1B |
| Harris' Antelope Squirrel | | | | | 1B |
| Golden Eagle | | | S | | 1B |
| Western Burrowing Owl | SC | S | S | | 1B |
| American Bittern | | | | | 1B |
| Ferruginous Hawk | SC | | S | | 1B |
| American Beaver | | | | | 1B |
| Variable Sandsnake | | | | | 1B |
| Tucson Shovel-nosed Snake | SC | | | | 1A |
| Gilded Flicker | | | S | | 1B |
| Sonoran Whipsnake | | | | | 1B |
| Pale Townsend's Big-eared Bat | SC | S | S | | 1B |
| Tiger Rattlesnake | | | | | 1B |
| Banner-tailed Kangaroo Rat | | | S | | 1B |
| Spotted Bat | SC | S | S | | 1B |
| Greater Western Bonneted Bat | SC | | S | | 1B |
| American Peregrine Falcon | SC | S | S | | 1A |
| Sonoran Desert Tortoise | CCA | S | | | 1A |
| Bald Eagle | SC | S | S | | 1A |
| Gila Monster | | | | | 1A |
| Sonoran Desert Toad | | | | | 1B |
| Desert Mud Turtle | | | S | | 1B |
| Western Red Bat | | S | | | 1B |
| Western Yellow Bat | | S | | | 1B |
| Ocelot | LE | | | | 1A |
| Lesser Long-nosed Bat | LE | | | | 1A |
| Antelope Jackrabbit | | | | | 1B |
| Lowland Leopard Frog | SC | S | S | | 1A |
| California Leaf-nosed Bat | SC | | S | | 1B |
| Gila Woodpecker | | | | | 1B |
| Lincoln's Sparrow | | | | | 1B |
| Abert's Towhee | | S | | | 1B |
| Sonoran Coralsnake | | | | | 1B |
| Arizona Myotis | SC | | S | | 1B |
| Cave Myotis | SC | | S | | 1B |
| Yuma Myotis | SC | | | | 1B |
| Pocketed Free-tailed Bat | | | | | 1B |
| Jaguar | LE | | | | 1A |
| Savannah Sparrow | | | | | 1B |
| Arizona Pocket Mouse | | | | | 1B |
| Goode's Horned Lizard | | | | | 1B |
| Regal Horned Lizard | | | | | 1B |
| Saddled Leaf-nosed Snake | | | | | 1B |
| Yellow Warbler | | | | | 1B |
| Brazilian Free-tailed Bat | | | | | 1B |
| Pacific Wren | | | | | 1B |
| Arizona Bell's Vireo | | | | | 1B |
| Kit Fox | No Status | | | | 1B |

| Species of Economic and Recreation Importance | |
|---|---|
| Gambel's Quail | White-winged Dove |
| Mountain Lion | Mourning Dove |

FWS – Fish and Wildlife Service
USFS – U.S. Forest Service
BLM – Bureau of Land Management
NPL – Native Plant Law
SC – Species of Concern
BGA – Bald and Golden Eagle Protection Act
S – Sensitive
CCA – Candidate Conservation Agreement
LE – Listed Endangered

SGCN 1A – Scored "1" for Vulnerability in at least one of the eight categories and matches at least one of the following: Federally listed as endangered or threatened under the Endangered Species Act (ESA); Candidate species under ESA; Is specifically covered under a signed conservation agreement (CCA) or a signed conservation agreement with assurances (CCAA); Recently removed from ESA and currently requires post-delisting monitoring; Closed season species (i.e., no take permitted) as identified in Arizona Game and Fish Commission Orders 40, 41, 42 or 43.
SGCN 1B – Scored "1" for Vulnerability in at least one of the eight categories, but match none of the above criteria

## Hydrology

The US 60X corridor is located within the East Salt River Valley sub-basin within the Phoenix Active Management Area. Five ephemeral drainages cross the US 60X corridor flowing to the southwest (ADWR)[2]. In addition, the Arizona Central Arizona Project (CAP) Canal crosses under US 60X east of Crismon Road. These drainages are conveyed through the study corridor via box culverts. It is anticipated that some of these washes would potentially qualify as Waters of the U.S. and be under the jurisdiction of the U.S. Army Corps of Engineers (Corps). Construction or placement of fill within these washes would be subject to the terms and conditions of Section 401, 402, and 404 of the Clean Water Act.

### Floodplains

Executive Order 11988 requires federal agencies to avoid long- and short-term adverse impacts to floodplains to the extent possible, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map shows a Flood Zones A, X3 and AH in proximity the study corridor, with the Flood Zone AH being adjacent to the eastern end of the corridor.

### Wetlands

Wetlands are defined by the Environmental Protection Agency (EPA) as lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Wetlands typically are areas where water covers the soil or is present at/near the surface of the soil year-round or during varying periods throughout the year. Wetlands are located throughout the study corridor vicinity, and include freshwater ponds and riverine wetlands (USFWS 2017).[3] Freshwater ponds in the area are primarily manmade. The washes that cross US 60X are identified as “riverine wetlands.”

### Water Quality

There are no waterbodies (commonly referred to as the 303[d] list) that were assessed by ADEQ as having impaired uses that require more than existing technology and permit controls to achieve or maintain acceptable water quality standards. Similarly, no Outstanding Natural Resource Waters, or “unique waters” providing special recreational or ecological significance associated with the water body occur within or near the US 60X corridor (ADEQ 2016)[4].

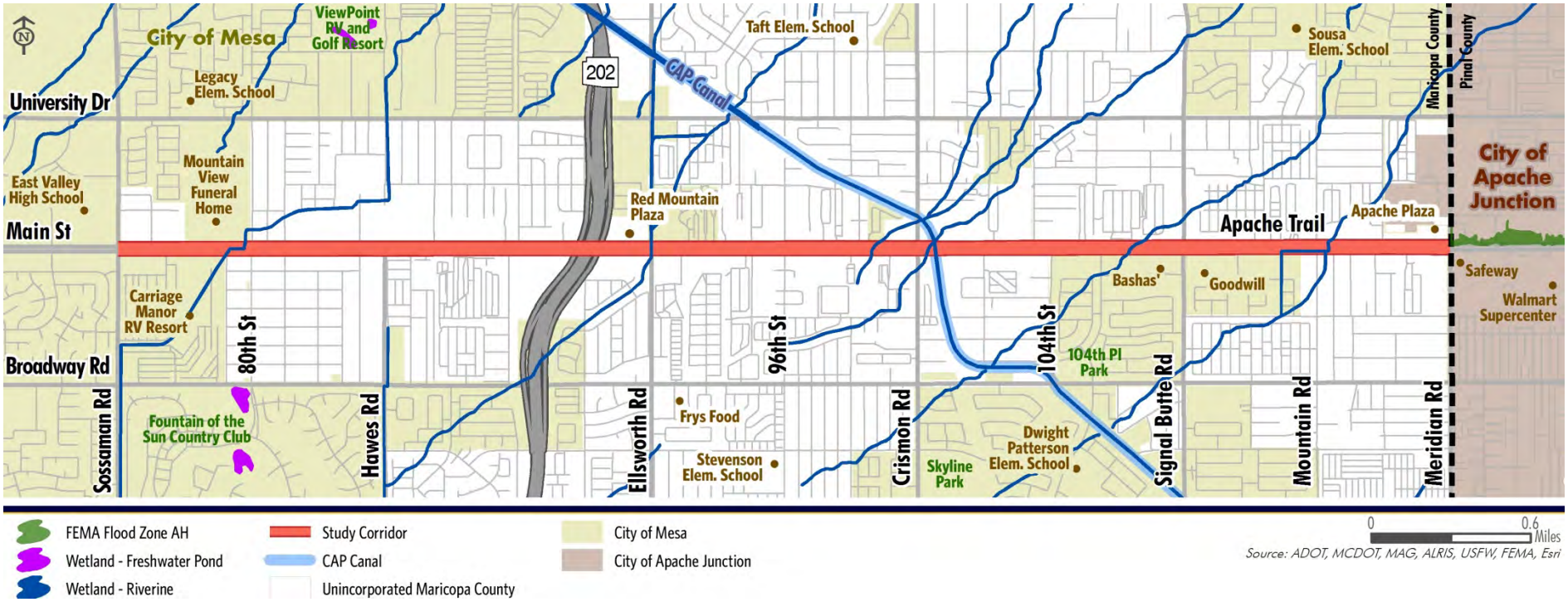
Figure 5.3.illustrates the location of major hydrologic features in the area.

[2] Arizona Department of Water Resources. 2010. Arizona Water Atlas, Volume 8, Active Management Planning Area, Section 8.1, Phoenix AMA.

[3] USFWS. 2017. National Wetlands Inventory – V2 interactive map. https://www.fws.gov/wetlands/data/mapper.html

[4] Arizona Department of Environmental Quality. 2016. Water Quality Program, Surface Water Monitoring and Assessments. http://www.azdeq.gov/programs/water-quality-programs/surface-water-monitoring-and-assesments accessed 04/10/2017.

**Figure 5.3: Hydrologic Conditions**




## Recommendations for Further Analysis

During the design of the project, the washes of the project area should be reviewed to determine if they are potentially jurisdictional. If they are, a Preliminary Jurisdictional Delineation should be prepared and submitted to the Corps. Subsequently, the plans should be reviewed for potential impacts to Waters of the U.S. If so, an appropriate Section 404 permit application would need to be prepared. If potential impacts at each unique wash are less than 0.10 acre, then a non-notifying Nationwide Permit would be appropriate. If more than 0.10 acre but less than 0.50 acre will be permanently impacted, then a pre-construction notification would also be necessary. If the area of permanent impact exceeds 0.50 acre, an Individual Permit would be necessary. Section 401 Certification would also be necessary from Arizona Department of Water Quality. A section 402 Arizona Pollutant Discharge Elimination System permit and associated plan would be necessary if the area of disturbance exceeds 1 acre.

## Air and Noise

Based on data provided by the ADEQ, the study corridor is within the following:

- Ozone 8-Hour – Non-Attainment
- Particulate Matter 10 (PM10) – Non-Attainment
- Carbon Monoxide (CO) – Maintenance

Projects that improve safety, add bicycle/pedestrian facilities, and improve lighting are exempt from conformity requirements under 40 CFR 93.126-127. No hot spot analysis is anticipated to be needed.

Maintaining acceptable noise levels to preserve the character of open spaces, residential quiet zones, and recreational facilities should be considered when selecting a potential transportation improvement project. The ADOT Noise Abatement Policy and FHWA Noise Abatement Criteria identify the level of allowable traffic noise level for different categories of land use and activities. For homes, churches, schools, and parks, ADOT will consider mitigation for receivers when predicted traffic noise levels are 64 dBA or higher. Along the study corridor there are numerous residential developments that may require low noise levels. The proposed improvements would not move the travel lanes closer to receivers by half or increase capacity; no modeling is anticipated.

### Recommendations for Further Analysis

During final design, coordination with the ADOT air and noise specialist is recommended to verify that no detailed analyses are necessary.

## Hazardous Materials

A regulatory review of federal and state hazardous materials database was performed to evaluate and identify the presence of hazardous materials present in the study area. The following federal and state environmental records were reviewed to identify incidents and regulated material sites:

- **Federal Brownfield** – Brownfields are real property whose expansion, redevelopment, or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. There are no brownfields adjacent to the study corridor.
- **Federal Superfund** – The National Priorities List is a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. Superfund is the federal government program to clean up the nation's uncontrolled hazardous waste sites. There are no superfund sites adjacent to the study corridor.
- **Federal Resource Conservation Recovery Act (RCRA) generator** – RCRA was established for sites that treat, store, and dispose of hazardous waste. There are 7 RCRA sites adjacent to the study corridor.
- **Federal Toxic Releases to Land (TRI)** – The Toxic Release Inventory contains information on toxic chemical releases and waste management activities reported annually by certain industries as well as federal facilities. There are no TRI sites adjacent to the study corridor.
- **Federal Toxic Substance Control Act (TSCA)** – TSCA addresses the production, importing, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon, and lead-based paint. There are no TSCA sites adjacent to the study corridor.
- **State Landfills** – The state holds records of permitted solid waste disposal facilities or landfills. There are no landfills adjacent to the corridor.
- **State Large Quantity Generator (LQG)** – Large quantity generator sites generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste, per month. There are no LQG sites adjacent to the study corridor.
- **State Leaking Underground Storage Tank (LUST)/Underground Storage Tank (UST)** – Leaking USTs are defined as regulated USTs that contain regulated substances including petroleum and hazardous substances, such as those typically found at gasoline stations, fleet fueling facilities, and industrial sites, that are suspected or confirmed of having a leak. 17 LUST and 13 UST sites are located in proximity to the study corridor.

Table 5.2 provides an overview of Hazardous Material sites identified within the study area. Figure 5.4 illustrates the hazardous materials located within the study area.

### Recommendations for Further Analysis

During the design phase, a Preliminary Initial Site Assessment or Phase I Environmental Site Assessment (ESA) should be conducted to identify potential environmental hazards and any appropriate mitigation. The level of analysis depends on whether any new right-of-way is included and on the funding of the project. If there is federal funding and new right-of way, a Phase I ESA is the appropriate level of investigation. In addition, any load bearing concrete or painted surfaces that will be modified would need to be tested for asbestos and lead-based paint, respectively. Hazardous materials reports, including asbestos testing in Maricopa County, only remain valid for 6 months.

**Table 5.2: Hazardous Materials Sites**

| Facility Type | Sites Adjacent to Corridor |
|---|---|
| **Environmental Protection Agency (EPA)** | |
| Brownfield | 0 |
| Resource Conservation Recovery Act (RCRA) Generators | 7 |
| Toxics Release Inventory (TRI) | 0 |
| Toxic Substance Control Act (TSCA) | 0 |
| **Arizona Department of Environmental Quality (ADEQ)** | |
| Large Quantity Generator (LQG) | 0 |
| Underground Storage Tank (UST) | 13 |
| Leaking Underground Storage Tank (LUST) | 17 |
| Priority One Underground Storage Tank | 0 |

*Source: Arizona Department of Environmental Quality, US Environmental Protection Agency*

**Figure 5.4: Hazardous Materials Sites**

## Cultural Resources

Cultural resources are properties that reflect the heritage of local communities, states, and nations. Properties judged to be significant and to retain sufficient integrity to convey that significance are termed “historic properties” and are afforded certain protection in accordance with state and federal legislation. The National Historic Preservation Act (NHPA) of 1966, as amended, defines historic properties as any prehistoric or historic sites, buildings, structures, districts (including landscapes) and objects included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Traditional cultural properties having heritage value for contemporary communities (often, but not necessarily, Native American groups) also can be determined eligible for, and listed in, the NRHP because of their association with historic cultural practices or beliefs that are important in maintaining the cultural identities of such communities. The Arizona Register of Historic Places is the state's list of districts, sites, buildings, structures, and objects worthy of preservation.

AZSITE (a cultural resource database maintained by the Arizona State Museum) was consulted to determine the nature and extent of previously recorded cultural resource sites and previously conducted research projects within the project area and a surrounding one-half mile area. The AZSITE database indicates that a Class III cultural resources survey that covers the entire study area conducted in 2002 in advance of proposed improvements by ADOT (reported in Breen 2003a and 2003b). Further, 16 previous surveys include portions of the project area or are adjacent to it, and an additional 28 surveys have been conducted within the one-half mile buffer.

Three cultural resource sites have been recorded within the search area; one site is located within the actual US 60X corridor and the other two are outside the study corridor in the one-half mile search buffer. Old US Highway 60, including the entire segment within the study corridor, has been designated a historic site and is considered eligible for the NRHP. The portion of this site within the US 60X corridor has been previously documented to record the historical significance of the site for another project, which mitigates an adverse effect if modifications to the site occur.

The second site consists of a historic amphitheater that is located on the northeast slope of Double Butte, approximately 0.15 miles north of US 60X. The site appears to date from circa 1934, and was recommended as eligible for the NRHP. The third site identified during the records search is a historic trash scatter situated approximately 0.30 miles south of US 60X within the current State Route 202 alignment. This site dated from approximately 1941-1958, and was recommended as not eligible for the NRHP and has likely been destroyed by construction of the State Route 202 alignment.

### Recommendations for Further Analysis

Since Old US Highway 60 within the study area has been previously documented to record the historical significance of the site, no further mitigation would be required to make modifications to the road. During the design phase, a qualified archaeologist should determine and document whether the historic amphitheater would be adversely affected by the proposed improvements. This could include visual changes, noise and vibration, etc. In addition, Section 106 consultation would be required (assumes federal undertaking/funding).

## Section 4(f) and Section 6(f)

Section 4(f) of the US Department of Transportation Act of 1966 and the Section 6(f) of the Land and Water Conservation Fund (LWCF) Act are intended to protect the nation's recreational resources from significant transportation-related impacts. Section 4(f) stipulates that the FHWA and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites that warrant preservation in place unless there is no feasible alternative or the projects include all possible planning to minimize harm to the property. The "use" of Section 4(f) is defined in CFR Title 23, Part 771.135(p) as:

- When property is permanently incorporated into a transportation facility;
- When there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or
- When there is a constructive use of a Section 4(f) property. A constructive use of Section 4(f) resource occurs when the proximity impacts of a proposed project adjacent or nearby a Section 4(f) property results in a substantial impairment to the property's activities or features that qualify a resource for protection under Section 4(f).

No schools with recreational features, publicly-owned recreational areas, or parks occur within 0.5 mile of the US 60X corridor. Segment 50 of the Central Arizona Project Canal (CAP) Trail within unincorporated Maricopa County[5] is a resource that would potentially be afforded protection under Section4 (f). None of the cultural sites identified within the US 60X corridor warrant preservation in place, therefore they would not be afforded protection under Section 4(f).

Section 6(f), which refers to Section 6(f)(3) of the LWCF Act, requires that any property acquired or developed with LWCF assistance be maintained perpetually in public outdoor recreation use. The acquisition of a Section 6(f) property requires that the property be replaced in-kind, and only with the approval of the National Park Service. No properties purchased or improved by LWCF funds were identified in the study corridor.

### Recommendations for Further Analysis

During the design phase, it should be determined whether there would be any direct or constructive use or a temporary occupancy of the CAP Trail. Any direct or constructive use would require coordination with the Official with Jurisdiction over the resource and public notification.

[5] Maricopa County Trail Commission. August 2004. *Maricopa County Regional Trail System Plan.* http://www.maricopacountyparks.net/assets/1/6/MaricopaTrailMasterPlan.pdf

## Title VI/Environmental Justice

Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. Executive Order 12898, Federal Actions to Address Environmental Justice in minority populations and low-income populations, dictates that programs, policies, and activities identify and address, as appropriate, disproportionately high adverse human health and environmental effects on minority and low-income populations. Protected populations considered in this analysis include: minority, elderly, low-income, and disabled populations.

Environmental justice analyses have historically relied on decennial census data for identifying these protected populations; however, beginning with the 2010 Census, altered data gathering techniques eliminated the collection of income and disability status. As a supplement to the 2010 Census, the American Community Survey (ACS) samples approximately one percent of households across the country annually to determine social and economic trends. Table 5.3 summarizes the percentage of these protected populations along the corridor, within five-miles, and in Maricopa County.

**Table 5.3: Title VI and Environmental Justice Populations**

| | Immediately Adjacent to Study Corridor | Within Five Miles of Study Corridor | City of Mesa | City of Apache Junction | Maricopa County | State of Arizona |
|---|---|---|---|---|---|---|
| Total Population | 20.733 | 325,010 | 458,860 | 36,586 | 4,018,143 | 6,641,928 |
| Minority Population | 28.6% | 21.9% | 15.6% | 9.4% | 20.4% | 21.6% |
| Age 65 and Older Population | 25.4% | 24.0% | 15.5% | 30.4% | 13.5% | 15.4% |
| Family with Female Head of Household (with Children Under 18 and No Husband Present) | 6.9% | 12.6% | 12.7% | 11.8% | 12.8% | 12.7% |
| Below Poverty Level | 23.6% | 5.9% | 16.5% | 24.0% | 17.0% | 18.2% |
| Population with a Disability | 24.0% | 14.9% | 11.8% | 21.2% | 10.5% | 12.2% |

*Source: 2011-2015 American Community Survey (ACS)*

### Recommendations for Further Analysis

Protected populations occur adjacent to the entire study area. Since the proposed improvements are specific to the segment of roadway, they cannot be constructed elsewhere. The proposed improvements would affect all people traveling or moving through the study area equally, and would improve both vehicular and non-motorized accessibility and movement through the corridor. While protected populations occur, no disproportionate impact is anticipated, and the improvements would provide a benefit once constructed. Outreach to the affected populations should continue throughout the development, design, and construction of the project. Translations and other accommodations as requested should be made to ensure information is communicated to all parties.

# 6. Stakeholder and Public Outreach

Public involvement is essential to the broad acceptance and successful implementation of any transportation improvement plan. The goal of community outreach is to educate the public about the study, provide opportunities for input, and to create a process to build consensus in support of study recommendations. For this study, the study team conducted a two-phase public outreach process to discuss the study area's issues and concerns, and obtain public and stakeholder input.

## Agency/Stakeholder Coordination

To facilitate agency and stakeholder communication, the study team conducted meetings with the following groups:

- Technical Advisory Committee (TAC): comprised of agency representatives, TAC meetings are held at key milestones throughout the project and allow agencies with vested interest in the project an opportunity to provide input and feedback. The role of the TAC is to provide technical guidance, support, advice, recommendations, and to perform document reviews throughout the study process. TAC members included representatives from:
    - ADOT Multimodal Planning Division
    - ADOT Communications
    - ADOT Phoenix Maintenance District
    - ADOT Transportation Engineering
    - ADOT Transportations Systems Management and Operations
    - Maricopa Association of Governments (MAG)
    - Maricopa County Department of Transportation (MCDOT)
    - City of Mesa
    - City of Apache Junction
    - Maricopa County Flood Control District (MCFCD)
- Core Study Team: in addition to the TAC, key representatives from ADOT, MCDOT, and the City of Mesa were asked to participate in a Core Study Team. The Core Study Team meets between TAC meetings and assists in guiding corridor evaluation and analysis. Achieving consensus of recommended improvements among the Core Study Team is a critical component of the study.

A project kick-off meeting was held on January 17, 2017 with the TAC and Core Study Team to introduce the study, present the purpose of the study, identify each person's role in the study, and develop a Project Charter. Three subsequent TAC meetings and three Core Study Team meetings were held at strategic points through the study. Meetings were held to discuss the following: existing and future conditions analysis results, preliminary corridor improvement concepts, refined corridor improvement concepts, drainage analysis with MCFCD, and Highway Safety Improvement Program (HSIP) funding. Each meeting commenced with a brief presentation by the study team followed by open discussion between the attendees.

## Stakeholder/Public Outreach

Public outreach is the process of involving the public throughout the transportation planning process through meaningful communication with interested citizens. To ensure that transportation decisions reflect the public's best interests, public involvement is a critical component of the transportation planning process. To engage the public, the study included two public open houses to inform, discuss, and to seek input. Additionally, a project website was developed and hosted by ADOT to enable citizens and the public to access study documents and to submit comments or questions. All meeting materials and meetings were developed in compliance with Title VI requirements.

### Stakeholder/Public Outreach - Phase I

The purpose of the first phase of stakeholder/public outreach was to seek input from the public regarding the existing and future deficiencies and needs of the study corridor. The study team hosted the Phase I meetings on June 13, 2017, with the purpose of seeking input from the public regarding the existing and future deficiencies and needs of the area and elicit input on the public's "vision" for the future of the US 60X corridor. This phase of outreach included two separate meetings at the Rural Metro Fire Station #857, located at 7631 E Main Street, Mesa, AZ 85207. The gathering times included:

- Meeting 1: June 13th - 10:00am to 1:00pm
- Meeting 2: June 13th - 5:00pm to 7:00pm

The meetings were held in open house style, with attendees invited to casually mingle with the study team. A series of boards were provided that outlined identified conditions, issues, and concerns along the corridor. Attendees were asked to identify additional issues, needs, and improvement ideas utilizing stickers or in writing. Comment forms (in English and Spanish) were also distributed to gain additional input from attendees. Additionally, a representative from Maricopa County Flood Control had a drainage map on display for attendees to discuss drainage concerns. A Spanish translator was also in attendance to accommodate Spanish speaking participants. In total, there were 42 members of the community in attendance, not including study team members. Key comments received during the meetings included:

#### *Study Corridor*

- The median should be landscaped throughout the corridor
- Lack of pedestrian and bicycle facilities
- Pavement conditions could be improved
- Storage lanes at crossovers are too short and fill up with turning vehicles
- Vehicles speed and speed limit enforcement is needed
- Lack of lighting

#### *Sossaman Road to Hawes Road*

- Closest bus stop is west of Sossaman Road and Main Street
- Confusing turns from NB Sossaman Road to Apache Trail
- Cars parked on shoulder in front of Mountain View Gardens Cemetery
- Heavy foot and bicycle traffic crossing US 60X between 80th Street and 81st Street
- Sight distance issues at 80th Street crossover
- Drainage issues west of 79th Place and east of 81st Street

### *Hawes Road to Ellsworth Road*

- Cars park along 85th Place in street clear-zone
- Pavement and congestion issues at 85th Place
- Roadway sides are washed away at Glenmar Road intersection
- Access management issues are evident at Ellsworth Road
- Culvert headwalls are close to the roadway
- Traffic control is needed throughout the segment
- The street is not correctly aligned at Glenmar Road and is confusing to motorists

### *Ellsworth Road to Crismon Road*

- Ellsworth Road Intersection:
  - Conflicting left turns on Ellsworth Road north of Main Street
  - McDonalds entrance should be right-in/right-out
  - Painted medians should be used for turns
- 98th Street Intersection/crossover can be confusing
- Long traffic light durations at Crismon Road

### *Crismon Road to Signal Butte Road*

- Signal timing issues at Signal Butte Road intersection
- Signal timing needs to be coordinated with Broadway Road
- Confusing control system at Cheshire signal
- Trucks parking/unloading along Main Street/Apache Trail
- High pedestrian traffic along the southern portion of the corridor from 102nd Street to Merrill Road
- Safety improvements needed at the Merrill Road intersection
- Flooding issues between 102nd Street and 104th Street

### *Signal Butte Road to Meridian Road*

- High traffic during winter season
- Lighting needed in the median
- Visibility issues at Mountain Road
- Long vehicle queues occur near 114th Street
- Wider crosswalks are needed at Meridian Road
- Roundabouts should be considered at the intersections

*Public Involvement Summary Report 1* provides a comprehensive summary of the first Public Open House meetings.

## Stakeholder/Public Outreach - Phase II

The purpose of the second phase of public outreach was to seek input from stakeholders and the public regarding the recommended corridor improvement concepts for the short-and long-term phases. The second set of Public Open House meetings focused on recommended intersection and corridor improvements to address the immediate and future needs of the corridor. The second set of Public Open House meetings took place at the Red Mountain Library, 635 N. Power Rd, Mesa, AZ 85205. At the following time slots:

- Meeting 1: November 6th - 10:00am to 1:00pm (formal presentation at 10:30am)
- Meeting 2: November 6h - 5:00pm to 7:00pm (formal presentation at 5:30pm)

A formal, 20-minute presentation was given at the onset of each meeting. Following the presentation, residents were invited to view display boards of the proposed recommendations and to discuss the proposed improvements with the study team members. Comment forms (in English and Spanish) were distributed to solicit feedback on items presented during the meeting to garner input on the needs of the public. A Spanish translator was also in attendance to accommodate Spanish speaking participants. In total, there were 30 members of the community in attendance, not including study team members.

Key comments received during the public meeting included:

### *Study Corridor*

- Concept 2 was the preferred alternative at the meetings due to cost effectiveness and ability to accommodate future transit options
- Priority improvements included, pedestrian/bicycle facilities, traffic signals, crossover and turn lane changes, and lighting
- Concerns were expressed that roadway construction will negatively affect local businesses
- Median landscaping should easily accommodate potential light rail infrastructure
- The bike lanes featured in the Long-Term solution should be moved off the roadway and should be protected from traffic
- Signal coordination at Sossaman Road, Ellsworth Road, Crismon Road, and Signal Butte Road, and a signalized pedestrian crossing at Mountain Road received general approval

### *Sossaman Road to Hawes Road*

- At the 81st Street intersection, in Concept 2, the cut in the median should be moved 50 FT east
- There is a significant elevation rise from 79th Street to Hawes Road

### *Ellsworth Road to Crismon Road*

- An 8 FT pedestrian refuge should be placed on US 60X at the intersection with Ellsworth Road in Concept 2
- Concept 2 should be changed at the intersection with Mountain Road to place the left turn lane in the median with the buffer to the right
- Option 1 in Concept 2 at Mountain Road is not preferred

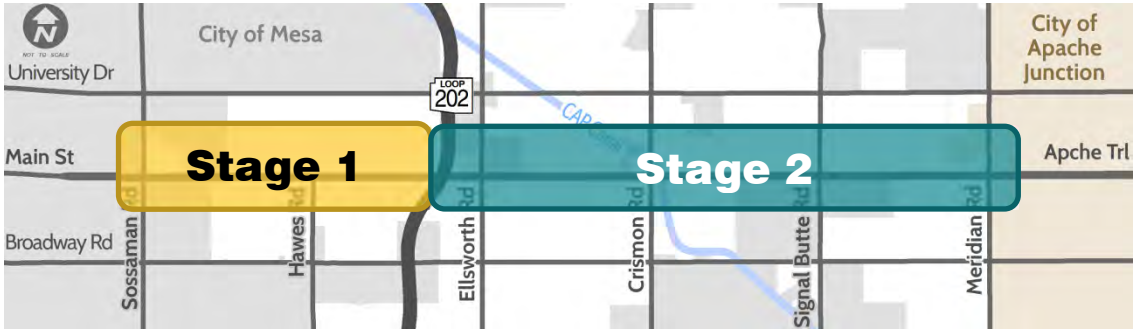
### *Signal Butte Road to Meridian Road*

- In Concept 1 at the Signal Butte intersection, a left turn lane should be placed for southbound traffic

*Public Involvement Summary Report 2* provides a comprehensive summary of the second Public Open House meetings.

# 7. Corridor Improvement Recommendations

Based on findings of the existing and future deficiency analysis from Working Paper 1 and Working Paper 2, input from the TAC and Core Study Team, a field review conducted by the Core Study Team, and input received during stakeholder and public open house meetings an ultimate corridor vision for the US 60X corridor was developed. This chapter presents a full listing of short- and long-term improvement recommendations to achieve this vision. Recommendations include roadway, pedestrian, and bicycle improvements. Together these projects will improve the existing roadway system, provide a network of pedestrian and bicycle facilities, support economic development, and improve safety and operations.




The implementation of the US 60X Corridor Master Plan is contingent upon the availability of funding. Depending on the amount of funding secured, recommended improvements may need to be implemented in two stages. If staging of improvements is necessary, is it recommended to complete projects from Sossaman Road to SR 202 in one stage and from SR 202 to Meridian Road in a separate stage.

## Preferred Design Concept Overview

Based on input from the Core Study Team, Alternative 1 was identified as the preferred design concept for the US 60X corridor. The preferred design concept includes a transitional design that progressively narrows the corridor to include three travel lanes with a raised median. The short- and long-term improvements include the following elements:

### Short-Term Improvements

- Re-stripe the existing pavement to include two 11-FT travel lanes, bike lanes, and 2-FT inside shoulder in each direction
- Maintain 64-FT drainage swale median
- Install 5.5-FT concrete sidewalk with sidewalk lighting
- Install mid-block pedestrian crossings and upgrade existing facilities to comply to ADA standards
- Intersection operational improvements
- Access management improvements throughout the corridor

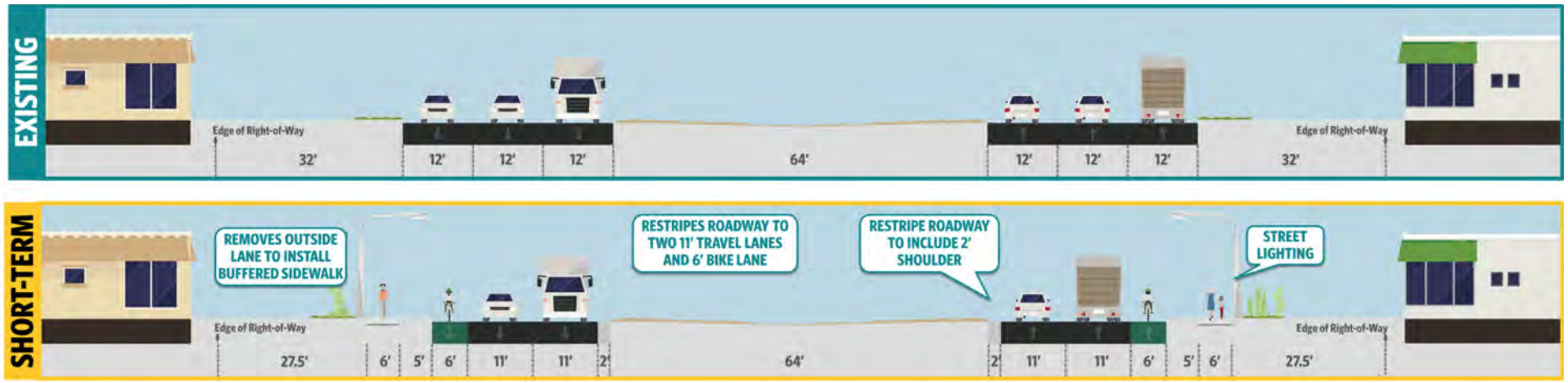
### Long-Term Improvements

- Roadway reconstruction to widen corridor to three 11-FT travel lanes in each direction with a 16-FT raised median with lighting
- Maintain on-street bike lanes and sidewalks constructed during short-term improvements in each direction
- Removes existing pavement to create 14.5-FT landscape buffer between roadway and the sidewalk
- Major drainage reconstruction
- Intersection operational improvements

## Recommended Short-Term Improvements

The ultimate typical section for the US 60X corridor is a six-lane roadway with bike lanes and sidewalks; however, until development and traffic volumes warrant the ultimate section, short-term improvements were developed. Figure 7.1 illustrates the recommended short-term typical section, while Figure 7.2 illustrates corridor-wide recommended improvements. Appendix B provides a detailed pre-scoping field review report that outlines potential risks, concerns, and conditions along the US 60X corridor as gathered during a field assessment conducted in December 2017.

**Figure 7.1: Short-Term Corridor Cross-Section**




### Roadway Improvements

To accommodate the short-term design recommendations, the following improvements are needed:

- **Existing Pavement:** based on the pavement condition rating of the roadway, the existing asphalt concrete (AC) pavement is in fair to good condition. This study did not include a pavement structural analysis; therefore, during the final design phase an evaluation of pavement conditions and the need for mill and overlay should be evaluated.
- **Roadway Striping:** the roadway should be restriped to include two 11-FT travel lanes and an inside 2-FT shoulder.
- **Lengthen Crossover Turn-bays:** new pavement will need to be added at crossovers to lengthen turn-bays in order to provide adequate storage capacity and deceleration length for turning vehicles. The reconfiguration will require new signing and striping per the latest MAG standards.
- **Pavement Removal:** the outside 12-FT travel lane should be converted to accommodate a 6-FT bike lane and pedestrian facilities. Scupper curbing is also recommended to be added adjacent to the 6-FT bike lane.
- **Driveways:** during final design, a complete assessment of driveway locations and conditions should occur. The assessment will recommend driveway closures or consolidations, paving, and the ultimate location of business access points along the corridor. No property or business owners along the study segment have been contacted as part of this study to explore the potential for driveway closures.

- **Intersection Vertical Grade Difference:** during final design, improvements to vertical grade differences should be considered to improve sight distance issues along the corridor. Improvements should be considered at:
    - Sossaman Road intersection
    - Ellsworth Road intersection
    - from 79th Place to 81st Street
    - 96th Street
    - Signal Butte Road
    - Crismon Road
    - 102nd Street
    - Mountain Road
- **Encroachments:** measures should be implemented to ensure than no vehicles are parked within the right-of-way, which restricts sight visibility.
- General roadway maintenance should occur to clear and clean pedestrian refuge areas, crossovers, and remove overgrown vegetation.
- The majority of the work can be performed within the existing right-of-way; however, utility acquisition may be required to accommodate project needs, primarily drainage.

### Traffic Improvements

To properly accommodate traffic along the corridor, the following improvements are recommended:

- **Arterial Intersection Traffic Signal Upgrades:** upgrade traffic signals to eliminate the need for two sets of signal poles for each direction of traffic. The proposed signal configuration should be implemented with ultimate configuration in mind to maintain forward compatibility.
- **Mountain Road Crossover:** the crossover should be reconfigured to a signalized intersection with pedestrian crosswalks. Mountain Road should also be evaluated to determine the need for an additional turn lane on Mountain Road.
- **Additional Turn Lanes:** 80th Street, Hawes Road, 88th Street, and 96th Street should be evaluated to assess the need for an additional turn lane.
- **Crossover Removals:** conduct a detailed traffic analysis for the closure of select crossovers to improve corridor traffic flow and reduce turning movement conflicts. If a crossover is removed, the next turning location will need to accommodate u-turns in addition to the increased traffic volumes caused by the removal of the crossover. Potential crossover closures include:
    - 83rd Place
    - East of Dolbeer Road
    - 98th Street
    - 102nd Street
    - East of Signal Butte Road

- **Signal Timing:** update traffic signal timing plans to accommodate adequate pedestrian crossing times and better coordinate traffic flow along US 60X. Consider changing northbound and southbound signal phasing from split phasing to lead-lag operations.
- **Mid-Block Pedestrian Crossings:** during final design, a complete assessment of potential locations for mid-block pedestrian crossings should be conducted. Marked mid-block pedestrian crossings should be installed in locations that experience heavy pedestrian traffic or where crash history indicates a possible need. While pedestrian crossing warrants may not be satisfied for the installation of a pedestrian hybrid beacon, a high-visibility marked crosswalk should be considered.
- **Street Lighting:** overhead street lights should be installed adjacent to the pedestrian sidewalk. During the design phase, assessment should be made to determine exact street lighting design and specifications.
- **Signage:** a complete assessment for MUTCD compliance and retroreflectivity should occur for all traffic signs located along the corridor. The assessment should include an inventory of existing signage and make recommendations on where to remove, add, or update signs. In addition, business signage encroaching within the public right-of-way should be identified.

### Bicycle and Pedestrian Improvements

The following bicycle and pedestrian improvements are recommended:

- **On-Street Bike Lanes:** 6 FT on-street, bike lanes should be striped along the entire length of the corridor
- **Pedestrian Sidewalks Alternatives:** the following pedestrian facility improvements are recommended:
  - Existing sidewalks will remain; however, a condition and ADA assessment should occur to determine if pedestrian facilities are ADA-compliant.
  - 6-FT sidewalk is recommended to be installed for the entire length of the corridor in both directions
- **American Disabilities Act (ADA):** during the final design, all pedestrian ramps should be verified for ADA compliance. The following pedestrian ramps are recommended to be constructed and/or upgraded to current ADA requirements:
  - Ellsworth Road: upgrade sidewalks on northwest/east corners and install ADA compliant sidewalks on southeast/west corners
  - Crismon Road: install ADA compliant sidewalks and ramps on all corners
  - Cheshire: install ADA compliant sidewalks ramps on all corners
  - Signal Butte Road: install ADA compliant sidewalks and ramps on all corners
  - Meridian Road: install ADA compliant sidewalks ramps on all corners
  - Clean pedestrian refuge areas at all signalized arterial intersections

## Drainage Improvements

The FCDMC conducted a preliminary drainage analysis of US 60X corridor as part of the East Mesa Area Drainage Master Plan (ADMP). Based on recommendations from the FCDMC analysis, short-term improvements may include:

- Extending, moving, and/or relocating existing drainage inlet facilities along the existing curb line to accommodate sidewalks and curb
- Off-site improvements to mitigate regional flooding
- Upgrades to existing culvers and box culverts to improve drainage along the corridor
- Minor erosion repair

During the design phase, a complete drainage assessment will be necessary to determine exact drainage requirements.

## Cost Estimates

Table 7.1 outlines planning-level cost estimate for the short-term improvements.

**Table 7.1: Short-Term Improvements Cost Estimates**

| | Corridor Wide Planning Cost Estimate | Stage 1 Planning Cost Estimate | Stage 2 Planning Cost Estimate |
|---|---|---|---|
| Roadway Construction | $3,700,000 | $1,295,000 | $2,405,000 |
| Street and Intersection Lighting | $1,200,000 | $420,000 | $780,000 |
| Traffic Signal Improvements | $2,900,000 | $1,015,000 | $1,885,000 |
| Traffic Control | 10% | 10% | 10% |
| Signing and Marking | 5% | 5% | 5% |
| Drainage | 10% | 10% | 10% |
| Miscellaneous Elements | 10% | 10% | 10% |
| Engineering and Contingencies | 25% | 25% | 25% |
| Mobilization | 10% | 10% | 10% |
| ICAP | 10.30% | 10.30% | 10.30% |
| Design Costs | 10% | 10% | 10% |
| **Total Costs** | **$15,100,000** | **$5,285,000** | **$9,815,000** |

Costs illustrate a preliminary drainage improvement estimate of 10 percent. Final drainage recommendations are pending the FCDMC drainage analysis of the US 60X corridor. Based on findings, cost estimates may increase. If final design recommends the addition of corridor-wide mill and overlay, an additional cost of $4,500,000 would occur.

## Schedule

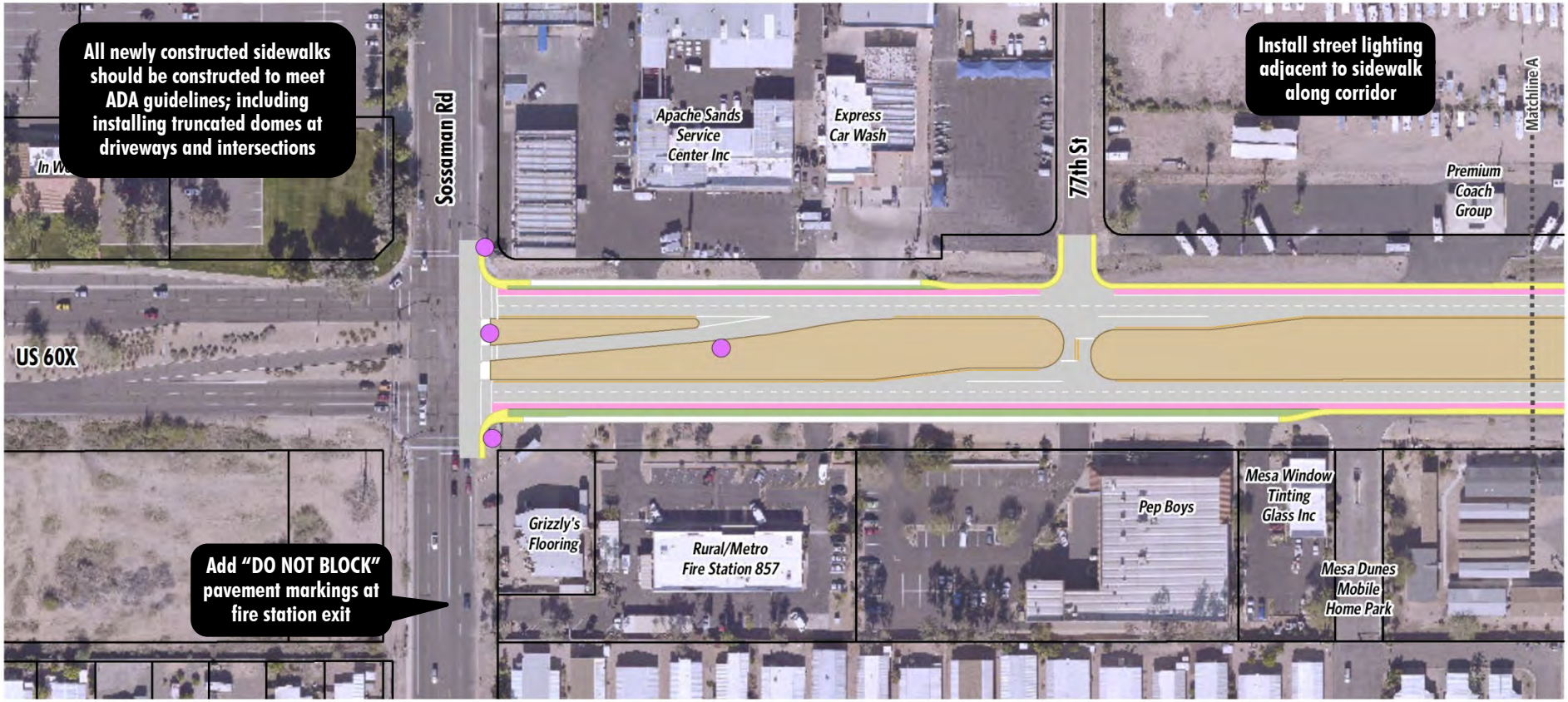
In January 2018, ADOT's Traffic Safety Section issued a formal call for Highway Safety Improvement Program (HSIP) projects for Fiscal Year (FY) 2021 and FY 2022. The HSIP is a data-driven framework for funding projects that achieve a significant reduction in traffic fatalities and serious injuries on public roads through the implementation and guidance of the State Highway Safety Plan (SHSP). Expected HSIP available funds for FY 2021 are $23 million and $32 million for FY 2022 and applications are due to the ADOT Traffic Safety Section no later than May 4, 2018. The application process includes:

- Projects will be prioritized based on the benefit to cost (B/C) ratio only. HSIP eligibility will be based on the minimum benefit to cost ratio at or above 1.5:1. Only fatal and serious related crashes will be considered correctable. Alcohol related fatal and serious injury crashes are also eligible.
- All ADOT applications will have to be reviewed by Regional Traffic Engineers. All state and local projects will compete for the same funding levels with priority going to the projects with the highest benefit to cost ratios.
- Local Project request must be approved by the MPO or COG.
- Maximum project cost $5 million; unless granted prior approval

Based on discussion with the Core Study Team and the timing of the HSIP application process, the following strategy and timeline is recommended to implement the US60X short-term improvements

1) Separate the US60X corridor into two segments 1) Sossaman Road to SR 202 and 2) SR 202 to Meridian Road
2) Based on the cost estimates for the two segments, it is recommended that ADOT submit an HSIP grant for each of the two segments utilizing the crash analysis provided in Working Paper #1 and the detailed short-term improvements cost estimate provided above.
3) If the projects are selected for programming, design should commence in FY 2020 and 2021 respectively for the two segments.
4) It is also recommend that a Design Concept Report (DCR) be initiated soon after acceptance of this report. The DCR will more accurately define the scope and cost of the project while allowing ADOT management time to work cooperatively with Maricopa County and the City of Mesa for funding and implementing the ultimate US60X corridor improvements. If agreements can be in place prior to FY 2021, then the short-term and ultimate improvements could be combined and constructed concurrently.
5) If an appropriate agreement for transfer of US60X to either Maricopa County or the City of Mesa cannot be completed, ADOT can continue forward with the implementation and construction of the short-term improvements as discussed above.

## Figure 7.2: Short-Term Corridor Improvement Recommendations




**Roadway Improvements**
- Existing Roadway
- New Pavement
- Existing Median
- New Median

**Landscape Improvements**
- New Landscaped Buffer

**Bicycle Improvements**
- New Bike Lane

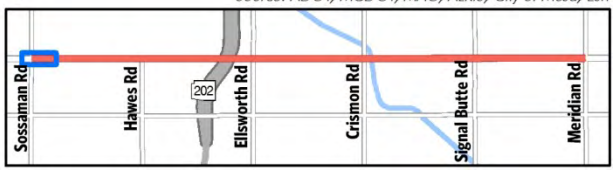
**Pedestrian Improvements**
- Install ADA Compliant Sidewalk and Truncated Dome
- Existing Sidewalk
- New Sidewalk

**Background Data**
- Existing Street Light
- Parcel Boundary

N

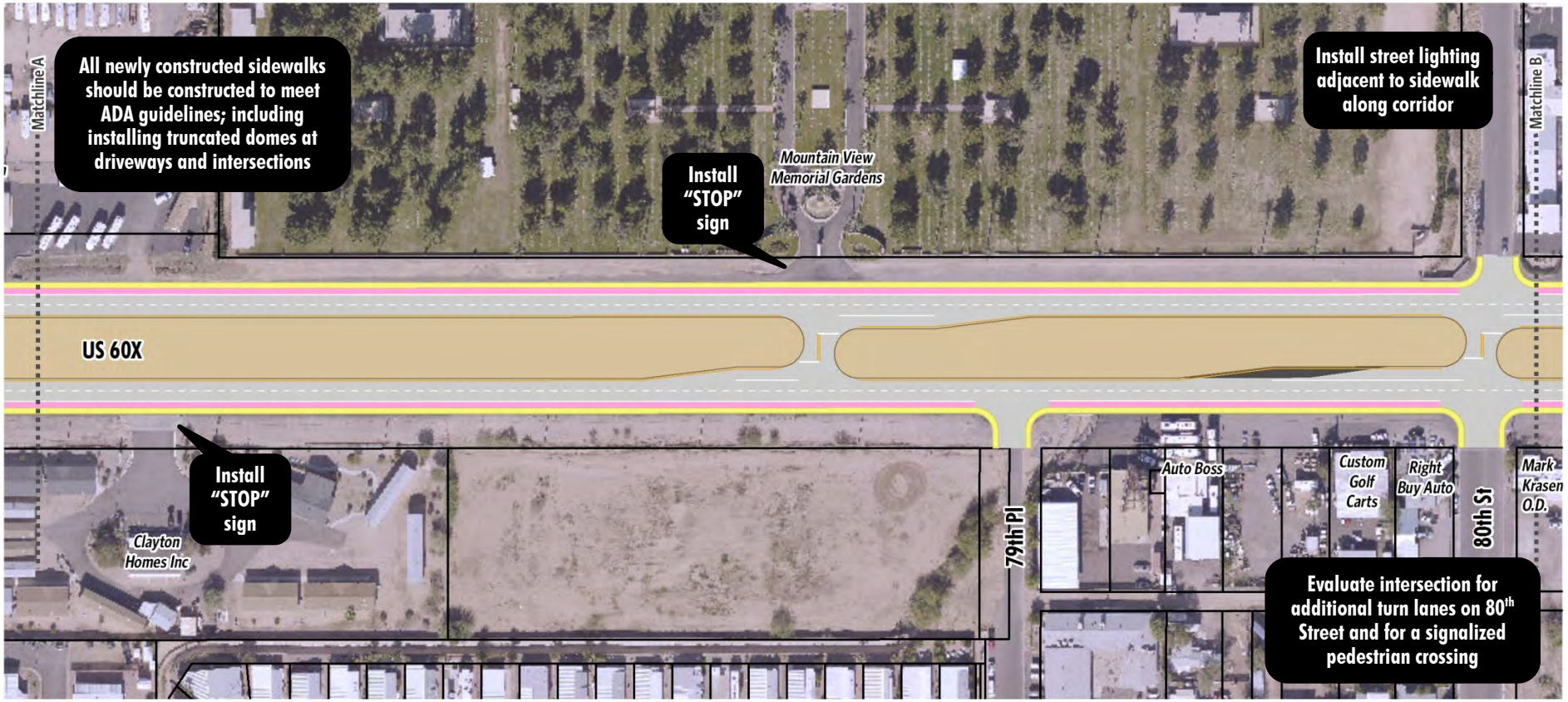
0 200 Feet

Source: ADOT, MCDOT, MAG, ALRIS, City of Mesa, Esri



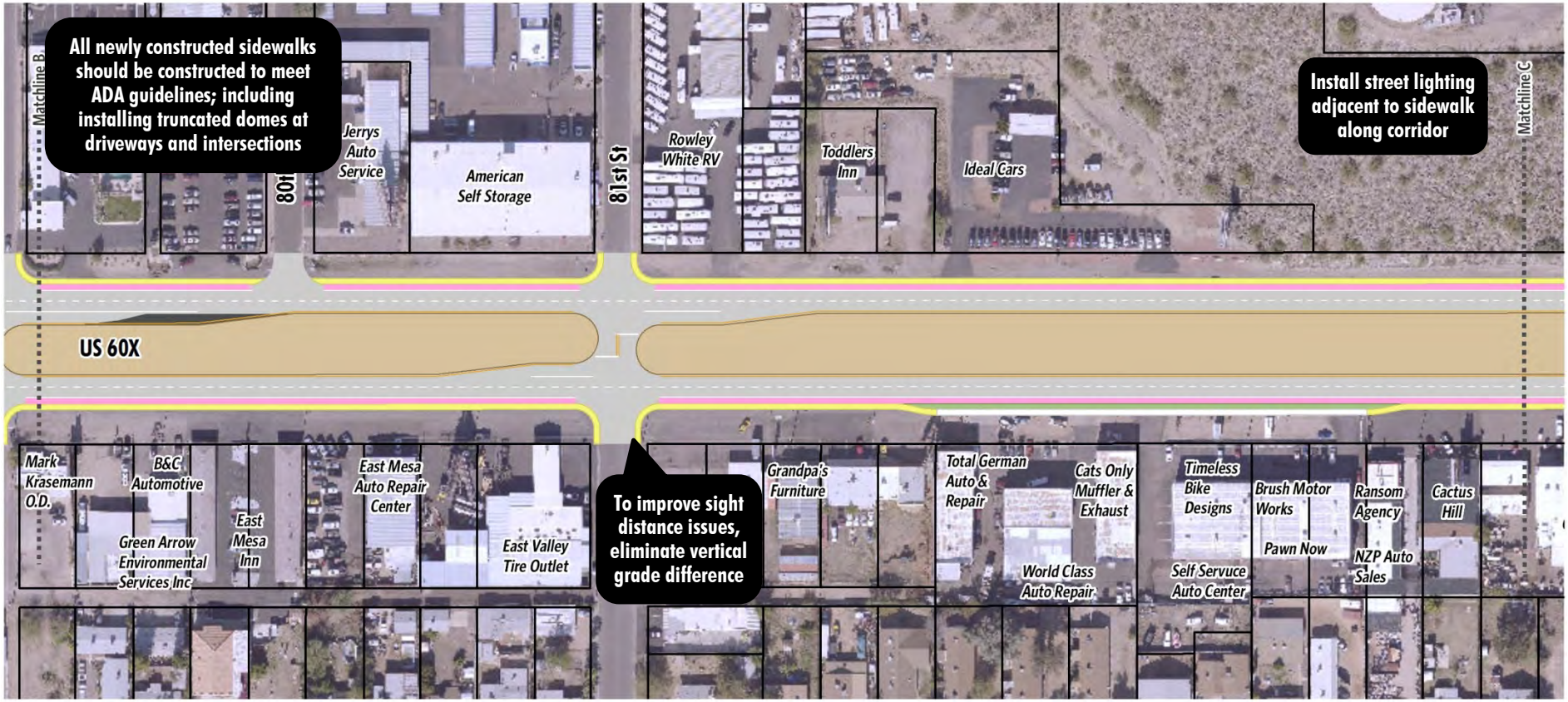

*Final drainage recommendations should be developed during final design

## Figure 7.2: Short-Term Corridor Improvement Recommendations (Continued)




*Drainage improvements pending FCDMC drainage analysis

## Figure 7.2: Short-Term Corridor Improvement Recommendations (Continued)




**Roadway Improvements**
- Existing Roadway
- New Pavement
- Existing Median
- New Median

**Landscape Improvements**
- New Landscaped Buffer

**Bicycle Improvements**
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**Pedestrian Improvements**
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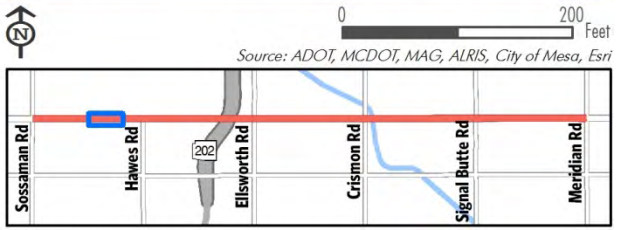


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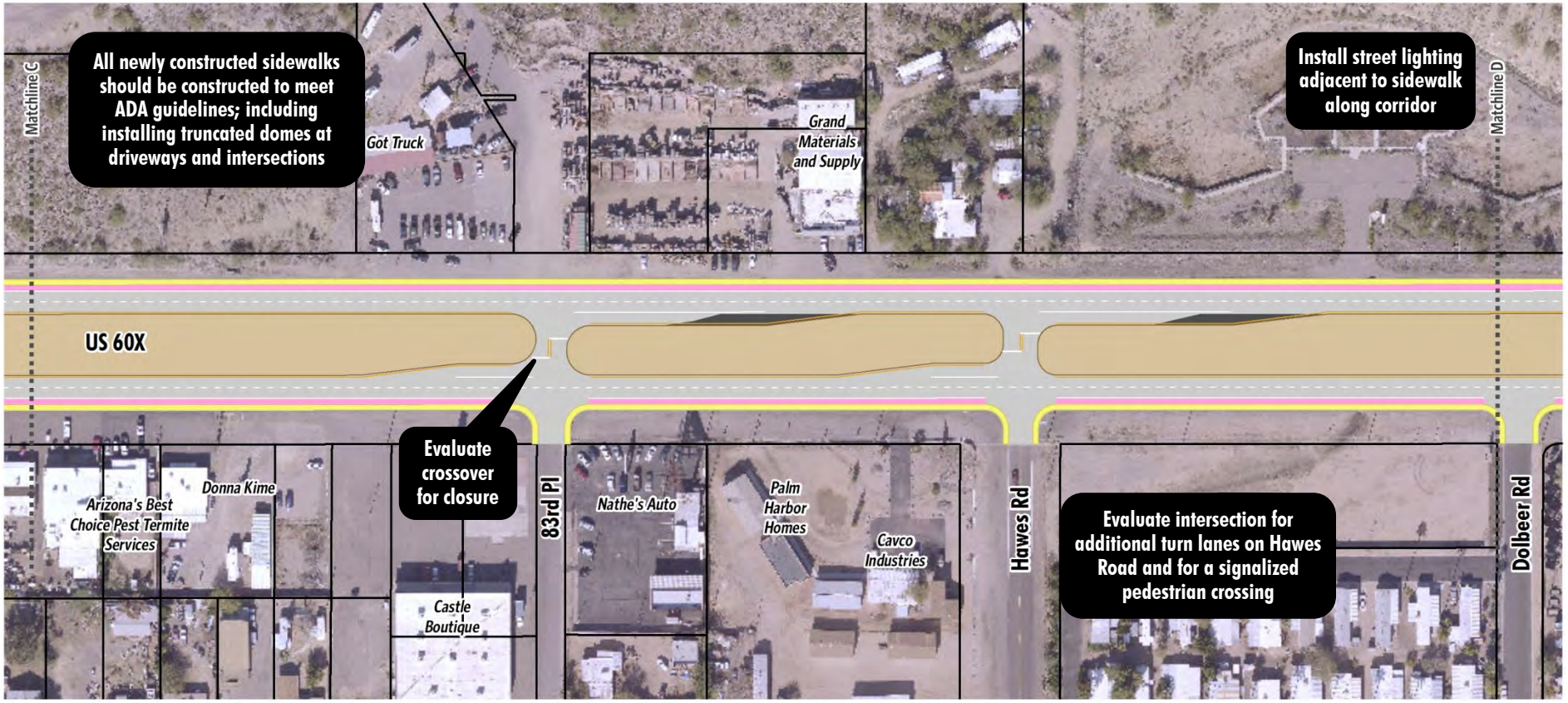


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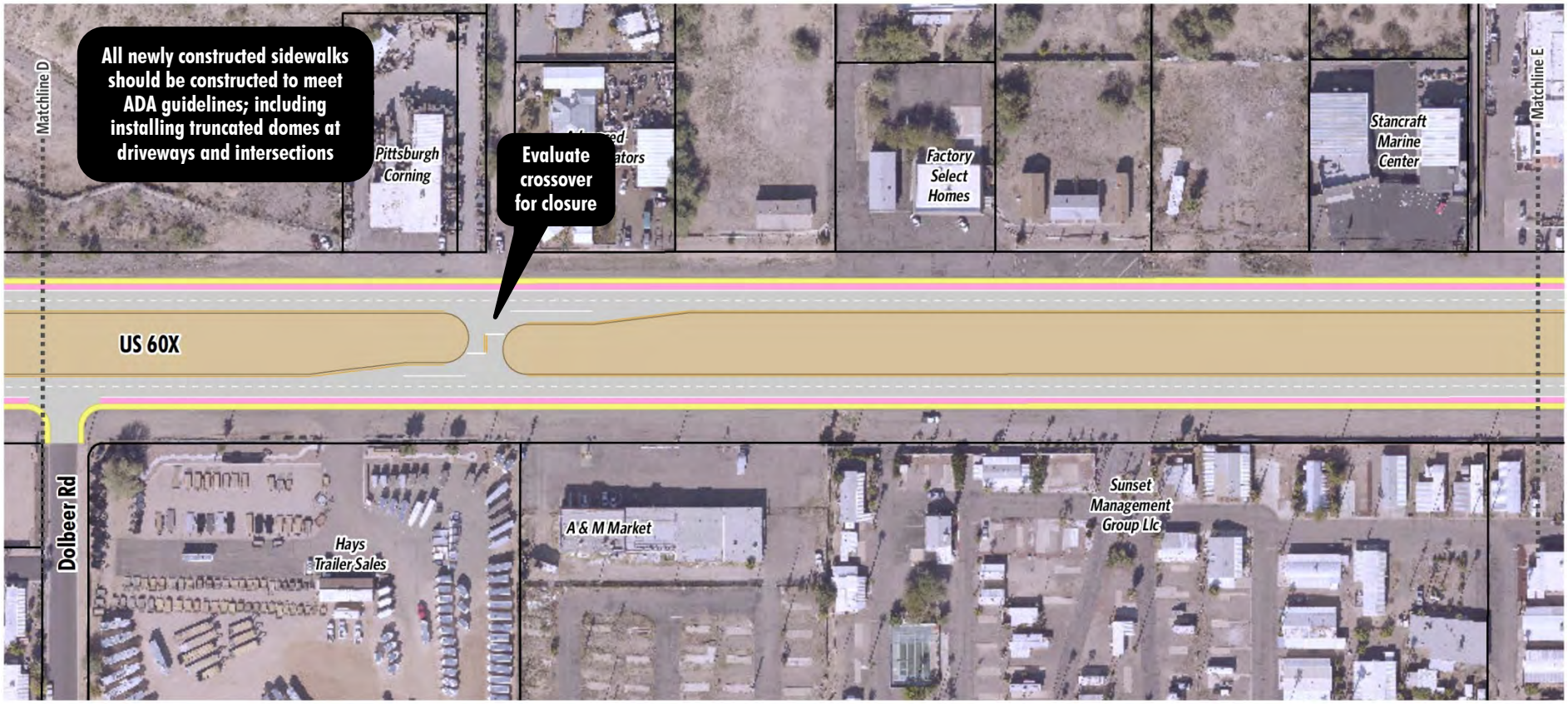


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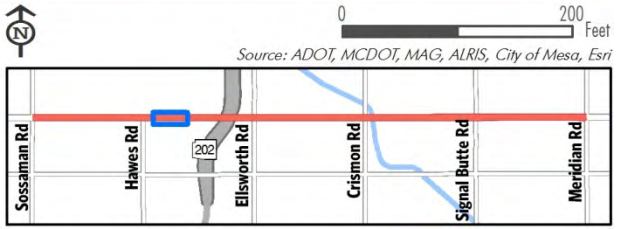


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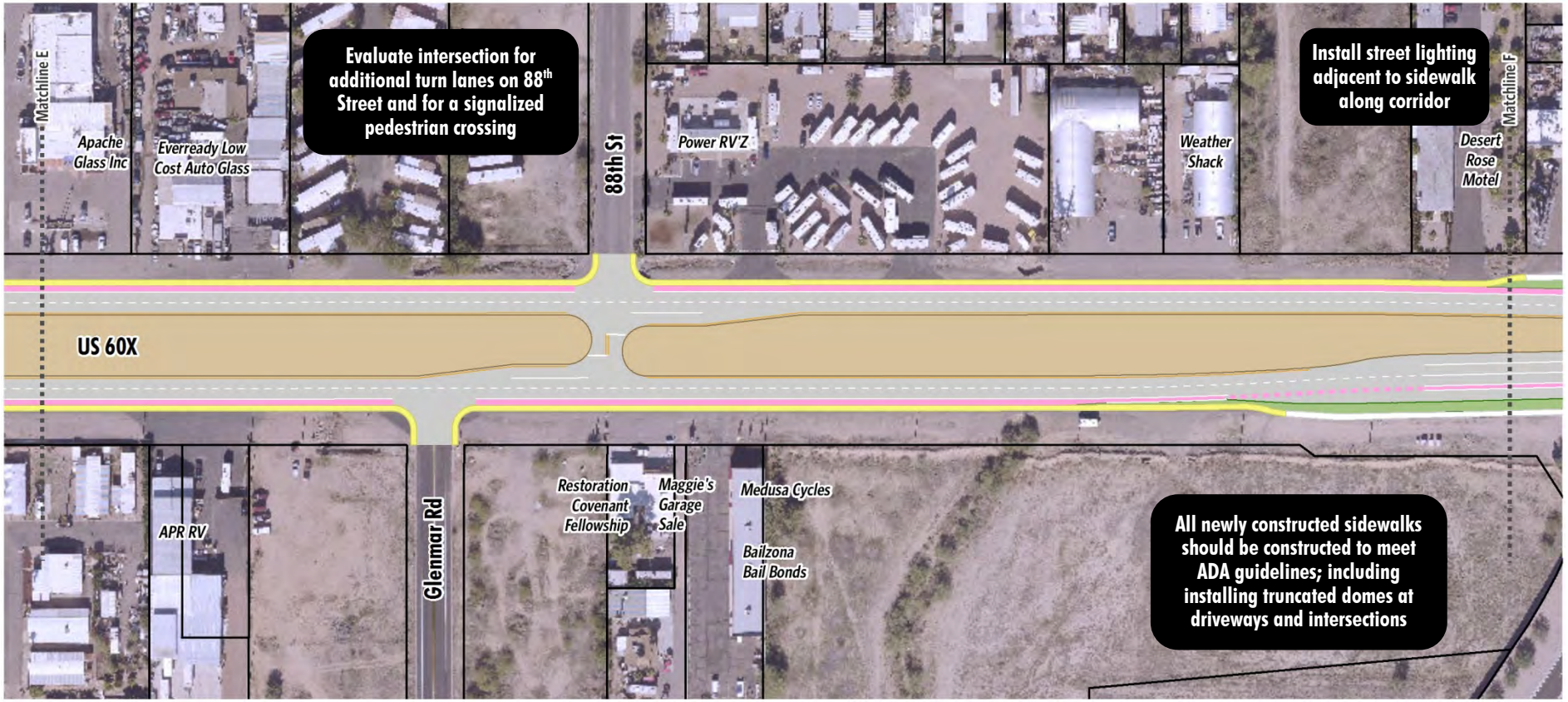


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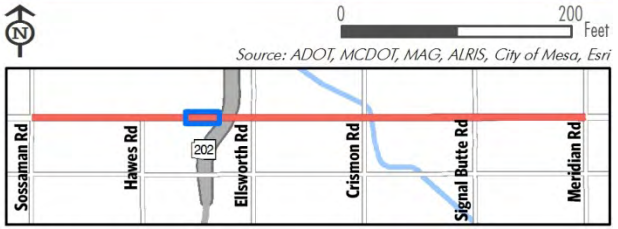


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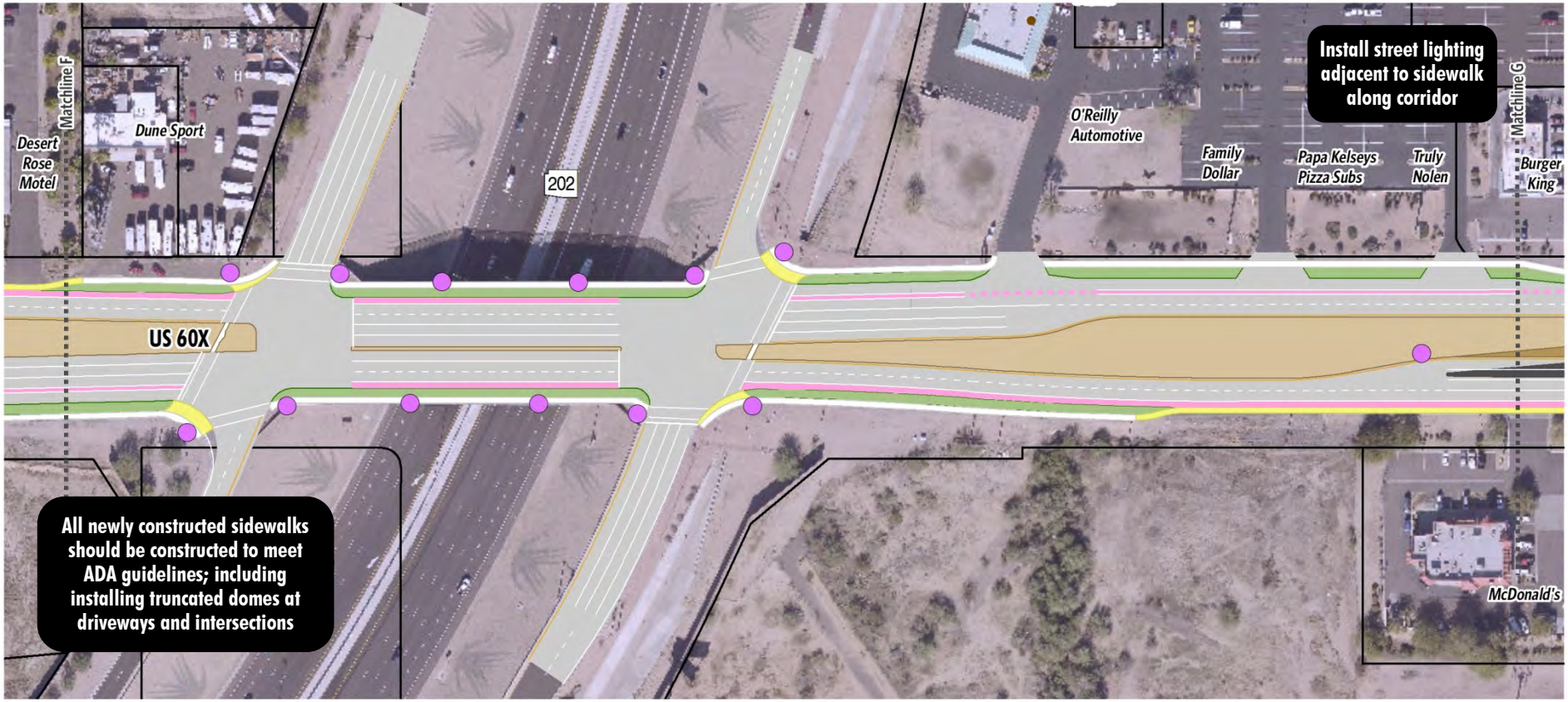


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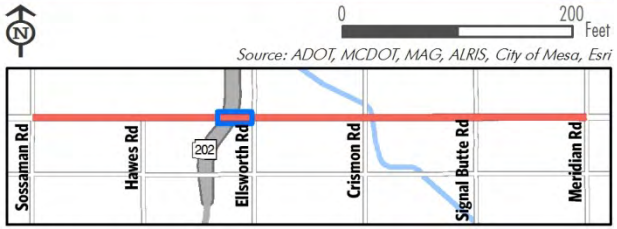


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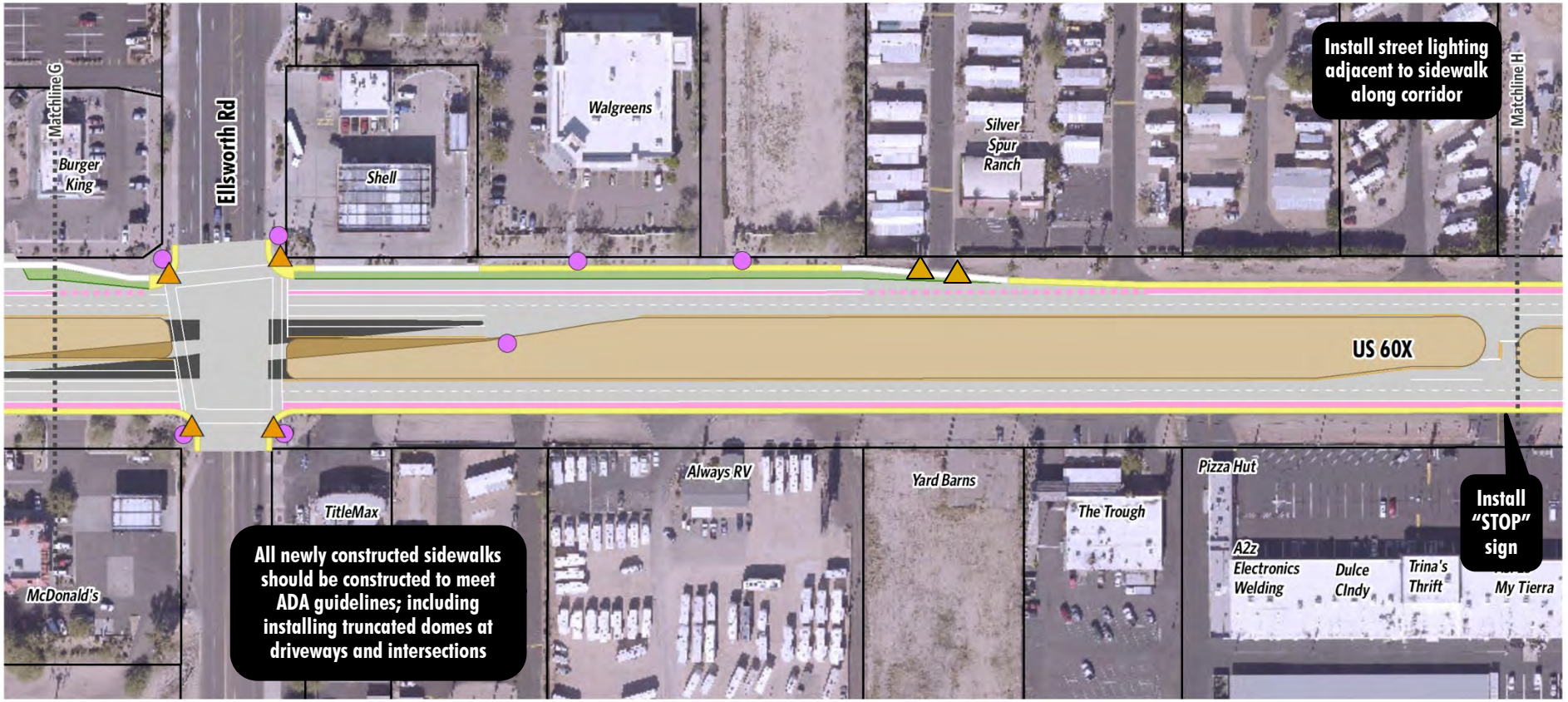


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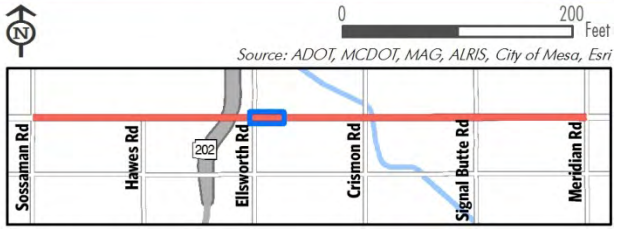


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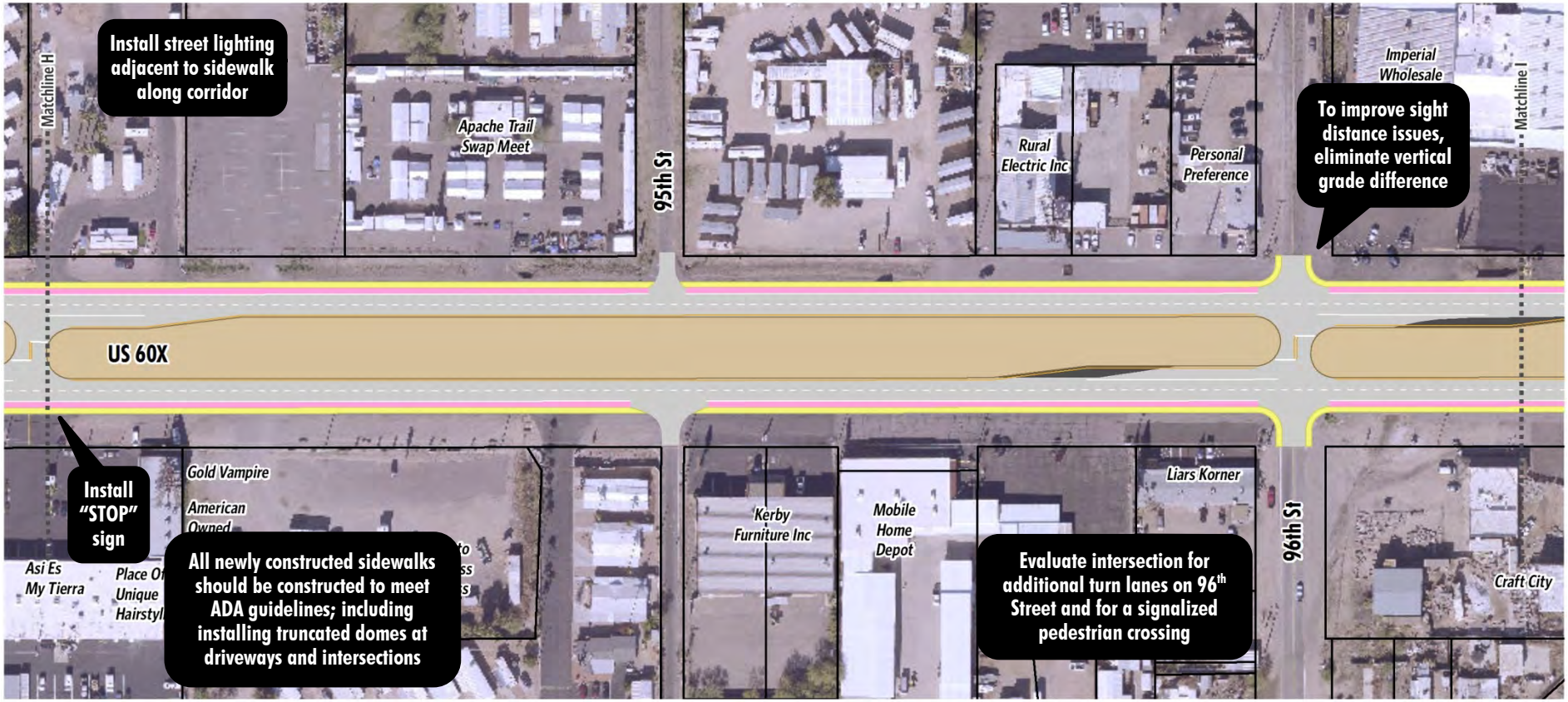


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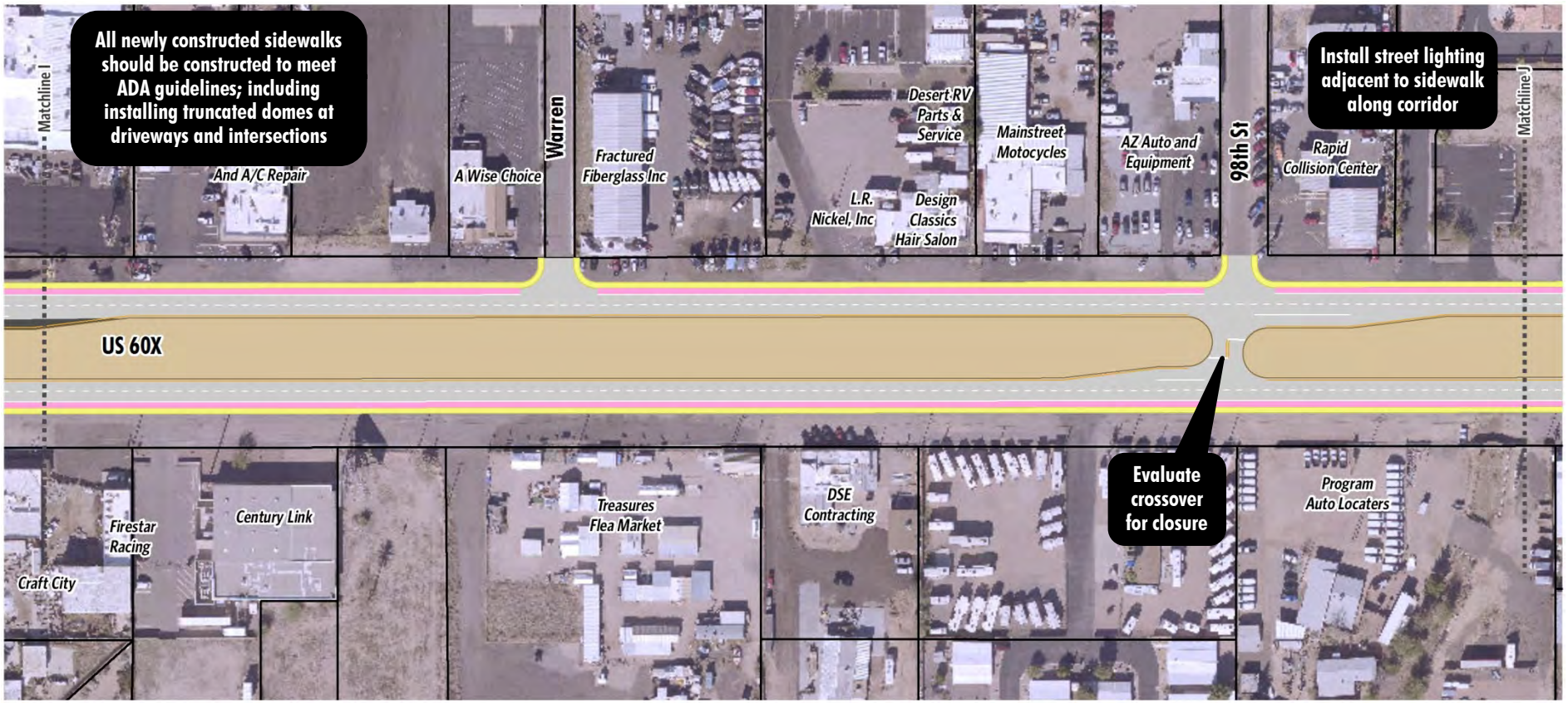


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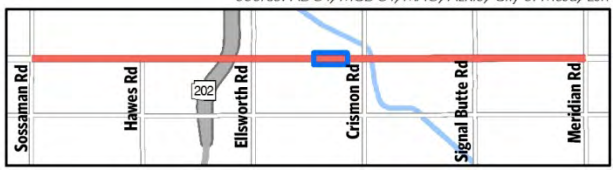
0 200 Feet

Source: ADOT, MCDOT, MAG, ALRIS, City of Mesa, Esri

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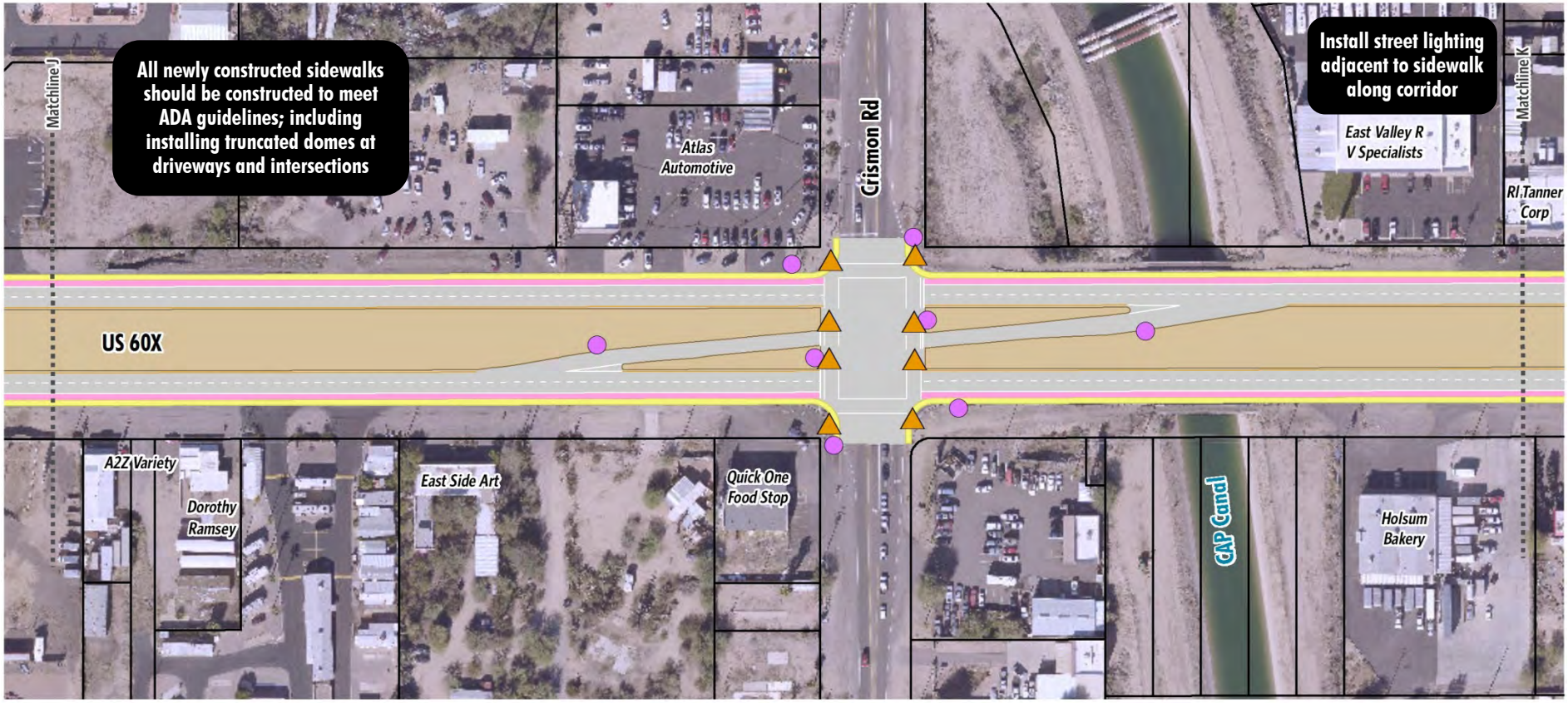


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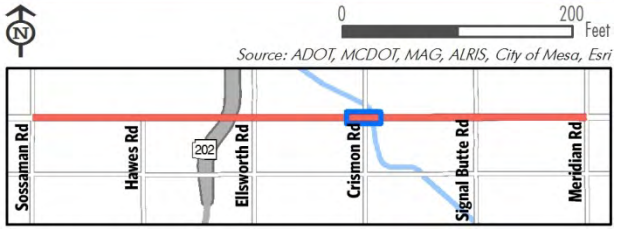


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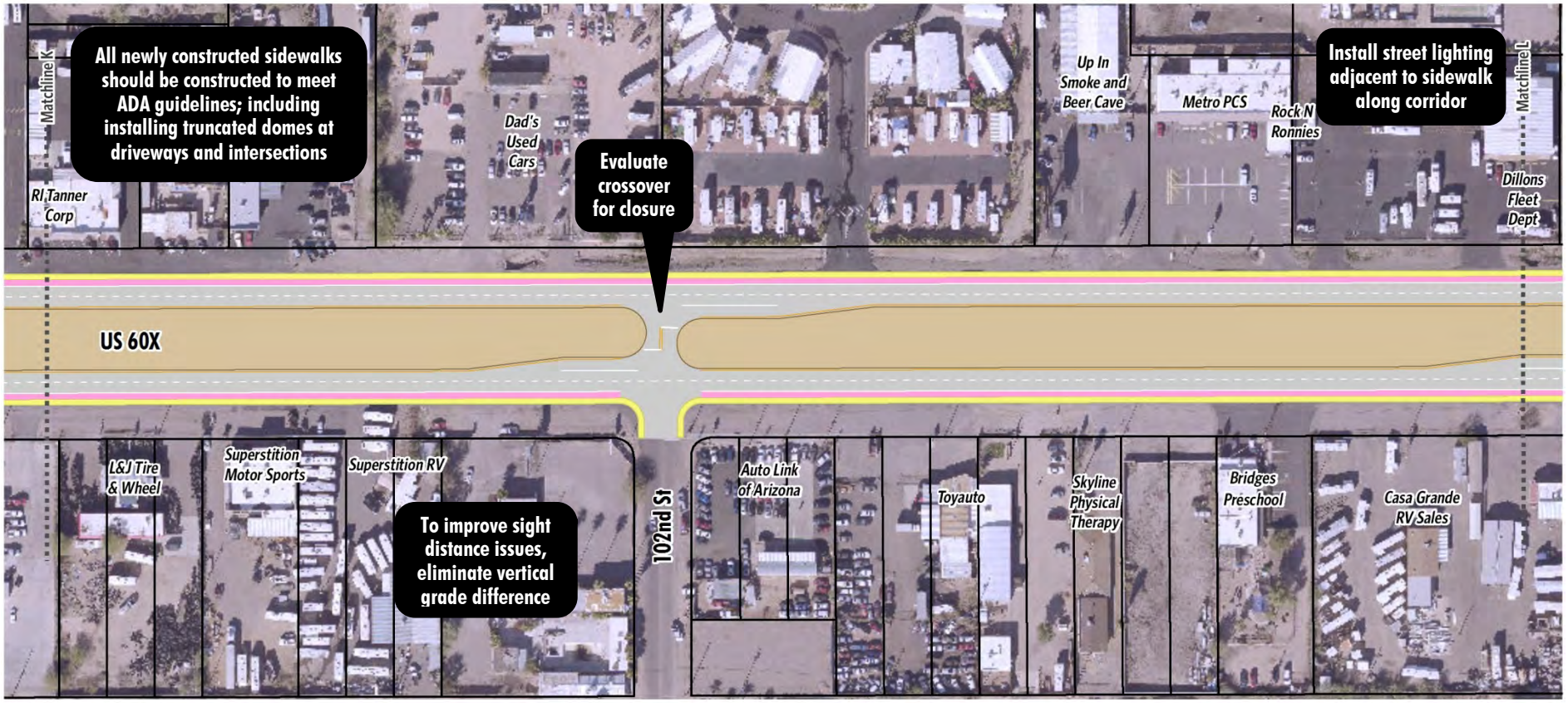


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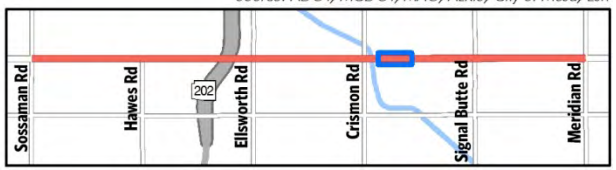


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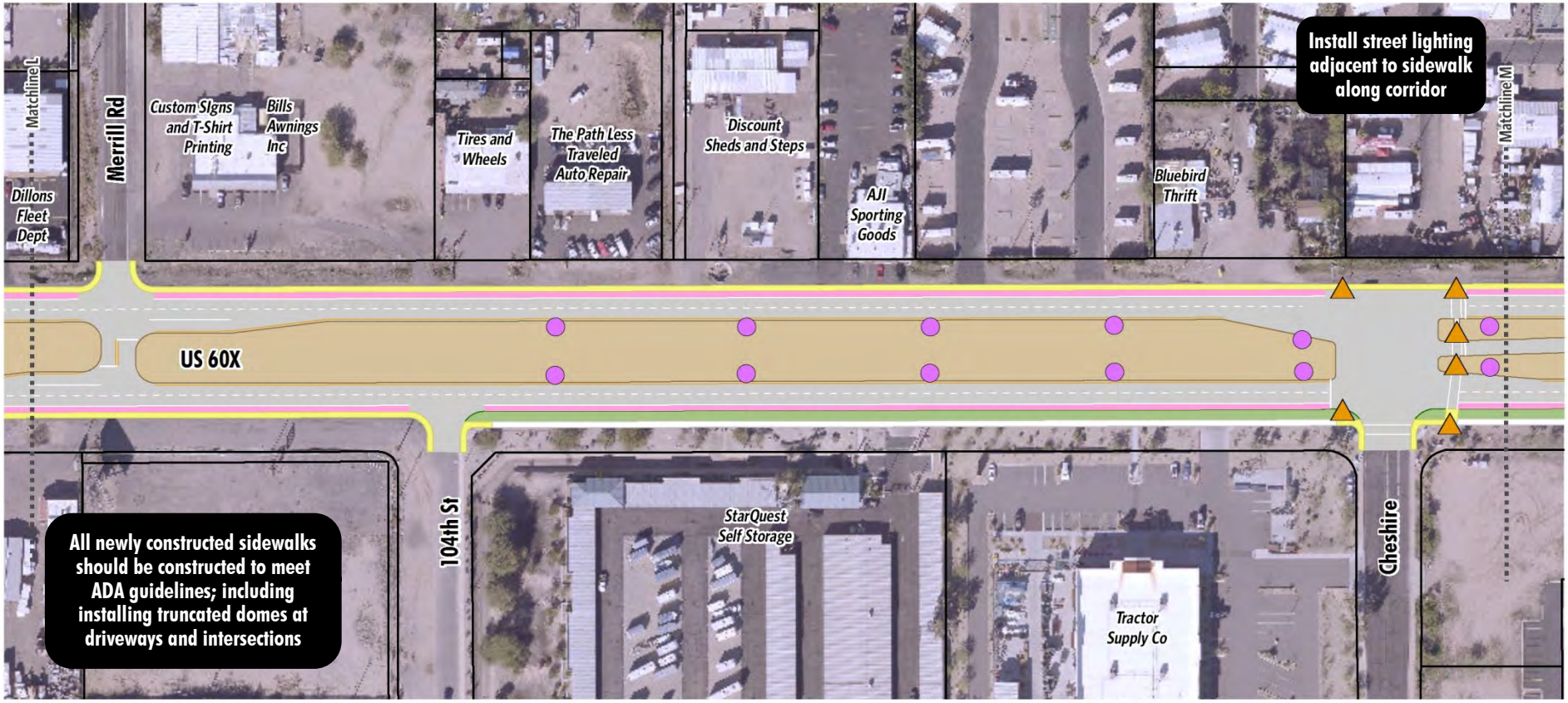


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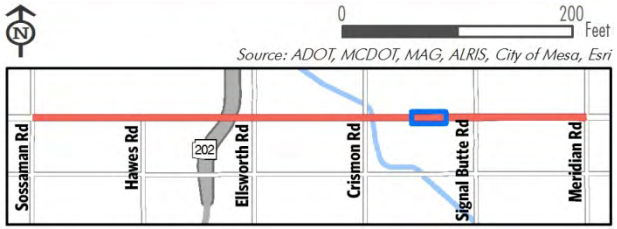


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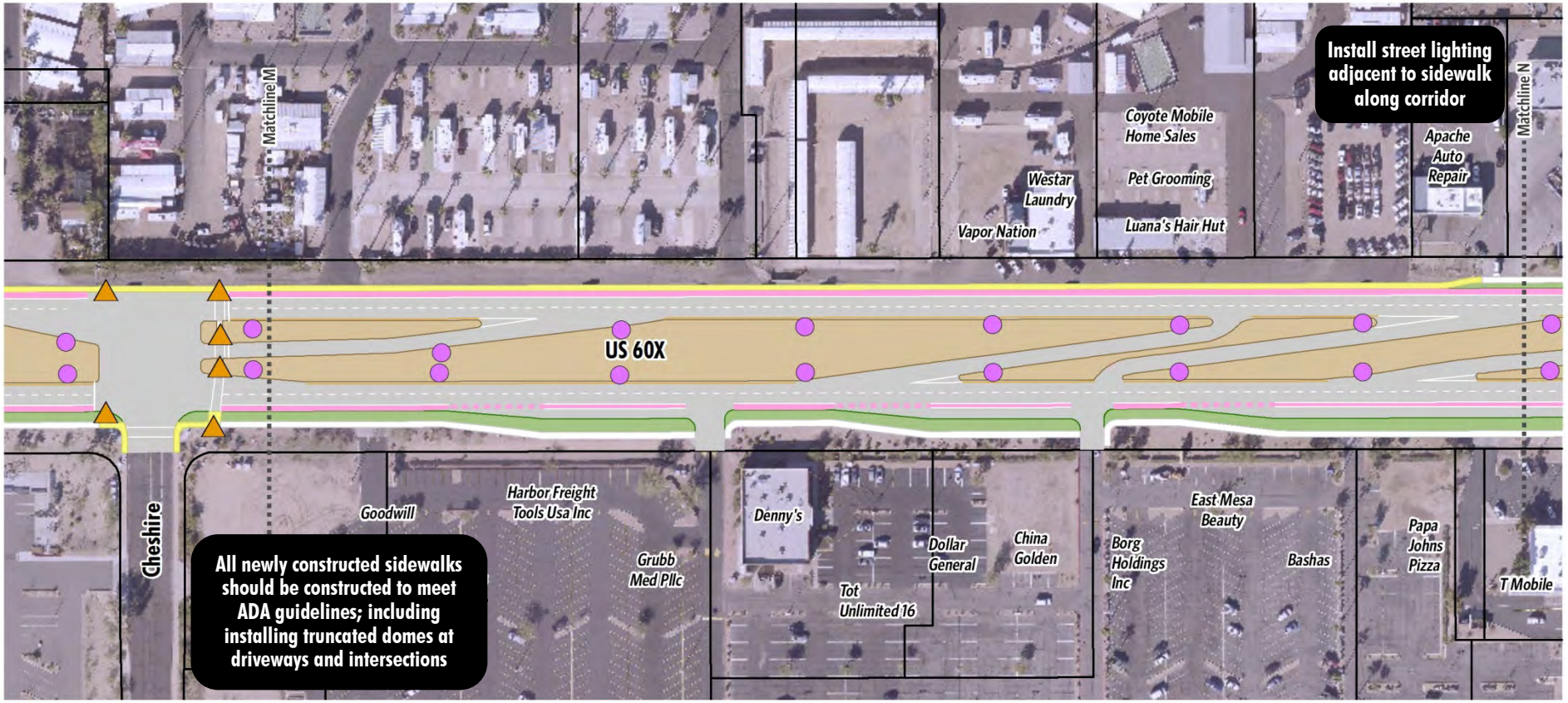


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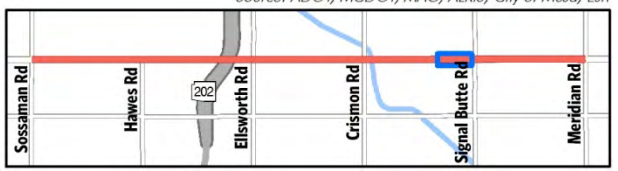


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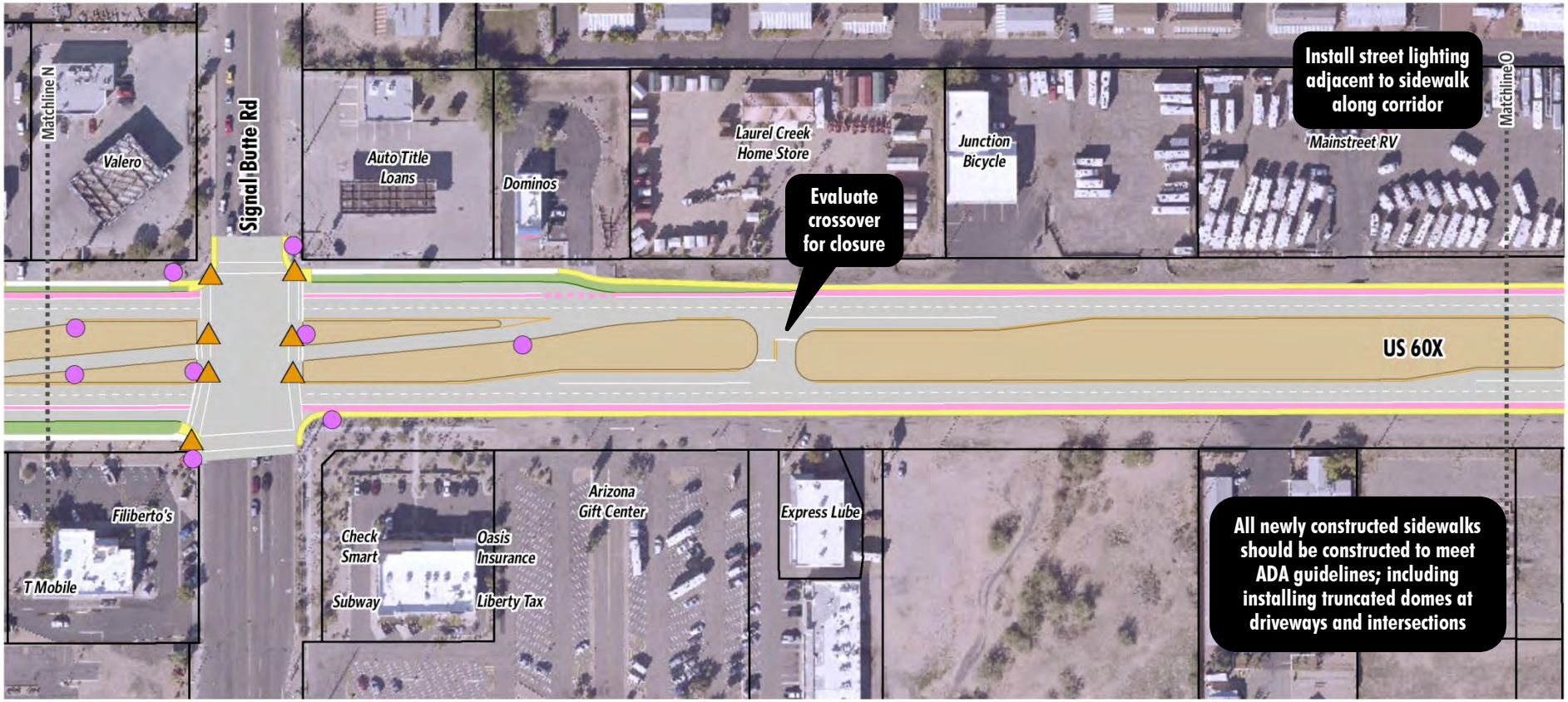


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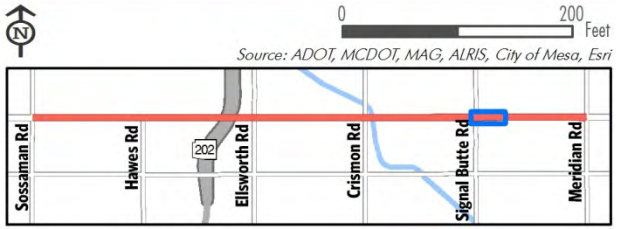


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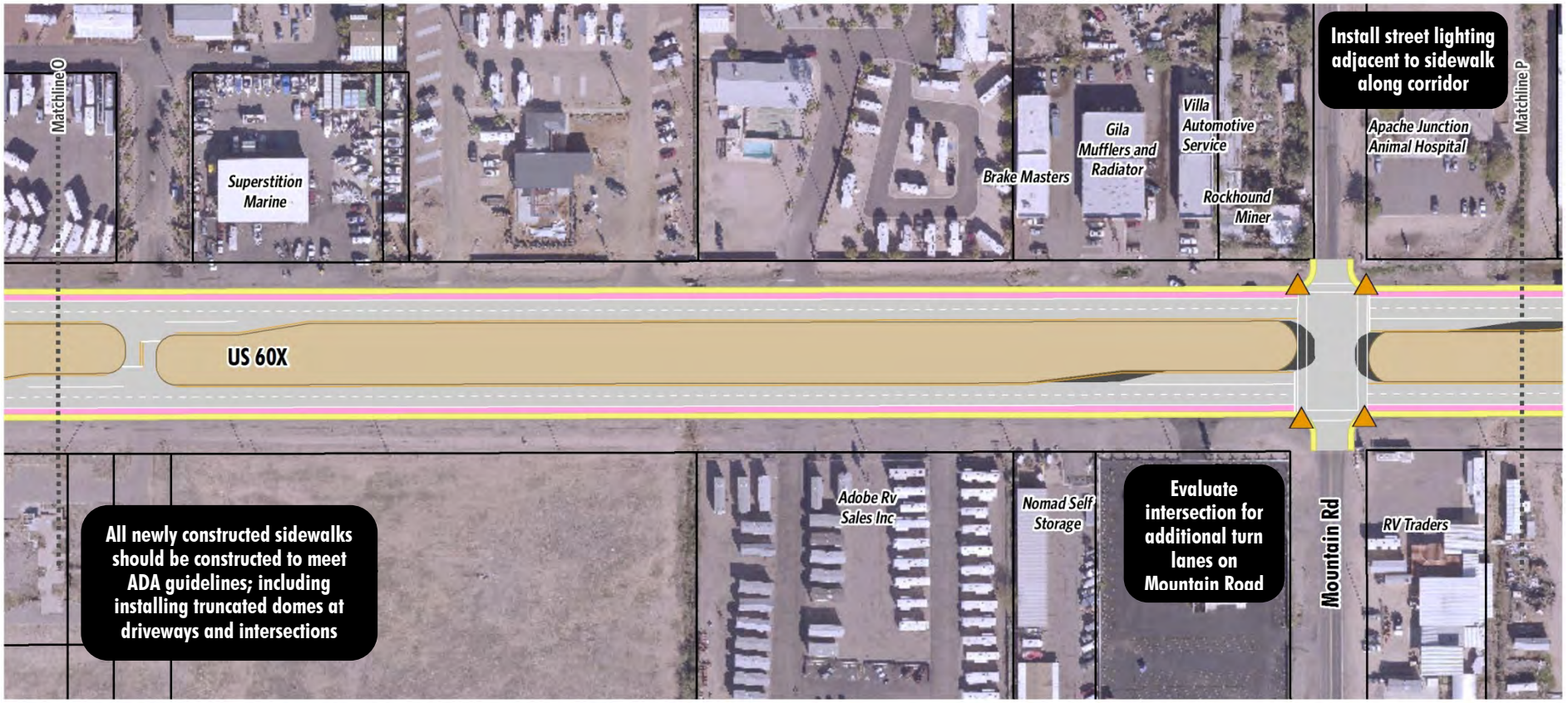


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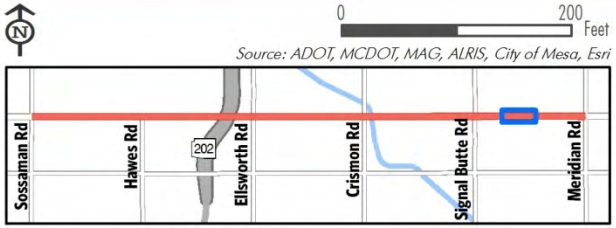


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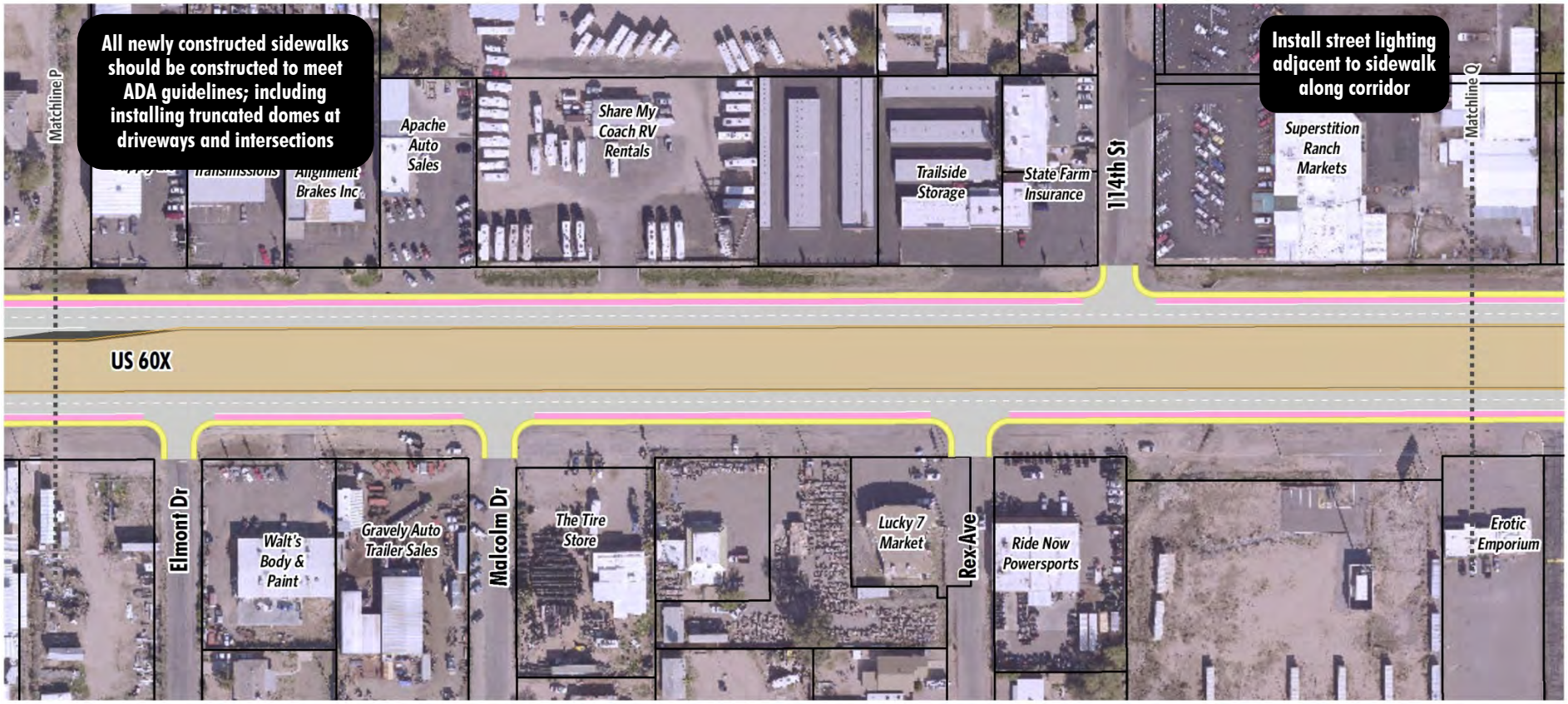


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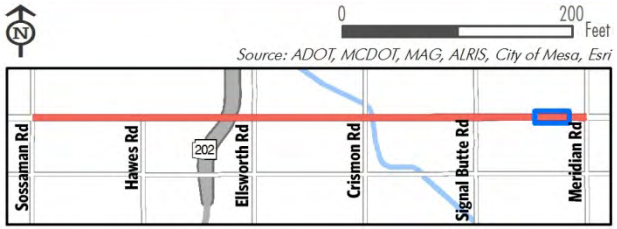


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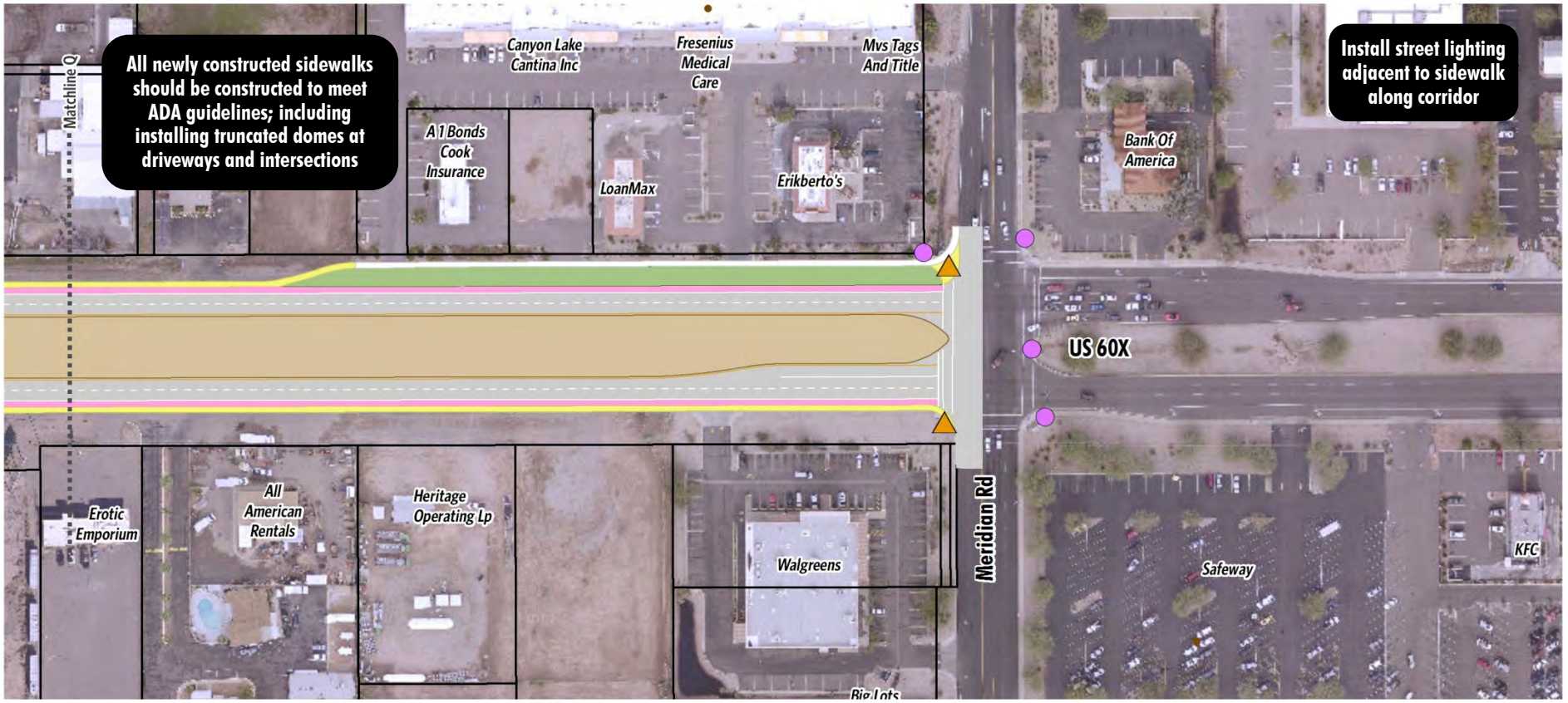


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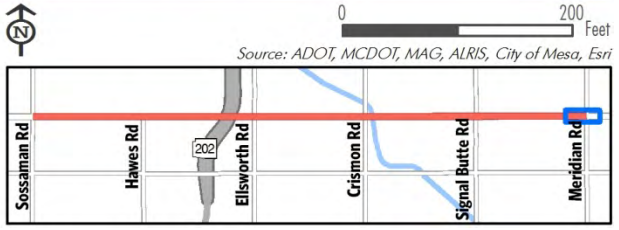


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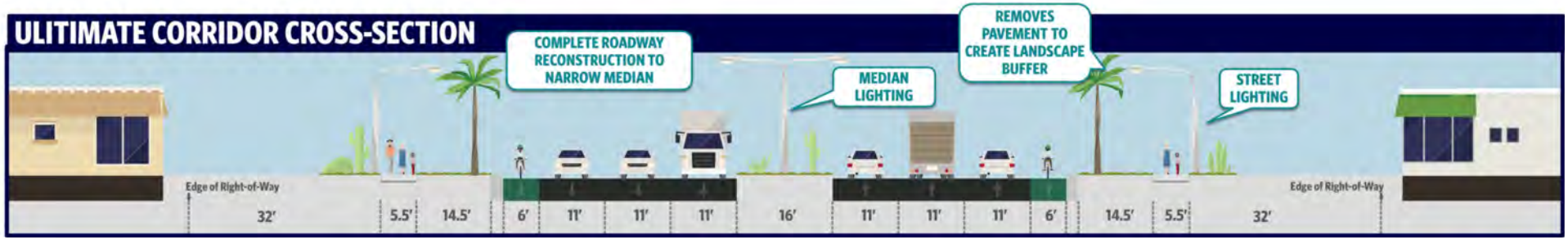
## Recommended Long-Term Improvements

The ultimate, preferred design concept for the US 60X corridor is to narrow the corridor to meet the current City of Mesa design standards. Figure 7.3 illustrates the ultimate corridor preferred cross-section. Appendix C illustrates short- and long-term corridor configurations for the preferred corridor design of US 60X corridor.

**Figure 7.3: Long-Term Corridor Cross-Section**




### Roadway Improvements

To accommodate the long-term design recommendations, the following improvements are needed:

- **Widen Corridor to 6 Lanes:** based on projected 2040 traffic volumes, two travel lanes meet future travel demand; however, traffic volumes are approaching capacity therefore the corridor may benefit from the addition of a third travel lane. As traffic increase, the need for an additional third lane should be re-evaluated.
- **Median Lighting:** installation of median lighting is recommended to further improve driver visibility.
- General roadway maintenance should occur to clear and clean pedestrian refuge areas, crossovers, and remove overgrown vegetation.
- The majority of the work can be performed within the existing right-of-way; however, utility acquisition may be required to accommodate project needs, primarily drainage.

## Traffic Improvements

To properly accommodate traffic along the corridor, the following improvements are recommended:

- **Traffic Signal Timing:** re-evaluate traffic signal timing plans based on actual traffic counts and updated lane configurations to ensure optimum coordination.
- **Intersection Improvements:** the following intersection related improvements are recommended:
  - Sossaman Road**:** reconfigure intersection to include dual left-turn lanes
  - Ellsworth Road**:** reconfigure intersection to include dual left-turn lanes
  - Crismon Road**:** reconfigure intersection to include dual left-turn lanes
  - Signal Butte Road**:** reconfigure intersection to include dual left-turn lanes
  - Meridian Road**:** reconfigure intersection to include dual left-turn lanes
- **Crossovers:** during the design phase, crossovers should be evaluated to determine if the crossover should be completely closed or converted to a signalized intersection. The evaluation should include a signal warrant analysis and a corridor wide operational analysis. Specific crossover improvements include:
  - 80th Street: evaluate the option of either closing crossover or signalizing intersection
  - Hawes Road: evaluate the option of either closing crossover or signalizing intersection
  - 88th Street/Glenmar Road: final design should evaluate the option of realigning 88th Street and Glenmar Road to eliminate the roadways skewed approaches or closing the crossover
  - 96th Street: evaluate the option of either closing crossover or signalizing intersection
- **Cheshire Intersection:** during the design phase, evaluate the option of closing intersection or maintaining signalized intersection with three thru lanes and one westbound left-turn lane
- **Additional Turn Lanes:** 80th Street, Hawes Road, 88th Street, and 96th Street should be evaluated to assess the need for an additional turn lane.

## Bicycle and Pedestrian Improvements

The following bicycle and pedestrian improvements are recommended:

- **Pedestrian and Bicycle Facilities:** the 6-FT on-street bike lanes and a 6- FT concrete sidewalk constructed during the short-term phase should remain along the entire length of the corridor.
- **Pedestrian Crossing Facilities:** during final design, a complete assessment of potential locations for mid-block pedestrian crossings should be conducted. Crossovers that have been converted to signalized intersections should be conducted to include sidewalk, ADA compliant ramps, pedestrian signal pushbutton, and pedestrian refuge areas where needed.

## Drainage Improvements

The FCDMC conducted a preliminary drainage analysis of US 60X corridor as part of the East Mesa Area Drainage Master Plan (ADMP). Based on recommendations from the FCDMC analysis, long-term improvements will require major drainage reconstruction, both along the corridor and off-site to mitigate regional flooding. During the design phase, a complete drainage assessment will be necessary to determine exact drainage requirements.

## Cost Estimates

Table 7.2 outlines planning-level cost estimate for the long-term improvements.

**Table 7.2: Long-Term Improvements Cost Estimates**

| | Corridor Wide Planning Cost Estimate | Stage 1 Planning Cost Estimate | Stage 2 Planning Cost Estimate |
|---|---|---|---|
| Roadway Construction | $17,800,000 | $6,230,000 | $11,570,000 |
| Street and Intersection Lighting | $410,000 | $143,500 | $266,500 |
| Traffic Signal Improvements | 3% | $0 | $0 |
| Traffic Control | 3% | 10% | 10% |
| Signing and Marking | 3% | 5% | 5% |
| Drainage | 10% | 10% | 10% |
| Miscellaneous Elements | 10% | 10% | 10% |
| Engineering and Contingencies | 25% | 25% | 25% |
| Mobilization | 10% | 10% | 10% |
| ICAP | 10.30% | 10.30% | 10.30% |
| Design Costs | 10% | 10% | 10% |
| **Total Costs** | **$27,000,000** | **$9,450,000** | **$17,550,000** |

Costs illustrate a preliminary drainage improvement estimate of 10 percent. Final drainage recommendations are pending the FCDMC drainage analysis of the US 60X corridor. Based on findings, cost estimates may increase.

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# APPENDIX A.

## SUMMARY OF EXISTING ROADWAY CHARACTERISTICS


**Roadway Features**
- Asphalt Roadway
- Concrete Roadway
- Concrete Median
- Dirt Median
- Sidewalk
- Existing Bike Lane

**Drainage Features**
- Culvert with Headwall
- Culvert with no Headwall
- Catch Basin
- Retention Basin
- Culvert
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- Lateral
- Open Drain

**Land Ownership**
- Parcel Boundary

**Crashes**
- Fatal Crash
- Bicycle Involved Crash
- Pedestrian Involved Crash

0 200 Feet

Source: ADOT, MCDOT, MAG, ALRIS, City of Mesa, Esri


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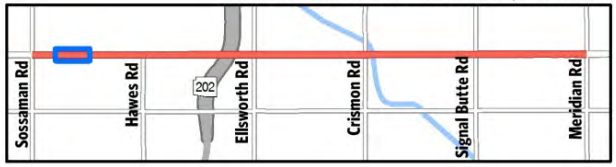

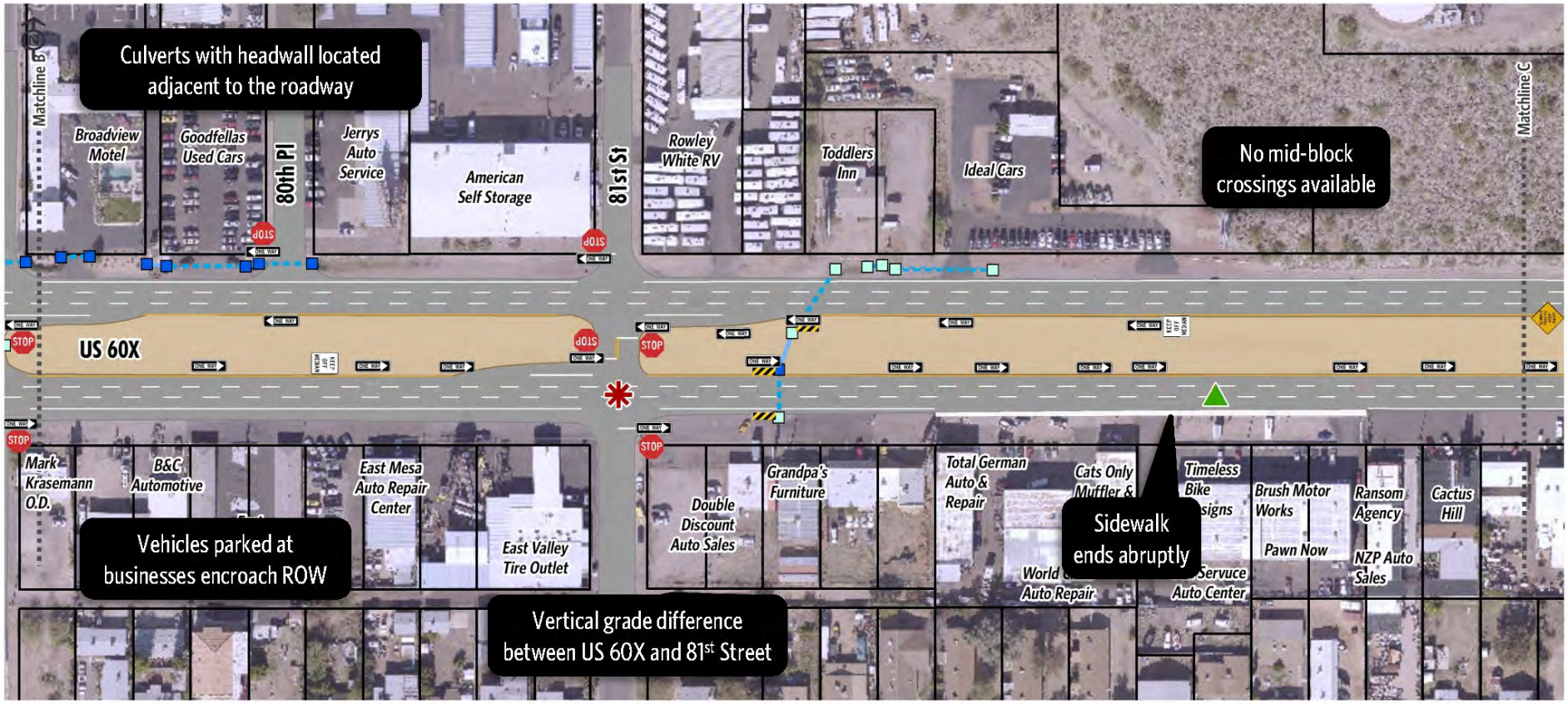


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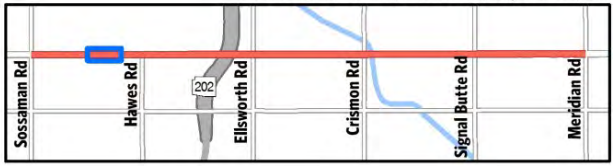

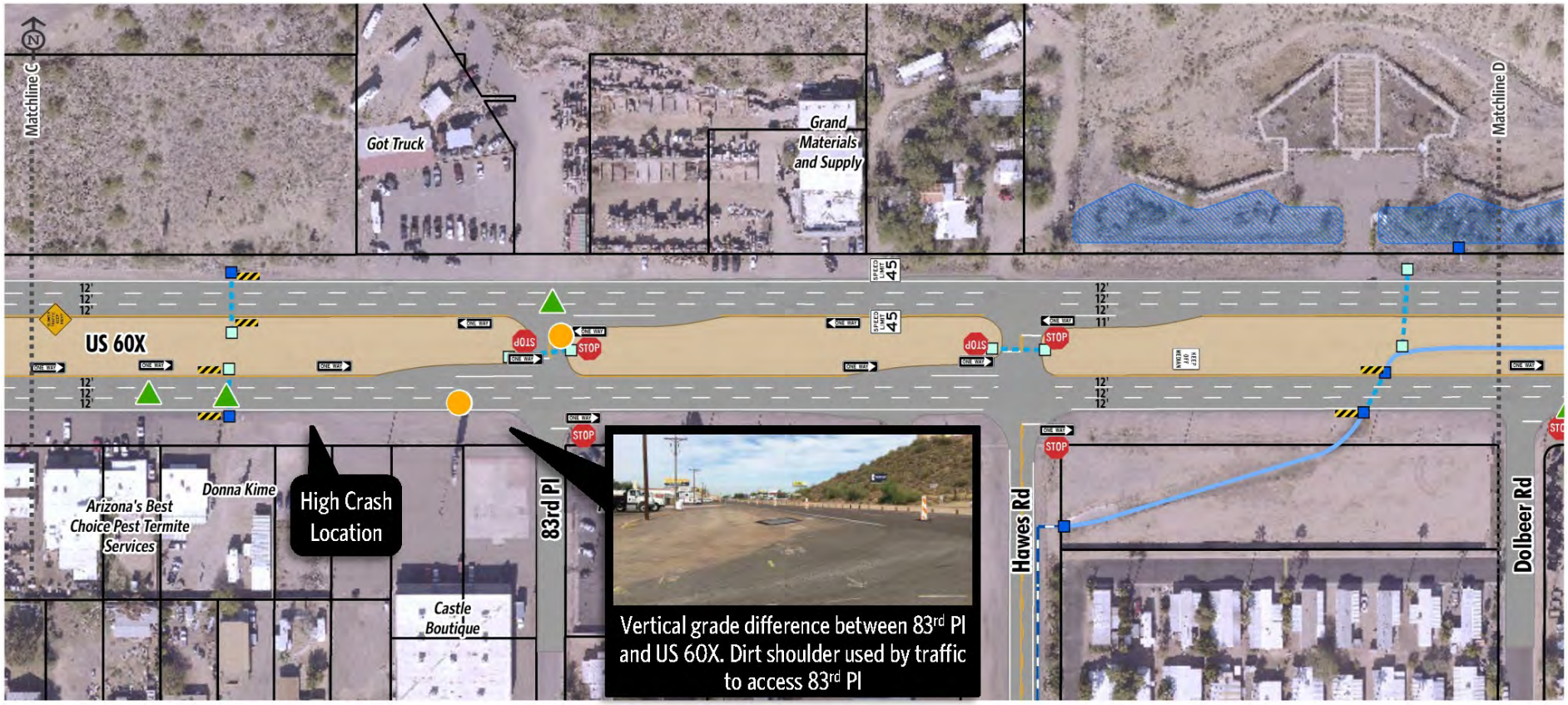


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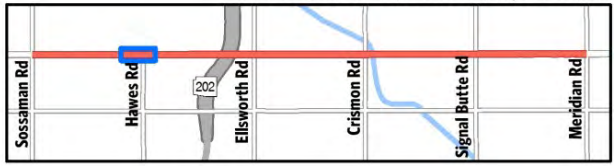

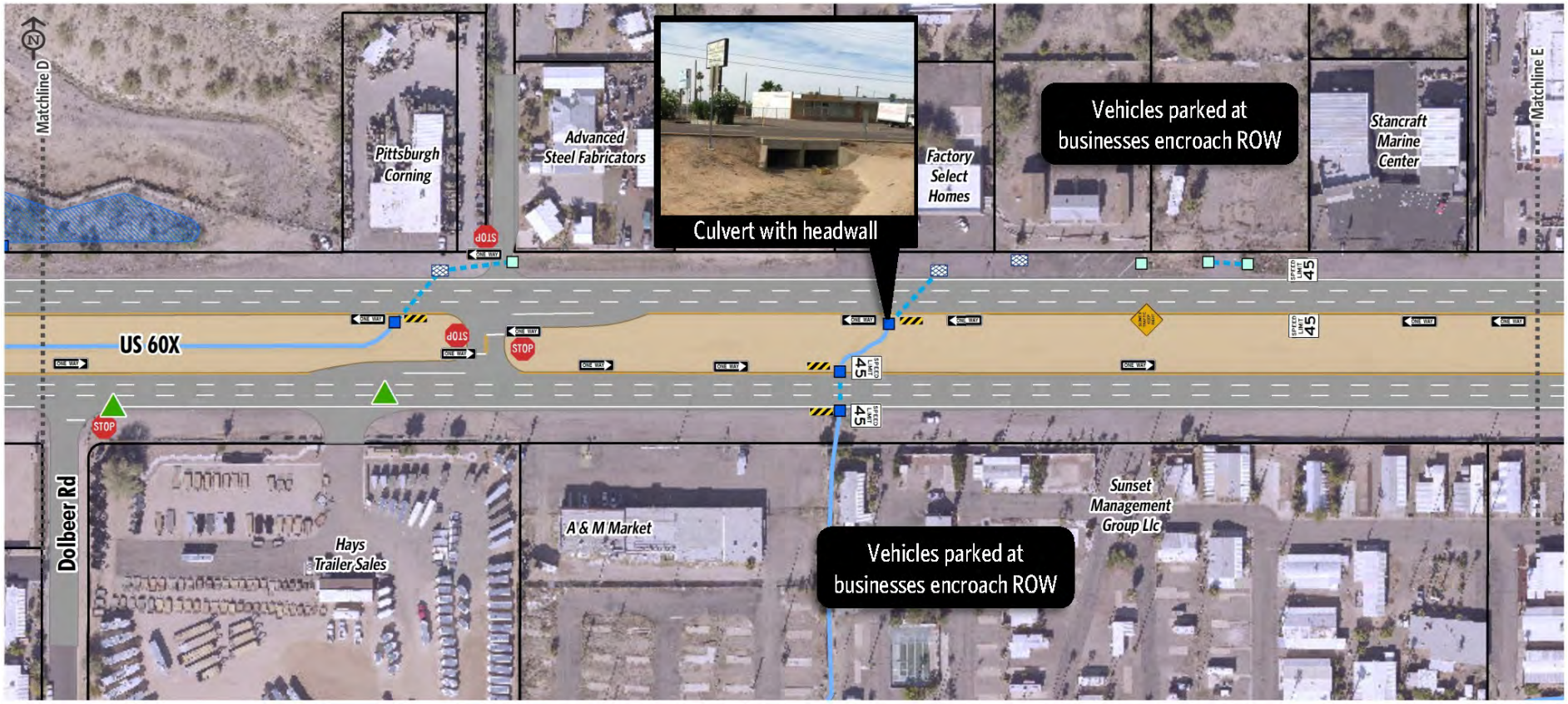


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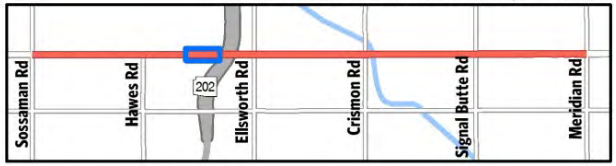

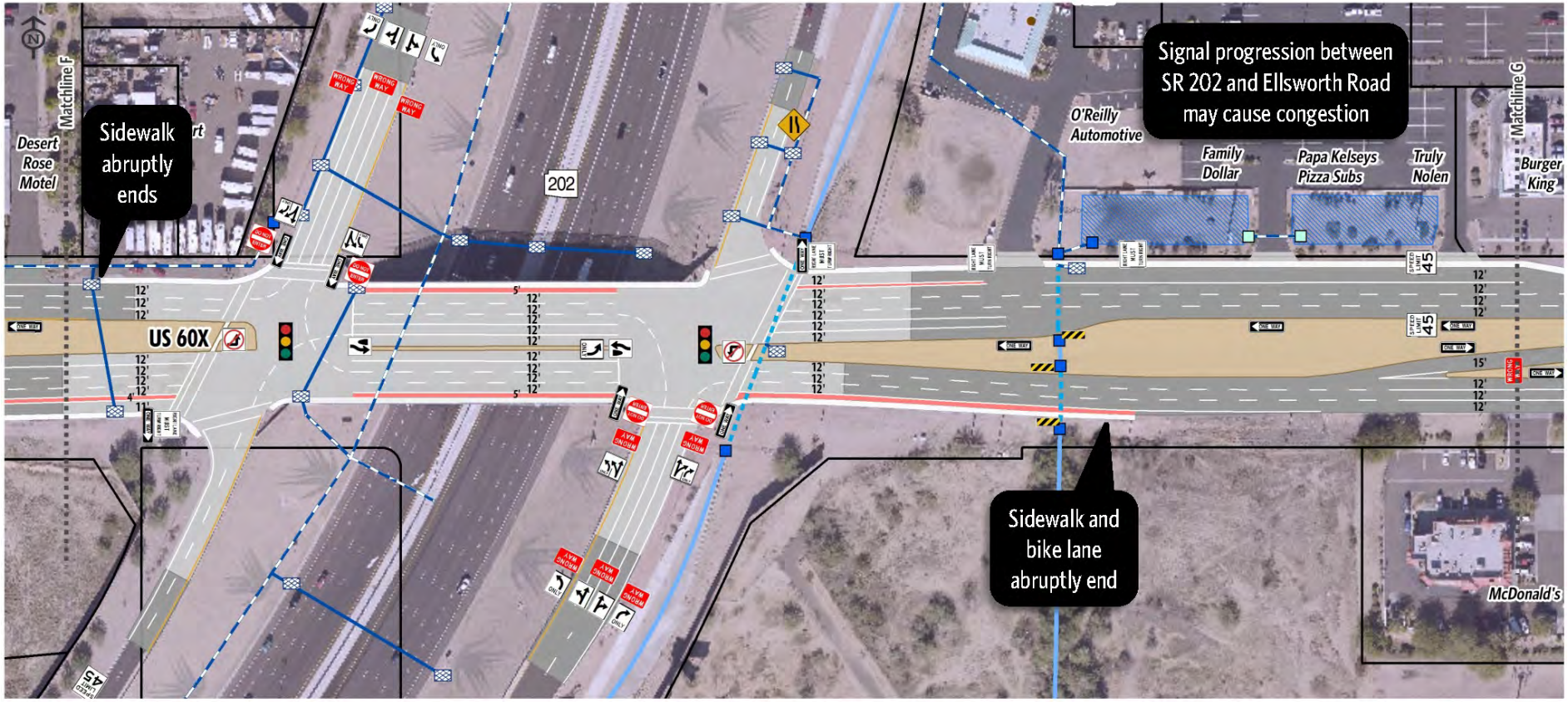


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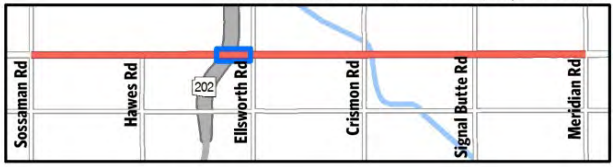

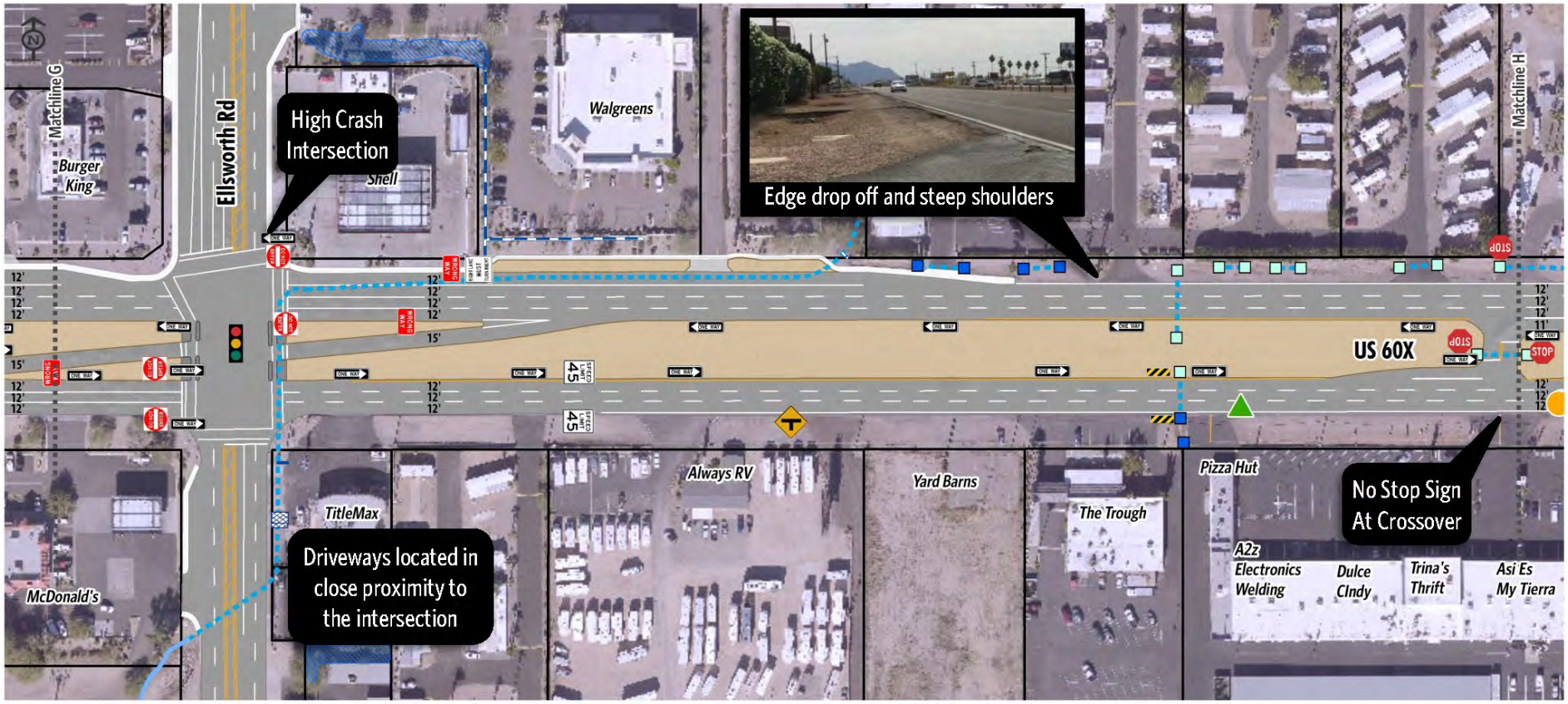


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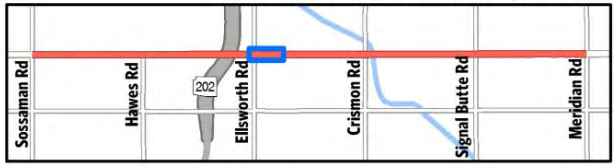

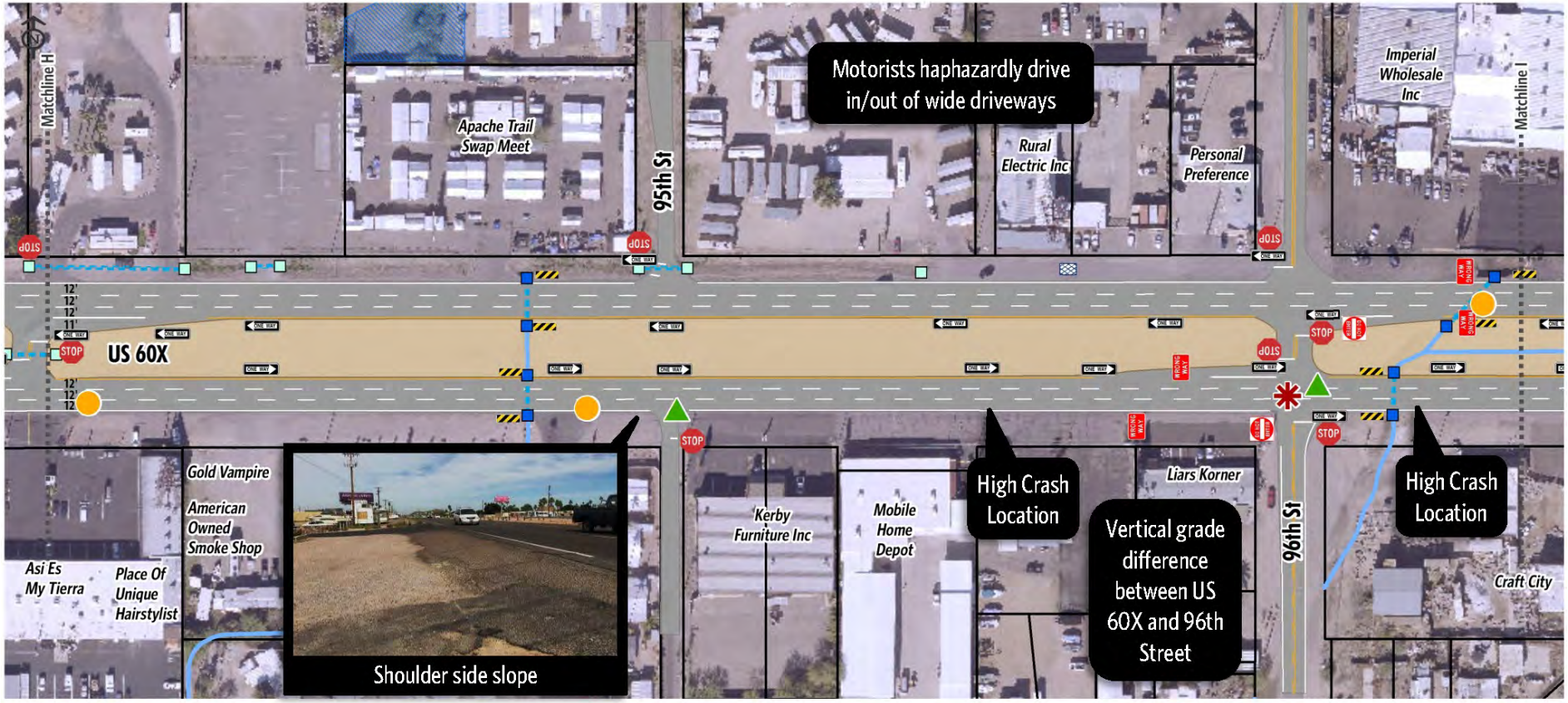


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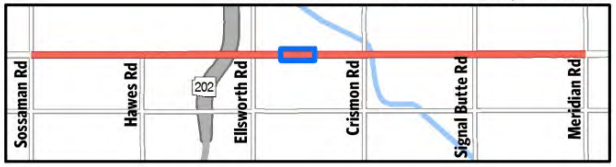

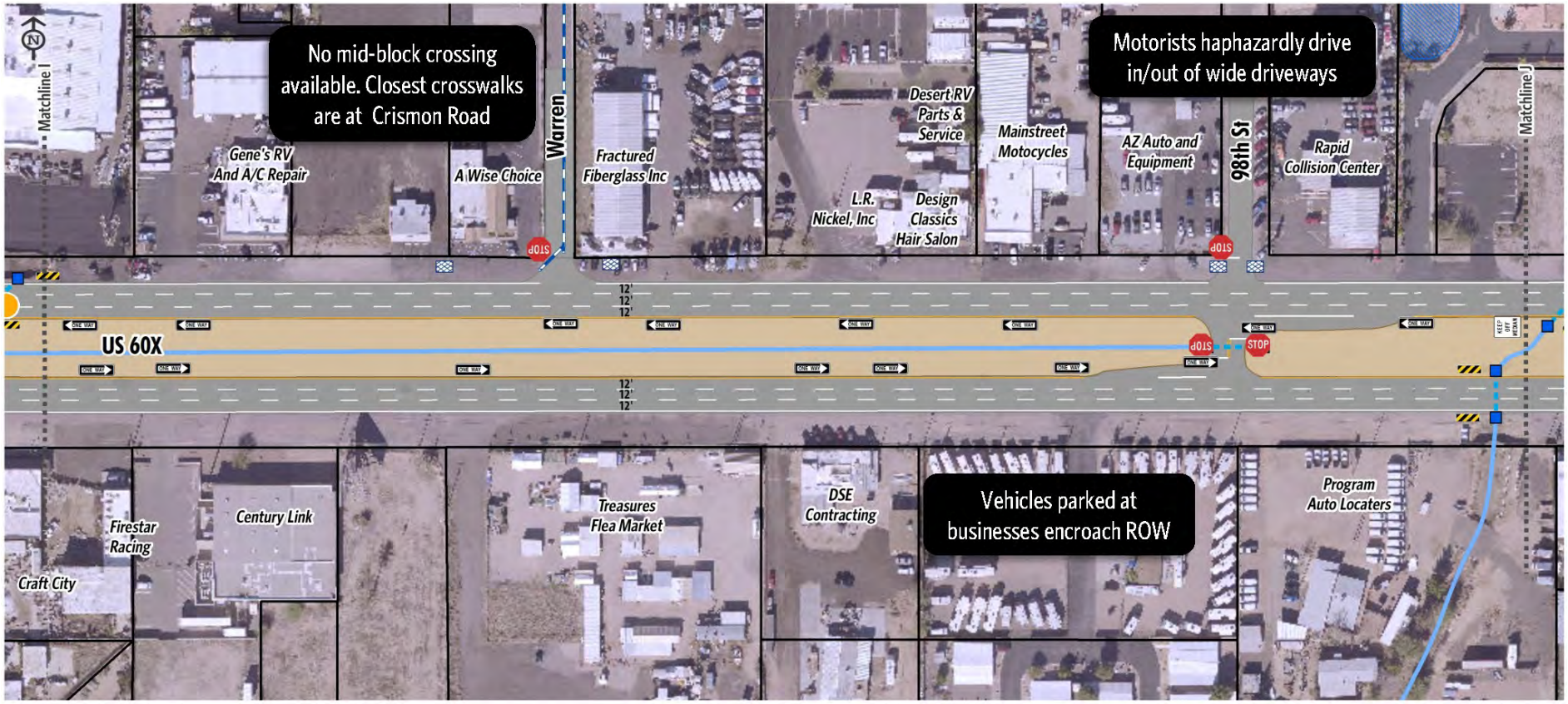


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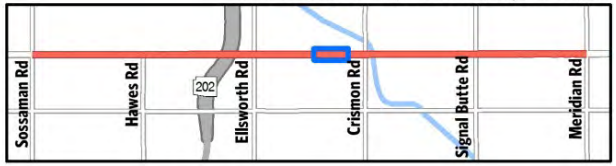

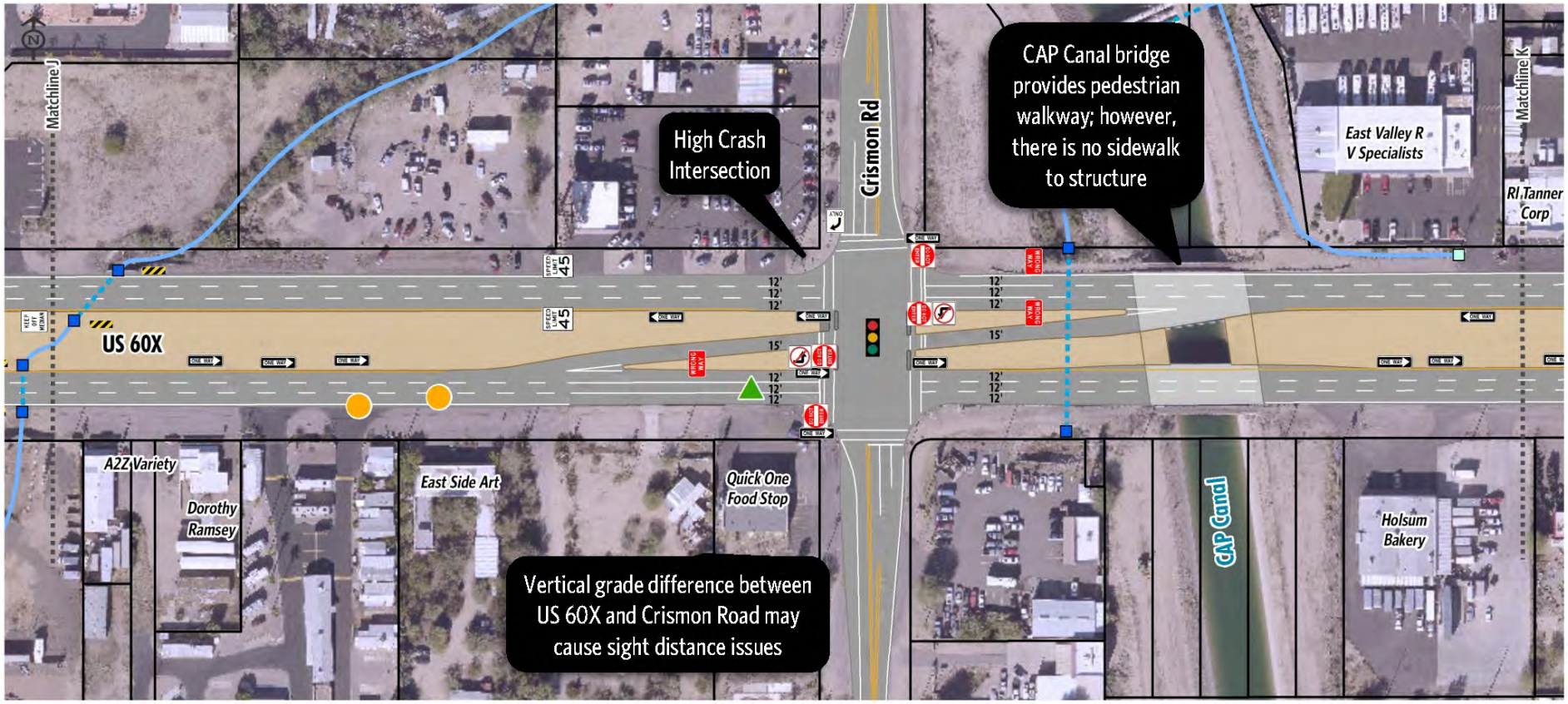


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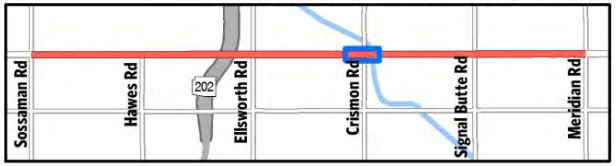

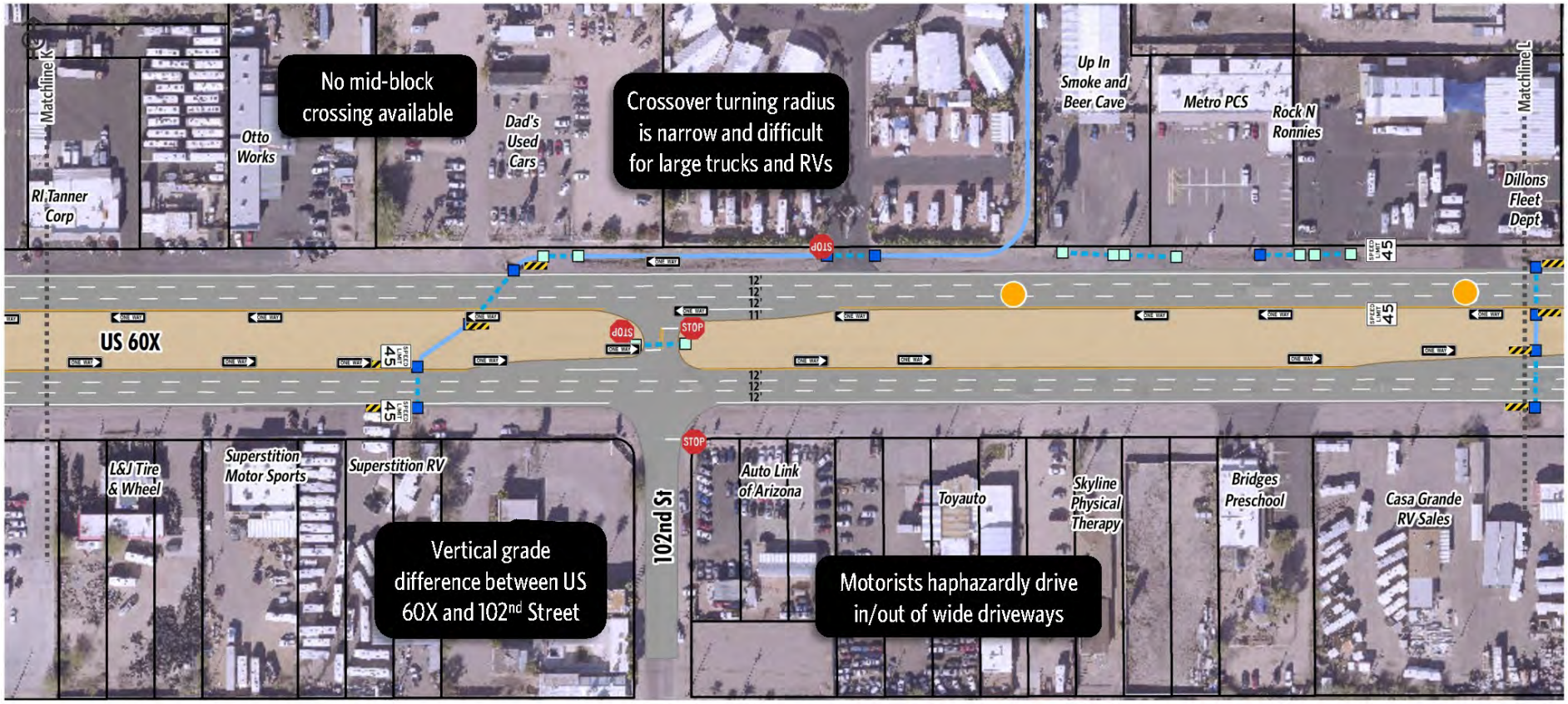


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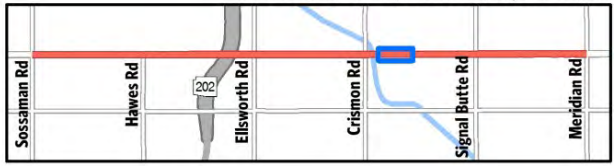

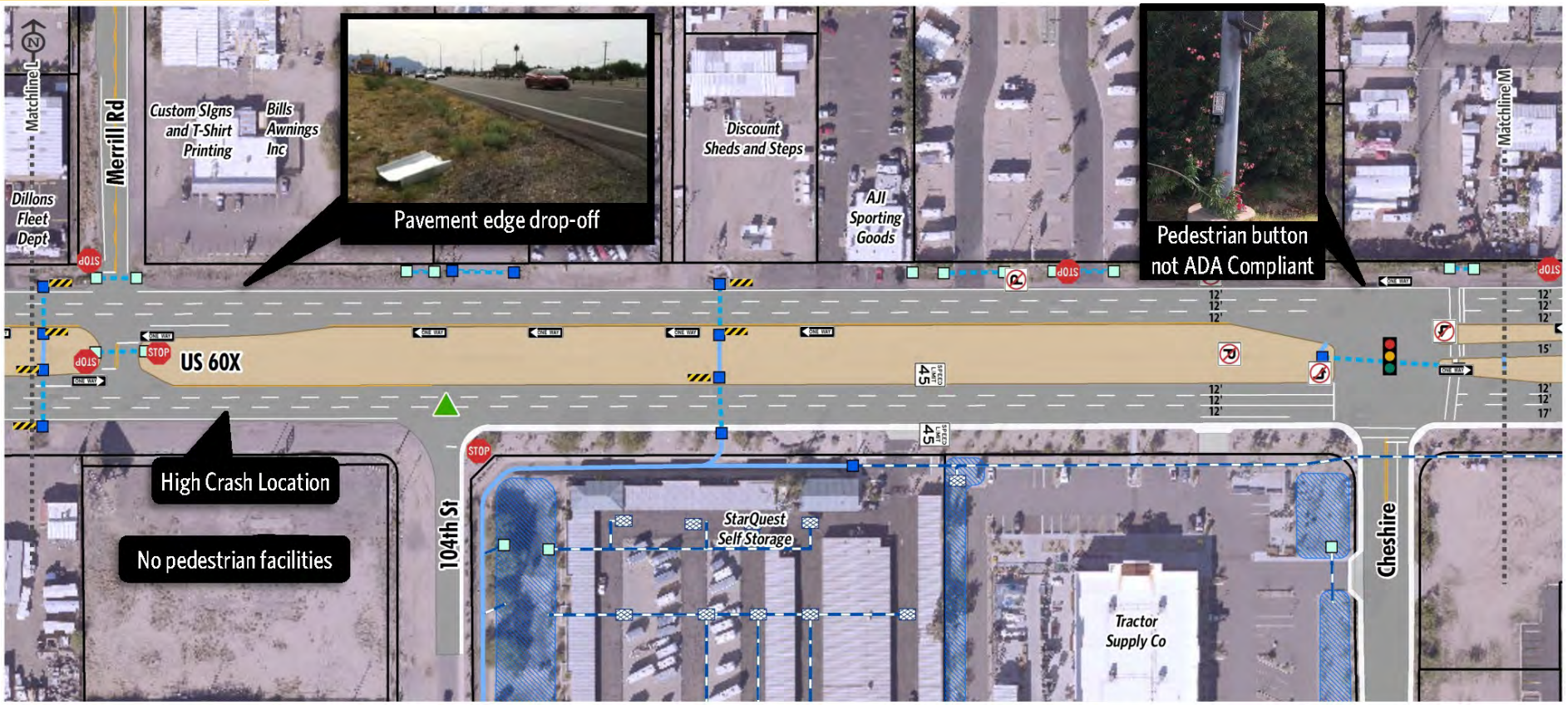


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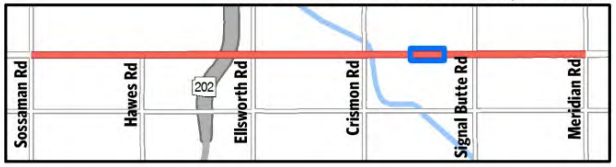


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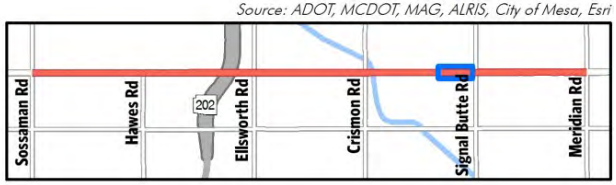

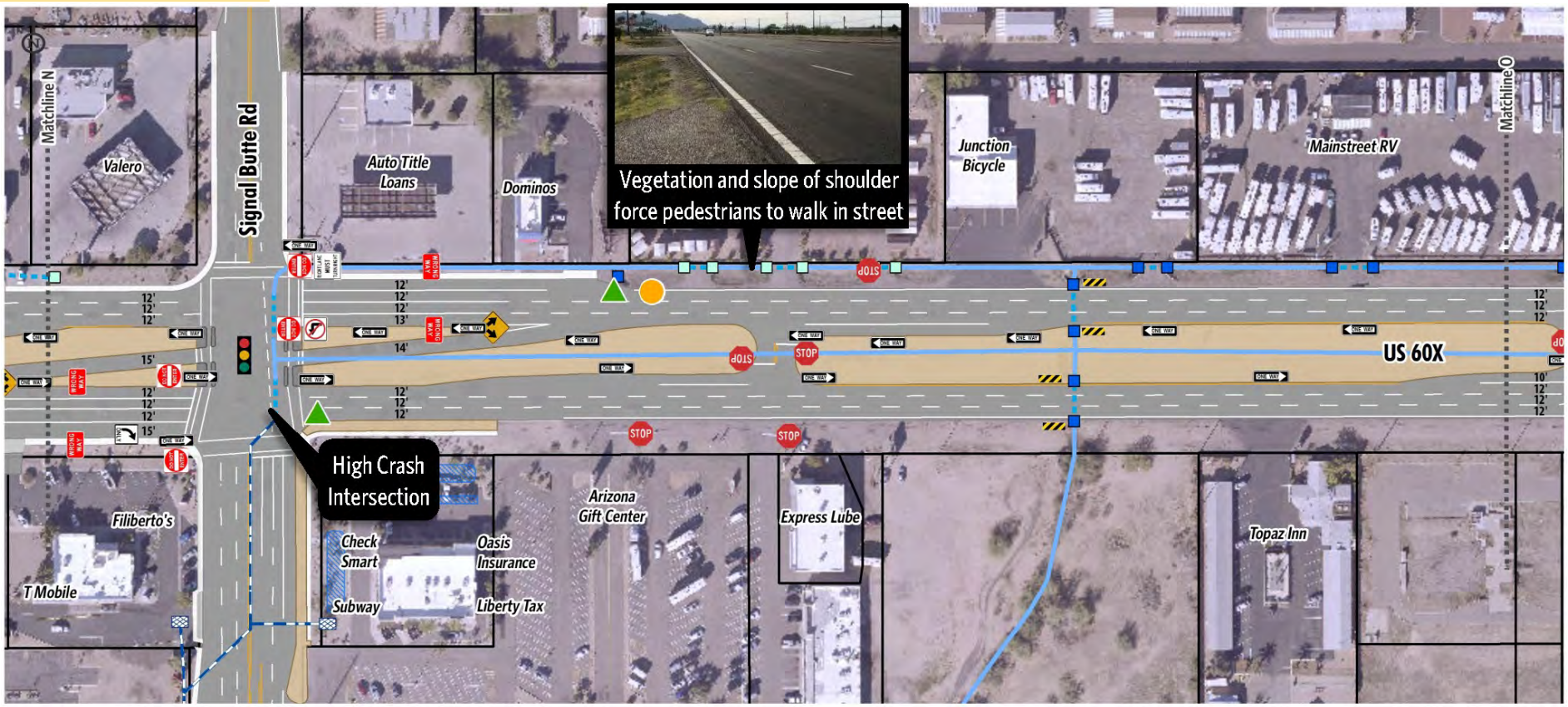


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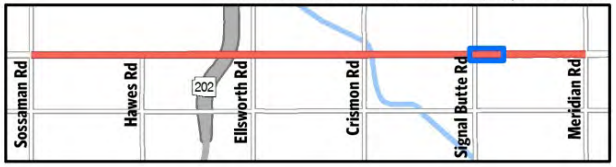

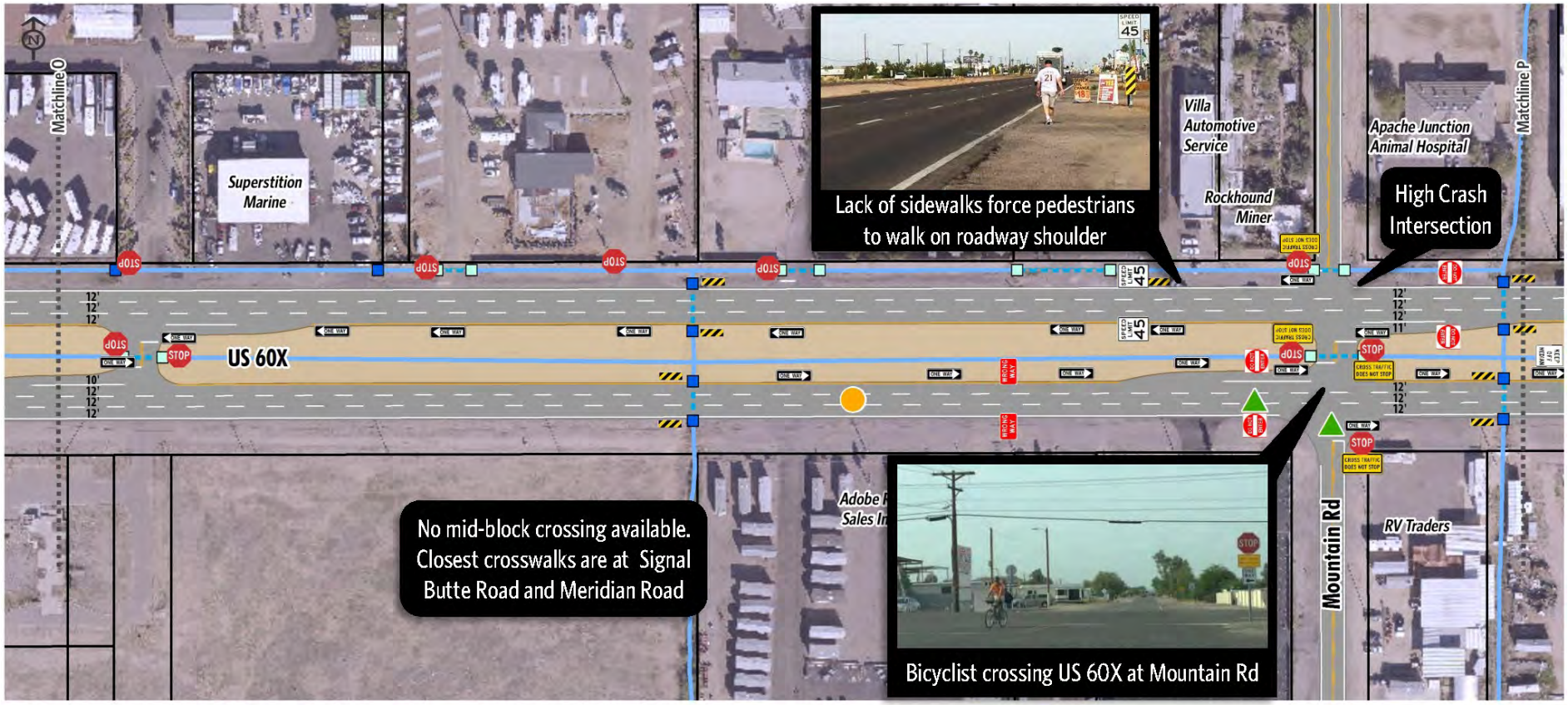


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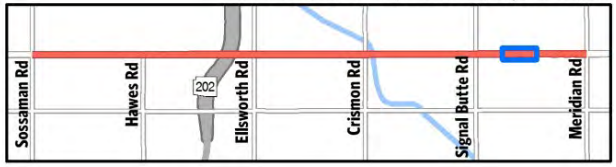

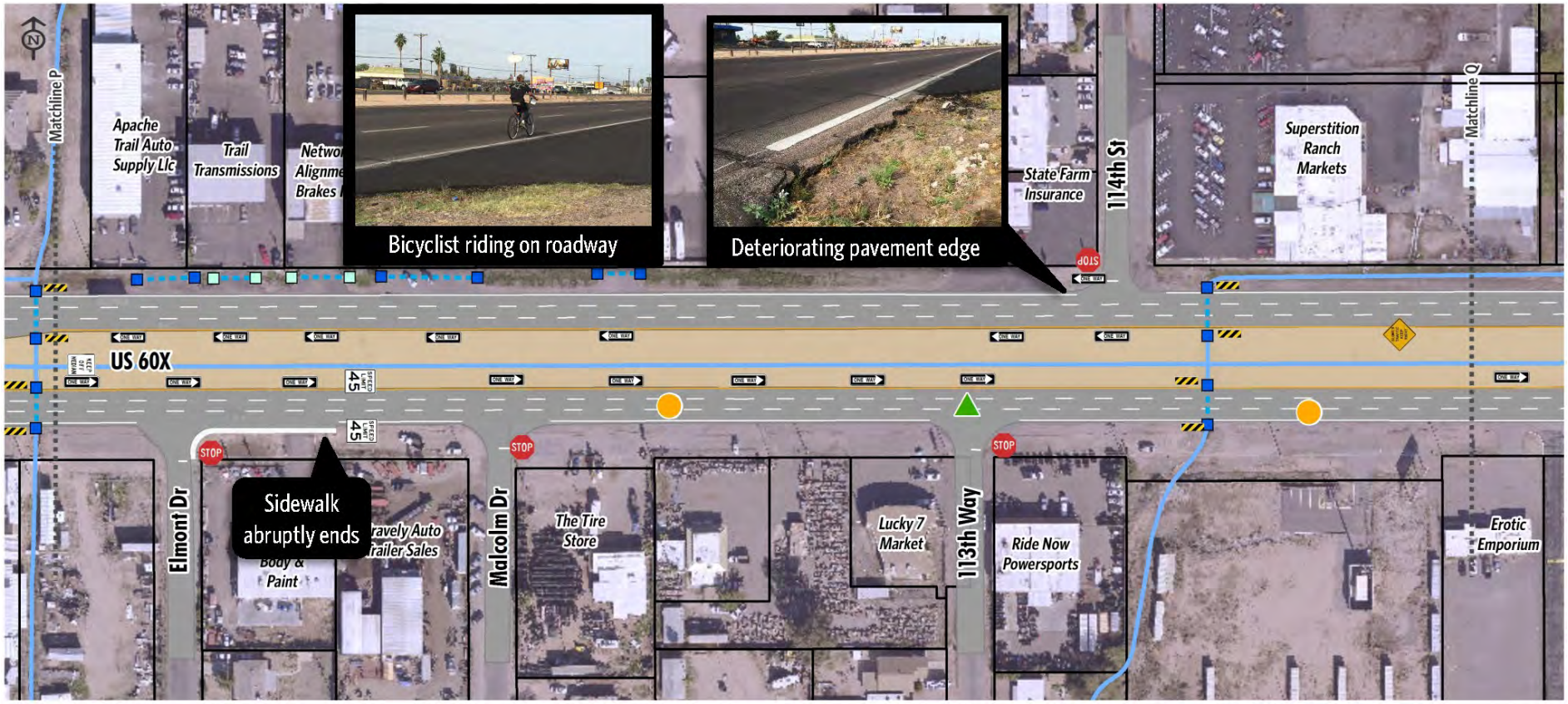


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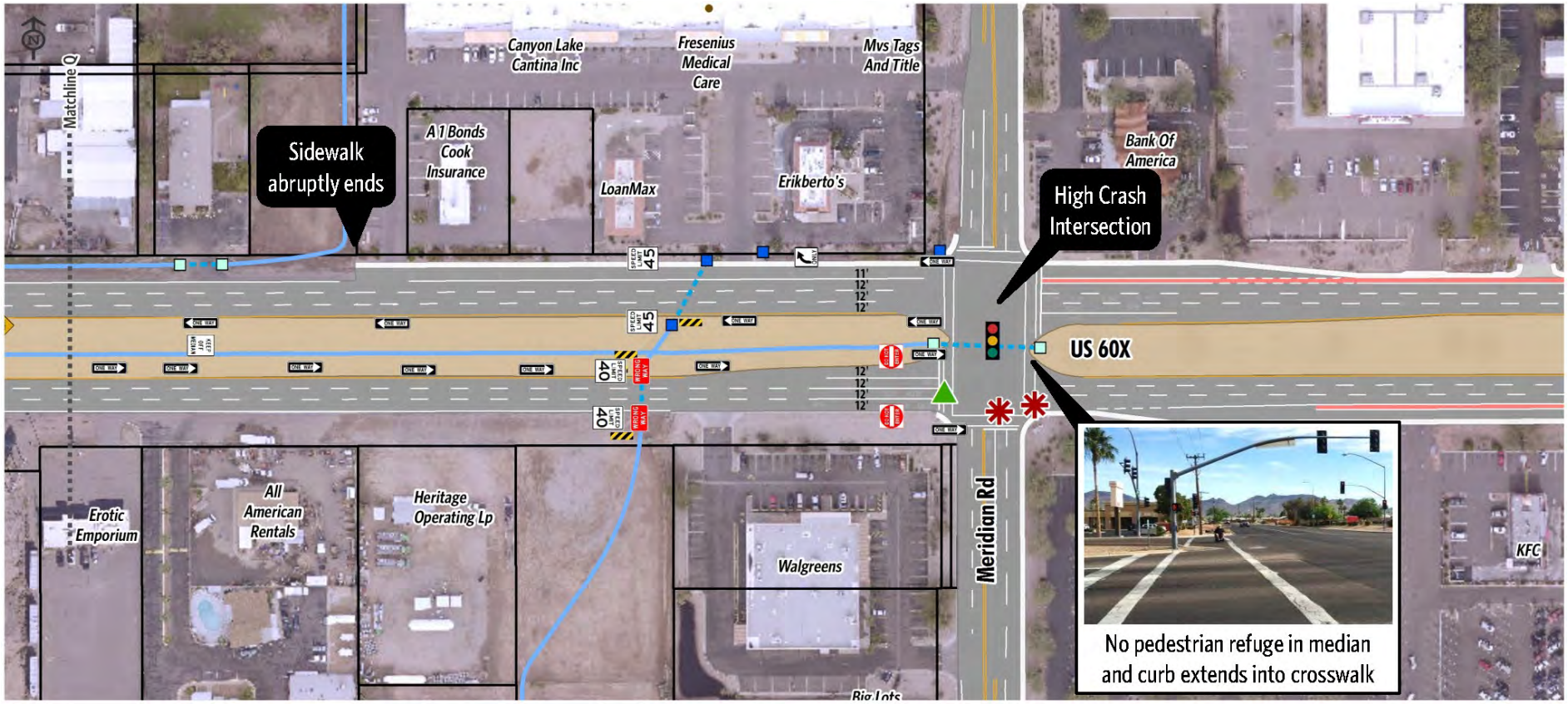


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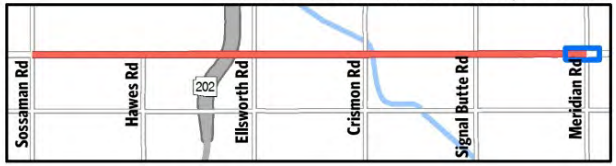

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# APPENDIX B.

# SHORT-TERM IMPROVEMENTS
# PRE-SCOPING FIELD REVIEW REPORT

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018
Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

The purpose of Preliminary Scoping (Pre-Scoping) is to more accurately develop a project's Scope of Work (SOW), Schedule, and Itemized Cost Estimate prior to programming a project in a Transportation Improvement Program (TIP). This process will help to streamline project design by reducing upfront work, scope changes, project delays, and TIP Amendments.

The information gathered from the Pre-Scoping Field Review Report will be used to develop the project's SOW, Schedule, and Itemized Cost Estimate, which will be summarized in the Pre-Scoping Report.

Pre-Scoping Field Review Forms are to be completed by functional groups responsible for each area as needed (based on the project scope). Not all projects will require all Field Review Forms to be filled out.

| Field Review Form | Name | Date Completed |
|---|---|---|
| Background Data | Jason Bottjen | 12/8/2017 |
| Bridge – Design | TBD | |
| Bridge – Hydraulics / Drainage | TBD | |
| District – Constructability | Raul Amavisca | 12/8/2017 |
| District – Maintenance | Raul Amavisca | 12/8/2017 |
| Environmental | TBD | |
| Geotechnical | Patrice Brun | 12/8/2017 |
| Pavement / Materials | TBD | |
| Right-of-Way | No Right of Way Impacts | |
| Roadway / Drainage | TBD | |
| Traffic / Safety | Tony Abbo, Mark Poppe, Michael Sanders | 12/8/2017 |
| Utilities | TBD | |

The below 23 USC 409 disclaimer is to be included in the Final Pre-Scoping Report and Field Review Report:

***23 USC 409 Disclaimer:***
*Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.*

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

**BACKGROUND DATA**

**(To be completed prior to KOM and Field Review)**

## Previous Projects

| ADOT / LPA / Tribal Project Number | Begin Milepost / Cross Street | End Milepost / Cross Street | Length (miles) | As-Built Date | Description |
|---|---|---|---|---|---|
| | | | | | ADOT Main St. (Apache Trail) Sossaman Rd to Meridian Rd Roadway Safety Assessment (2014) |
| | | | | | ADOT Apache Trail Speed Study (2015) |
| | | | | | Northeast MCDOT CAR Study |
| | | | | | ADOT Pedestrian Safety Action Plan Update (2017) |
| | | | | | ADOT Bicycle Safety Action Plan (2012) |
| | | | | | MCDOT Northeast Valley Safety Study (2010) |
| | | | | | Main Street Separated Bicycle Lanes and Complete Streets Project Assessment (2016) |
| | | | | | |

To 'check' boxes, double click and select 'checked' in the Default value box

| ITEM | YES | NO | If Yes, Describe (or see below) |
|---|---|---|---|
| Past Study Completed? | ☒ | ☐ | Findings: RSA and Northeast Valley CAR recommended safety improvements. |
| Project included in TIP? | ☐ | ☒ | |
| Is AADT available? | ☒ | ☐ | See Working Paper 1 |
| Is crash data available? | ☒ | ☐ | See Working Paper 1 |
| Known Transit needs? | ☒ | ☐ | Recent studies and public outreach indicate the public desire for transit along the US 60X corridor. |
| Known Freight needs? | ☐ | ☒ | |
| Known Railroad needs? | ☐ | ☒ | |
| Known Airport needs? | ☐ | ☒ | |
| Known Bike needs? | ☒ | ☐ | The RSA and US 60X study recommend the addition of bike lanes along the corridor due to the heavy bicycle usage and high rate of bicycle-involved crashes. |
| Known Pedestrian / ADA needs? | ☒ | ☐ | The RSA and US 60X study recommend the addition of pedestrian facilities along the corridor due to the heavy pedestrian usage and high rate of pedestrian-involved crashes. |
| Other needs? | ☒ | ☐ | Lighting, drainage improvements, signage replacement, pavement maintenance |

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

## BRIDGE DESIGN FIELD REVIEW FORM

**BRIDGE NO._____**

To 'check' boxes, double click and select 'checked' in the Default value box

| ITEM | ITEM NEEDED | | | LOCATION / QUANTITY / NOTES |
|---|---|---|---|---|
| | YES | NO | MAYBE | |
| Replace Bridge | ☐ | ☒ | ☐ | #02843 SR 202 Overpass 80' span - will not be affected, |
| Span Bridge | ☐ | ☒ | ☐ | #01417 CAP Canal (EB) 27' span – will not be affected, may need jersey barrier for pedestrian protection. |
| Box Culvert | ☐ | ☒ | ☐ | #01418 CAP Canal (WB) – 27' span - will not be affected, may need jersey barrier for pedestrian protection. |
| Unique Structure | ☐ | ☒ | ☐ | Smaller culverts > 20' span – Provide temporary protection with GR or extend past clear zone. |
| Replace Bridge Deck | ☐ | ☒ | ☐ | No replacement, retro fit of sidewalk may require minor deck repairs. |
| Widen | ☐ | ☒ | ☐ | No widening is required since the outside lane is converted to curb, gutter, sidewalk, and bike lane. |
| Rail/Sidewalk Barrier | ☐ | ☐ | ☒ | Evaluation by Bridge Group. |
| Corrosion Protection | ☐ | ☒ | ☐ | |
| Structural Repairs | ☐ | ☒ | ☐ | |
| Deck | ☐ | ☐ | ☒ | |
| Superstructure | ☐ | ☒ | ☐ | Minor deck repair may be required to add the sidewalk across bridges.<br>No other bridge repairs are anticipated. |
| Substructure | ☐ | ☒ | ☐ | |
| Concrete Wearing Course | ☐ | ☒ | ☐ | |
| Expansion Joints | ☐ | ☐ | ☒ | Check condition of expansion joints during final design. |
| Approach Panels | ☐ | ☐ | ☒ | Evaluation by Bridge Group. |
| Erosion/Scour Protection | ☐ | ☐ | ☒ | Minor erosion repairs may be required, evaluate during final design. |
| Painting | ☐ | ☒ | ☐ | Concrete structures, no painting required. |
| Over Water? | ☐ | ☒ | ☐ | Two structures span the canal. |
| Utility accommodation | ☐ | ☒ | ☐ | No utility relocation is required. |
| Need Asbestos Assessed? | ☐ | ☒ | ☐ | No asbestos since project is removing pavement and base materials only. |
| Removals | ☐ | ☐ | ☒ | Minor removals may be required for the installation of the lights. |
| Br Inventory Sheet indicates that Accelerated Bridge Construction (ABC) should be considered? | ☐ | ☒ | ☐ | If yes, Project Manager should complete Stage 2 ABC selection process. |
| Other | ☐ | ☐ | ☐ | |

Comments and Risk Identification:

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

## BRIDGE HYDRAULICS / DRAINAGE FIELD REVIEW FORM

To 'check' in the check boxes, double click and click on 'checked' in the Default value box

| ITEM | ITEM NEEDED | | | Struc. # If any | RP | LOCATION / QUANTITY / NOTES |
|---|---|---|---|---|---|---|
| | YES | NO | MAYBE | | | |
| Mainline Culverts<br>☒ Repair<br>☐ Line<br>☒ Replace<br>☒ Extend | ☐ | ☒ | ☐ | | | The drainage recommendations will be part of the FCDMC study findings, no major drainage improvements are part of the interim project. |
| Sideline Culverts<br>☐ Replace<br>☐ Extend | ☐ | ☒ | ☐ | | | |
| Tile | ☐ | ☒ | ☐ | | | |
| Storm Sewer | ☐ | ☒ | ☐ | | | |
| Erosion Repairs | ☐ | ☐ | ☒ | | | Minor erosion repairs may be required. |
| Waterway analysis | ☐ | ☒ | ☐ | | | |
| Risk Assessment | ☐ | ☒ | ☐ | | | |
| Ditch Hearing | ☐ | ☒ | ☐ | | | |
| Special Structures | ☐ | ☒ | ☐ | | | |
| Weirs | ☐ | ☒ | ☐ | | | |
| Vortex | ☐ | ☒ | ☐ | | | |
| Fish Passage | ☐ | ☒ | ☐ | | | |
| Ponds | ☐ | ☒ | ☐ | | | |
| Other: | ☐ | ☐ | ☐ | | | |

Comments and Risk Identification:

Coordination is needed with the FCDMC to ensure that drainage and roadway improvements do not negatively affect off-site flows. Mitigation of upstream flooding impacts may require a regional flooding solution due to the built-out, urban nature of the watershed and lack of downstream drainage infrastructure.

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Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

## DISTRICT - CONSTRUCTION FIELD REVIEW FORM

To 'check' boxes, double click and select 'checked' in the Default value box

| ITEM | ITEM NEEDED | | | LOCATION / QUANTITY / NOTES |
|---|---|---|---|---|
| | YES | NO | MAYBE | |
| Detour[a] | ☐ | ☒ | ☐ | Traffic can be maintained during construction through lane reduction. |
| Temporary Construction[a] | ☐ | ☒ | ☐ | The short-term improvements should not be throw-away; therefore, final design should attempt to incorporate a transitional design that seamlessly converts from short- to long-term improvement needs. |
| Staging[a] | ☐ | ☒ | ☐ | No staging anticipated. |
| Stockpiling | ☐ | ☒ | ☐ | No stockpiling due to the urban environment. |
| Innovative Contracting | ☐ | ☐ | ☒ | This could be an option for project delivery. |
| Traffic Control | ☒ | ☐ | ☐ | TCP will be developed during final design. |
| Other | ☐ | ☐ | ☐ | |

Comments and Risk Identification:

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018
Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

## DISTRICT - MAINTENANCE FIELD REVIEW FORM

To 'check' boxes, double click and select 'checked' in the Default value box

| ITEM | ITEM NEEDED | | | LOCATION / QUANTITY / NOTES |
|---|---|---|---|---|
| | YES | NO | MAYBE | |
| Striping | ☒ | ☐ | ☐ | Thermoplastic striping with RPMs should be installed. |
| Signing | ☒ | ☐ | ☐ | Updates to signs are recommended to assure they are visible. |
| Lighting | ☒ | ☐ | ☐ | Lighting is a very important item to improve visibility for both motorists, bicyclists and pedestrians. |
| Curb & Gutter | ☒ | ☐ | ☐ | Curb and gutter are needed to establish access control adjacent to the businesses. |
| Low gravel shoulder correction | ☐ | ☒ | ☐ | |
| Guard Rail Repair | ☐ | ☒ | ☐ | |
| Fencing | ☐ | ☒ | ☐ | |
| Noisewall | ☐ | ☒ | ☐ | |
| Drainage Repair | ☒ | ☐ | ☐ | Minor drainage repair items required in conjunction with the curb and gutter installation. |
| Erosion Area Correction | ☐ | ☐ | ☒ | Minor erosion repairs may be required. |
| Flooding Area Correction | ☐ | ☒ | ☐ | Interim improvements will not include flooding area correction. |
| Snow Trap, Storage, Icing Correction | ☐ | ☒ | ☐ | |
| RWIS | ☐ | ☒ | ☐ | |
| Anti-Icing System | ☐ | ☒ | ☐ | |
| Frost Heave Correction | ☐ | ☒ | ☐ | |
| Rest Area Work | ☐ | ☒ | ☐ | |
| Landscaping | ☐ | ☐ | ☒ | Landscaping may be included, not eligible for safety improvement funds. |
| Millings needed | ☐ | ☒ | ☐ | |
| Other salvage items | ☐ | ☐ | ☒ | Salvage items will be determined during final design. |
| Other: | ☐ | ☐ | ☐ | |

Comments and Risk Identification:

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

**ENVIRONMENTAL FIELD REVIEW FORM**

To 'check' boxes, double click and select 'checked' in the Default value box

| ITEM | YES | NO | MAYBE | LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS |
|---|---|---|---|---|
| 4(f) / 6(f) sites | ☐ | ☒ | ☐ | Reviewing area again once design is complete is recommended. |
| Extensive Cultural/Historical Work | ☐ | ☒ | ☐ | Area surveyed. US 60X is historic and eligible for the NRHP. It has been previously documented to record historical significance under a separate undertaking. |
| Title VI/Environmental Justice Populations | ☒ | ☐ | ☐ | Greater percentage minority, elderly, below poverty level, and disabled occur within/adjacent to the corridor than comparative populations. Improvements will affect all people equally and would ultimately provide enhanced and more accessible facilities. |
| Noise Concerns | ☐ | ☐ | ☒ | Sensitive receivers are present. Noise studies needed to determine if levels would exceed noise thresholds for nearby and adjacent sensitive receivers. |
| Jurisdictional Waters or Wetlands | ☐ | ☐ | ☒ | Washes that cross the corridor may be jurisdictional. A Pre-JD would be needed to determine if they are jurisdictional and to quantify the area of permanent impact to determine the appropriate Clean Water Act permit. |
| Floodplain | ☒ | ☐ | ☐ | Flood Zones AH occurs at the eastern limit of the corridor. |
| State/Federal T&E Species | ☐ | ☐ | ☒ | Based on predictive modeling, the ocelot, lesser long-nosed bat, and jaguar have the potential to occur in or near the corridor. Columnar cactus and agave plants could provide marginal habitat for bats. |
| Wildlife Crossing Concerns | ☐ | ☒ | ☐ | Proposed improvements would not change the available crossings in the corridor. |
| Hazmat or Contaminated site | ☒ | ☐ | ☐ | There are 7 Resource Conservation Recovery Act generators, 17 leaking underground storage tanks, and 13 underground storage tanks in proximity to the corridor. Load-bearing concrete structures may contain asbestos. Painted surfaces, including roadway markings, may contain lead. Additional investigation is recommended. |
| Prime or Unique Farmland | ☐ | ☒ | ☐ | Based on soil characteristics, prime farmland if irrigated occurs within the eastern end of the corridor. Since this area is identified as "urban" within the 2010 census and no active agriculture is occurring, the areas adjacent to US 60X would not be considered prime or unique farmland. |
| Air Quality Nonattainment or Maintenance Area | ☒ | ☐ | ☐ | The corridor is in nonattainment for the ozone 8-hour and particulate matter 10 (PM10), and is in a maintenance area for carbon monoxide. |
| Noxious or Invasive Species | ☐ | ☐ | ☒ | If noxious or invasive species are present, they should be treated to prevent their spread. |

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Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

## ENVIRONMENTAL FIELD REVIEW FORM (CONTINUED)

To 'check' boxes, double click and select 'checked' in the Default value box

| ITEM | YES | NO | MAYBE | LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS |
|---|---|---|---|---|
| Visual Quality Concerns | ☐ | ☒ | ☐ | The area is developed. Proposed improvements are consistent with the existing development in the area and as a result, the corridor would retain its existing character. |
| Public Involvement Required | ☐ | ☐ | ☒ | It may be appropriate to reach out to public and agency stakeholders when design is available, particularly if considerable time has elapsed and/or if feedback received early in the process is contentious. |
| Significant Environmental Impacts | ☐ | ☒ | ☐ | No significant environmental impacts are known at this time. Review of potential impacts should be undertaken once design is developed to confirm. |
| Avoidance Areas | ☐ | ☒ | ☐ | None known at this time. |
| Other | ☐ | ☐ | ☐ | |

| | | | | |
|---|---|---|---|---|
| **Anticipated NEPA Clearance Type** | Categorical Exclusion (CE) ☒ | Environmental Assessment (EA) ☐ | Environmental Impact Statement (EIS) ☐ | N/A (No federal funds anticipated) ☐ |

| | | | |
|---|---|---|---|
| **Anticipated Permits Needed** | Section 404 Permit: Nationwide Permit ☒ Individual Permit ☐ | Individual Section 401 Certification ☐ | Section 402 Permit: AZPDES ☒ NPDES ☐ |

Comments and Risk Identification:

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

# GEOTECHNICAL FIELD REVIEW FORM

To 'check' in the check boxes, double click and click on 'checked' in the Default value box

| ITEM | YES | NO | MAYBE | LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS |
|---|---|---|---|---|
| Will geotechnical borings be required? | ☐ | ☐ | ☒ | Est Drilling/Excavation Depth: Since only a sidewalk is being added, borings may not be required. |
| Will rock coring be required? | ☐ | ☒ | ☐ | |
| Will test pits be required? | ☐ | ☐ | ☒ | Est Drilling/Excavation Depth: Since only a sidewalk is being added, test pits may not be required. |
| Is site accessible by a 4-wheel vehicle, backhoe, or trackhoe? | ☒ | ☐ | ☐ | |
| Will a seismic refraction survey be required? | ☐ | ☒ | ☐ | |
| Will geologic mapping be required? | ☐ | ☒ | ☐ | |
| Will soil/rock lab testing be required? | ☐ | ☐ | ☒ | |
| Will geotechnical investigation require a separate Environmental Clearance? | ☒ | ☐ | ☐ | |
| Other: | ☐ | ☐ | ☐ | |

Comments and Risk Identification:

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

# PAVEMENT / MATERIALS FIELD REVIEW FORM

To 'check' in the check boxes, double click and click on 'checked' in the Default value box

| ITEM | | ITEM NEEDED | | | LOCATION / QUANTITY / NOTES |
|---|---|---|---|---|---|
| | | YES | NO | MAYBE | |
| Hot Mix Asphaltic Concrete Pavement | Minor Rehab/Preventative Maint (Chip Seal, Slurry Seal, etc.) | ☒ | ☐ | ☐ | *For the short-term improvements, a surface coat will be required due to the change of striping.* |
| | Major Rehab (Mill & Replace Only) | ☐ | ☒ | ☐ | |
| | Major Rehab (Mill, Replace & Overlay) | ☐ | ☒ | ☐ | |
| | Major Rehab (Overlay Only) | ☐ | ☒ | ☐ | |
| | Reconstruction | ☐ | ☒ | ☐ | |
| | Widening/Adding Turn Lanes | ☐ | ☒ | ☐ | |
| | Pavement Core | ☐ | ☒ | ☐ | |
| | Falling Weight Deflectometer Test | ☐ | ☒ | ☐ | |
| Portland Cement Concrete Pavement | Joint Repairs | ☐ | ☒ | ☐ | No Concrete pavement work. |
| | Dowel Bars | ☐ | ☒ | ☐ | |
| | Major CPR | ☐ | ☒ | ☐ | |
| | Minor CPR | ☐ | ☒ | ☐ | |
| | Widening/Turn Lanes | ☐ | ☒ | ☐ | |
| | Pavement Core | ☐ | ☒ | ☐ | |
| | Other: | ☐ | ☐ | ☐ | |
| Sub-surface | Aggregate Base Improvement | ☐ | ☒ | ☐ | Minor base work for sidewalk placement. |
| | Subgrade Improvement | ☐ | ☒ | ☐ | Minor subgrade work for construction of sidewalk. |
| | Other: | ☐ | ☐ | ☐ | |
| Shl-der | Shoulder Work | ☐ | ☒ | ☐ | *(include shoulder width) Shoulder is being replaced with curb, gutter and sidewalk.* |
| | Other: | ☐ | ☐ | ☐ | |
| Edge Drains | Edge Drain Video Insp | ☐ | ☒ | ☐ | |
| | Edge Drain Flushing | ☐ | ☒ | ☐ | |
| | New Edge Drains | ☐ | ☒ | ☐ | |

Comments and Risk Identification:

This study did not include a pavement structural analysis; therefore, during the final design phase an evaluation of pavement conditions and the need for mill and overlay should be evaluated.

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

**RIGHT-OF-WAY FIELD REVIEW FORM**

To 'check' boxes, double click and select 'checked' in the Default value box

| Location | Existing ROW Width | Owner | Comments |
|---|---|---|---|
| | | | **No Right of Way will be affected by the improvements.** |
| | | | |
| | | | |

| | |
|---|---|
| List all adjacent land owners within the project limits | |

| ITEM | YES | NO | MAYBE | PARCEL # / LOCATION / QUANTITY / NOTES |
|---|---|---|---|---|
| Potential Full-Parcel ROW Take | ☐ | ☒ | ☐ | All interim work will within existing right-of way. |
| Potential Partial-Parcel ROW Take | ☐ | ☒ | ☐ | All interim work will be within existing right-of way. |
| Access Issues | ☐ | ☐ | ☒ | Access management will be implemented with the construction of the curb, gutter and sidewalk. There are no construction site access issues. |
| Temporary Construction Easement (TCE) required | ☐ | ☒ | ☐ | All interim work will within existing right-of way. |
| Drainage Easement required | ☐ | ☒ | ☐ | No changes in drainage. |
| Access Easement required | ☐ | ☒ | ☐ | All interim work will within existing right-of way. |
| Plats needed | ☐ | ☒ | ☐ | All interim work will within existing right-of way. |
| Other | ☐ | ☐ | ☐ | |

Comments and Risk Identification:

All short-term improvements will be constructed within the existing ROW. During final design, a complete assessment of driveway locations and conditions should occur. The assessment will recommend driveway closures or consolidations, paving, and the ultimate location of business access points along the corridor. No property or business owners along the study segment have been contacted as part of this study to explore the potential for driveway closures.

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Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

## ROADWAY / DRAINAGE FIELD REVIEW FORM

To 'check' boxes, double click and select 'checked' in the Default value box

| ITEM | ITEM NEEDED | | | LOCATION / QUANTITY / NOTES |
|---|---|---|---|---|
| | YES | NO | MAYBE | |
| Design Exception | ☐ | ☒ | ☐ | No design exception is anticipated at this time. |
| CSS Design Flexibility | ☒ | ☐ | ☐ | CSS and Complete Streets will be considered during design. |
| Hor. Curve Correction | ☐ | ☒ | ☐ | |
| Vert. Curve Correction | ☐ | ☒ | ☐ | |
| Crown Correction | ☐ | ☒ | ☐ | |
| Super Correction | ☐ | ☒ | ☐ | |
| Side Slope Correction | ☐ | ☒ | ☐ | |
| Shlder slope correction | ☐ | ☒ | ☐ | |
| Flatten Entrance Slopes | ☐ | ☒ | ☐ | |
| Sight-line Obstr. Correction | ☒ | ☐ | ☐ | Associated with the driveways and access to the road. Evaluate during final design. |
| Guardrail | ☐ | ☒ | ☐ | |
| Curb & Gutter | ☒ | ☐ | ☐ | Needed to maintain access control, with minimal impact to business driveways. |
| Retaining Walls | ☐ | ☒ | ☐ | No guardrail should be required, since curb, gutter and sidewalk will be constructed. |
| Spillway | ☐ | ☒ | ☐ | |
| Downdrain | ☐ | ☒ | ☐ | |
| Scuppers | ☐ | ☐ | ☒ | Scuppers may be needed to pass drainage through the new curb. |
| 69kV lines Steel Poles | ☐ | ☐ | ☐ | |
| Other: Light Poles | ☒ | ☐ | ☐ | New pedestrian lights need too be constructed along the edge of the new sidewalk. |

Comments and Risk Identification:

During final design, improvements to vertical grade differences should be considered to improve sight distance issues along the corridor.

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

**TRAFFIC / SAFETY FIELD REVIEW FORM**

To 'check' in the check boxes, double click and click on 'checked' in the Default value box

| ITEM | ITEM NEEDED | | | LOCATION / QUANTITY / NOTES |
|---|---|---|---|---|
| | YES | NO | MAYBE | |
| **Bicycle Countermeasures** | | | | |
| Bike Lane | ☒ | ☐ | ☐ | New bike lanes will be included through re-striping of the roadway. |
| Pavement Markings / Signs | ☒ | ☐ | ☐ | Required to reduce lane widths and delineate bike lanes. |
| Shared Use Path | ☐ | ☒ | ☐ | Prefer to keep bikes and pedestrians separated. |
| Other: | ☐ | ☐ | ☐ | |
| **Curve Countermeasures** | | | | |
| Enhanced Delineation and Friction for Horizontal Curve | ☐ | ☒ | ☐ | No changes to horizontal or vertical alignment. |
| Curve Warning Signs | ☐ | ☒ | ☐ | |
| Other: | ☐ | ☐ | ☐ | |
| **Intersection Countermeasures** | | | | |
| Access Control | ☒ | ☐ | ☐ | Implemented on the outside of the road with the installation of the curb and gutter. |
| Pedestrian Phasing | ☒ | ☐ | ☐ | At signalized intersections |
| Pedestrian Signal/ Countdown Signal | ☒ | ☐ | ☐ | At signalized intersections. |
| Offset/lengthen turn lane | ☐ | ☒ | ☐ | Turn lanes will be implemented in future phases of the project. |
| Phasing/protected left turn | ☒ | ☐ | ☐ | Signal timing/synchronization should be implemented along the corridor. |
| Roundabout | ☐ | ☒ | ☐ | Not preferred by the study team or the public for this corridor. |
| Signal Backplates with Retroreflective Borders | ☐ | ☐ | ☒ | Evaluate during final design. |
| Stop Bar | ☒ | ☐ | ☐ | Stop bars needed at intersecting roadways |
| Other: | ☐ | ☐ | ☐ | |
| **Lane / Roadway Departure Countermeasures** | | | | |
| Longitudinal Rumble Strips / Stripes on 2-Lane Roads (shoulder & centerline) | ☐ | ☒ | ☐ | Curb and gutter will delineate road on the outside edge. RPMs could be installed on the inside edge if needed. |
| Raised Median Barrier | ☐ | ☒ | ☐ | This is recommended for the ultimate cross-section. |
| Safety Edge | ☒ | ☐ | ☐ | In areas outside of driveways. |
| Shoulder | ☐ | ☒ | ☐ | Will be replaced with curb and gutter. |
| Other: | ☐ | ☐ | ☐ | |

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

| ITEM | ITEM NEEDED | | | LOCATION / QUANTITY / NOTES |
|---|---|---|---|---|
| | YES | NO | MAYBE | |
| **Pedestrian Countermeasures** | | | | |
| ADA Improvement | ☒ | ☐ | ☐ | ADA improvements will be required at all intersections, |
| Crosswalk | ☒ | ☐ | ☐ | Crosswalks should be included in all intersections. |
| Median and Ped Xing Island (urban / suburban area) | ☐ | ☐ | ☒ | Final design should consider the placement of signalized pedestrian crossing at the mid-block. Additionally, existing pedestrian islands and crossings need to be cleaned and upgraded for ADA compliance |
| Pedestrian Hybrid Beacon | ☐ | ☐ | ☒ | Final design should consider the placement of signalized pedestrian crossing at the mid-block. |
| Pedestrian Warning Sign (Ped Xing, No Right on Red, Yield to Peds) | ☒ | ☐ | ☐ | |
| Road Diet | ☒ | ☐ | ☐ | To implement the sidewalk and bike lanes, the roadway will be reduced from three-lanes to two-lanes each direction. |
| Sidewalk | ☒ | ☐ | ☐ | New sidewalk is recommended along the outside edge of the roadway in both directions. |
| Traffic Calming | ☐ | ☒ | ☐ | Lane widths reduced to 11FT |
| Widen Shoulder | ☐ | ☒ | ☐ | No shoulder widening with interim improvements. |
| Other: | ☐ | ☐ | ☐ | |
| **Railroad Crossing Countermeasures** | | | | |
| Active Advanced Warning Sign | ☐ | ☒ | ☐ | No railroad crossing within project limits. |
| Flashing Light Signals | ☐ | ☒ | ☐ | |
| Gates (Automated, Channelized, Four-Quadrant) | ☐ | ☒ | ☐ | |
| Pavement Markings | ☐ | ☒ | ☐ | |
| Signage | ☐ | ☒ | ☐ | |
| Train Detection System | ☐ | ☒ | ☐ | |
| Traffic Signal | ☐ | ☒ | ☐ | |
| Warning Bell | ☐ | ☒ | ☐ | |
| Wayside Horn System | ☐ | ☒ | ☐ | |
| Other: | ☐ | ☐ | ☐ | |

Comments and Risk Identification:

During the final design, all pedestrian ramps should be verified for ADA compliance. Existing sidewalks will remain; however, a condition and ADA assessment should occur to determine if pedestrian facilities are ADA-compliant.

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Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)

# UTILITIES
# FIELD REVIEW FORM

| (1) Info Source | (2) FACILITY OWNER | (3) FACILITY TYPE | (4) LOCATION | (5) Impact | (6) ROW /TCE | (7) REMARKS/ REASON FOR CONFLICT |
|---|---|---|---|---|---|---|
| B, C | Southwest Gas | Gas | | N | | |
| B, C | Salt River Project | Electric | Overhead power along both sides of corridor | N | | |
| B, C | Arizona Department of Transportation | Culverts, Storm Drain | Culverts and bridges located along the entire length of the corridor | Y | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

1) **Use A – Permit Log, B – Field Observation, C – Utility/Other**
2) **Facility Owner (company/agency) name and contact information. Note: this does not include drainage features located underground**
3) **Type and Size of facility**
4) **Use Milepost or Stationing. Last resort describe**
5) **Y – Likely to impact facility with project N – Not likely to impact facility**
6) **Y – If relocation, likely to need TCE or ROW N- No**
7) **Pertinent Information include potential relocation cost, schedule impacts, coring requirements, potential Utility Agreement notes, or other risks**

Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018
Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)



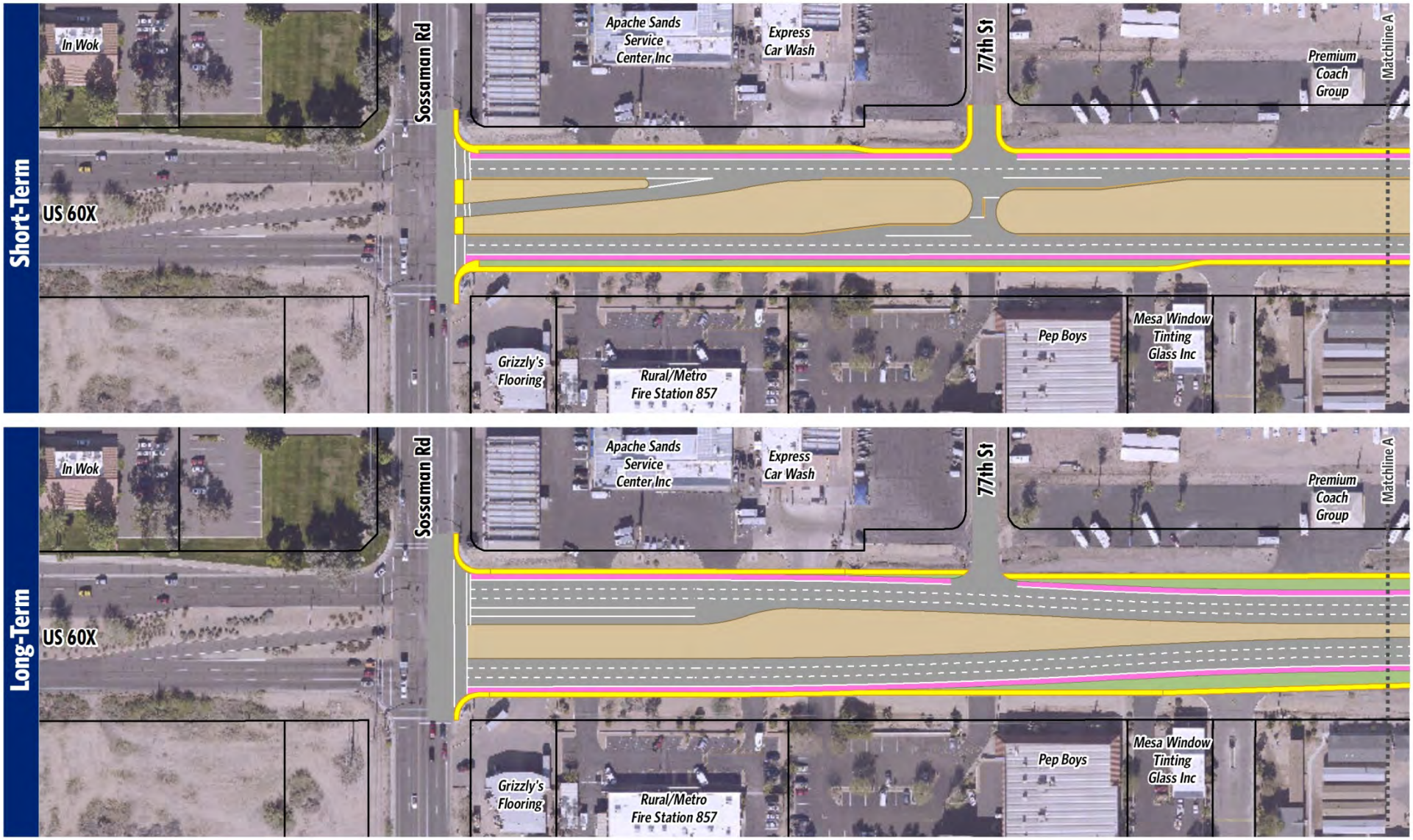
Project #: TBD Name:US60X (Main Street/Apache Trail) Date: 2/14/2018

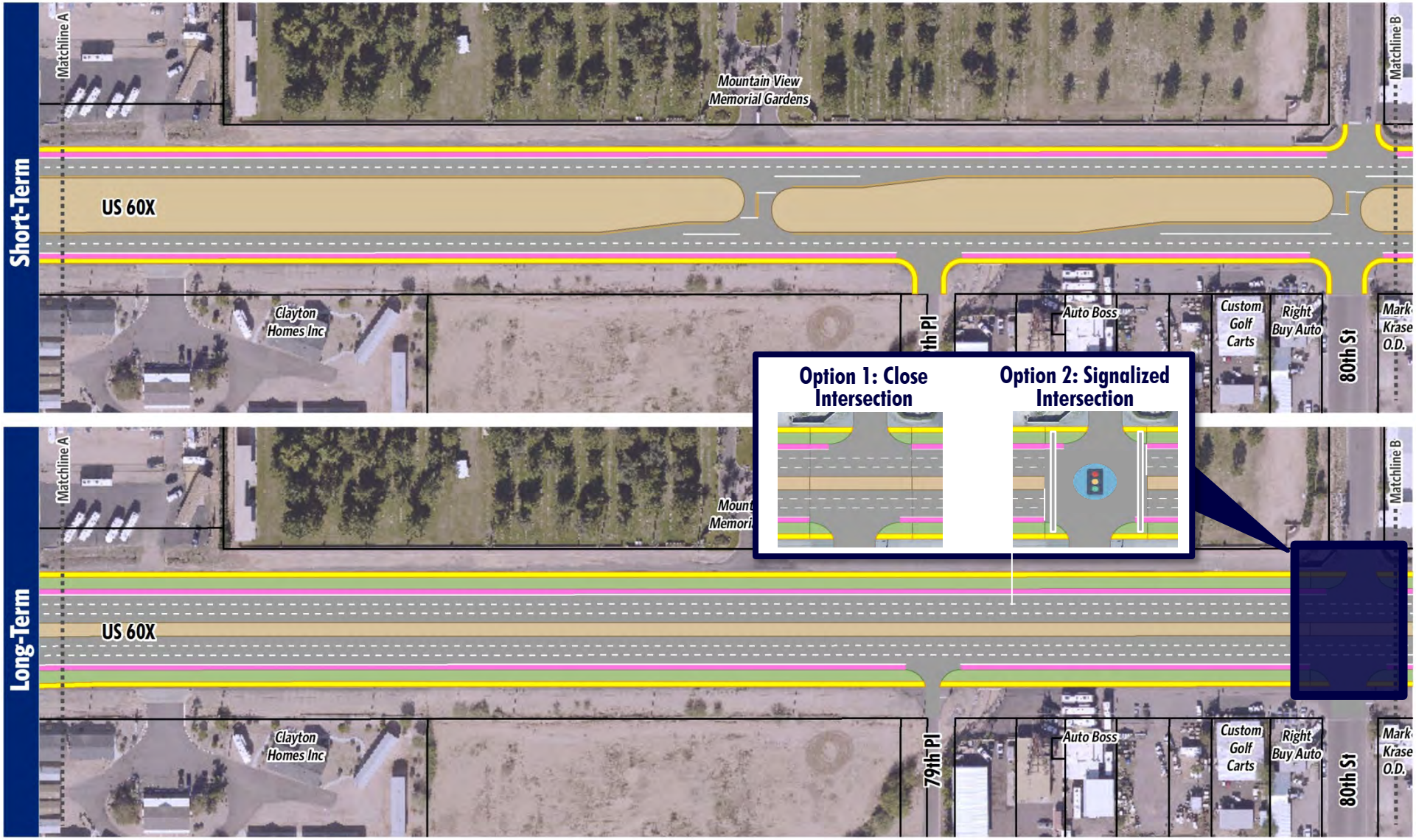
Project Limits: Sossaman Road to Meridian Road (Short-Term Safety Improvements)


Additional project photos are available on the project deliverable CD.

# APPENDIX C.

## RECOMMENDED CORRIDOR IMPROVEMENT CONCEPT

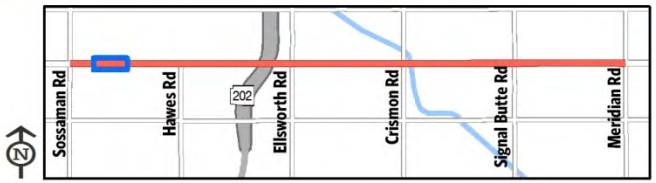

Short-Term
In Wok
US 60X
Sossaman Rd
Apache Sands Service Center,Inc
Express Car Wash
77th St
Premium Coach Group
Matchline A
Grizzly's Flooring
Rural/Metro Fire Station 857
Pep Boys
Mesa Window Tinting Glass Inc
Long-Term
In Wok
US 60X
Sossaman Rd
Apache Sands Service Center,Inc
Express Car Wash
77th St
Premium Coach Group
Matchline A
Grizzly's Flooring
Rural/Metro Fire Station 857
Pep Boys
Mesa Window Tinting Glass Inc
Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary
0
200 Feet
Source: ADOT, MCDOT, MAG, Maricopa County Assessor
N
Sossaman Rd
Hawes Rd
202
Ellsworth Rd
Crismon Rd
Signal Butte Rd
Meridian Rd

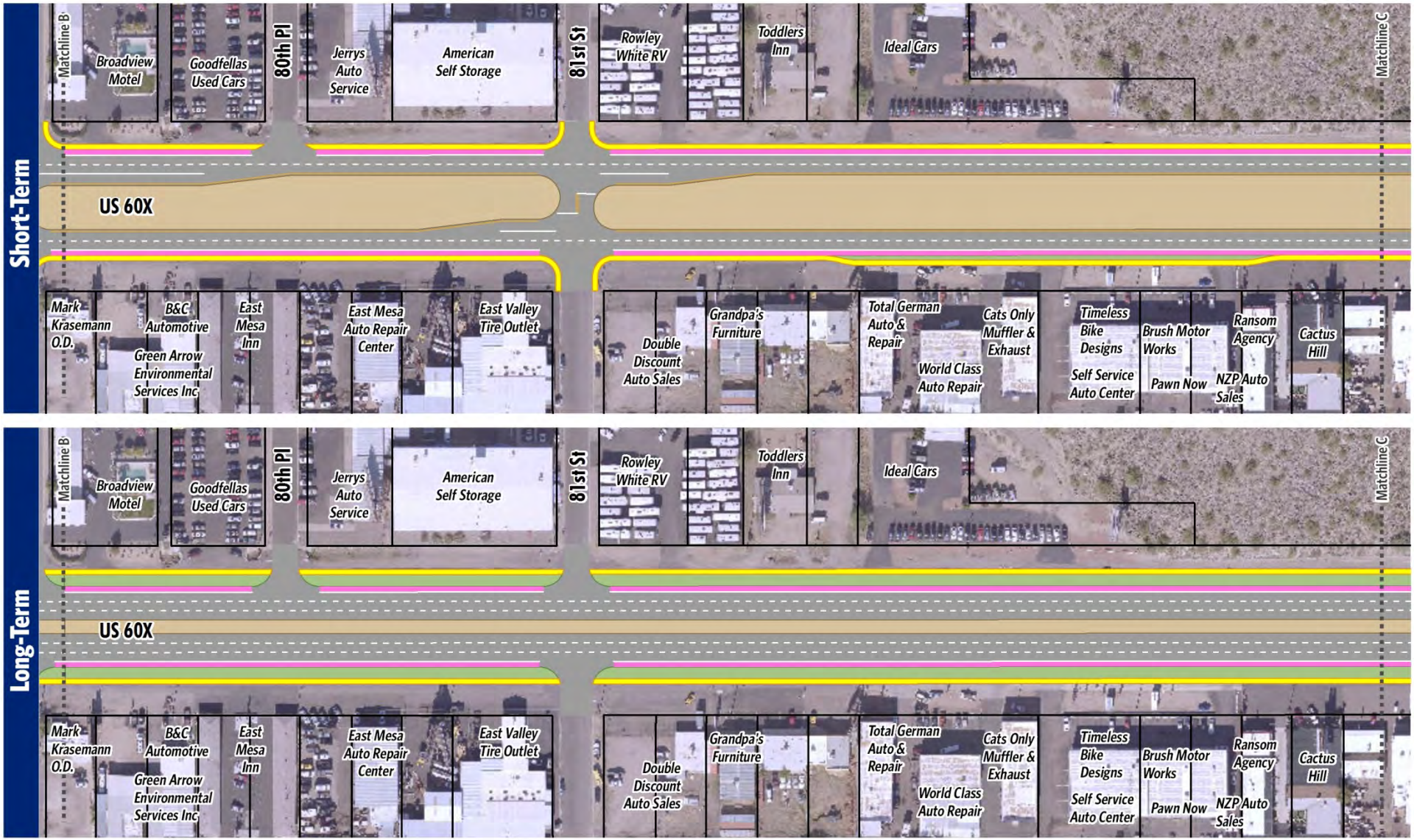


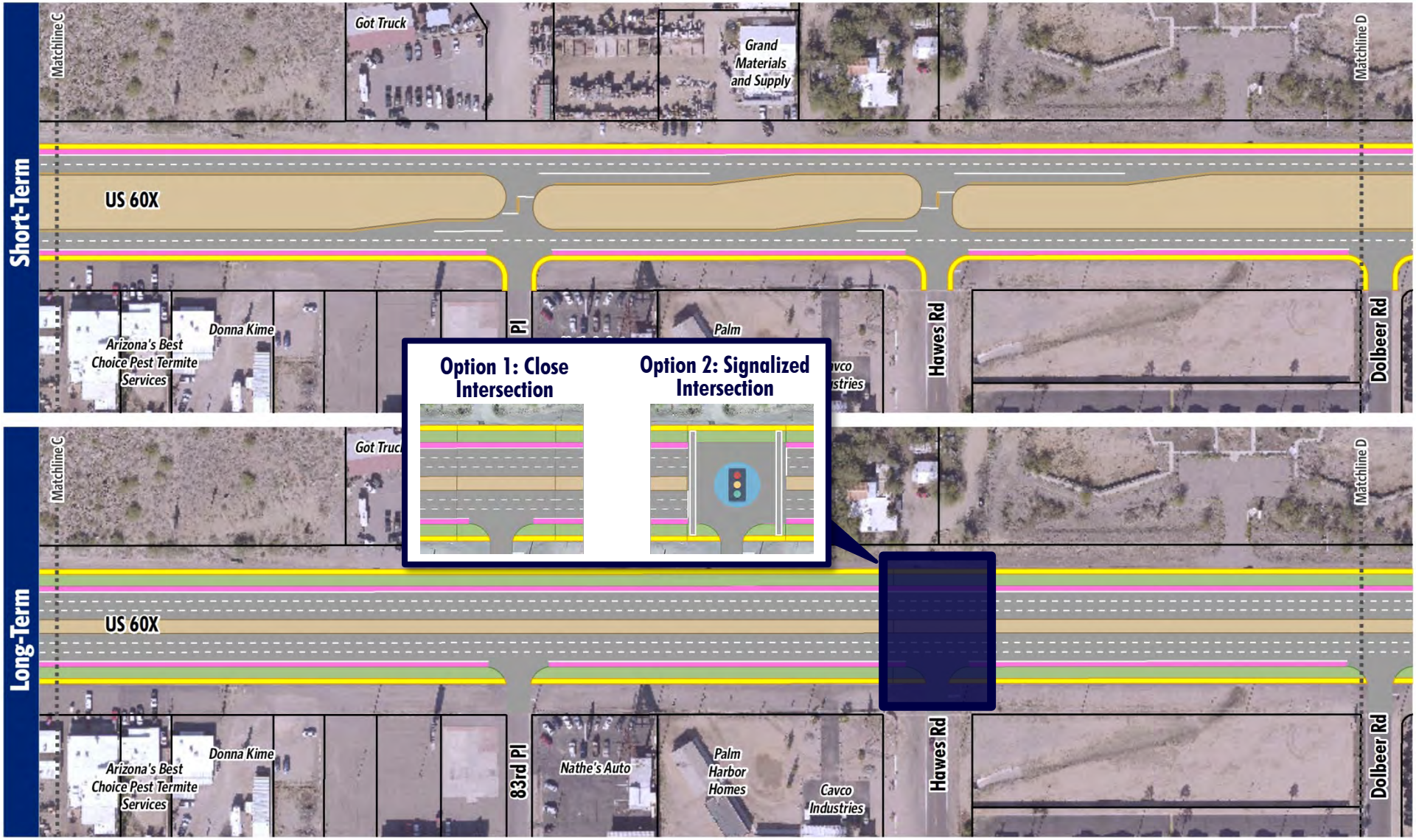

Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

Source: ADOT, MCDOT, MAG, Maricopa County Assessor



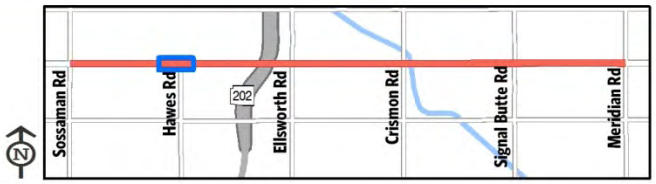

Short-Term
Matchline B
Broadview Motel
Goodfellas Used Cars
80th Pl
Jerrys Auto Service
American Self Storage
81st St
Rowley White RV
Toddlers Inn
Ideal Cars
Matchline C
US 60X
Mark Krasemann O.D.
B&C Automotive
Green Arrow Environmental Services Inc
East Mesa Inn
East Mesa Auto Repair Center
East Valley Tire Outlet
Double Discount Auto Sales
Grandpa's Furniture
Total German Auto & Repair
World Class Auto Repair
Cats Only Muffler & Exhaust
Timeless Bike Designs
Self Service Auto Center
Brush Motor Works
Pawn Now
Ransom Agency
NZP Auto Sales
Cactus Hill
Long-Term
Matchline B
Broadview Motel
Goodfellas Used Cars
80th Pl
Jerrys Auto Service
American Self Storage
81st St
Rowley White RV
Toddlers Inn
Ideal Cars
Matchline C
US 60X
Mark Krasemann O.D.
B&C Automotive
Green Arrow Environmental Services Inc
East Mesa Inn
East Mesa Auto Repair Center
East Valley Tire Outlet
Double Discount Auto Sales
Grandpa's Furniture
Total German Auto & Repair
World Class Auto Repair
Cats Only Muffler & Exhaust
Timeless Bike Designs
Self Service Auto Center
Brush Motor Works
Pawn Now
Ransom Agency
NZP Auto Sales
Cactus Hill
Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary
0
200
Feet
Source: ADOT, MCDOT, MAG, Maricopa County Assessor
Sossaman Rd
Hawes Rd
202
Ellsworth Rd
Crismon Rd
Signal Butte Rd
Meridian Rd
N

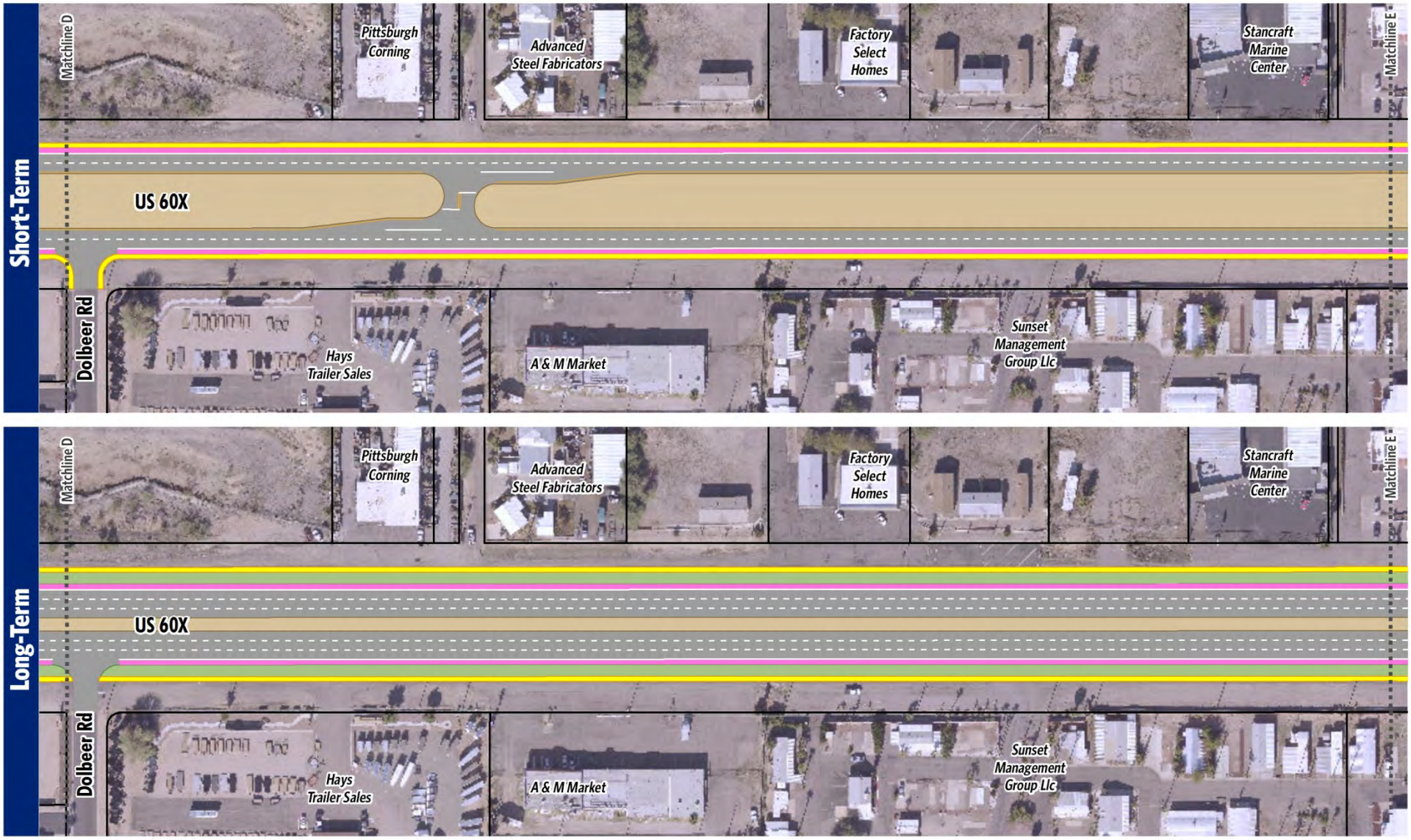



Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

Source: ADOT, MCDOT, MAG, Maricopa County Assessor

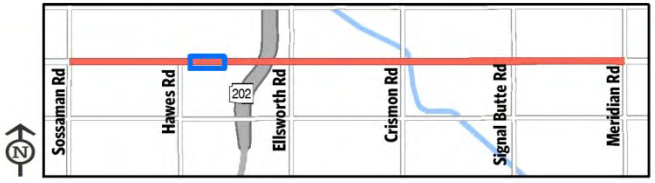


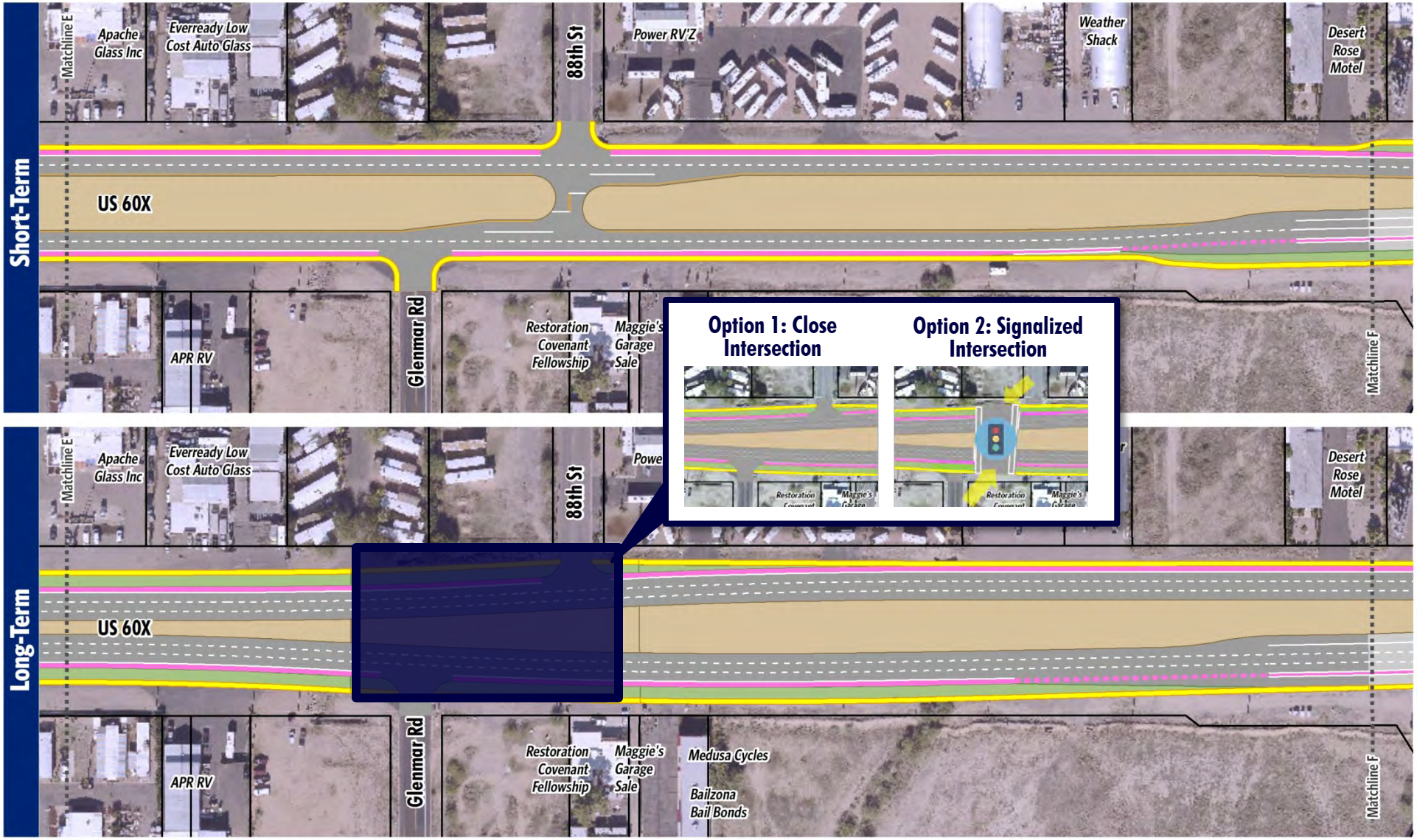



Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

Source: ADOT, MCDOT, MAG, Maricopa County Assessor

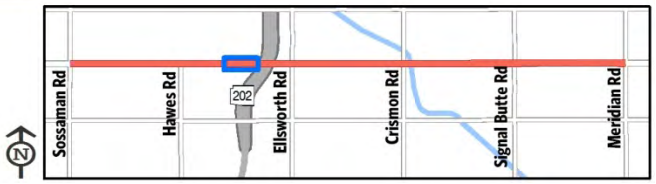


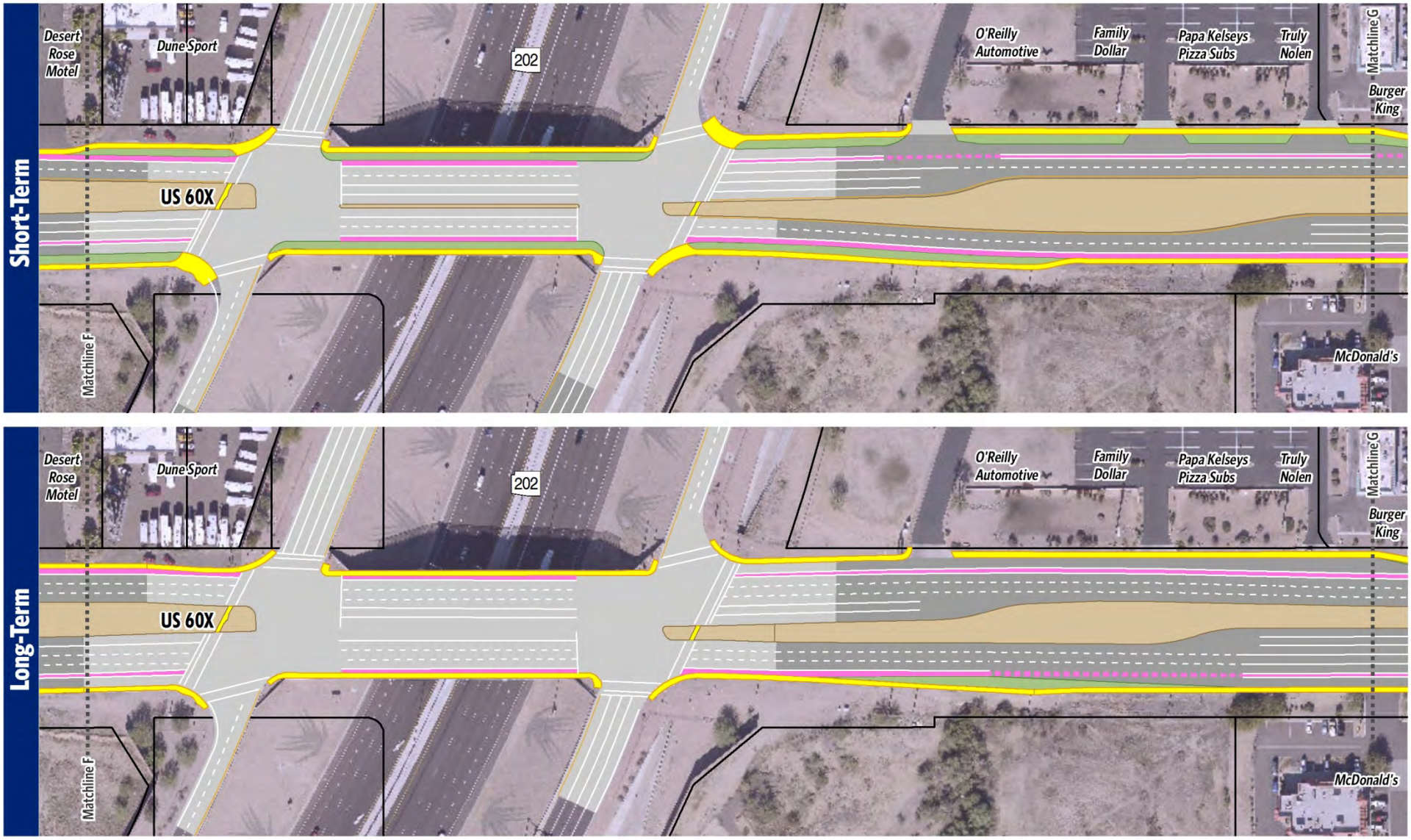



Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

Source: ADOT, MCDOT, MAG, Maricopa County Assessor

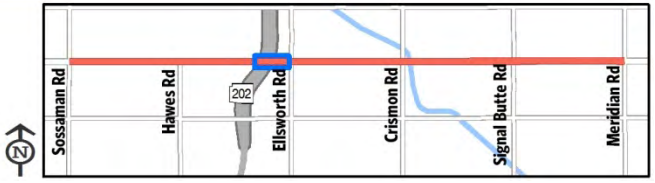





Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

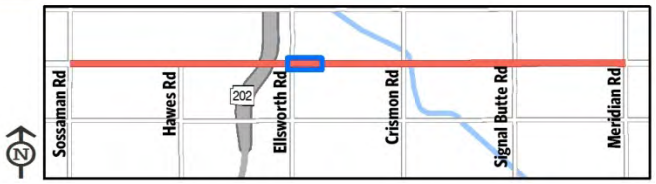
Source: ADOT, MCDOT, MAG, Maricopa County Assessor

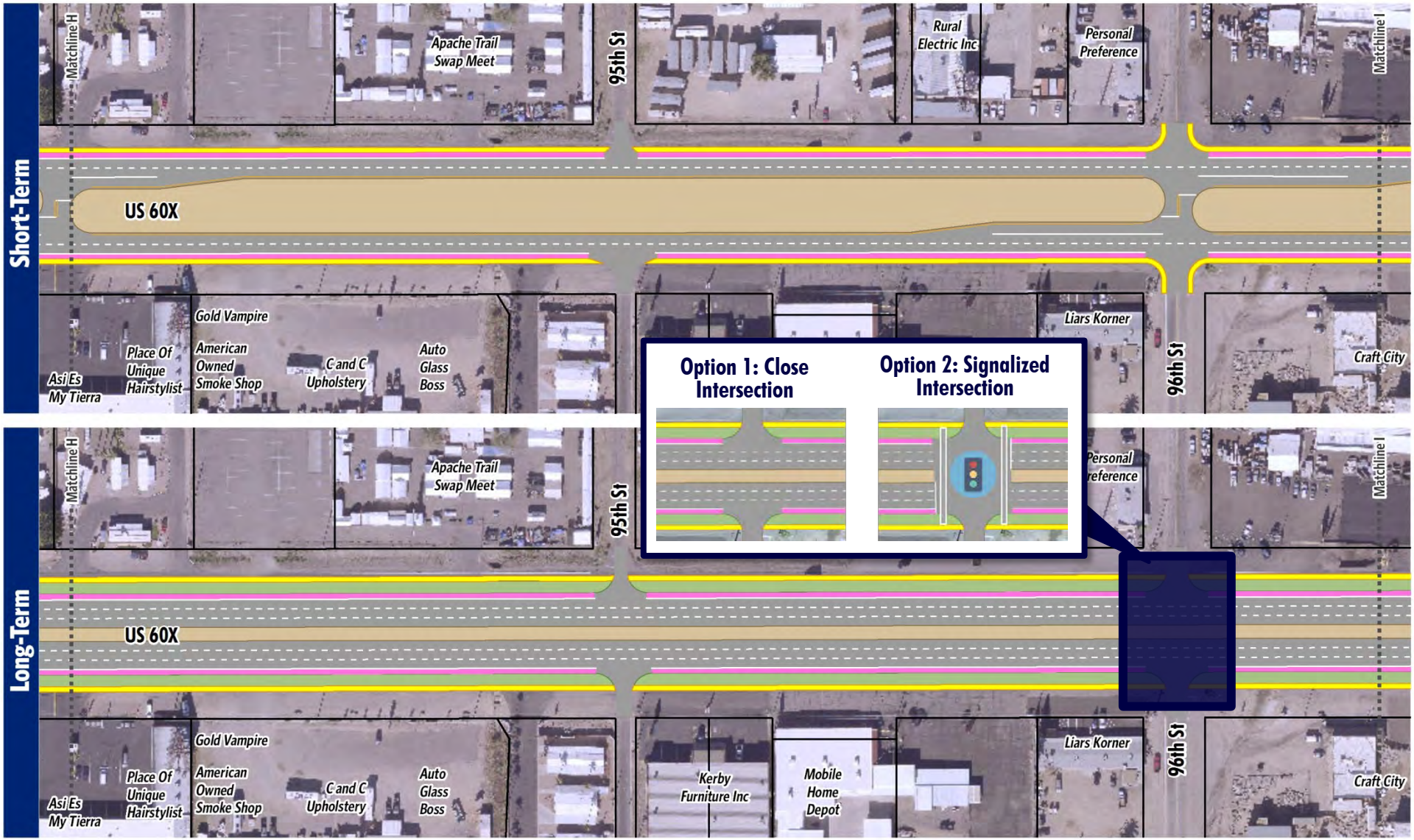



Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

*Source: ADOT, MCDOT, MAG, Maricopa County Assessor*

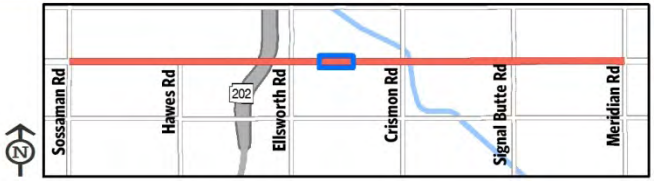





Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

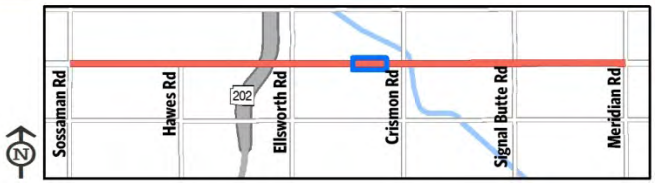
Source: ADOT, MCDOT, MAG, Maricopa County Assessor

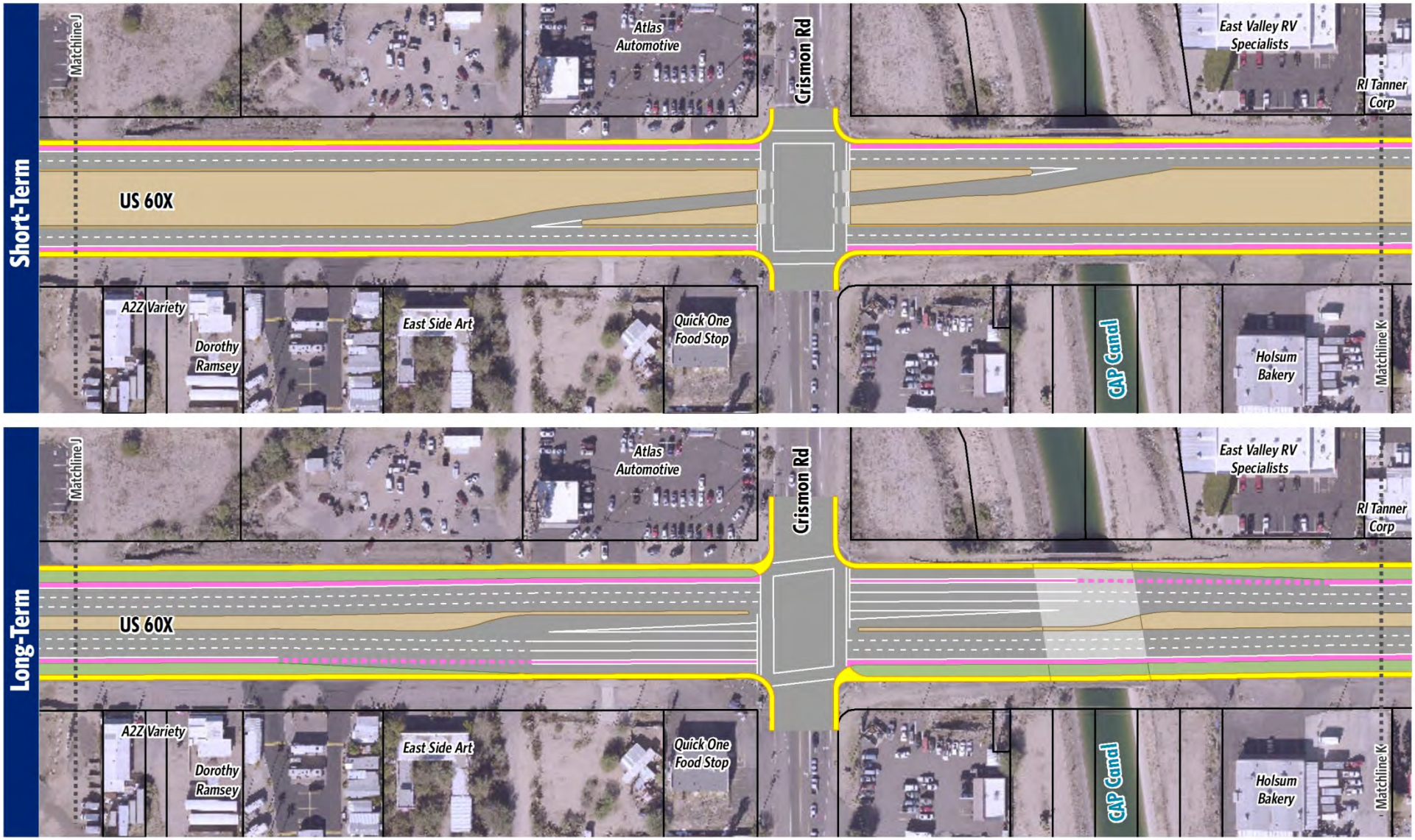



Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

*Source: ADOT, MCDOT, MAG, Maricopa County Assessor*

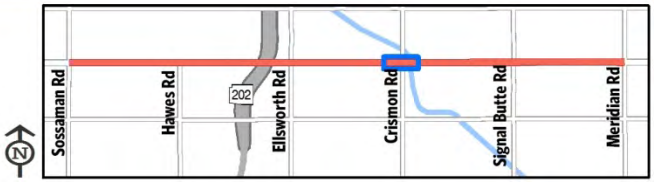


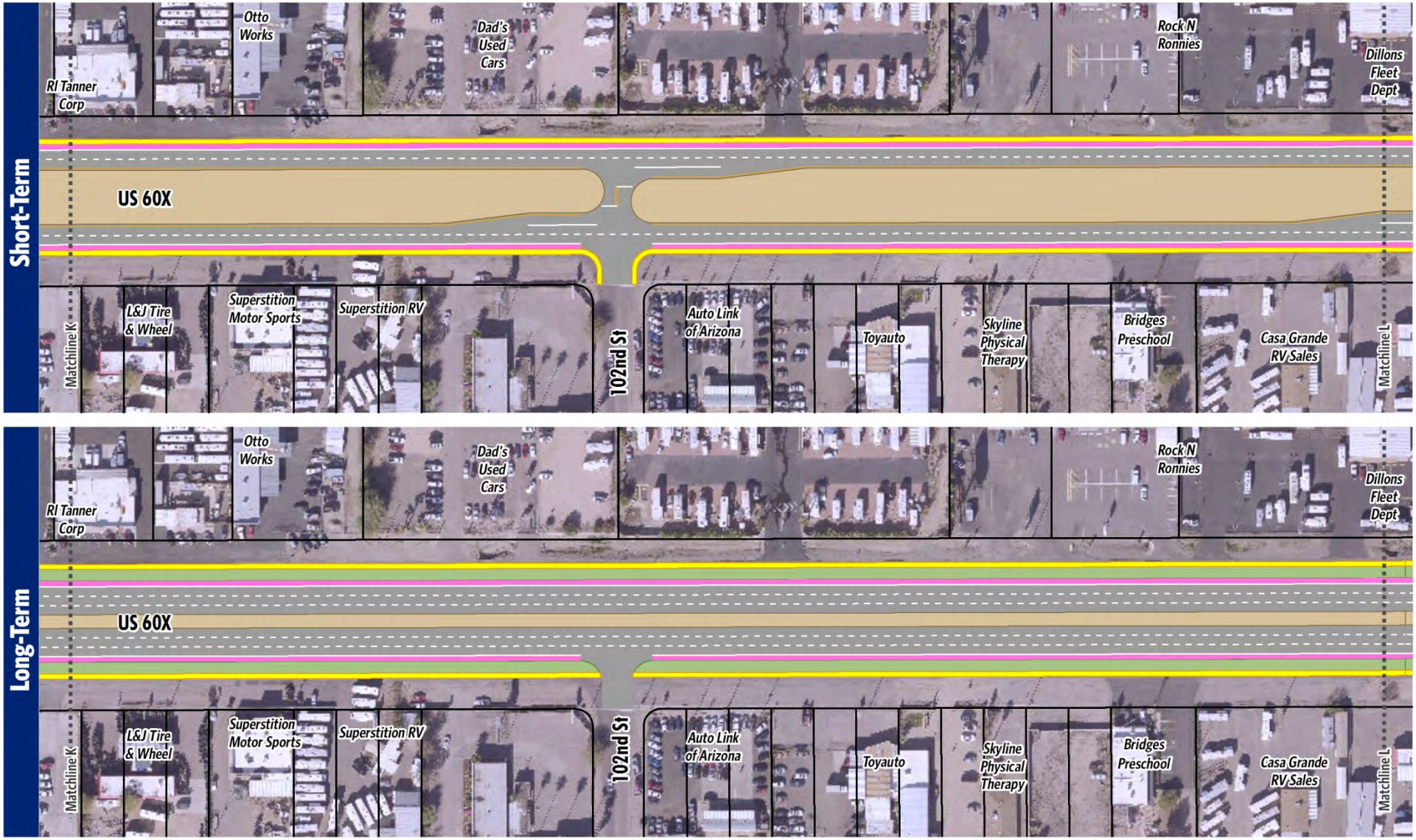



Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

Source: ADOT, MCDOT, MAG, Maricopa County Assessor

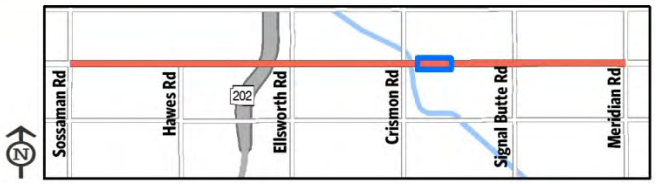


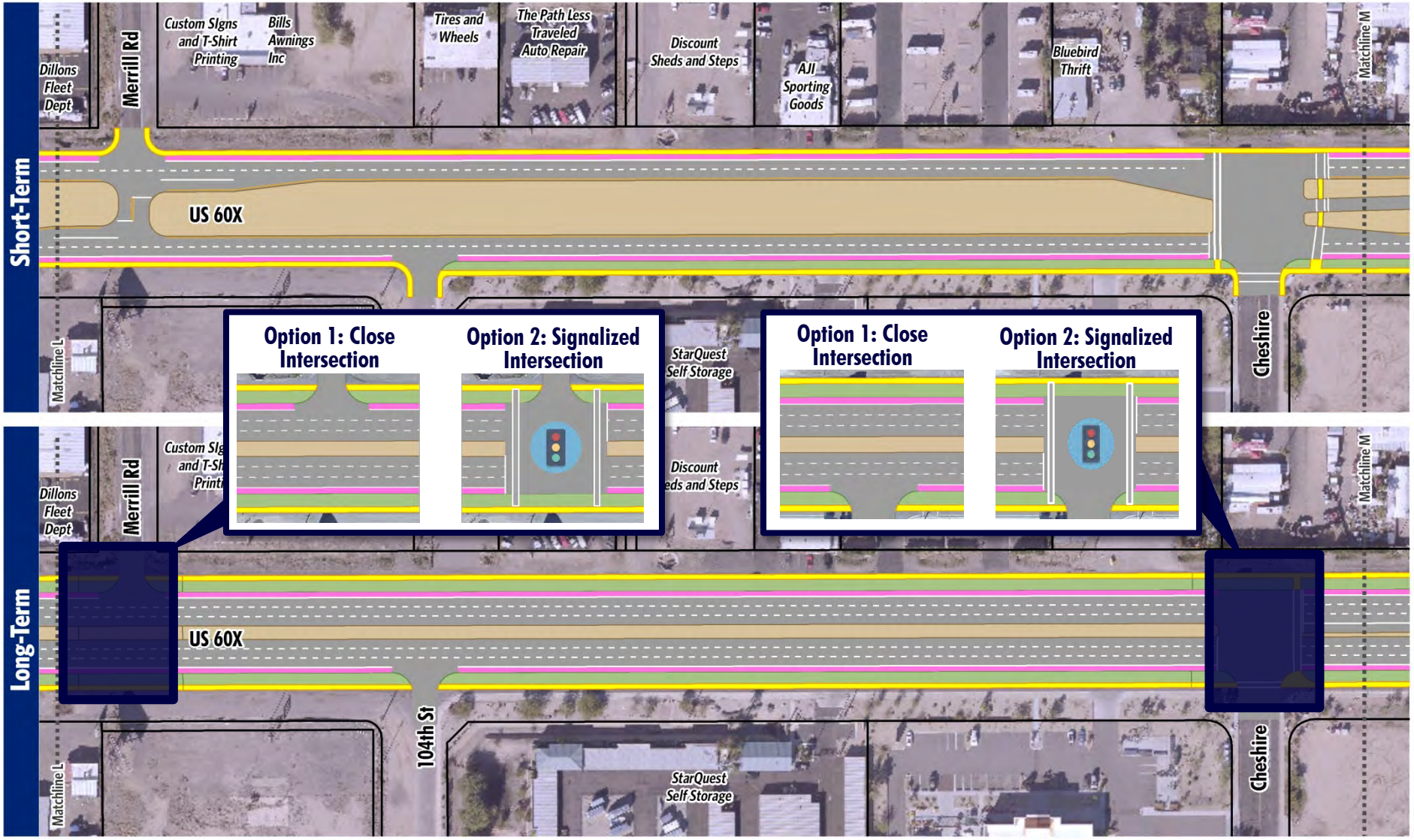



Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

Source: ADOT, MCDOT, MAG, Maricopa County Assessor

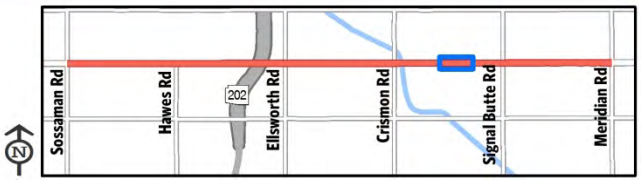


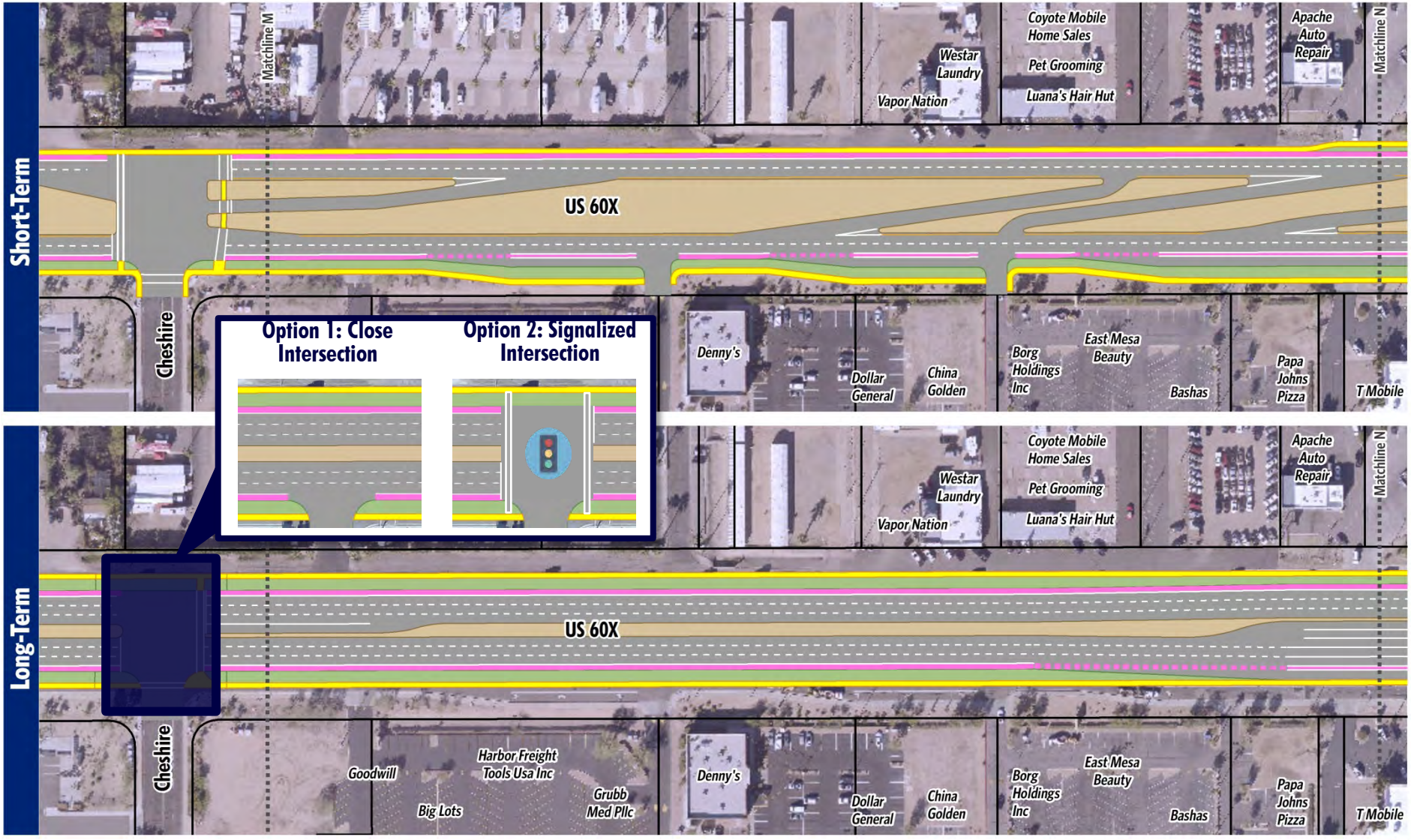


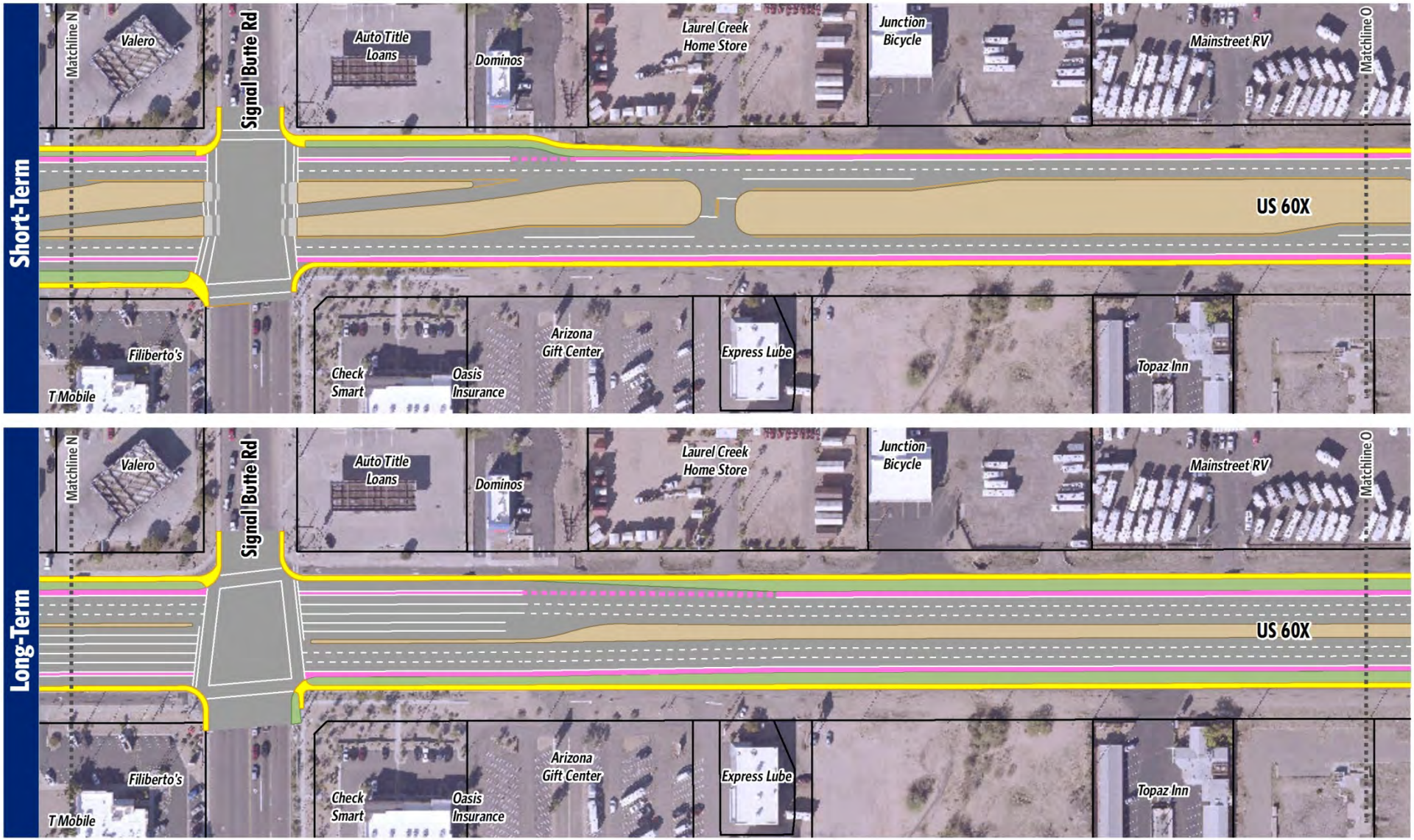

Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

Source: ADOT, MCDOT, MAG, Maricopa County Assessor



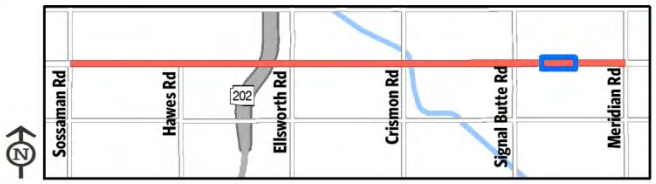

Short-Term
Long-Term
US 60X
US 60X
Matchline M
Matchline N
Cheshire
Cheshire
Option 1: Close Intersection
Option 2: Signalized Intersection
Westar Laundry
Vapor Nation
Coyote Mobile Home Sales
Pet Grooming
Luana's Hair Hut
Apache Auto Repair
Denny's
Dollar General
China Golden
Borg Holdings Inc
East Mesa Beauty
Bashas
Papa Johns Pizza
T Mobile
Goodwill
Big Lots
Harbor Freight Tools Usa Inc
Grubb Med Pllc
Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary
0
200
Feet
Source: ADOT, MCDOT, MAG, Maricopa County Assessor
N
Sossaman Rd
Hawes Rd
202
Ellsworth Rd
Crismon Rd
Signal Butte Rd
Meridian Rd

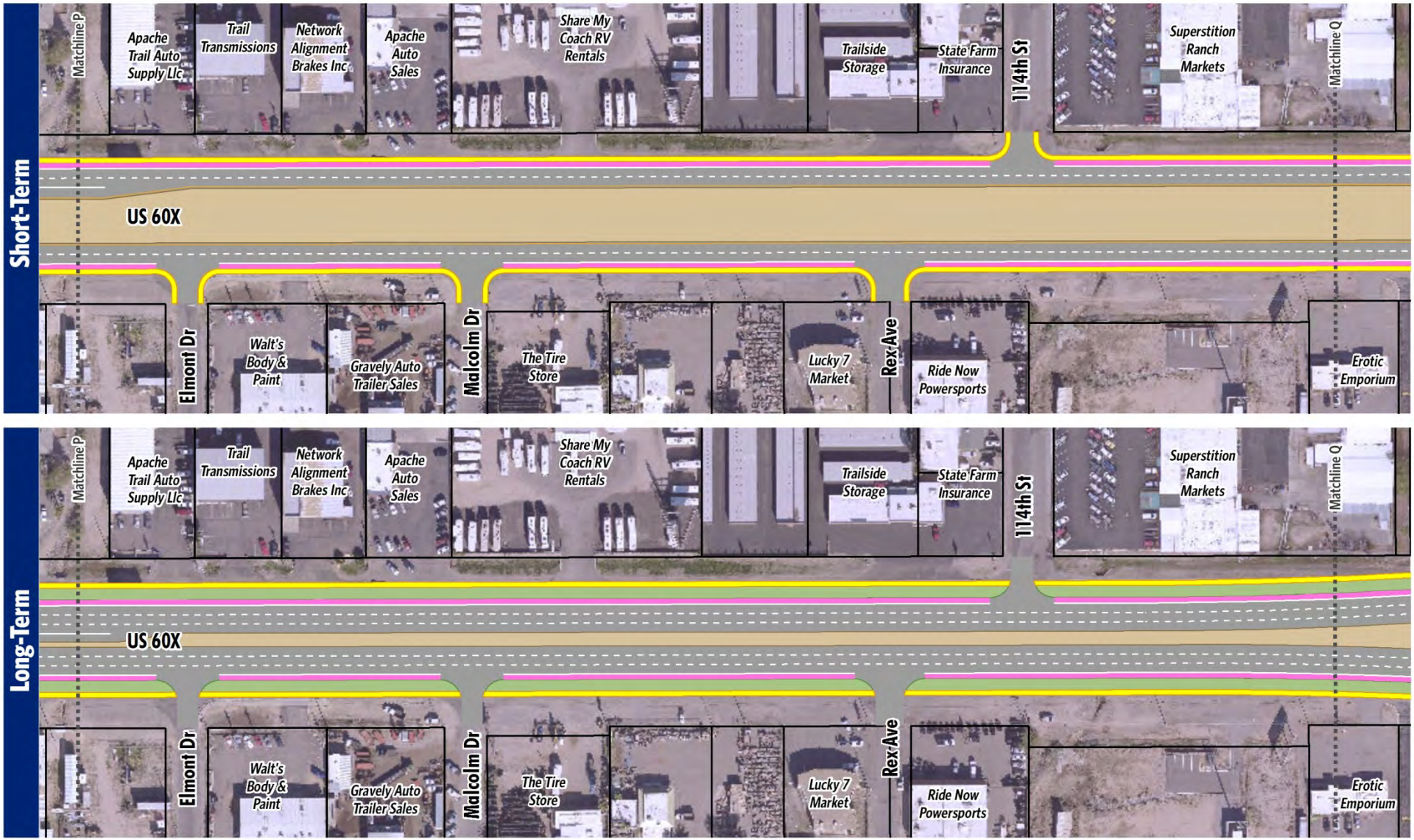

Short-Term
Long-Term
Matchline N
Matchline O
Valero
Signal Butte Rd
Auto Title Loans
Dominos
Laurel Creek Home Store
Junction Bicycle
Mainstreet RV
US 60X
Filiberto's
T Mobile
Check Smart
Oasis Insurance
Arizona Gift Center
Express Lube
Topaz Inn
Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary
0
200
Feet
Source: ADOT, MCDOT, MAG, Maricopa County Assessor
Sossaman Rd
Hawes Rd
Ellsworth Rd
Crismon Rd
Signal Butte Rd
Meridian Rd
202
N


Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

*Source: ADOT, MCDOT, MAG, Maricopa County Assessor*

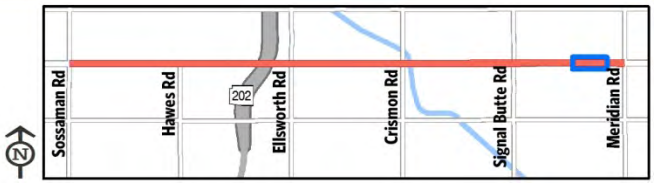


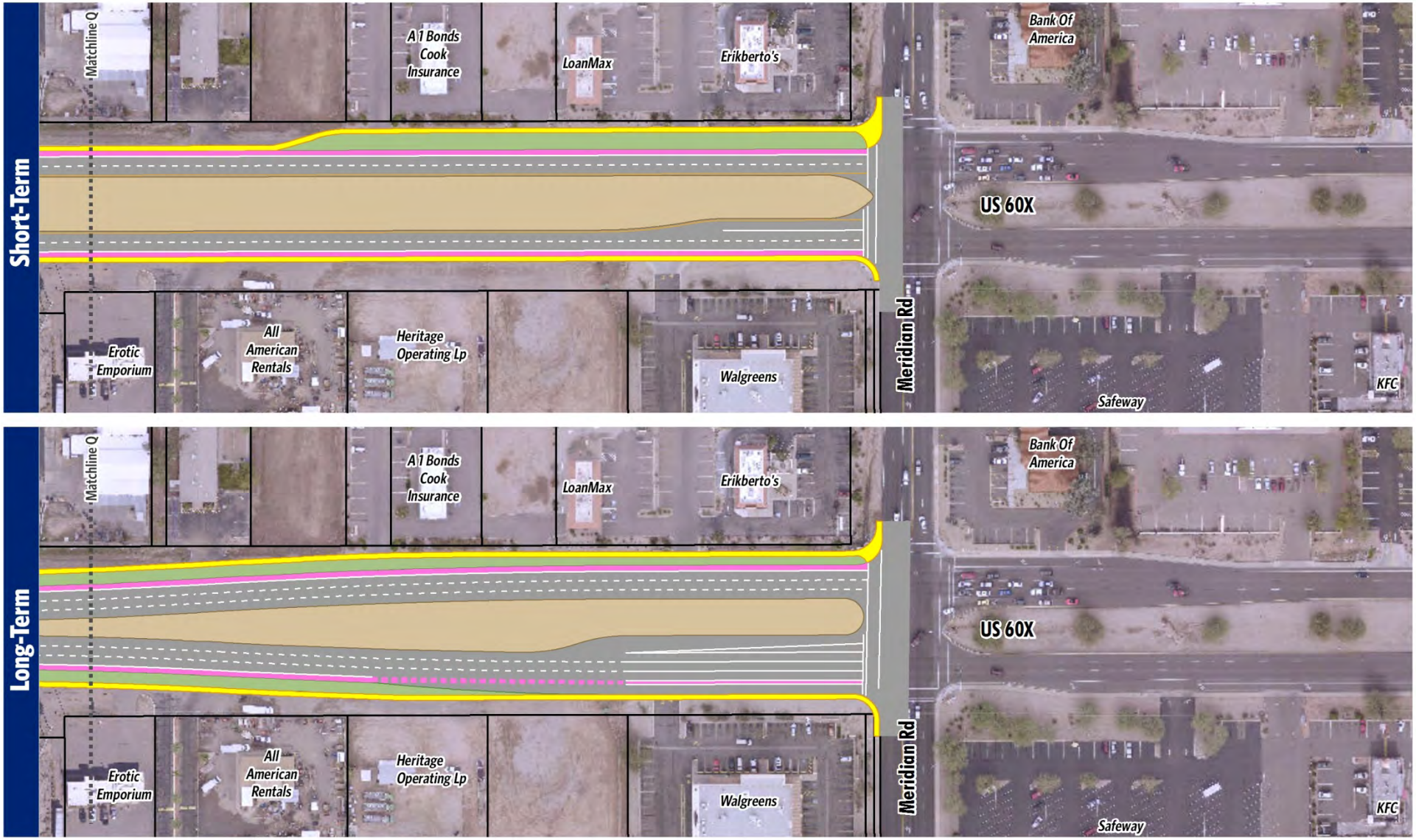



Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

Source: ADOT, MCDOT, MAG, Maricopa County Assessor

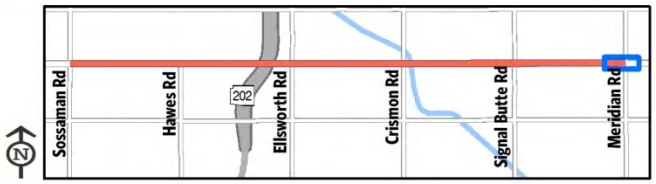





Asphalt Roadway
Concrete Roadway
Median
Sidewalk
Landscaped Buffer
Bike Lane
Parcel Boundary

0 200 Feet

Source: ADOT, MCDOT, MAG, Maricopa County Assessor



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