City of Yuma
Transportation Master Plan

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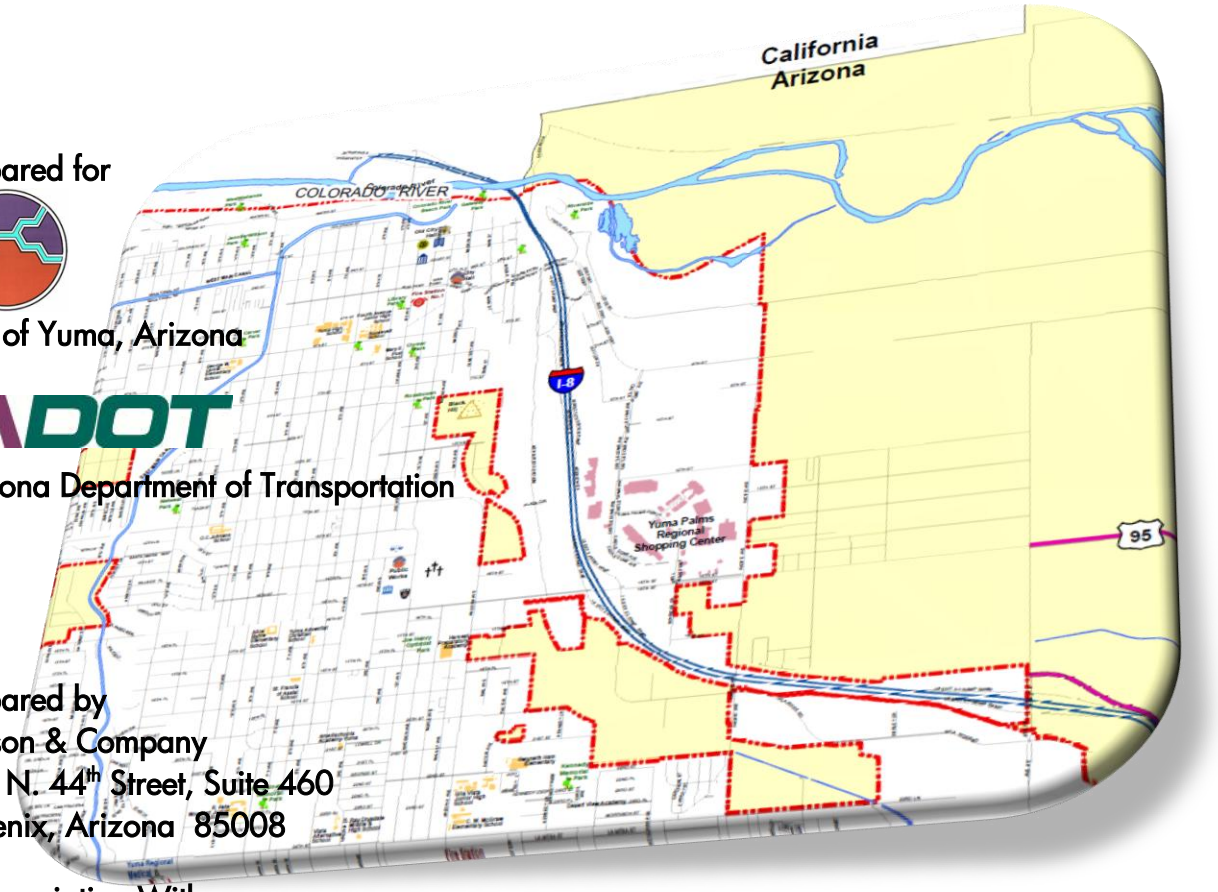
City of Yuma Transportation Master Plan

Final Report



Prepared for

City of Yuma, Arizona
&
ADOT
Arizona Department of Transportation

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1.0 INTRODUCTION

This Transportation Master Plan (TMP) provides a framework for developing an effective and efficient multimodal transportation system to serve the City of Yuma well into the future. This plan contemplates the City's future under an assumption of Buildout conditions, which reflect potential development over the next 40 to 60 years. The TMP has been conceived and developed to ensure transportation systems are affordable and safe. It includes policies and investment strategies for traditional roadway improvements; but, as a multimodal plan, it also outlines enhancements to public transportation, bicycle facilities, pedestrian environments, and other mobility and accessibility functions. The principal objective is to establish a plan that promotes the health, welfare, and mobility of Yuma's residents and visitors in a safe, efficient, and environmentally sensitive manner.

1.1 BACKGROUND

In 2012, City of Yuma voters approved a comprehensive update of the General Plan that provides a framework for the City's growth and future development and includes a Transportation Element. The Transportation Element was derived from various planning documents, including the City's *Major Roadways Plan*, completed in 2005. The *Major Roadways Plan* was based on assumptions for growth and development that were severely compromised by the significant global recession manifested in 2007. As a consequence of the recession, the City, region, and State suffered funding shortfalls that severely impacted the ability to sustain pre-recession transportation system development practices. Investment in the City's transportation infrastructure declined considerably, leading the City to focus on transportation system maintenance and provide only minor upgrades to roadways and intersections, or forestall major roadway projects altogether.

Despite financial constraints and adjustments resulting from the recession, the City must continue to plan for the future with mobility being a critical component to the community's economic viability and quality of life. The General Plan attempts to address some of the deficiencies now present due to the recessionary impacts on revenue and highlights several issues currently affecting mobility within the City: an incomplete roadway grid system, a lack of adequate and safe pedestrian facilities, and a discontinuous bikeway system. Significant advances have been made in the provision of public transit service with creation of the Yuma County Intergovernmental Public Transportation Authority (YCIPTA). Nevertheless, identification of transportation issues and other general mobility concerns in the General Plan and the need to have a more coordinated approach to future transportation decisions stimulated this further, more detailed and comprehensive examination of the City's transportation system.

The TMP has been developed to identify focused strategies for addressing near term issues of mobility and accessibility and establish a long term framework within which future transportation challenges of the community may be addressed in a comprehensive and coordinated manner. While some assumptions and recommendations of the *Major Roadways Plan* may still hold true today, future investments in the City's transportation system must integrate improvements to key transportation corridors with increasing demand for bicycle, pedestrian, and transit travel. Targeting transportation improvements is an effective means of supporting reinvestment and building more choice, convenience, and cost-effectiveness into the total transportation system.

Developing a "Complete Streets" model for the transportation system offers the City of Yuma a framework of principles directed toward accommodating the travel of all people, regardless of age, ability, income, ethnicity, or chosen mode of travel. These principles guide roadway design and development to enable the City to create a street network that is integrated and connected with

appropriate facilities for each mode of travel. Adopting a Complete Streets policy means changing the transportation planning and design process as well as funding decisions to ensure the needs of all travelers are identified, understood, and accommodated by each project undertaken. The result is that Complete Streets are created that enable safe and efficient movements throughout the community.

The TMP, therefore, seeks to identify a bundle of projects and services to improve access to transportation for persons with varying mobility needs and capabilities. The objective is to ensure all modes are developed and maintained to provide viable options for different ways or modes of traveling within the study area. Because mobility, which includes connectivity and accessibility, extends beyond the City's incorporated limits and Municipal Planning Area (MPA), development of the TMP relied on collaboration with neighboring communities and affected public agencies to achieve a more efficient multimodal transportation network.

1.2 PURPOSE OF STUDY

The TMP serves as guidance for decision makers, residents, employers, and future investors during implementation of significant mobility improvements that will, in turn, influence current and future manufacturing, commercial, agricultural, and tourism activities. It establishes a clear vision of the City's short- and long-term transportation priorities, aligning the City's future transportation needs and projects with the needs and projects identified by neighboring municipalities (specifically Somerton and San Luis). In addition, the TMP recognizes and meshes with planning objectives associated with:

- Transportation Needs for the Foothills and Mesa Del Sol Areas (April, 2012);
- Regional Transportation Plan: 2014-2037 (RTP) development by the Yuma Metropolitan Planning Organization (YMPO);
- Plans and policies being developed by YCIPTA;
- Service and access needs of Yuma International Airport (YUM); and
- Access and air space needs of the Marine Corps Air Station-Yuma (MCAS-Yuma).

Through active coordination and collaboration with adjacent jurisdictions, this Transportation Master Plan will become a viable mechanism for improving connectivity with these jurisdictions and other transportation stakeholders represented in the region and beyond.

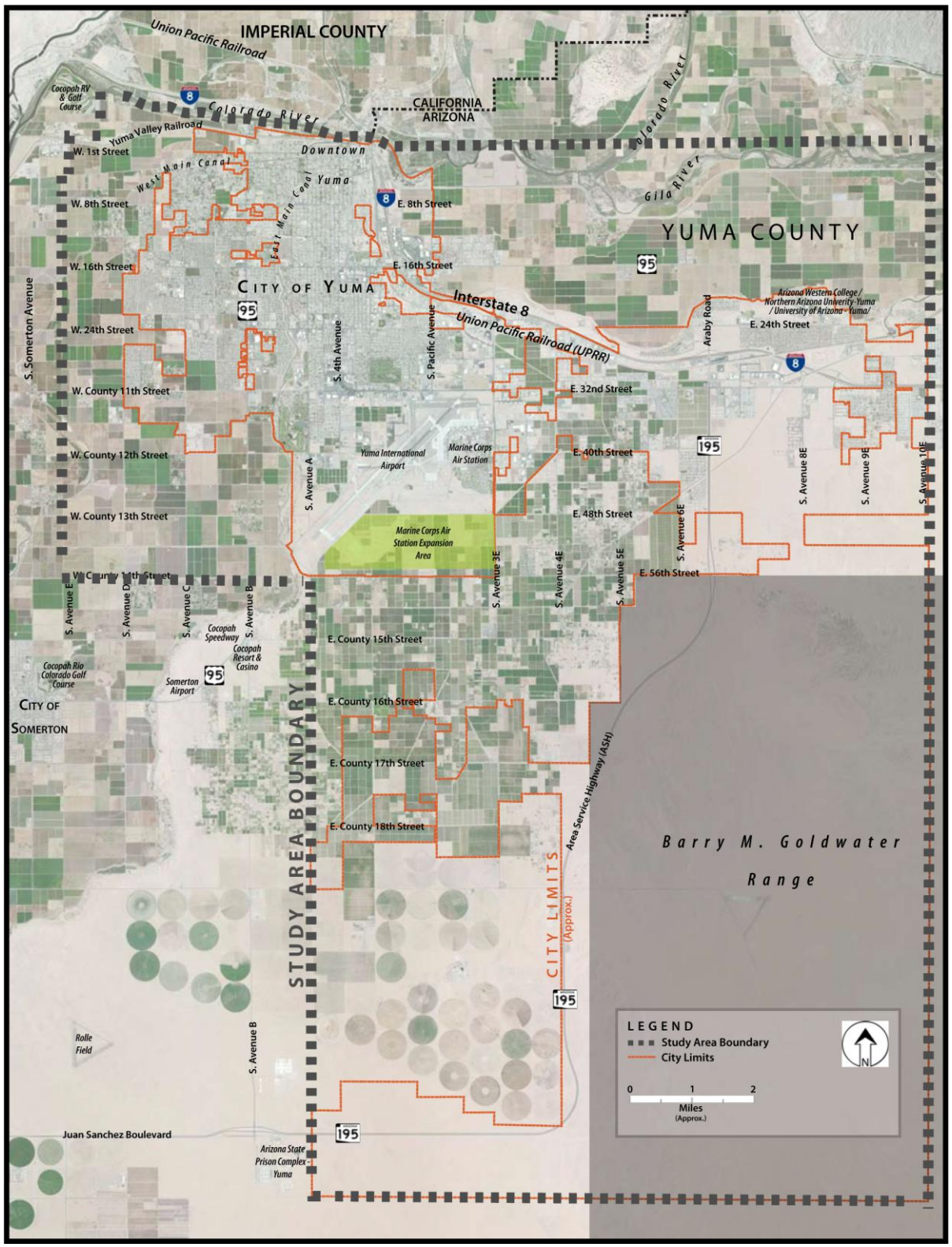
1.3 DESCRIPTION OF THE STUDY AREA

The study area for the City of Yuma TMP is equivalent to the City's MPA, which encompasses approximately 194 square miles (SqMi) or 124,000 acres (**Figure 1**). Approximately 60 percent of the MPA (116 SqMi or 74,240 acres) lies within the incorporated limits of the City. This includes approximately 52 SqMi contained within the Barry M. Goldwater Range (BMGR), which occupies the southeastern corner of the study area. The 78 SqMi (approximate) outside the boundary of the City under the jurisdiction of Yuma County predominately is associated with four large agricultural areas:

- Western Colorado River – west of the City and the airport (approx. 16 SqMi);
- Northeastern Gila River – north of Interstate 8/24th Street (approx. 23 SqMi);
- Citrus growing area – east, southeast, and south of the airport/MCAS (approx. 18 SqMi); and
- Center pivot irrigation area – south of County 18th Street to SR-195/Araby Road (approx. 17 SqMi).

The remainder of the study area (approximately four square miles) lies within smaller pockets of the County and in County Islands within the city limits of Yuma.

FIGURE 1 – PROJECT STUDY AREA



The TMP addresses the interconnections of the major travel facilities and services within the study area. It also identifies strategies and projects to be implemented in the future for improving connectivity to assure efficient and effective mobility for residents and visitors, while supporting necessary transportation needs of commerce and industry.

1.4 SOCIOECONOMIC CHARACTERISTICS OF THE STUDY AREA

The City of Yuma is the largest City in Yuma County by area and by population. The Arizona Department of Administration (ADOA) estimated the City's 2013 population at 95,717 year-round residents. This represents 46 percent of the 2013 estimated Yuma County population of 209,323. In the winter months, the population of the region increases by approximately 80,000 with the addition of seasonal visitors and workers.

The MCAS-Yuma is a major socioeconomic engine within the study area. The dynamics of the military facility, related training activity, and associated research and development enterprises have attracted new industry, created jobs, and contributed to economic growth. Although clearly assets to the community, the influx of winter visitors and the population and commercial activity associated with MCAS-Yuma adds extra demand to study area roadways.

As the study area continues to Buildout conditions, additional demands will be placed on existing study area transportation facilities, and expansion of current facilities and services will be required to serve newly developing areas. **Figures 2 and 3** display the location and concentration of new development, in terms of new dwelling units and employees, as the study area builds out according to anticipated land uses documented in the General Plan.

Study area population and employment are anticipated to approximately double existing levels under assumptions for Buildout conditions of the study area. Major population growth areas include the area directly southwest of the core area of the City of Yuma; along the eastern edge of the study area south of Interstate 8 near the foothills; and in the Estancia planned development area, south of County 16th Street, particularly along SR-195/Area Service Highway (ASH). Major growth in employment is anticipated to occur in and around the Yuma International Airport/MCAS-Yuma complex, along the Interstate 8 corridor, and west of the SR-195/ASH corridor in the Estancia planned development area.

FIGURE 2 – ANTICIPATED CHANGES IN DWELLING UNITS UNDER BUILDOUT CONDITIONS

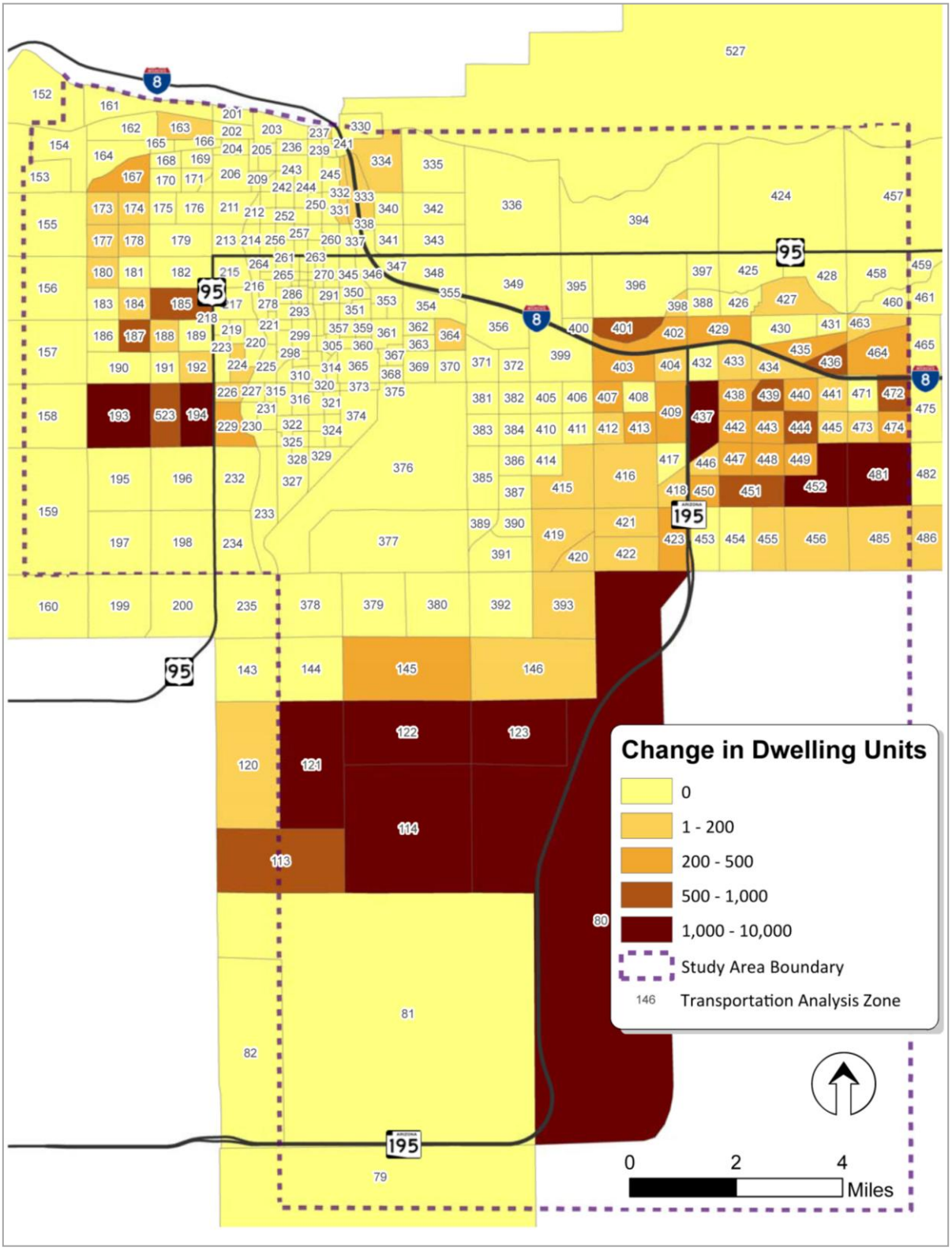
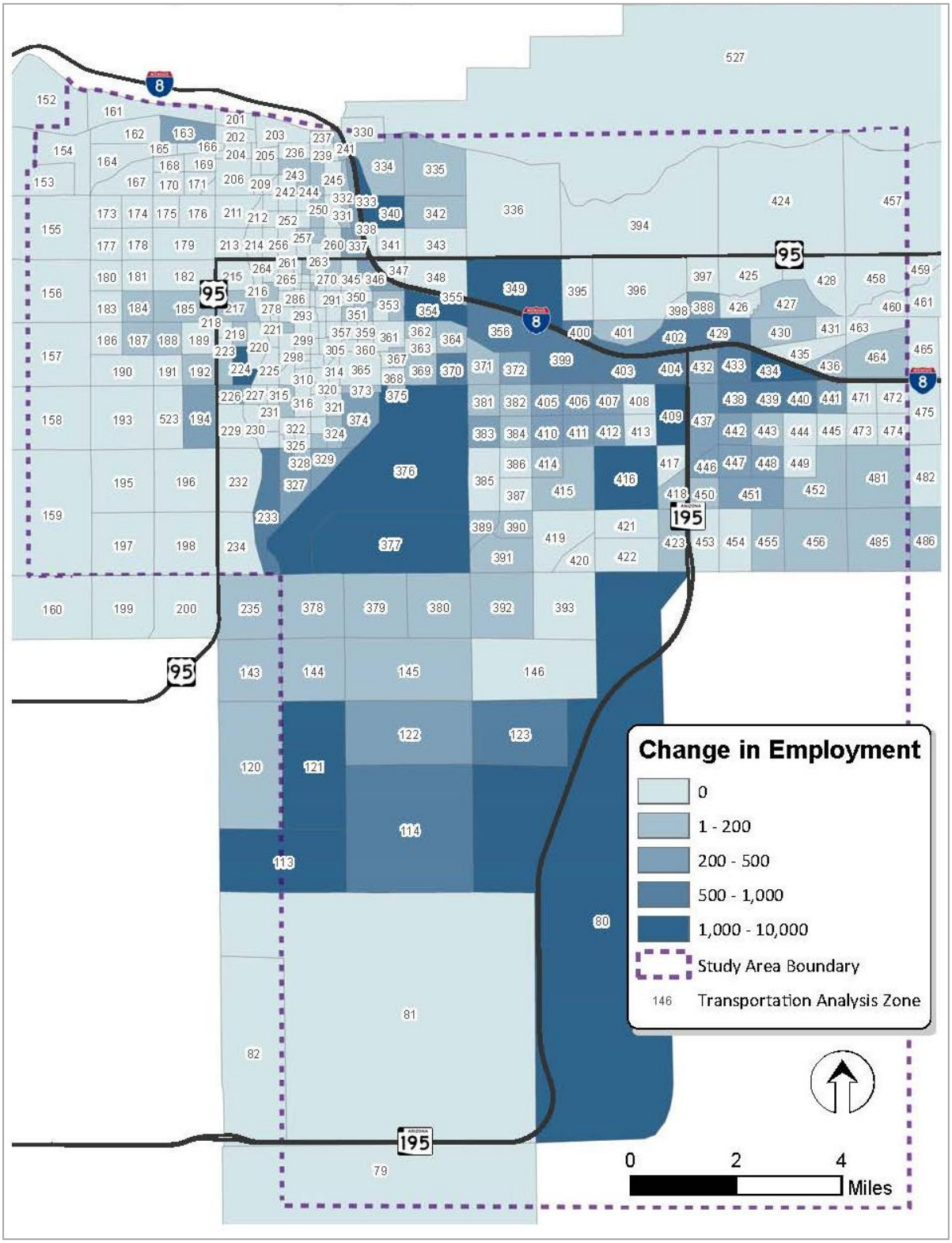


FIGURE 3 – ANTICIPATED CHANGES IN EMPLOYMENT UNDER BUILDOUT CONDITIONS



2.0 TRENDS AND CONDITIONS

The *Major Roadways Plan* was adopted to provide a rational, fiscally responsible framework for developing a comprehensive system of roadways, sidewalks, and paths for the safe and efficient movement of people, goods, and cargo within the area under the jurisdiction of the City. The objectives of the *Major Roadways Plan*, initially developed in 1997 and updated in 2005, remain essentially the same today. However, social, economic, and political changes have occurred that make a large portion of the plan untenable in its current form. A comprehensive evaluation of City transportation needs was necessary to provide a long-term implementation guide to address changes in transportation priorities.

Thus, the TMP provides guidance for developing an innovative transportation system that ultimately will incorporate and integrate all modes of travel, while promoting mobility and safety through infrastructure investments and renewal. It provides a "new" baseline transportation planning framework within which safety improvements, traffic congestion, multimodal transportation needs, and roadway network improvement priorities may be addressed.

The study area has an extensive transportation system facilitating the movement of people and goods. Major routes associated with the roadway network provide important linkages between and among origins and destinations within the City that are critical to the social and economic vitality of the community. Some of these routes also provide vital links for regional and inter-jurisdictional travel, as well as support mobility and accessibility needs associated with national markets and destinations. Public transit services rely on the roadway network to enhance mobility and accessibility options in the study area, and the recently created YCIPTA is well on the way to building a responsive public transportation organization. While much has been accomplished to improve bicycle and pedestrian facilities, essential links are missing, and safety and security on these facilities is lacking. Finally, railroad operations and freight transport, whether associated with the expansive agricultural activities of the study area, commercial/industrial enterprises, or international trade with Mexico through the San Luis Land Port of Entry (LPOE), have long been key components of the City's transportation system. Assuring efficient and effective goods movements remains important to the balance and performance of the City's economy.

The following provides a summary of the current status of the study area transportation system and services, along with a description of anticipated needs to serve existing and future study area growth. Additional detail is provided in Appendix A - *Working Paper 1: Current and Future Conditions*.

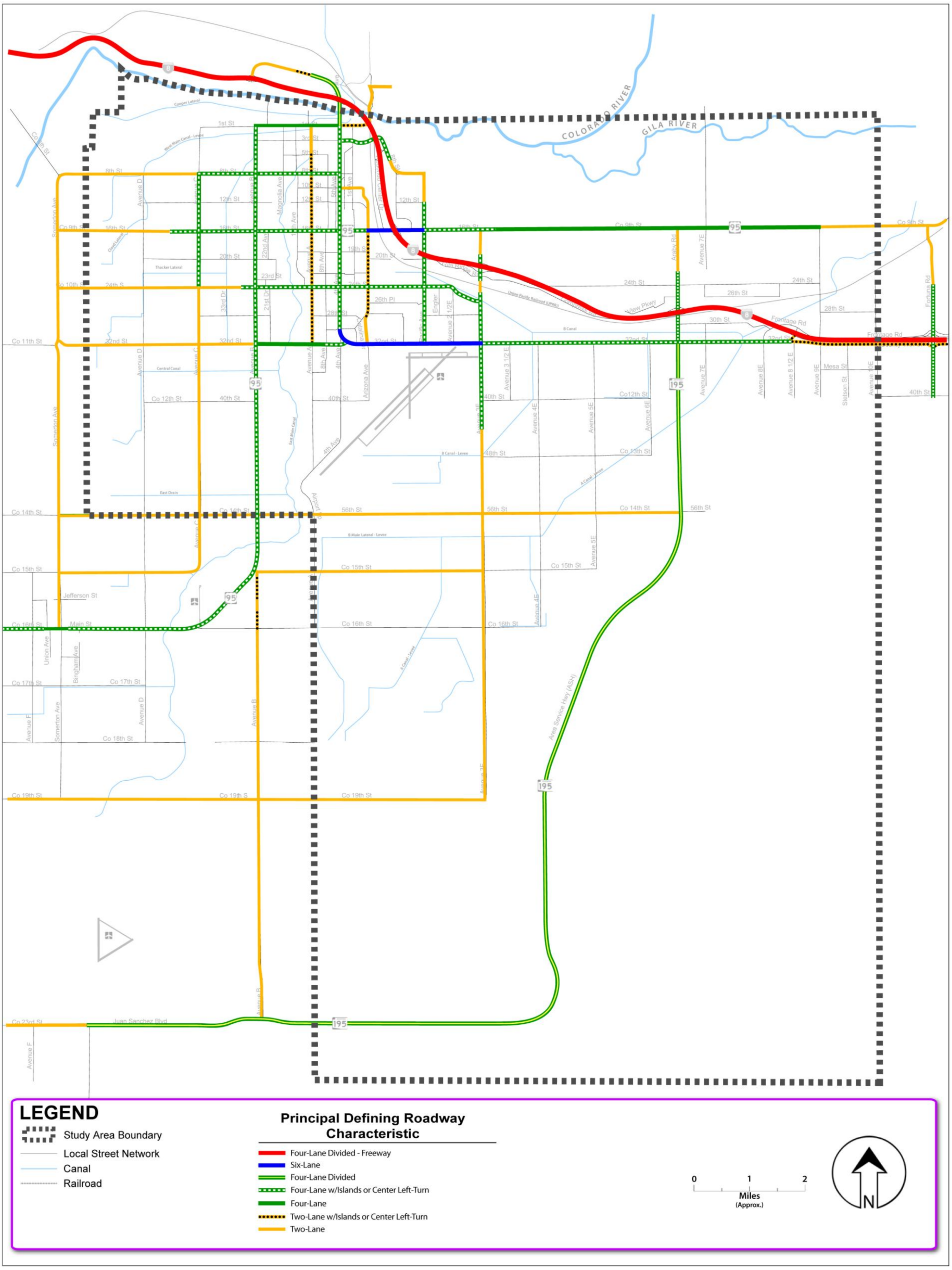
2.1 CURRENT ROADWAY NETWORK CHARACTERISTICS

The study area roadway network consists of three principal components: roadways of the State Highway System (SHS); major urban roadways or arterials; and local streets (**Figure 4**). The focus of the TMP is on the first two categories, although consideration of facilities in the third category certainly is necessary when considering linkages to enhance mobility and accessibility.

2.1.1 STATE HIGHWAY SYSTEM

Three roadways on the State Highway System (SHS) are critical to the study area transportation network. These facilities contribute to regional mobility, assure national connectivity, and support international trade.

FIGURE 4 – MAJOR STUDY AREA ROADWAYS



- Interstate 8 (I-8) is the major east-west highway running through the northern portion of the study area. I-8 provides access to West Coast markets and connects with the larger Interstate system to the east for access to Central Arizona, the Midwest, Northeast, and East Coast markets.
- US-95 is a critical north-south facility connecting the City and study area with Mexico at the San Luis I LPOE, approximately 25 road miles south of I-8. US-95, also referred to as the Western Passage of the CANAMEX Corridor, extends north from Yuma through Las Vegas, NV, to northern Idaho and Canada.
- State Route (SR) 195 (Area Service Highway – ASH), is a north-south roadway connecting San Luis to I-8. This facility provides an alternative to US-95 for regional, national, and international travel and freight shipments. It also is an essential roadway link for the San Luis II Commercial LPOE, completed in 2009, which is situated on Avenue E at the U.S./Mexico border.

The CANAMEX Corridor Project has the key objective of creating a direct trade route from Canada to Mexico through supporting US States en route, including Montana, Idaho Nevada, Utah, and Arizona, to harvest the benefits of increased trade, tourism, and economic activity within the region.

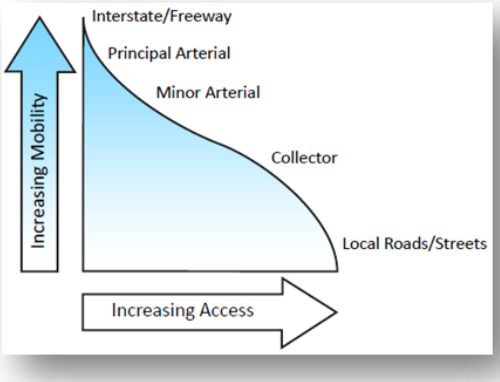
Source: CANAMEX Corridor Coalition

2.1.2 LOCAL ROADWAY NETWORK

Beyond the three SHS facilities, the study area is served by a roadway network largely developed on a grid system supporting a functional hierarchy of access and mobility. That is to say, the different streets forming the local roadway network are identified according to the purpose or function of the street relative to travel needs in the community and the travel demand of its citizens.

- Principal Arterial streets serve to move regional traffic at moderate speeds, while providing limited access to adjacent land.
- Minor Arterial streets serve regional/sub-regional traffic circulation needs by moving traffic at moderate speeds, while providing limited access to adjacent land and connections to Principal Arterials.
- Collector streets support shorter-distance trips and primarily serve to collect and distribute traffic between key traffic generators and between Local streets and Arterial streets and allow direct access to properties abutting the roadway.
- Local streets serve shorter trips (generally less than one mile), provide direct access to adjacent land, and collect/distribute traffic between key traffic generators, local streets, and arterial streets

Relationship of Functional Classifications



2.1.3 ROADWAY NETWORK FUNCTIONAL CLASSIFICATION

The concept of functional classification establishes a decision/design framework for a community's roadway network, i.e., roadways are classified by

the type of function they serve (see graphic at left). The application of functional classification principles appropriately integrates the highway planning and design process. The Federal Highway Administration (FHWA) provides elaboration of this concept as a roadway network design tool:

> *Once the functional classification of a particular roadway has been established, so has the allowable range of design speed. With the allowable range of design speed defined, the principal limiting design parameters associated with horizontal and vertical alignment are also defined. Similarly, a determination of functional classification establishes the basic roadway cross section in terms of lane width, shoulder width, type and width of median area, and other major design features.*

The functional classification system categorizes roads by how they perform in regard to providing access and mobility. A Principal Arterial, for example, provides mobility for longer-distance trips at high speeds with minimal access to adjoining properties. Conversely, the function of a Local Street is to support lower speeds and provide direct access to neighborhoods and properties in the community.

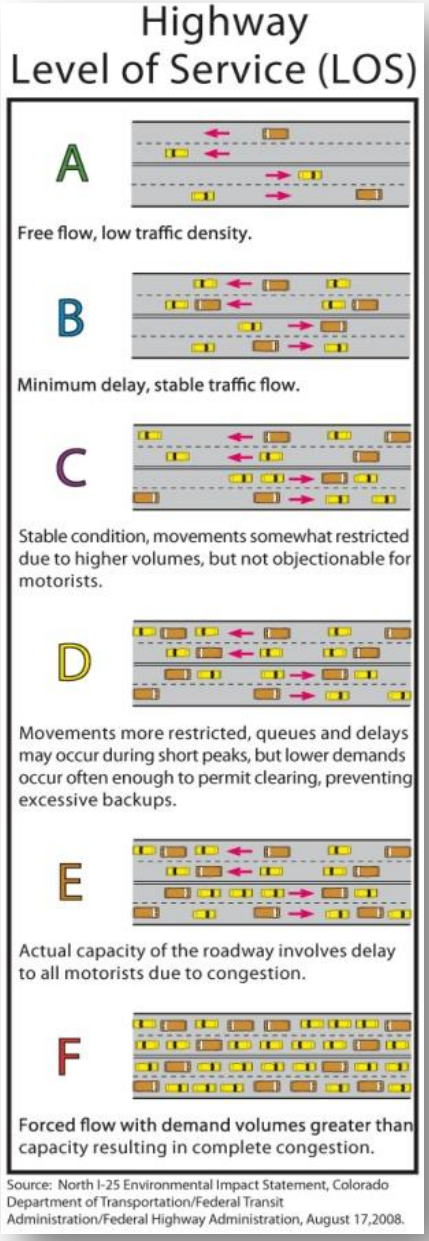
Figure 5 shows the current functional classifications of primary streets of the study area. The map clearly shows the street grid often referred to and understood in terms of "Mile Roads" and "Half-Mile" Roads and the three facilities on the SHS described above, as well as other major roadways. Excluding freeway ramps, seven functional classifications are shown. This functional classification system was adopted by ADOT in May, 2012, and approved by the FHWA in July, 2012.

2.1.4 ROADWAY NETWORK PERFORMANCE AND DEFICIENCIES

Roadway capacity is an important consideration in determining the overall health of the roadway network. Traffic congestion can be determined by comparing average daily traffic volumes to the vehicular capacity of the roadway. Roadway capacity typically is associated with functional classification of the roadway and the number of travel lanes available, particularly through travel lanes.

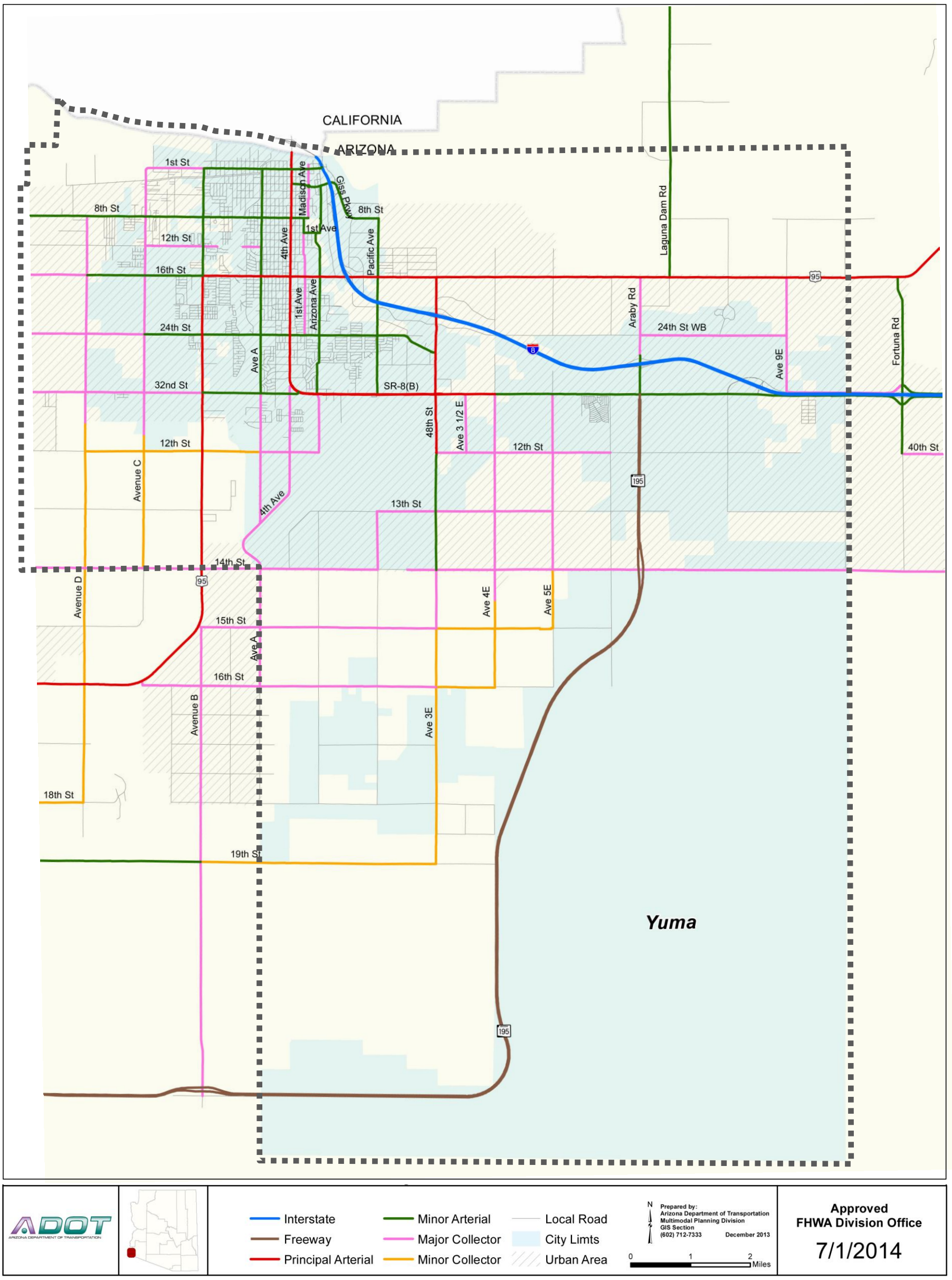
LEVEL OF SERVICE

Transportation engineers and planners commonly use a rating system to measure the operational status of roadway segments and interchanges/intersections comprising a local roadway network. This rating system is referred to as level of service (LOS), which yields a measurement of the performance of network components (see graphic at right).



Source: North I-25 Environmental Impact Statement, Colorado Department of Transportation/Federal Transit Administration/Federal Highway Administration, August 17,2008.

FIGURE 5 – EXISTING ROADWAY FUNCTIONAL CLASSIFICATION



ROADS AND STREETS LOS

The Highway Capacity Manual 2010 (HCM2010) defines LOS as a qualitative measure describing operating conditions associated with a traffic stream. Six levels of service, as shown in the preceding graphic, are defined using letters. LOS A represents the best operating condition, and LOS F is the worst. LOS is related to the expected capacity of the different roadway functional classifications.

- **LOS A** represents free flow conditions with little or no impedance to travel.
- **LOS B** is in the range of stable flow, but the presence of other traffic begins to be noticeable.
- **LOS C** also is in the range of stable flow, but marks the beginning of the range in which the operation of individual vehicle operators becomes significantly affected by others
- **LOS D** represents high-density traffic conditions, but stable flow. Speed and freedom to maneuver are severely restricted, and drivers experience a generally poor level of comfort and convenience.
- **LOS E** represents operating conditions at or near the capacity level of the roadway. All speeds are reduced to a low but relatively uniform value.
- **LOS F** defines forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point at a given period of time exceeds the amount which can traverse the point.

LOS for segments forming the existing roadway network, based on estimates of current travel demand, is shown in **Figure 6**. This figure reveals that all study area roadways are operating at LOS D or better.

Figure 7 displays LOS for the network with travel demand forecasted under Buildout conditions of the study area. As expected, the existing roadway network is not sufficient to provide acceptable LOS, particularly in identified growth areas. In addition, numerous streets are too constrained to permit widening or other design changes to create greater capacity. These streets are listed in **Attachment 1**.

LOS analysis indentifies congestion anticipated to occur over the course of the day. It does not, however, account for delays that could occur over a short period of high traffic demand, particularly at intersections during the peak periods of travel.

INTERSECTION LOS

Intersection LOS also is defined by six categories of service (see graphic at right). Operating conditions are defined in terms of the average vehicle delay of all movements through an intersection, usually in seconds per vehicle. Delay is attributed to signal operations and includes initial deceleration, queue move up time, stopped delay, and acceleration delay.

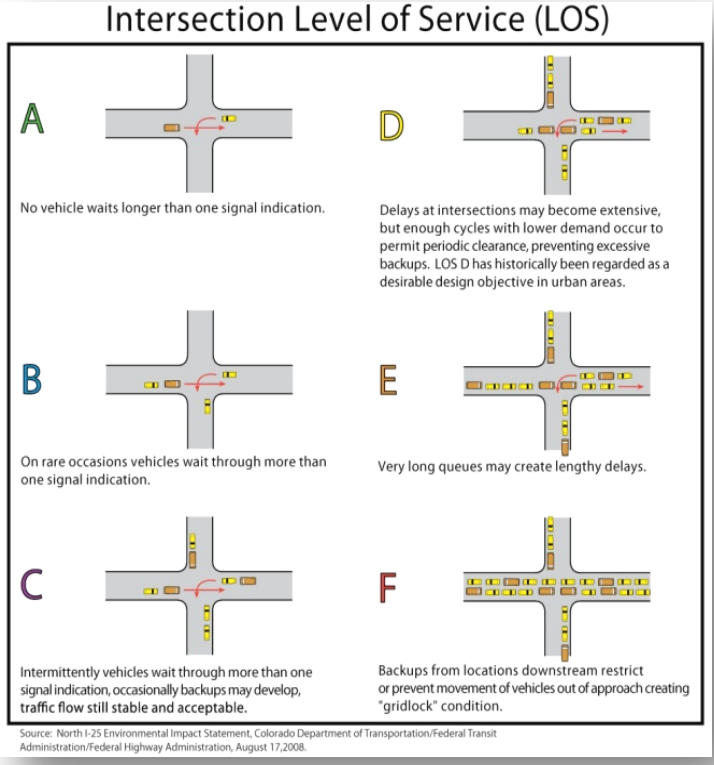


FIGURE 6 – EXISTING ROADWAY LEVEL OF SERVICE

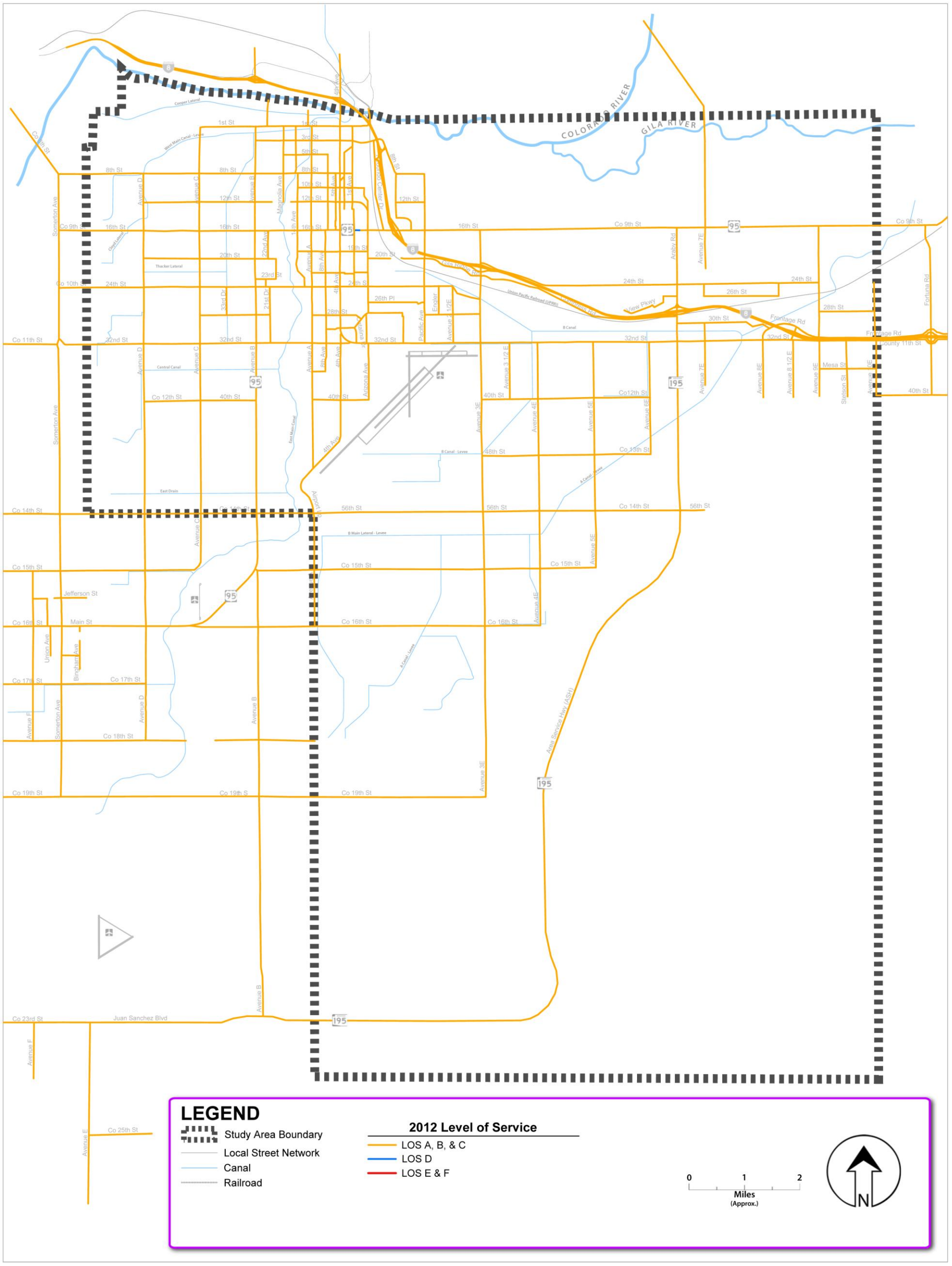
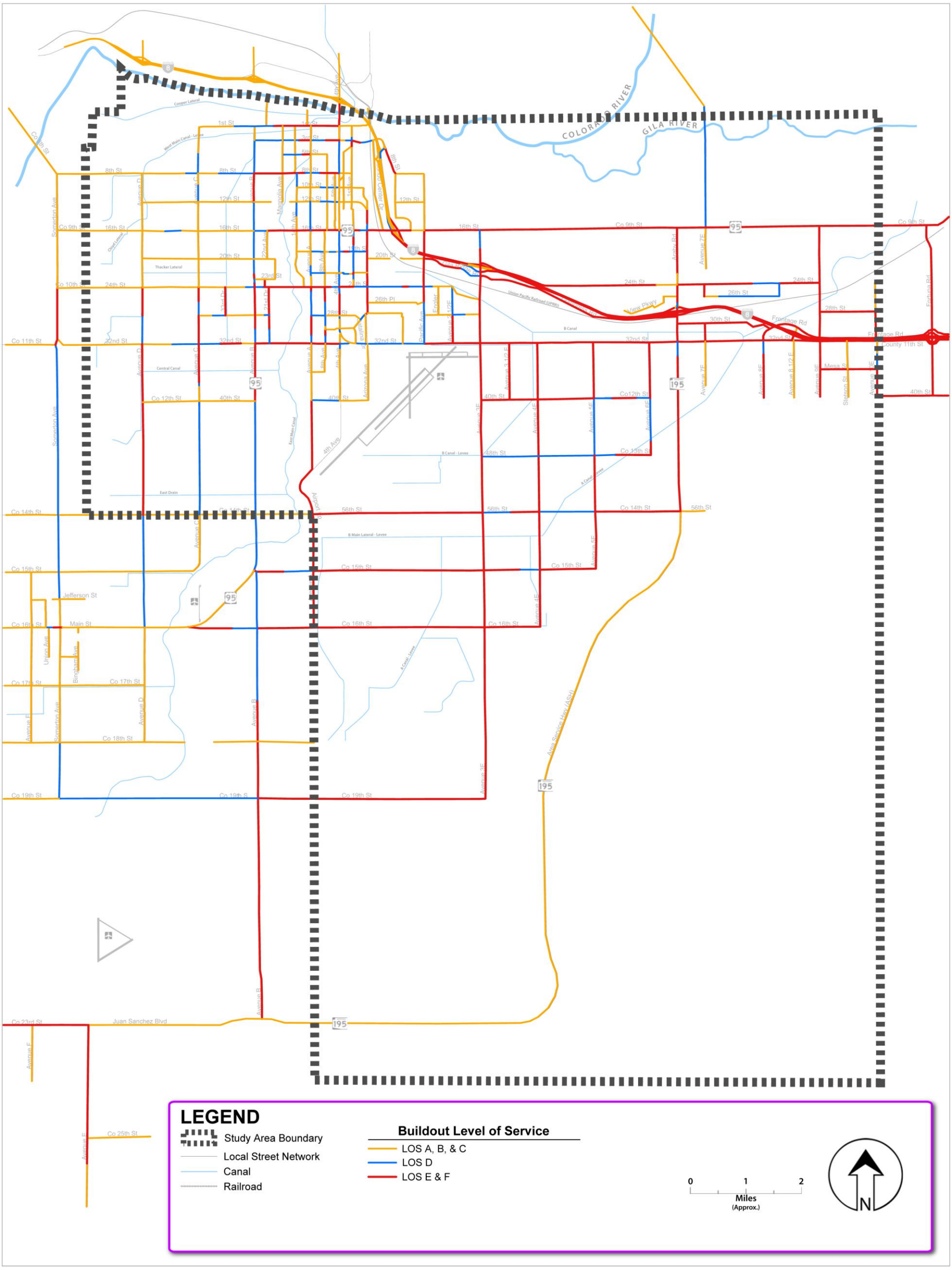


FIGURE 7 – FORECAST ROADWAY LEVEL OF SERVICE UNDER BUILDOUT CONDITIONS



Twelve intersections within the study area were surveyed to gain greater understanding of vehicle operations. The survey, conducted during the AM, Mid-Day, and PM peak periods, was based on a list provided by City staff identifying current and potentially critical intersections culled through the application of four criteria:

- Intersections currently experiencing problems;
- Intersections anticipated to experience problems in the future, due to development actions;
- Key intersections that had not been recently evaluated; and
- Intersections that are proposed for improvements.

Figure 8 identifies the 12 intersections surveyed and shows each location. The LOS analysis revealed that two of the 12 intersections currently are operating at LOS E or worse: the intersections of 24th Street/Avenue B and 32nd Street/Big Curve. Conditions at all intersections are anticipated to grow worse as the study area develops and additional travel demand is placed on the roadway network. Each of these selected locations is expected to experience degraded levels of service under Buildout conditions.

2.2 CURRENT TRANSIT SERVICES

Public transit service in the study area is provided by YCIPTA, which administers, plans, operates, and maintains the Yuma County Area Transit (YCAT) system. YCAT operates routes throughout Yuma County and parts of California. YCAT fixed-route services, vanpools, and Dial-A-Ride/Demand Responsive (DAR/DR) buses serve most of the study area with connections to the cities of San Luis and Somerton. YCAT also serves the Cocopah Indian Reservation, south of the study area; the Town of Wellton and unincorporated communities of Gadsden, Ligurta, and Fortuna in Yuma County, east of the study area; the Cocopah RV Resort, northwest of the study area, the Quechan/Fort Yuma Indian Reservation, north of the study area; and Winterhaven and El Centro across the Colorado River in California.

2.2.1 FIXED-ROUTE SERVICE

Fifteen routes (including three routes with selected service only) operate Monday through Saturday with a fleet of 18 large buses operating on fixed routes and nine small cutaways and vans geared to specialized services (e.g., DAR/DR). In addition, YCIPTA operates a "flexible" DR Service, the NightCAT, specifically to accommodate travel needs associated with Arizona Western College (AWC), Northern Arizona University-Yuma Campus (NAU-Yuma), and University of Arizona-Yuma Campus (UA-Yuma) at the integrated campus in the eastern portion of the study area. **Figure 9** shows the current extent of services provided through the YCAT system.


Photo from Yuma Regional Transit Study

YCAT's service includes routes extending beyond the City of Yuma to establish

FIGURE 8 – EXISTING LEVEL OF SERVICE (LOS) AT SURVEYED INTERSECTIONS

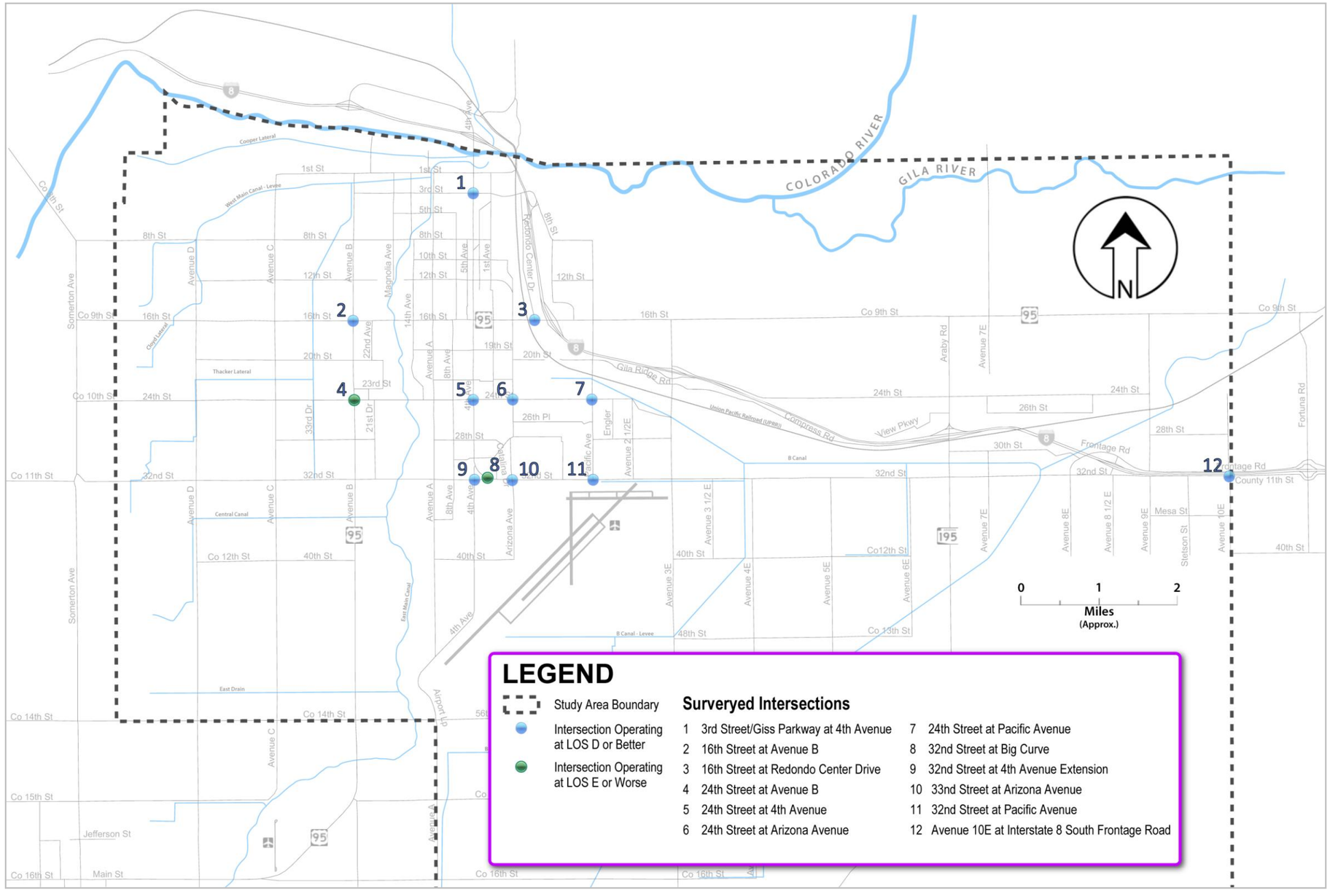
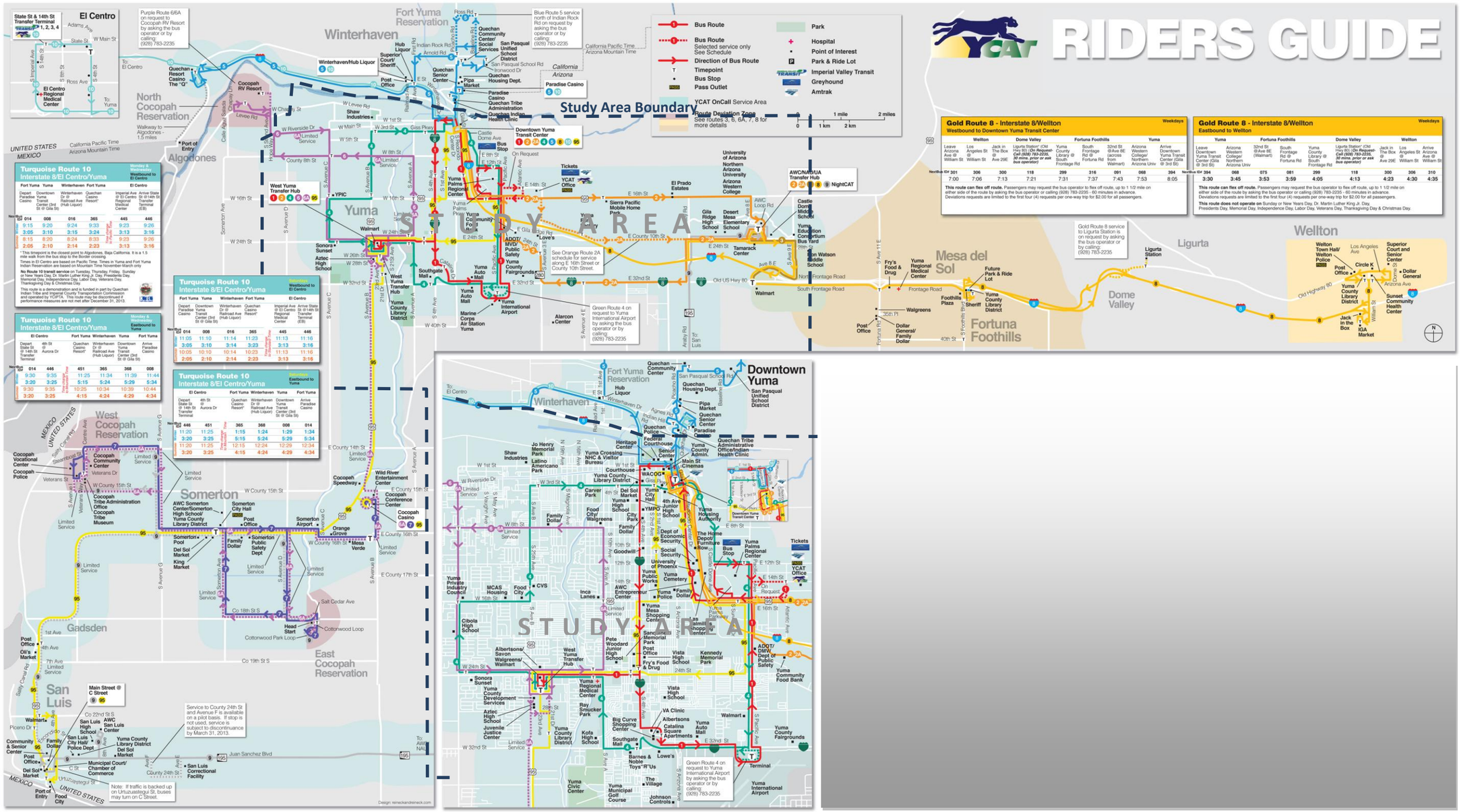


FIGURE 9 – EXISTING YCAT SYSTEM MAP



connections with significant regional destinations. Two routes connect the study area with Winterhaven, Quechan/Fort Yuma Indian Reservation, and Paradise Casino in California north of the study area; one route provides connectivity with the Fortuna Hills community east of the study area; and three routes serve to provide connectivity with Somerton, Cocopah Indian Community and Cocopah Casino Resort, and San Luis southwest of the study area.

2.2.2 OTHER SERVICES

The YCAT Vanpool service maintains an inventory of vans supporting transportation of multiple persons to/from high employment areas in the study area and areas of Yuma County not served by YCAT.

The Greater Yuma Area DAR service – "YCAT OnCall" – provides service to persons 60 years of age and older and those with a disability. The service area matches the YCAT service area. Minivans provide the door-to-door service needed by this specialized passenger group. The DAR system provides complementary Paratransit service within ¾ of a mile of YCAT routes. Anyone who is permanently or temporarily mobility impaired can use the YCAT OnCall service. Users are generally defined as persons of any age, who are functionally unable to use the regularly scheduled fixed route system.


Photo from Yuma Regional Transit Study

2.2.3 FACILITIES

YCIPTA also controls the route structure, passenger amenities, and operating facilities. YCIPTA facilities include transit centers, bus stops, and a vehicle maintenance facility.

Transit Centers: There are three prominent transit facilities within the study area that permit YCAT patrons to transfer between routes: Downtown Yuma Transit Center on 3rd and Gila streets; West Yuma Transfer Hub, located at the AWC/NAU/UA campus complex on the north side of 24th Street; and the Palms Regional Center, which includes two transfer facilities located on Castle Dome Avenue near Target on 12th Street, and on 16th Street near Yuma Palms Parkway/Sunridge Drive.


Photo from Yuma Regional Transit Study

Transit Stops: Most of the more than 500 transit stops on the YCAT system do not have a sign indicating there is a stop at the assigned location. A few have passenger amenities, such as bench, information, trash can, and other items. YCIPTA currently is in the process of developing Bus Stop Standards for the YCAT service area. The new standards will allow YCIPTA to evaluate the bus stops serving the community and determine what actions to take.

Vehicle Maintenance Facility: YCIPTA owns all vehicles operated for fixed-route and DAR/DR services. The YCIPTA leases the system's maintenance facility, which is located at East 14th Street and Atlantic Avenue. This facility also houses YCIPTA administrative offices.

2.2.4 RIDERSHIP

Ridership on the YCAT system steadily increased from 2010 to the present. During the 2010-2011 fiscal period, there were fewer than 250,000 total passenger trips on the YCAT system. Ridership increased to approximately 300,000 total passenger trips in the 2011- 2012 fiscal period, and topped 380,000 total passenger trips during the 2012-2013 fiscal period. The share of revenue from the farebox increased during this time span from approximately 14 percent to around 21 percent. This has permitted YCIPTA and its member agencies to reduce contributions to system operations, bringing the local match down from approximately 38 percent of system costs to around 29 percent.

2.2.5 DEFICIENCIES

Prior to creation of YCIPTA, the YCAT system struggled to operate on unstable funding sources. Funding was dependent on: local matches; Local Transportation Assistance Fund (LTAF); fare revenue; advertising, in-kind support, and miscellaneous revenues; Federal funding assistance programs; and private contributions. The LTAF, which provided funding support from Arizona lottery revenue, was terminated in 2013, significantly decreasing revenue for transit services. Creation of YCIPTA established a funding platform based on contributions of member agencies. Although this stabilizes a component of the funding framework for YCAT, vagaries of economic conditions of members still can result in radical adjustments in services provided.

The new funding framework, incorporating support from the City of Yuma, State of Arizona, Federal transit assistance programs, and partnerships is providing solid ground for system growth and improved services. Growth in service is dependent on funding levels attained from contributing members and partnerships.

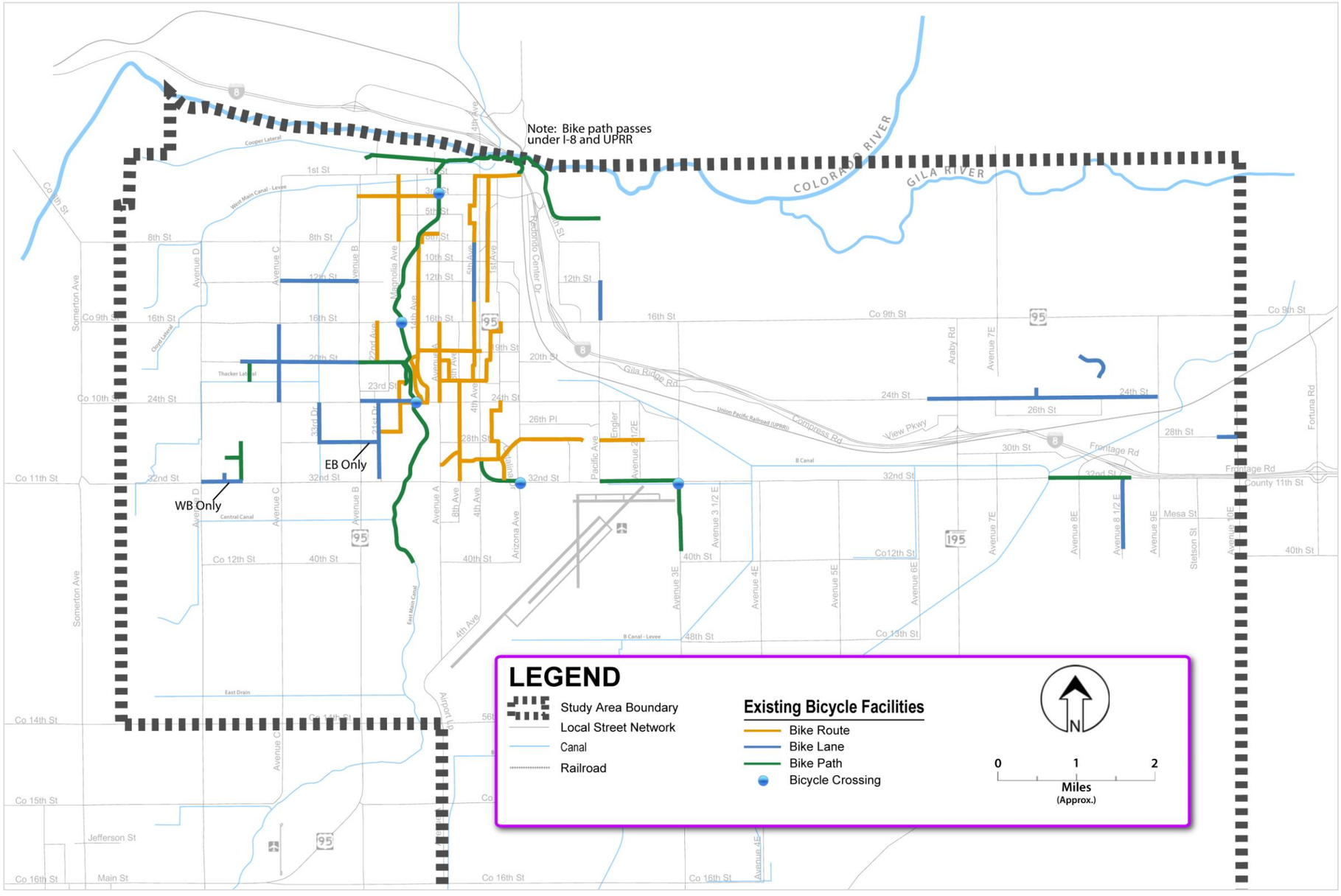
YCIPTA is also studying the prospects for a voter-approved countywide sales tax to support transit services. Leading up to the vote, YCIPTA will be discussing with the public proposed service changes that would eliminate loop routes in favor of two-way service on major thoroughfares, such as 32nd Street, 16th Street, 8th Street, 4th Avenue, Avenue A, Avenue B, Avenue C, Pacific Avenue, and Giss Parkway.

2.3 CURRENT BICYCLE FACILITIES

The current City of Yuma Bicycle Facilities Master Plan (BFMP), adopted by the Yuma City Council in April, 2009, expanded and updated the 1995 Bicycle Element of the City of Yuma General Plan. This Plan subsequently was modified and incorporated in the 2012 General Plan, and a map of the bicycle system was adopted June 6, 2012. At the present time there are slightly more than 36 miles of bike facilities available in the study area. **Figure 10** shows the locations of existing bike routes, bike lanes, and bike paths, as well as bicycle crossings that permit bicyclists to safely cross major intersections. The bicycle system in the study area still has a number of gaps that make it difficult for bicyclists to engage confidently in extended pleasure rides or longer commutes. However, it is important to note, that design standards adopted with the BFMP and General Plan comply with requirements of the Americans with Disabilities Act (ADA).

Feedback from the public outreach process indicates a desire for additional bicycle facilities for both recreational and commuter travel in the study area. Desire was expressed to provide bicycle facilities that would create “looped” travel routes throughout the study area.

FIGURE 10 – EXISTING BICYCLE FACILITIES



Source: Map 3-5, Transportation Element, City of Yuma 2012 General Plan, June 6, 2012, and City of Yuma staff input.

2.4 CURRENT PEDESTRIAN FACILITIES

The City's General Plan states "the City shall plan, design and operate all transportation facilities to enable safe and convenient access for all users, including motorists, pedestrians, bicyclists and transit riders." However, it also notes there are a number of gaps in the pedestrian network. The Transportation Element of the General Plan gives definition and guidance to the provision of facilities to satisfy the General Plan policy statement. Standards established comply with regulations associated with ADA as well as City Codes and Construction Standards. The Transportation Element Action Plan (1-5 years) further identifies, as a project for completion, an inventory of roadways lacking pedestrian facilities and calls for installation of pedestrian improvements on roadways not meeting construction standards.

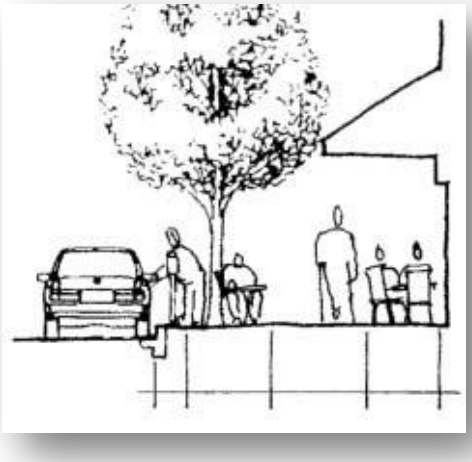
2.4.1 STRATEGIC PEDESTRIAN CORRIDORS

Twelve strategic roadway corridors were reviewed and evaluated to identify deficiencies related to pedestrian mobility in the study area:

1) 4th Avenue from Colorado River to 32nd Street
2) 4th Avenue Extension from 32nd Street to 40th Street
3) Arizona Avenue from 10th Street to 32nd Street
4) Pacific Avenue from 8th Street to 32nd Street
5) Avenue A from 1st Street to 32nd Street
6) Avenue 3 E from US-95/County 9th Street to 32nd Street
7) 1st Street from 4th Avenue to Avenue B
8) 8th Street from 4th Avenue to Avenue B
9) US-95/ 16th Street from Arizona Avenue to Engler Avenue
10) 24th Street from Avenue A to Pacific Avenue
11) 32nd Street from Avenue B to Avenue 3 E
12) 40th Street from Avenue 3 E to Avenue 10 E.

2.4.2 EVALUATION OF PEDESTRIAN FACILITY NEEDS

The investigation for the TMP focused on identifying areas where no pedestrian travelway (aka sidewalk) is provided, as well as the presence of driveway and intersection ramps and their compliance with ADA requirements. Driveways were classified into two groups: those "with curb returns," and those "without curb returns." Curb returns are roadway curbs extended around the corner into the path of a driveway, which results in the sidewalk being discontinuous across the driveway, i.e., a driveway with curb returns looks like an ordinary street versus a sloped driveway entering the roadway from an adjacent parcel of land. Driveways and intersections were reviewed to determine whether the pedestrian access met ADA requirements. Specifically, two features were evaluated: the presence of detectable warnings (often simply referred to as "truncated domes") on ramps; and the cross slope of sidewalks at driveways.



The field review indicated that approximately 26 miles of additional sidewalk would be required to provide continuous pedestrian travelway in these strategic corridors. Additionally, **Table 1** is a summary

of the number of driveways with and without curb returns and intersection corners found to be ADA-compliant. The information provided in **Table 1** reveals the following:

- 20% of 1,010 driveways without curb ramps meet current ADA requirements;
- 34% of 123 driveways with curb ramps meet current ADA requirements; and
- 26% of the 656 intersection corners evaluated meet current ADA requirements.

TABLE 1 – ADA COMPLIANCE OF DRIVEWAYS AND INTERSECTIONS

Corridor	Driveways without Curb Return			Driveways with Curb Return			Intersection Corners		
	ADA	Total	% ADA	ADA	Total	%ADA	ADA	Total	% ADA
1st Street	75	98	77%	0	1	0%	5	92	5%
8th Street	0	76	0%	1	6	17%	28	74	38%
16th Street	0	9	0%	14	20	70%	17	29	59%
24th Street	10	70	14%	0	3	0%	11	68	16%
32nd Street	2	53	4%	6	28	21%	18	63	29%
40th Street	0	44	0%	0	1	0%	0	5	0%
Avenue A	83	238	35%	6	8	75%	83	118	70%
4th Avenue	1	208	0%	4	14	29%	7	124	6%
4th Avenue Ext.	0	13	0%	0	4	0%	0	4	0%
Arizona Avenue	32	139	23%	6	11	55%	12	67	18%
Pacific Avenue	0	41	0%	5	22	23%	0	47	0%
Avenue 3 E	0	21	0%	0	5	0%	9	27	33%
Total	**203**	**1,010**	**20%**	**42**	**123**	**34%**	**168**	**656**	**26%**

Prepared by Wilson & Company, April, 2014.

2.5 OTHER TRANSPORTATION SERVICES

In 2011, approximately 357 million tons of freight valued at $421 million moved in, out, within, and through the State of Arizona. This is down significantly from 2005, when approximately 557 million tons of freight valued at $2.3 billion was moved in Arizona. On a weight basis, roughly three quarters of this freight moved on the highway system in trucks. Railroads moved most of the remaining tonnage, with air cargo accounting for only one- tenth of one percent by weight.

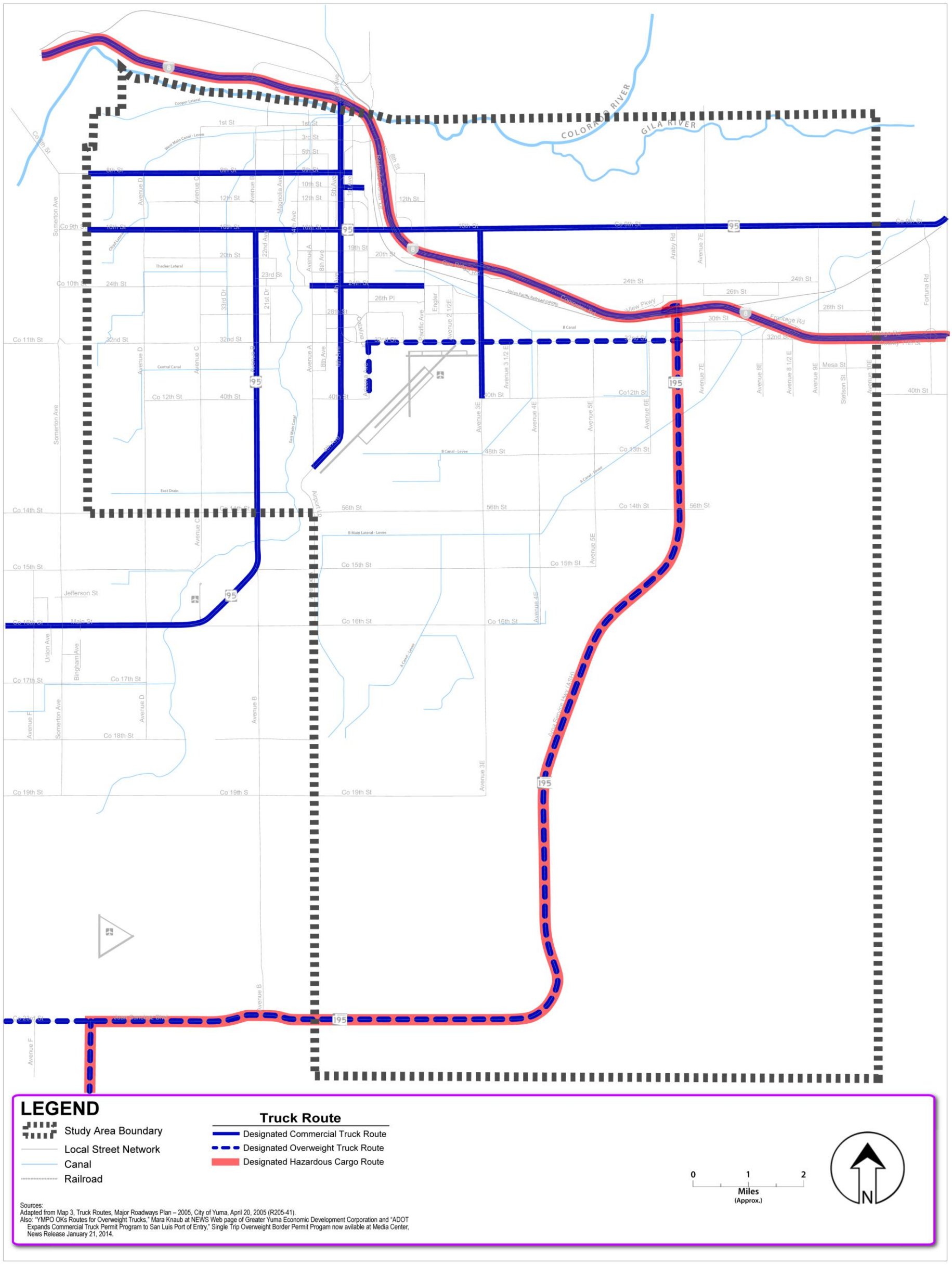
2.5.1 TRUCKING

Freight moves by truck to almost all activity centers in the study area. But, major commercial and industrial trucking activity is limited to designated Truck Routes. These routes are built to standards that permit servicing large, heavy vehicles up to tractor/semi-trailer combinations with wheelbases not exceeding 50 feet. **Figure 11** shows the location of currently designated truck routes in the study area.

2.5.2 RAILROAD SERVICES

There is one railroad company operating in the study area – the Union Pacific Railroad (UPRR). The UPRR operates regular rail freight services on its east-west, mainline Sunset Route that traverses southern Arizona. The UPRR Sunset Route primarily serves a rail freight operation; however, Amtrak operates the Sunset Limited and Texas Eagle passenger routes along this UPRR line.

FIGURE 11 – EXISTING TRUCK ROUTES



Sources:
Adapted from Map 3, Truck Routes, Major Roadways Plan – 2005, City of Yuma, April 20, 2005 (R205-41).
Also: "YMPO OKs Routes for Overweight Trucks," Mara Knaub at NEWS Web page of Greater Yuma Economic Development Corporation and "ADOT Expands Commercial Truck Permit Program to San Luis Port of Entry," Single Trip Overweight Border Permit Progam now avilable at Media Center, News Release January 21, 2014.

RAIL FREIGHT SERVICE

The UPRR Sunset Route has become a vital link in the 32,000 mile UPRR system. The UPRR operates between 45 and 55 freight trains daily on the Sunset Route. These operations are part of the cross-country rail route that traverses the southern part of the United States, connecting Los Angeles, California, and Jacksonville, Florida, via Yuma, Tucson, El Paso, Houston, and New Orleans. Connections to the east also facilitate rail service to Chicago and the Northeast United States. It is Arizona's second busiest rail line, and many of the trains operating on the line exceed one mile in length. Yuma County's inbound and outbound rail service currently is almost entirely devoted to agriculture, with inbound shipments of grain to feedlots, outbound shipments of grain, and shipments of fertilizer.

The UPRR is improving its Sunset Routes by double-tracking this mainline between Los Angeles, California, and El Paso, Texas. Improvements, once completed, are expected to support a substantial increase, i.e., doubling, in rail freight traffic through Arizona in future years. At this time, the Sunset Route is double-tracked in the Yuma area from a point just west of the All-American Canal and approximately 770 feet west of Quechan Road in California, north of the Colorado River. The double-tracked mainline picks up approximately 350 feet south of the Colorado River Bridge and continues to Avenue 4 E. The mainline is still a single track railroad corridor between Avenue 4 E and Avenue 9 E, whereupon double-tracking continues eastward. Except for Avenue 9 E, the UPRR mainline is completely grade separated from all crossing arterial roadways and Interstate 8.

According to the company's Web site, 24 percent of all freight cars handled by UPRR on the Sunset Route Pacific originate or terminate in Southern California. Trains hauling "double-stacked" marine containers out of multimodal facilities in California dominate the route. Construction materials, including lumber, plywood, steel and cement, also common cargo, as well as the gasoline additive ethanol. The Mexican gateways of Nogales, Arizona, and Calexico, California support the movement of a high volume of automobiles and automobile parts. The Sunset Route is also an important transcontinental route for the package express business and grain.

RAIL PASSENGER SERVICE

Amtrak passenger service is available in the study area at a platform on Gila Street, which is 600 feet north of 3rd Street (Harold C. Giss Parkway). The Amtrak station is a platform only with no ticket office. Ten long-term parking spaces are available for rail travelers. The Sunset Limited Route operates between Los Angeles, CA, and New Orleans, LA, where there is a connection to Jacksonville, FL, on the East Coast and points north up the Eastern Seaboard. The Texas Eagle Route connects with this route in San Antonio, TX, for travel to Chicago, IL.

2.5.3 AIR SERVICE

Yuma International Airport (YUM) is co-located with the MCAS-Yuma. Civilian air activity consists of regional service to Phoenix and Los Angeles, with two air carrier airlines operating out of the airport. The combined facility includes four runways, with two being used primarily for military aircraft operations and the other two primarily for civilian operations. The existing ground air traffic network includes: full-length parallel taxiways, runway exit/entrance taxiways, and stub taxiways providing access to landside facilities (passenger terminal, aircraft storage, aircraft parking aprons, and support facilities). The passenger terminal building provides five air carrier gate positions, expanded ticketing, and departure areas, as well as a mechanized baggage claim system.

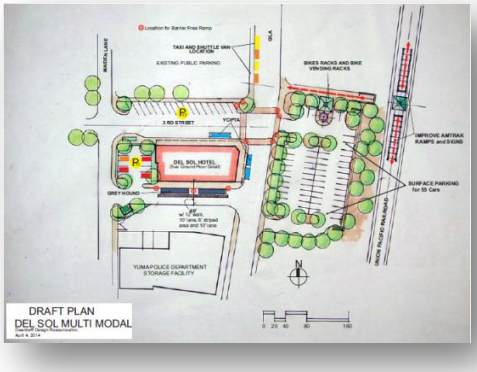
There is no single building or facility dedicated solely to air cargo at the airport. Nevertheless, US Airways (American Airlines) offers Premier Pak service through its airport ticket counter. This service is

available seven days a week from 5:30am to 10:30pm. Air cargo facilities are located on 40th Street directly west of the airport runways. A FedEx facility is located within the Defense Contractor Complex. In November, 2013, two grants were awarded to increase the parking area for large aircraft, which will enhance airport safety and preserve the airport's capacity.

2.6 HOTEL DEL SOL MULTIMODAL TRANSPORTATION CENTER

The Hotel Del Sol in downtown Yuma was constructed in 1926 and is individually listed on the National Register of Historic Places (NRHP). Originally named the Hotel Del Ming, after the hotel manager and then mayor of Yuma, the hotel's location at 300 S. Gila Street is immediately relevant to the community transportation system. It is directly across the street from the original railroad depot and is close to the Colorado River, the historic railroad swing span pivot bridge (now restored as Pivot Point Plaza), the original "Ocean-to-Ocean" Highway, and the modern I-8. The adaptive reuse proposal for this historic property, which has been a priority for the City and the YMPO for the past decade, would create a true Multimodal Center.

This property and its location represent a rare opportunity to tie together Yuma's past, its current transportation needs, and budding downtown revitalization efforts. Redevelopment plans for the Center include: bays for YCAT buses and waiting areas to facilitate system transfers; Greyhound interstate buses; a renovated pedestrian pathway to the Amtrak platform, where Sunset Limited and Texas Eagle service is available; additional waiting areas and passenger amenities to accommodate Amtrak passengers, On-Call ADA Paratransit patrons, and Quartzsite Transit Service patrons; as well as a Park-n-Ride (P&R) facility to support connections with YCAT regional service. It is anticipated that the center also will have waiting areas and amenities to support the services of private shuttle operators providing connections to various destinations, such as Mexico (via San Luis), Phoenix Sky Harbor Airport, Phoenix Mesa Gateway Airport, Tucson, and Nogales. Renovations to the Hotel Del Sol are expected to create a mixed-use development with significant space available for YCIPTA offices, private office and retail uses, kiosks and/or offices for transit service providers, a gift store, and food service facilities.



3.0 MULTIMODAL TRANSPORTATION SYSTEM PLAN

This portion of the TMP outlines each major element of a complete multimodal transportation system for the City of Yuma, including a Roadway System Plan, Transit System Plan, Bicycle System Plan, and Pedestrian System Plan. Details regarding the development of recommended system elements are provided in Appendix B – *Working Paper 2: Evaluation of Alternatives and Plan for Improvements.*

3.1 ROADWAY SYSTEM PLAN

The objective of the Roadway System Plan is to provide a framework for developing a preferred combination of projects that would best serve the City of Yuma at Buildout. Potential improvements were identified to compliment the long-range (no-build) base network, which consists of the existing roadway network plus a series of programmed improvements. The process of identifying potential improvement projects for testing and evaluation followed a two-step screening process. In the first step, a wide range of potential improvement projects was developed and presented on a map for discussion and evaluation. Each project was carefully defined, its characteristics examined, benefits reviewed, and disadvantages identified. Subsequent to this process, alternative improvement scenarios were formulated that would mitigate the level of service (LOS) deficiencies exposed by the analysis of existing and future travel demand associated with Buildout conditions (refer to **Figures 6 and 7**).

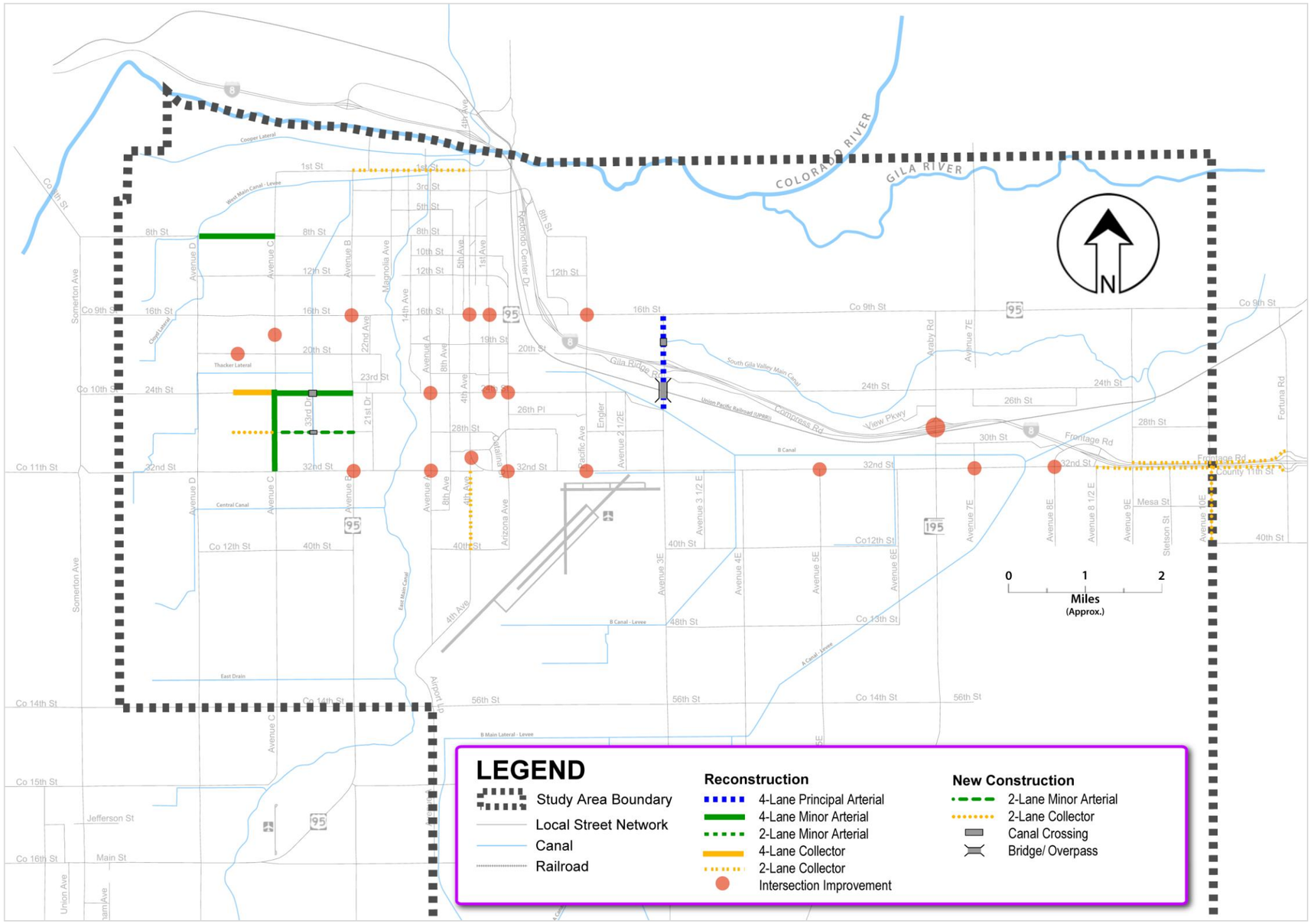
3.1.1 BASE NETWORK OF PROGRAMMED PROJECTS

Several roadway improvement projects are currently programmed to be completed in the upcoming years and are, therefore, considered part of the long-range roadway network. **Figure 12** illustrates these programmed improvements, which include both roadway and intersection improvements, as described below.

ROADWAY IMPROVEMENT PROJECTS

- Widening of Avenue 3 E between Interstate 8 and US-95/16th Street. The improvement project will involve widening Avenue 3 E from two lanes to five lanes, including a median.
- Reconstructing Avenue 3 E to create a 4-lane Minor Arterial from US-95/ 16th Street to the B Canal south of the UPRR corridor. This improvement would support an earlier decision by the City and State to route traffic, particularly truck traffic, from SR-195 at its junction with I-8 to Avenue 3 E to make connection with US-95. This improvement action would require construction of a new 4-lane bridge for the widened roadway to cross over the UPRR corridor, a distance of approximately 450 feet.
- Reconstruct and widen 24th Street to four lanes between Avenue B to Avenue C.
- Widening the two-lane I-8 South Frontage Road between Avenue 8 ½ and Fortuna Road/Avenue 11 E.
- Widening the two-lane I-8 North Frontage Road between Avenue 9 E and Fortuna Road/ Avenue 11 E.
- Avenue 10 E improvements between 40th Street and I-8 South Frontage Road.
- Extending the westbound right-turn lane, including roadway widening, on 16th Street from approximately Maple Avenue to 1st Avenue.
- Construction of 28th Street between Avenue B and Avenue C to Minor Arterial standard, including a crossing at the Thacker Lateral.
- Widening 8th Street between Avenue C and Avenue D to better accommodate travel demand in the northwestern portion of the study area. This project would be implemented by Yuma County.

FIGURE 12 – PROGRAMMED ROADWAY IMPROVEMENTS



- Reconstructing 1st Street between 4th Avenue and Avenue B to create a 2-lane Collector. The City will be narrowing the roadway from four lanes to establish two lanes with a center left-turn lane and improve mobility and safety conditions for bicycles and pedestrians. This improvement is based on the findings of a Roadway Safety Audit (RSA) prepared for 1st Street. An RSA is a formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. The objective of an RSA is to qualitatively estimate and report on potential road safety issues and identify opportunities for improvements in safety for all road users.
- Widening the cross-section of 4th Avenue between 32nd and 40th streets.
- Reconstructing 24th Street to create a 4-lane Collector between 45th Avenue and Avenue C.
- Reconstructing Avenue C between 24th and 32nd streets to create a 4-lane Minor Arterial.
- Constructing 28th Street as a 2-lane Collector west of Avenue C to 45th Avenue.

INTERSECTION IMPROVEMENT PROJECTS

- Reconstructing the I-8/Araby Road traffic interchange to replace the existing signalized ramp intersections with roundabouts.
- Reconstructing the 16th Street/4th Avenue intersection to provide greater capacity.
- Add an eastbound right-turn lane at the 32nd Street/Avenue 7 E intersection.
- Add a westbound right-turn lane at the 32nd Street/Avenue 8 E intersection.
- Add a southbound right-turn lane from 4th Avenue/Big Curve to southbound 4th Avenue Extension.
- Add a westbound right-turn lane at the 24th Street/1st Avenue intersection.
- Add a westbound right-turn lane at the 16th Street/Pacific Avenue intersection.
- Add a westbound right-turn lane at the 32nd Street/Arizona Avenue intersection.
- Add a westbound right-turn lane at the 20th Street/45th Avenue intersection.
- Add eastbound and westbound right-turn lanes at the 24th Street /Arizona Avenue intersection.
- Add a westbound right-turn lane at the 32nd Street/Pacific Avenue intersection.
- Install a traffic signal at the intersection of 18th Street and Avenue C.
- Expansion of the 32nd Street/Avenue B intersection to full design, including intersection improvements at Avenue A, 21st Drive, and 15th Avenue.
- Add eastbound and westbound right-turn lanes at the 32nd Street/Avenue 5 E intersection.
- Add a northbound right-turn lane at the Avenue B/16th Street intersection.

3.1.2 ROADWAY NETWORK ALTERNATIVES

In addition to the No-Build Alternative, five roadway network alternatives, Alternatives A through E, were defined and evaluated during preparation of the TMP. Alternatives A through D represented various combinations of different strategies and improvement projects throughout the study area. Alternative E focused solely on establishment of a new north-south travel corridor in the western portion of the study area – I-8 to SR-195 east of San Luis via Avenue D, and a new east-west travel corridor in the central portion of the study area –Avenue D to SR-195 via 56th Street/County 14th Street. Each alternative, nevertheless, represents a reasonable response to the opportunities and constraints within the study area and forecast travel demand at Buildout. The No-Build Alternative provided a basis for considering how the study area roadway network would function, if no other improvements are implemented beyond those currently planned or programmed. As such, it established a baseline for comparison when evaluating the other five alternative roadway improvement scenarios.

3.1.3 LONG-RANGE ROADWAY SYSTEM PLAN

The evaluation of roadway network alternatives relied on a matrix describing how each alternative performed relative to five goals and 16 objectives, as shown in **Table 2**. This process revealed Alternative B as preferred overall. Subsequent stakeholder feedback resulted in minor alterations to the Alternative B network to develop the final Buildout roadway network. Recommended roadway projects associated with the recommended Buildout roadway network are shown in **Figure 13**.

The recommended Buildout roadway network represents a full palette of improvement projects developed to directly address critical mobility and connectivity issues associated with the eastern and southern portions of the study area, which are expected to experience the greatest amount of growth and change under assumptions for Buildout conditions. The intent of this alternative is to ensure an adequate arterial and collector system is in place to support expected study area growth.

- Interstate 8 would be widened to six travel lanes between 16th Street and Fortuna Road, improving connectivity to the downtown area from the east.
- A new 2-lane Collector roadway would be constructed along the alignments of Main Street and Walnut Avenue to provide a connection between Arizona Avenue/ Walnut Avenue and 3rd Street/Harold C. Giss Parkway.
- 32nd Street would be expanded to create a 6-lane Principal Arterial from Avenue B to its intersection with Big Curve. The new cross section would incorporate the two bridges already constructed over the East Main Canal.
- Two key connecting projects are proposed that would combine to improve mobility and accessibility around the commercial area directly east of the Yuma Palms Regional Center.
  - 12th Street/County 8½ Street would be extended eastward to Avenue 3 E as a 2-lane Collector.
  - The extension eastward of 12th Street/ County 8½ Street would connect with Avenue 3 E, which would be reconstructed as a 2-lane Collector south to US-95/ County 9th Street.
- Avenue 3½ E would become a more important connector for travel in the central and eastern portions of the study area. The existing roadway, between 30th and 40th streets would be reconstructed to create a 4-lane Minor Arterial. The reconstructed roadway would be extended northward from 30th Street to Avenue 3 E at Palo Verde Street. It also would be extended southward to 48th Street. This improvement action would require construction of two bridge structures: one over a B Canal siphon on the south side of 32nd Street, and the second over a B Canal lateral on the 44th Street alignment.
- 40th Street improvements would enhance connectivity with the Foothills area east of the study area. The segment between Avenue 3 E and Avenue 6 E would be reconstructed to create a 4-lane Minor Arterial. Between Avenue 6 E and Avenue 8 ½ E, a grade-separated overpass would be constructed at SR-195 that would exclude access to SR-195, but allow traffic to cross over the expressway on a bridge. New construction would continue the 4-lane Minor Arterial cross section east to Avenue 10 E, connecting foothills traffic with the nearby commercial center. This improvement action would require two bridge structures: one over a B Canal lateral just west of Avenue 4 E, and the second at the A Canal where it crosses the Avenue 7 E alignment.

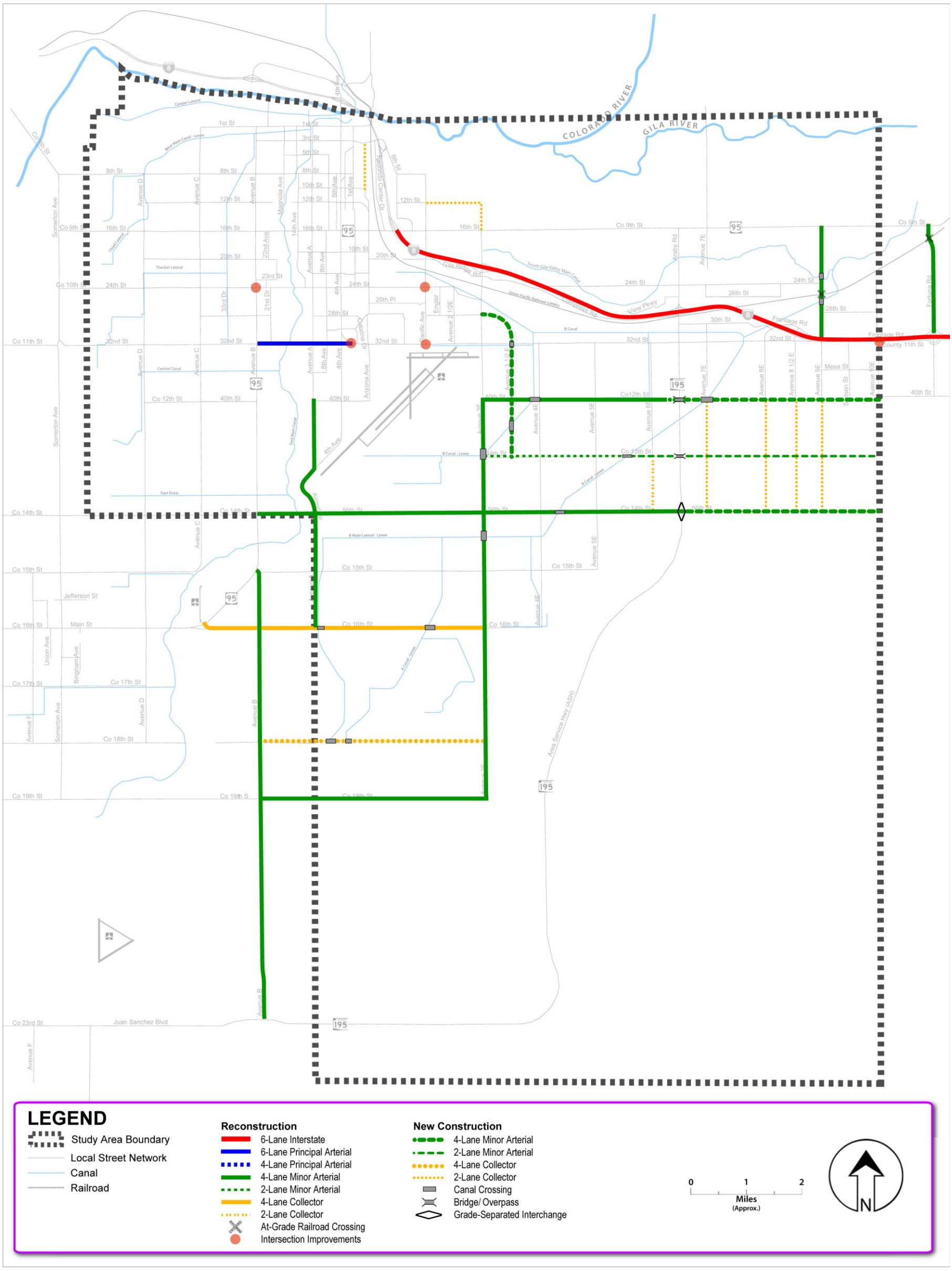
TABLE 2 – SUMMARY EVALUATION OF ALTERNATIVES

Goals and Objectives	Candidate Roadway Network Alternatives					
	No-Build	Alt A	Alt B	Alt C	Alt D	Alt E
Local Plan Consistency						
Support existing, expanding, or new development	◒	◓	◓	●	●	◓
Projects are identified in existing RTP, corridor study, or comprehensive plan	●	◓	◓	◓	●	◒
Local Plan Consistency Subtotal	3	8	8	9	10	6
Safety & Mobility						
Minimize daily vehicle miles traveled (VMT)	●	◓	○	●	○	◒
Minimize the number of lane miles on all facilities operating at LOS E or F	●	○	◓	◓	●	●
Minimize the percent of congested (LOS E or F) daily VMT	●	○	◓	◓	●	◒
Provide additional subregional connectivity	●	◓	●	◓	●	◒
Safety & Mobility Subtotal	4	14	16	17	18	7
Environmental Compatibility						
Minimize impacts associated with crossing of floodplains or disturbance of drainage features	●	◒	◒	◒	●	◓
Minimize impacts to resources protected under Section 4(f) – Parks – and 6(f) – Historic & Archaeological Sites	●	○	○	○	◒	◓
Minimize impacts to Known or Likely Sensitive Environmental Habitats (e.g., Threatened, Endangered, and other sensitive species) and Wildlife Corridors	●	○	○	○	◒	◓
Minimize daily vehicle hours traveled (VHT)	●	◒	◓	●	◓	●
Environmental Compatibility Subtotal	16	10	12	13	9	13
Cost						
Minimize capital cost	●	○	○	◒	●	◓
Minimize operating and maintenance cost (Total Lane Miles)	●	○	○	◒	●	◓
Minimize right-of-way cost (Total Road Miles)	●	○	○	●	●	◓
Minimize VHT per Lane Mile - Maximize roadway network productivity	●	○	○	◓	○	◒
Cost Subtotal	16	12	12	9	6	14
Ease of Implementation						
Maximize the likelihood of acceptance by local elected officials	●	○	●	◓	◓	◒
Maximize the likelihood of acceptance by outside agencies, stakeholders & the community	●	○	●	◓	◓	◒
Ease of Implementation Subtotal	2	6	10	8	10	4
GRAND TOTAL	41	50	58	56	53	44

LEGEND

● Strong Disadvantage = 1 ◒ Disadvantage = 2 ○ Neutral = 3 ◓ Advantage = 4 ● Strong Advantage = 5

FIGURE 13 – RECOMMENDED ROADWAY IMPROVEMENTS AT BUILDOUT



- Connectivity with the Foothills area east of the study area also would be enhanced by grade separating 48th Street with an overpass at SR-195. The existing segment of 48th Street, between Avenue 3 E and the A Canal, would be reconstructed to create a 2-lane Minor Arterial, and this cross section would be continued eastward to Avenue 10 E. Similar to the case with 40th Street, this improvement action would exclude access to SR-195, but it would allow traffic to cross over the expressway unimpeded. This improvement action would require construction of one bridge at the A Canal where it crosses the Avenue 5½ E alignment.
- Avenue 9 E would be reconstructed to create a 4-lane Minor Arterial from the I-8 N. Frontage Road to US-95/ County 9th Street. This improvement action would require reconstruction (or widening) of one bridge just north of 28th Street that crosses over the Main Gila River Canal. The existing bridge is not sufficiently wide to accommodate the basic cross section of the 4-lane Minor Arterial. A second bridge, which crosses over the South Gila Valley Main Canal just north of 24th Street, would be sufficiently wide to accommodate Avenue 9 E reconstructed as a 4-lane Minor Arterial. However, the width of neither bridge is sufficient to accommodate the recommended cross section for a 4-lane Minor Arterial under the Complete Streets concept. The 2-lane at-grade crossing of the UPRR tracks will also need to be reconstructed to accommodate the new 4-lane Minor Arterial cross section.
- Although outside the study area, improvements to Fortuna Road have been recommended, as this facility can provide a viable alternative for access to the colleges, Yuma Palms Regional Center, and downtown Yuma via US-95. As such, this connection would be a reliever for I-8, providing an alternative route for Foothills/Mesa Del Sol residents. This improvement to Fortuna Road would require reconstruction/widening of the UPRR crossing, which would entail moving the automated crossing gates and flashing signals.
- 56th Street/ County 14th Street would be reconstructed and widened to create a 4-lane Minor Arterial from Avenue B to SR-195/ASH. This roadway would be extended to the east of SR-195/ASH as a 4-lane Minor Arterial to the Foothills area. This improvement action would include construction of a grade-separated interchange at SR-195/ASH, where today there is a 440-foot separation of the northbound and southbound lanes that will accommodate the overpassing Expressway. The SR-195 overcrossing would be constructed within the existing separation, and the existing northbound and southbound lanes would become the on- and off-ramps.
- Avenue 3 E would be reconstructed to create a four-lane Minor Arterial south of 40th Street to County 19th Street. This improved travel corridor would provide enhanced mobility and accessibility for the southern portion of the study area, particularly the proposed future Estancia development. In addition, it would provide needed capacity increases for activities associated with the MCAS – Yuma, Yuma International Airport. Improvements also would aid travel to the San Luis LPOEs from eastern portions of the study area via County 19th Street and Avenue B. This improvement action would require two bridge structures: one over a B Canal lateral at the 48th Street, and the second at a B Canal lateral at the County 14½ Street alignment.
- The existing County 16th Street would be reconstructed to create a 4-lane Minor Arterial between US-95 and Avenue 3 E. In addition, a new 'T' intersection would be constructed at US-95 to integrate travel on County 16th Street with Avenue C (Extended) coming from the south. The improvement action would support the proposed future Estancia development and improve access to the City of Somerton. It would require modification/reconstruction of the bridge structure crossing the A Canal at Avenue 2 E.
- Between Avenue B and Avenue 3 E, a new four-lane Collector roadway would be created along the County 18th Street alignment. Existing 2-lane segments would be reconstructed, and a new

4-lane roadway would be constructed where today there is a facility. The improvement action would support the proposed future Estancia development. This improvement action would require two bridge structures: one over a B Canal lateral at the 8th Avenue alignment, and the second over a smaller A Canal lateral at the 4th Avenue alignment.

- County 19th Street would be widened to create a four-lane Minor Arterial. This action would provide needed capacity for future east-west travel associated with the southern portion of the proposed future Estancia development. This improvement also would take advantage of the upgraded access provided by improvements to Avenue 3 E, as noted above.
- Avenue A would be reconstructed to create a four-lane Minor Arterial between 40th Street and County 16th Street. This improvement would be instrumental in supporting industrial development west of the airport and providing improved access between the central and northern portions of the study area and the southern portion of the study area.
- Avenue B would be reconstructed to create a 4-lane Minor Arterial, upgrading the linkage between US-95 Street and SR-195 at County 15th, eight miles to the south. This improvement action would enhance regional accessibility for the proposed future Estancia development located between County 16th and 19th streets and provide improved and more direct access from the central and northern portions of the study area to the City of San Luis and the San Luis II LPOEs.

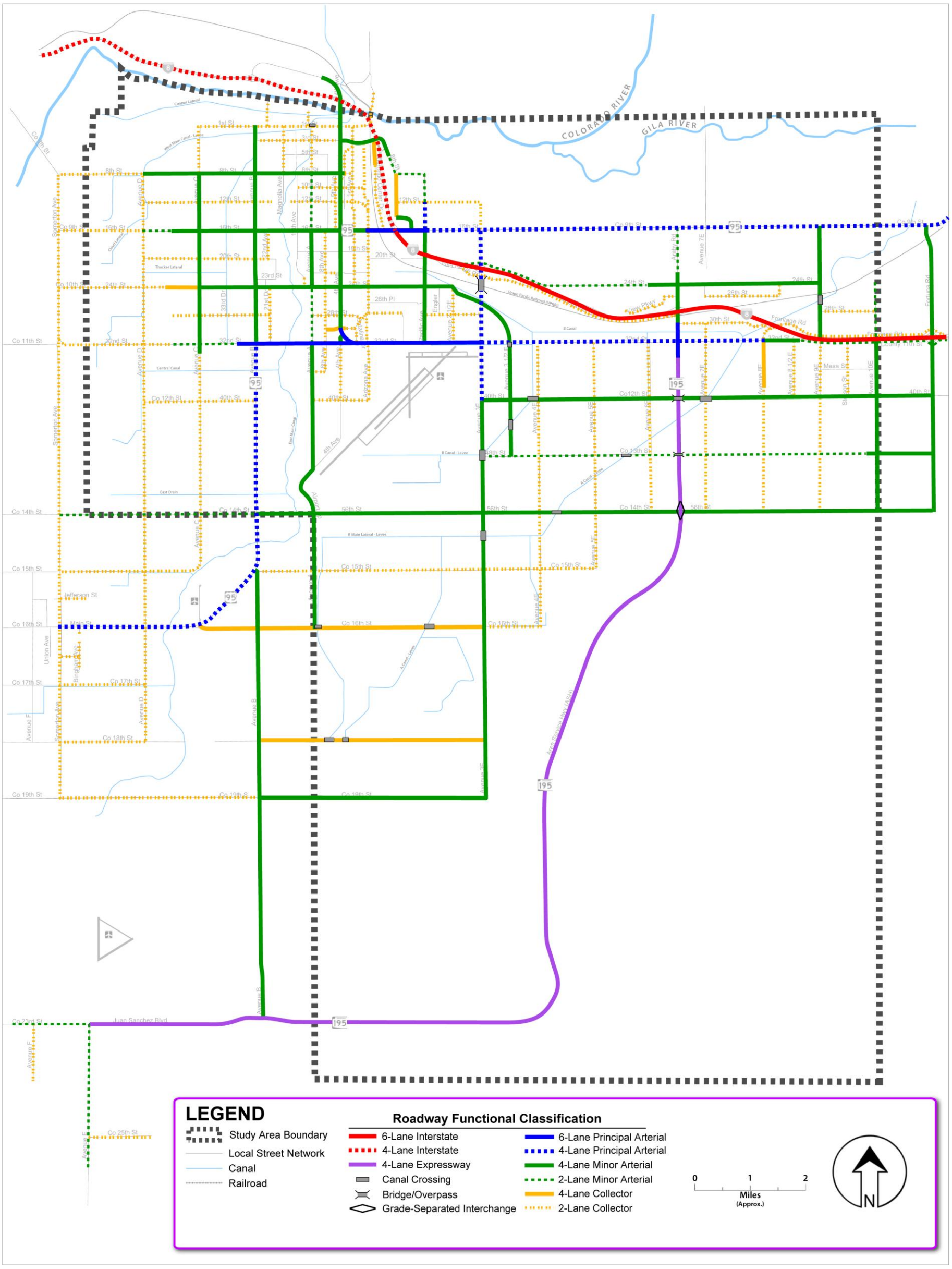
Figure 14 shows the roadway classification and number of lanes for Interstate, arterial, and collector facilities that would form the roadway network for the study area at Buildout. Roadway classifications indicated in **Figure 14** are intended to identify applicable roadway cross section standards for future roadway widening and new construction and do not necessarily correlate to the Functional Classifications adopted by FHWA and ADOT.

3.1.4 PROPOSED CHANGES IN ADOPTED ROADWAY FUNCTIONAL CLASSIFICATION

Figure 5 illustrated the Existing Roadway Functional Classification adopted by the FHWA and ADOT. Roadway improvements proposed as part of the Buildout network will change the role and function of several existing roadways, as well as introduce new roadway connections. It is recommended that the following revisions to adopted functional classifications be considered as roadway improvements are implemented:

- 1st Street from Avenue B to 4th Avenue – reclassify from a Minor Arterial to a Collector based on cross section reduction to two travel lanes
- 32nd Street from Avenue C to Avenue B – reclassify from Collector to Minor Arterial
- 40th Street east of Avenue 3 E – reclassify from Collector to Minor Arterial
- 48th Street east of Avenue 3 E – reclassify from Collector to Minor Arterial
- 56th Street/County 14th Street – reclassify from Collector to Minor Arterial
- County 19th Street from Avenue B to Avenue 3 E – classify as a Minor Arterial (not currently classified)
- Avenue C from 8th Street to 32nd Street – reclassify from Collector to Minor Arterial
- Avenue A from 32nd Street to County 16th Street – reclassify from Collector to Minor Arterial
- Avenue 3 ½ E – classify as Minor Arterial (not currently classified).

FIGURE 14 – RECOMMENDED ROADWAY NETWORK AT BUILDOUT



3.1.5 ROADWAY PLANS INCLUDED IN YMPO RTP

The 2014-2037 YMPO RTP indicates that there are projects in the study area included in the YMPO plan that contradict the TMP recommendations:

- 16th Street widening from Avenue B to 6th Avenue and from 3rd Avenue to Maple Avenue – four to six lanes
- 24th Street widening from Avenue B to Pacific Avenue – four to six lanes

3.1.6 RECOMMENDED IMPROVEMENTS AT SELECTED INTERSECTIONS

An analysis of the forecasted volumes indicated the following intersections are anticipated to operate at unacceptable LOS E or F under assumed Buildout conditions with the Preferred Roadway Network:

- 24th Street at Avenue B (AM, Midday, PM)
- 24th Street at Pacific Avenue (AM, Midday, PM)
- 32nd Street at Big Curve (PM)
- 32nd Street at Pacific Avenue (Midday, PM)
- Avenue 10 E at Interstate 8 South Frontage Road (AM, Midday, PM).

Recommended intersection improvements to support Buildout traffic conditions include:

24TH STREET AND AVENUE B

- Single right-turn bays eastbound and southbound
- Dual left-turn bays on all approaches
- Widening northbound and southbound approaches to provide an additional through lane through the intersection.

24TH STREET AND PACIFIC AVENUE

- Single right-turn bays for all directions
- Dual left-turn bays for all directions

32ND STREET AND BIG CURVE

- Add northbound left-turn bay
- Restripe existing northbound shared through-left lane to create an exclusive through lane
- Revise signal phasing to remove northbound/southbound split phasing

32ND STREET AND PACIFIC AVENUE

- Eastbound dual left-turn bays
- Southbound dual right-turn and dual left-turn bays

AVENUE 10 E AND I-8 SOUTH FRONTAGE ROAD

- Install signal at intersection
- Westbound left-turn bay
- Eastbound right-turn bay.

3.2 TRANSIT SYSTEM PLAN

The *Yuma Regional Transit Study*, completed January, 2012, and a recently completed *Five-Year Short-Range Transit Plan* provide comprehensive information regarding transit needs in the study area and a basis for defining a fiscally-constrained program of improvements in the near-term of five to 10 years. Because funding provisions would invariably be subject to the ebb and flow of economic conditions, as well as political preferences, over a 40-60 year planning horizon, the TMP focuses on identifying changes in route structure to accommodate expected long-term growth in the study area.

3.2.1 NEAR-TERM TRANSIT SERVICES

Several transit service improvements are in the YCIPTA pipeline that will directly affect mobility and accessibility for study area residents:

Photo from Yuma Regional Transit Study

- A new multimodal transit center at the former Hotel Del Sol at 3rd and Gila streets in Downtown Yuma will offer access to Amtrak's interstate passenger rail service and Greyhound intercity bus service in addition to YCAT local bus service.
- YCIPTA's 10-Year Capital Plan calls for expenditures of $250,000 for upgrading transit stops with shelters and other amenities, as warranted.
- YCIPTA also has included in the 10-Year Capital Plan more than $6 million for bus fleet and support vehicle replacement as well as $400,000 for bus turnouts to reduce congestion on the street system

3.2.2 LONG-RANGE TRANSIT SYSTEM PLAN

The YMPO *2014-2037 Regional Transportation Plan* (RTP) includes the following long-range goals and objectives with respect to regional transit service being provided through YCIPTA:

Transit Goals	Objectives / Performance Measures
Contribute positively to regional air quality by promoting transit as an alternative transportation choice	❖ Increase regional transit service area of coverage ❖ Increase annual transit ridership ❖ Increase percentage of regional person-trips made by transit
Increase investments in transit system capital, service expansion, and operational enhancements	❖ Evaluate feasibility of new transit funding sources ❖ Public and jurisdictional support for new transit funding sources

Source: *Working Together, Moving Forward*, YMPO 2014-2037 Regional Transportation Plan, Yuma Metropolitan Plan Organization. Final Report, August 2013.

In addition to these general long-range goals and objectives for transit, there would be a need to serve the new growth areas expected to develop in the next 40 to 60 years, i.e., as defined by Buildout conditions. There are two areas within the study area of particular significance for future public transit service, due to the substantial growth potential each represents.

The Long-Range Transit System Plan developed for this TMP (**Figure 15**) includes "Planned Routes," reflecting a network simplified over the current service YCAT route structure. These planned routes reflect YCIPTA's intent to minimize the use of "loop" routes in favor of two-way service as a means of using timed transfer to improve service effectiveness and efficiency. It also includes "Potential Future Additions" to the YCAT system to serve the two growth areas under assumed Buildout conditions adopted for this TMP. Potential future routes are shown for illustrative purposes only; no attempt has been made to constrain route development or the provision of transfer facilities based on funding.

The potential future routes and transfer hubs (or timed transfer points) have been developed to serve the expected development pattern in the growth areas and satisfy the need to provide connectivity between and among the several major destinations within or proximate to the study area. Specifically, it would be desirable, as Buildout conditions occur, to assure connectivity through timely and convenient transfers that eliminate exceedingly long trips from one side of the study area to another. On the other hand, a transfer for transit patrons is a significant negative and is penalized in travel demand models, making the trip less attractive. Therefore, the potential future route structure incorporates through routes that permit longer trips, such as from the Cocopah Casino to Downtown Yuma, without a transfer. Nevertheless, accommodating transfers at strategic locations also creates greater flexibility of travel for the transit patron and, therefore, increases the likelihood of the transit system use.

It is important to note that the potential route structure displayed for Buildout conditions necessarily would be subject to extensive review, as YCIPTA develops and matures as a regional transit provider. Federal regulations require that any route changes be thoroughly examined and reviewed within a formal public involvement program

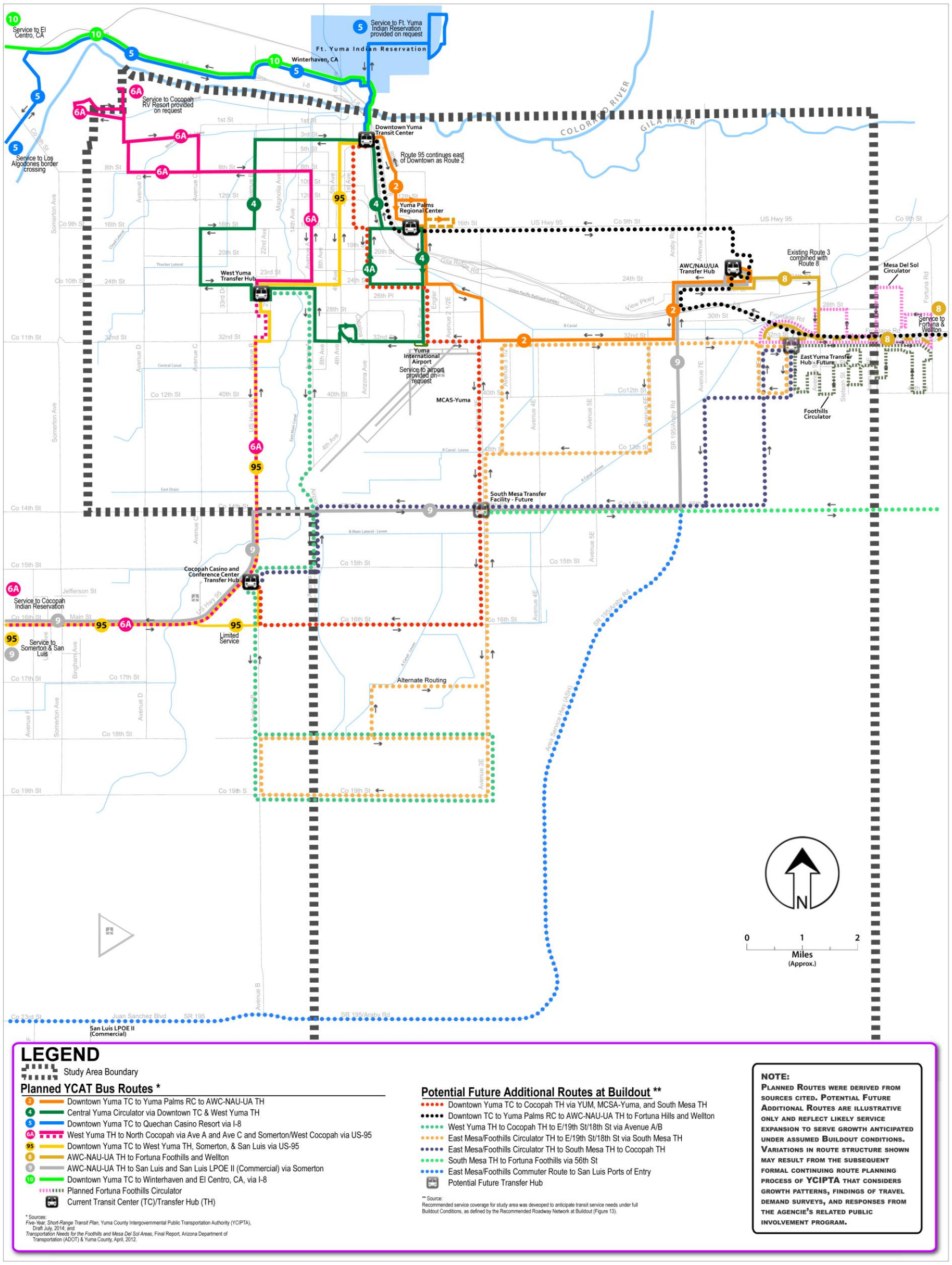
3.3 BICYCLE SYSTEM PLAN

The Long-Range Bicycle System Plan incorporates the four types of bikeway facilities shown in the *Bicycle Facilities Master Plan* adopted by the City of Yuma in 2009 plus additions provided through guidance from current bicycle planners for the City and public input. Based on generally accepted definitions of bicycle facilities, the following bikeway types were defined and identified on a map of the study area:

- Bike Route
- Bike Lanes
- Shared Use Path (replaces Bike Path)
- Shared Use Trail (replaces Multi-Use Path).

Bikeway is a generic term used to refer to any portion of a facility specifically designated for use by bicyclists that may be part roadway or street, established path, or other separate travel way. Bikeways may be designated for exclusive use of bicyclists or part of a roadway or street, in which case bicyclists and motorists share the road. Brief descriptions of the four types of bikeways incorportated in the Long-Range Bicycle System Plan follow.

FIGURE 15 – RECOMMENDED TRANSIT NETWORK AT BUILDOUT



LEGEND

Study Area Boundary

Planned YCAT Bus Routes *

- 2 — Downtown Yuma TC to Yuma Palms RC to AWC-NAU-UA TH
- 4 — Central Yuma Circulator via Downtown TC & West Yuma TH
- 5 — Downtown Yuma TC to Quechan Casino Resort via I-8
- 6A — West Yuma TH to North Cocopah via Ave A and Ave C and Somerton/West Cocopah via US-95
- 95 — Downtown Yuma TC to West Yuma TH, Somerton, & San Luis via US-95
- 8 — AWC-NAU-UA TH to Fortuna Foothills and Wellton
- 9 — AWC-NAU-UA TH to San Luis and San Luis LPOE II (Commercial) via Somerton
- 10 — Downtown Yuma TC to Winterhaven and El Centro, CA, via I-8
- Planned Fortuna Foothills Circulator
- Current Transit Center (TC)/Transfer Hub (TH)

* Sources:
Five-Year, Short-Range Transit Plan, Yuma County Intergovernmental Public Transportation Authority (YCIPTA), Draft July, 2014; and
Transportation Needs for the Foothills and Mesa Del Sol Areas, Final Report, Arizona Department of Transportation (ADOT) & Yuma County, April, 2012.

Potential Future Additional Routes at Buildout **

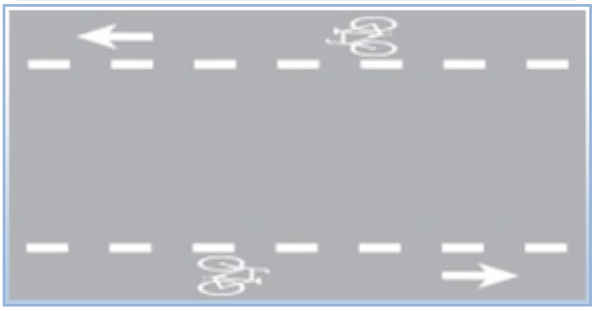
- Downtown Yuma TC to Cocopah TH via YUM, MCSA-Yuma, and South Mesa TH
- Downtown TC to Yuma Palms RC to AWC-NAU-UA TH to Fortuna Hills and Wellton
- West Yuma TH to Cocopah TH to E/19th St/18th St via Avenue A/B
- East Mesa/Foothills Circulator TH to E/19th St/18th St via South Mesa TH
- East Mesa/Foothills Circulator TH to South Mesa TH to Cocopah TH
- South Mesa TH to Fortuna Foothills via 56th St
- East Mesa/Foothills Commuter Route to San Luis Ports of Entry
- Potential Future Transfer Hub

** Source:
Recommended service coverage for study area was deveoped to anticipate transit service needs under full Buildout Conditions, as defined by the Recommended Roadway Network at Buildout (Figure 13).

NOTE:
PLANNED ROUTES WERE DERIVED FROM SOURCES CITED. POTENTIAL FUTURE ADDITIONAL ROUTES ARE ILLUSTRATIVE ONLY AND REFLECT LIKELY SERVICE EXPANSION TO SERVE GROWTH ANTICIPATED UNDER ASSUMED BUILDOUT CONDITIONS. VARIATIONS IN ROUTE STRUCTURE SHOWN MAY RESULT FROM THE SUBSEQUENT FORMAL CONTINUING ROUTE PLANNING PROCESS OF YCIPTA THAT CONSIDERS GROWTH PATTERNS, FINDINGS OF TRAVEL DEMAND SURVEYS, AND RESPONSES FROM THE AGENCIE'S RELATED PUBLIC INVOLVEMENT PROGRAM.

Bike Lane: A portion of a roadway designated for the exclusive use of bicyclists through striping, signage, and pavement markings. A bike lane generally is a minimum of five feet in width.

Typical Striping for Bike Lane on Roadway



Bike Route: A connected, continuous system of bikeways designated by local jurisdictions and appropriately marked on roadways with directional and informational markers. Bike routes may consist of a combination of all types of bikeways, which includes Sharrows which direct bicyclists to move in a normal traffic lane. Bike routes can be numbered just like bus routes, although numbering is not necessary and signs designating the route are dependent on local policies.

Typical Shared Use Path

Shared Use Path: A pathway physically separated from motorized vehicular traffic by an open space buffer or constructed barrier. A shared use path may be within the right-of-way of a roadway/highway or fully independent within its own dedicated right-of-way. Shared use paths may be used by bicyclists, pedestrians, skater, joggers/runners, wheelchair users (including wheelchairs with electric power), and other nonmotorized modes of conveyance. Generally, shared use paths are a minimum of 10 feet wide and may be paved or unpaved.

Shared Use Trail: The shared use trail is an extension of the shared use path concept generally established in rural, undeveloped areas. Shared use trails accommodate the movements of all travels modes of the shared use path, some of which may be redefined as hikers, mountain bikers, and cross country skiers. Shared use trails also, in particular, are available for equestrian activities. Generally, shared use paths are a minimum of 10 feet wide and may be paved or unpaved. These facilities also may include 2-foot clear zones on each side, as they usually are established and maintained in natural settings, often through public lands, such as state parks and national forests.

Typical Shared Use Path

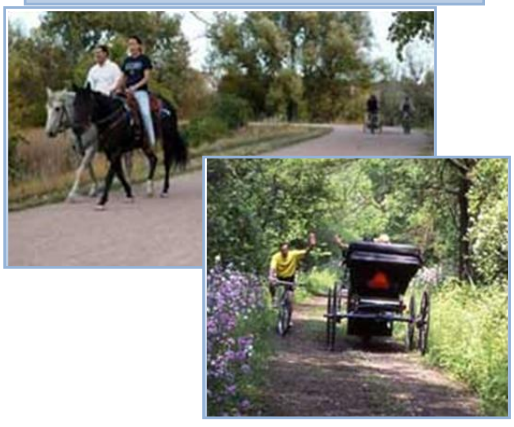


Figure 16 illustrates the proposed location of bike routes in conjunction with the Long-Term Bicycle System Plan, and **Figure 17** identifies existing and proposed bicycle facilities, including bike lanes, shared use paths, and shared use trails. The recommended network would create continuity and connectivity for future bicyclists, providing additional support for bicycle commuting as an alternative journey-to-work mode of travel.

FIGURE 16 – RECOMMENDED BICYCLE ROUTES AT BUILDOUT

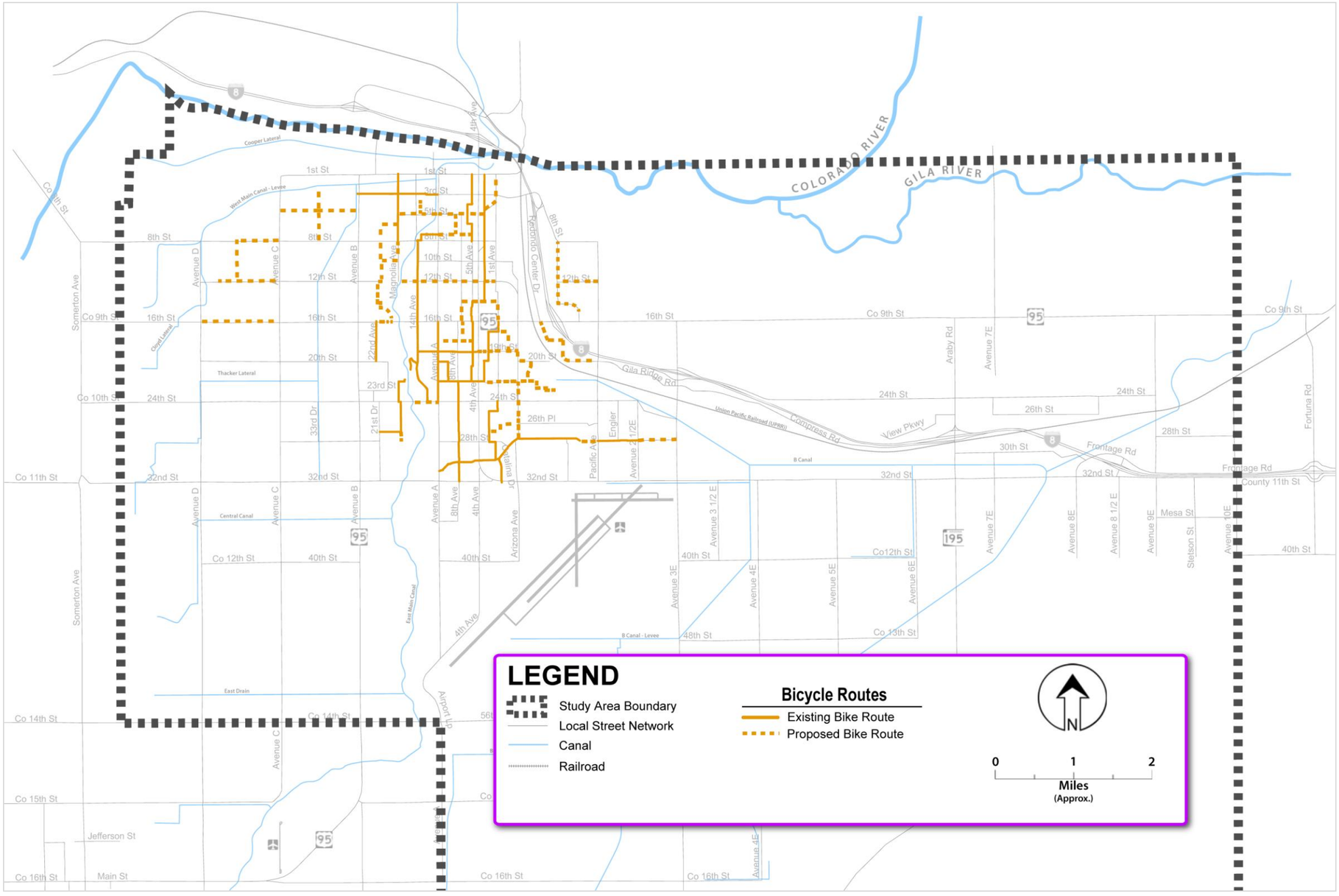
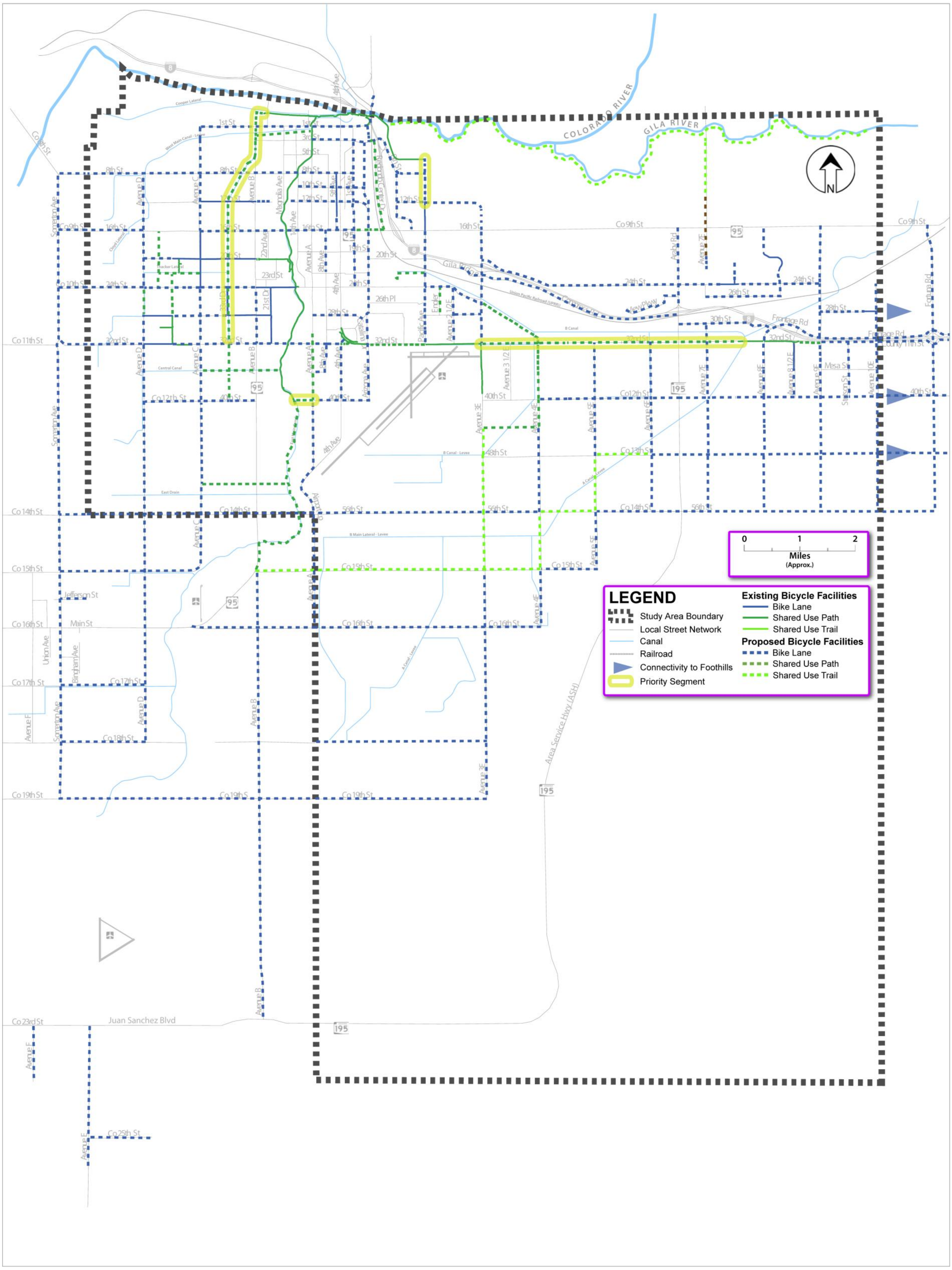


FIGURE 17 – RECOMMENDED BICYCLE FACILITIES AT BUILDOUT: BIKE LANES, PATHS, AND TRAILS



3.4 PEDESTRIAN SYSTEM PLAN

Every trip by any mode begins and ends with walking. Therefore, pedestrian facilities and connections to the various travel modes serve as a foundation for the City's transportation system. Efficient, safe, and secure pedestrian environments aid: meeting significant travel demand oriented to the Downtown, providing reliable access to transit services, connecting neighborhood destinations, and creating a vibrant street life. Although walking is the most basic form of travel, pedestrian environments also can create a sense of place that expands the travel experience, e.g., sidewalk cafes, spaces for events, gathering places for conversation, art and green spaces, and window shopping.

3.4.1 GUIDANCE FOR ACCOMMODATING PEDESTRIAN TRAVEL

Critical guidance for pedestrian planning in communities is based on the Americans with Disabilities Act (ADA), signed into law on July 26, 1990. This is the premier piece of legislation addressing accommodation of pedestrians in United States communities. The Department of Justice (DoJ) published revised regulations for Titles II and III of the Americans with Disabilities Act of 1990 "ADA" in the *Federal Register* on September 15, 2010. These regulations adopted revised, enforceable accessibility standards called the 2010 ADA Standards for Accessible Design "2010 Standards" or "Standards." The 2010 Standards set minimum requirements – both scoping and technical – for newly designed and constructed or altered State and local government facilities, public accommodations, and commercial facilities to be readily accessible to and usable by individuals with disabilities. State and local governmental facilities must follow the requirements of the 2010 Standards, including both the Title II regulations at 28 CFR 35.151; and the 2004 ADA Accessibility Guidelines (ADAAG) at 36 CFR, Part 1191 (Appendices B and D). Public accommodations and commercial facilities must follow the requirements of the 2010 Standards, including both the Title III regulations at 28 CFR, Part 36, Subpart D; and the 2004 ADAAG at 36 CFR, Part 1191 (Appendices B and D). These final rules went into effect on March 15, 2011, and have been required since March 15, 2012. The U.S. Access Board (Board) is a Federal agency that promotes equality for people with disabilities. The agency acts by providing leadership regarding accessible design and development of accessibility guidelines and standards for the built environment, transportation systems, communication networks, medical diagnostic equipment, and information technology. The Board is developing new guidelines for public rights-of-way. These new guidelines will address various mobility issues, including: access for blind pedestrians at street crossings; wheelchair access to on-street parking; and various constraints or impediments to mobility posed by space limitations, roadway design practices, slope, and terrain. The new guidelines also will cover pedestrian accessibility issues associated with sidewalks and streets, including: crosswalks, curb ramps, street furnishings, pedestrian signals, parking, and other components or features of public rights-of-way. The Board's aim in developing these guidelines is to assure access for persons with disabilities is provided wherever a pedestrian way is newly built or altered, and that the same degree of convenience, connection, and safety afforded the general public is available to pedestrians with disabilities. Once these guidelines are adopted by the DoJ, they will become enforceable standards under Title II of the ADA.

The Board is supplementing its rulemaking on public rights-of-way to also cover Shared Use Paths. Proposed rights-of-way guidelines, which address access to sidewalks, streets, and other pedestrian facilities, incorporate requirements for pedestrian access routes, including specifications for route width, grade, cross slope, surfaces, and other features. The Board proposes to apply these and other relevant requirements to Shared Use Paths as well. This supplementary rulemaking also would add provisions tailored to Shared Use Paths into the rights-of-way guidelines.

3.4.2 DEFICIENCIES AND NEEDS

The City of Yuma's policies, design guidelines, and standard street details should be reviewed and modified, as necessary, to ensure compliance with the new and proposed ADA requirements. The City should develop an ADA Transition Plan to reflect these changes and continue to replace noncompliant pedestrian access locations in compliance with Title II, which requires state and local governments to make their programs and services accessible to persons with disabilities. **Table 3** identifies the specific number and type of pedestrian conditions that are non-compliant with ADA relative to the Preferred Buildout Roadway System Plan. Improvements at these locations should be designed and scheduled when street improvements identified under Alternative B are implemented.

Figure 18 identifies locations within the study area where sidewalks should be constructed along strategic corridors to provide a continuous pedestrian travelway.

In addition to these measures identified above, additional study should be conducted to determine potential improvements that could improve pedestrian safety in corridors exhibiting high incidence of fatal or incapacitating crashes involving pedestrians. Previous analysis of study area crashes between 2008-2013 indicates that the greatest incidence of these crashes occurred in the following locations:

- 8th Street between Avenue B and 4th Avenue,
- 16th Street between Avenue A and Arizona Avenue,
- 24th Street between Avenue B and Pacific Avenue, and
- 4th Avenue between 3rd Street and 12th Street.

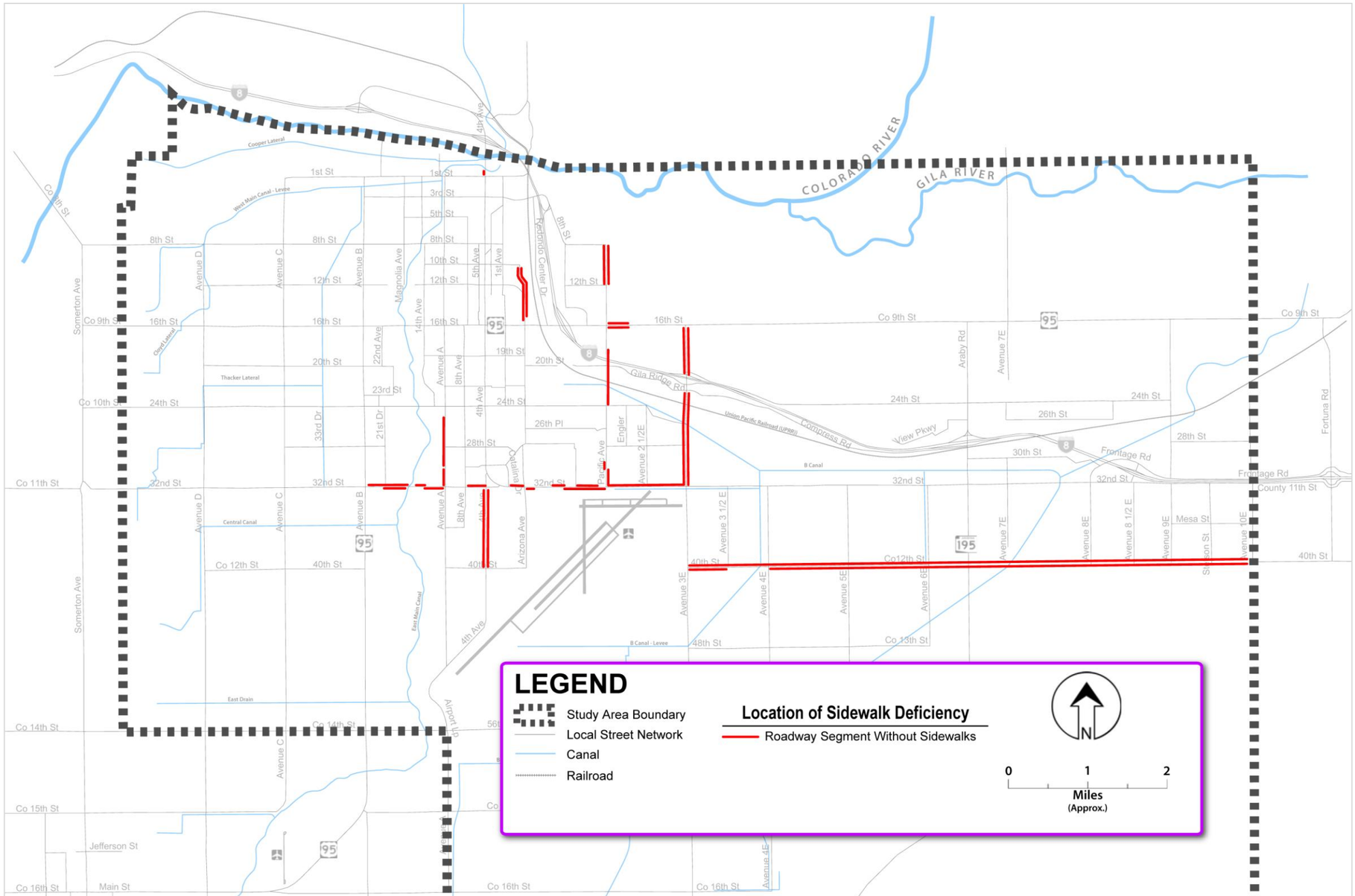
TABLE 3 – ADA DRIVEWAY AND INTERSECTION COMPLIANCE: ALTERNATIVE B

Roadway	Segment Affected	Driveways with Curb Return		Driveways without Curb Return		Intersection Ramps		Sidewalks (miles)	
		Non-ADA	Total	Non-ADA	Total	Non-ADA	Total	Non-ADA	Total
1st Street	Avenue B to 4th Avenue	1	1	23	98	83	88	0.0	3.58
32nd Street	Avenue B to Big Curve	15	16	27	27	26	43	2.13	3.95
40th Street	Avenue 3 E to Avenue 6 E	1	1	39	39	4	5	6.51	7.10
40th Street	Avenue 6 E to Avenue 10 E	0	0	5	5	0	0	9.56	9.56
Avenue 3 E	US-95 to I-8	0	0	6	6	10	10	1.53	1.53
Avenue 3 E	I-8 to 40th Street	1	1	11	11	14	30	2.85	5.58

Prepared by Wilson & Company, April, 2014.

During 2014, a Roadway Safety Assessment (RSA) occurred along 24th Street between Avenue C and Avenue 3E. Additional RSAs are also being conducted along 1st Street from Avenue C to Ocean Bridge and along 32nd Street from Pacific Avenue to Avenue 10 E. Similar RSAs could be conducted for the remaining corridors. These RSAs are aimed at identifying opportunities to improve the safety of the roadway based on identification of potential safety issues and could include site specific recommendations for improved lighting, signalized mid-block pedestrian crossings, or modifications to roadway speed limits based on an in depth review of the corridor and factors contributing to pedestrian crashes.

FIGURE 18 – PEDESTRIAN DEFICIENCIES IN STRATEGIC CORRIDORS



3.4.3 OTHER PEDESTRIAN STRATEGIES

In addition to the pedestrian walkways, paths, trails, and curb and driveway ramps, pedestrian facilities also include traffic calming features, grade-separated crossings, and other elements that encourage pedestrian movement such as lighting, landscaping, site furnishings and amenities, and public art. Other items to consider when implementing roadway widening or new construction include:

INTERSECTIONS

Crossing wide roadways is a significant barrier to pedestrian movement. Safe intersection design requires that pedestrians have safe and comfortable access while still meeting the needs of drivers.

CROSSWALK MARKINGS

Crosswalk markings should be provided at all signalized intersections.

MINIMIZE CROSSING DISTANCES

Minimizing crossing distances for pedestrians at intersections helps to increase the safety of slower-crossing pedestrians and enhances the comfort of all pedestrians. Tools to address this include:

- Reduced curb return radius
- Medians and refuge islands
- Curb bulb-outs and extensions

MINIMIZE PEDESTRIAN/VEHICLE CONFLICTS

There are many ways to minimize conflicts between pedestrians and motor vehicles at intersections, including enhancing visibility and sight distance, restricting on-street parking, signalizing intersections, grade separation, and regulating turning movements.

MID-BLOCK CROSSINGS

Given a choice between an inconvenient safe route and a convenient route that may be less safe, many pedestrians will select the more convenient route. There are numerous options available including pedestrian refuges, flashing beacons, high intensity activated crosswalks (HAWK), and grade-separation. HAWK stands for High-Intensity Activated CrossWalK, which is a crossing system devised to permit pedestrians to control traffic-stopping lights on demand at the designated crossing. It is officially referred to as a "pedestrian hybrid beacon." HAWK signals offer a good solution for mid-block locations where there is a heavy pedestrian traffic demand. Though generally applied for pedestrian crossings, they have been applied with respect to bicycle traffic. The signal timing can be adjusted to account for the regular presence of older, disabled, and/or younger users of the HAWK.

Cover Photo, Safety Effectiveness of the HAWK Pedestrian Crossing Treatment, FHWA-HRT-10-042, July, 2010.

SIGNAL TIMING AND PEDESTRIAN ACTUATED SIGNALS

Traffic signals are typically timed to efficiently move motorized vehicles through intersections. Pedestrians usually must stop and wait to cross at every signalized intersection. Signals with excessively long waits may cause pedestrians to cross against the signal, increasing the potential for pedestrian/motor vehicle conflicts. Signal timing should be set closer to the speed of slower pedestrians

rather than the average speed of all users. The use of pedestrian count-down signals can help provide additional information on the amount of time available to cross the roadway.

ACCESSIBLE PEDESTRIAN SIGNALS

An accessible pedestrian signal is "a device that communicates information about pedestrian timing in non-visual format such as audible tones, verbal messages, and/or vibrating surfaces". Accessible pedestrian signals provide information to pedestrians about the existence and location of a pedestrian push button, the direction of the crosswalk, and other information about the intersection.

Currently in the U.S., accessible pedestrian signals are typically installed upon request along a specific route of travel for a particular individual or group of individuals who are blind or visually impaired. Title II of ADA requires municipalities and states to make their 'programs' accessible. Pedestrian circulation is considered a program, and an accessible pedestrian signal may be necessary to provide access to certain types of intersections. Some municipalities have considered the addition of accessible pedestrian signal at intersections as part of their ADA transition plan.

LIGHTING

Pedestrian level lighting should be provided in areas where there is pedestrian activity in early morning, evening, and nighttime hours. If provided, a minimum of one-foot-candle of light from grade to five feet above the walking surface, between sunset and sunrise, at vehicular intersections, changes in grade, and at crosswalks is recommended. Provide points of illumination along the sidewalk or walkway so that users can move comfortably from light to light.

SHADE

Pedestrians in the Yuma area seek protection from the sun from late spring through fall. For other months of the year, when temperatures are cooler, pedestrians seek filtered or direct sunlight to be comfortable. The most intense sunlight and temperature extremes occur from May to September, from 12:00 noon to sunset. Shade cover can be provided by either an architectural feature, such as a covered walkway or shelter, or the canopy of a tree.

SEATING

Comfortable and frequent seating can help promote walking and create a comfortable pedestrian environment. All benches or other seating surfaces must meet guidelines for accessibility. Seating and other furnishings should not protrude into the pedestrian route of travel. Benches should allow a person in a wheelchair to have immediate adjacent access (3-foot radius minimum). Seating opportunities can be either fixed or moveable and the seating surface should not be so rough that it is uncomfortable to sit or can damage skin or clothing. Seating opportunities should consider the intense heat and sun of Arizona's climate through appropriate placement, materials, and sensitive designs that mitigate heat retention.

3.5 TRUCK ROUTING PLAN

Goods and freight movement by truck within the City of Yuma and the greater study area primarily is focused today I-8, US-95, SR-195and four arterial roadway: 8th Street, 16th Street, 4th Avenue, and 32nd Street. While it is important to ensure full access to the community for the delivery of goods and freight, it also is important that truck movements be limited to a select number of routes. Restricting truck movements to major roadways and incorporating necessary capacity and design parameters to accommodate fleet characteristics is essential to maintaining the safety and security of the community.

3.5.1 GENERAL TRUCKING

Nearly all vehicle movements in growing urban areas, like Yuma, are tied both directly and indirectly to truck movements. Local trucking is an important part of the community's supply and delivery system and, thus, an important part of the local economy. In fact, "the total resource costs of urban goods movement are comparable to those of urban person movement…. In other words, about half of total urban transportation costs, in economic terms, are related to freight."[1] Indeed, "passengers going to shop, going to work, coming from work, going to a restaurant for lunch or dinner, going to a movie, or just going for a drive are indeed making freight-related trips. If trucks from the food and department store warehouses, from suppliers to manufactures, from restaurant and entertainment supply houses, and from highway paving and construction companies had not made their trips, passengers would not be making theirs."[2]

Therefore, a principal goal with respect to identifying community truck routes within the community is to coordinate engineering, educational, informational, and enforcement efforts. Coordination and discussion allows the community to ensure trucks remain on designated truck routes until reaching the intersection nearest their destination. The objective of the Truck Routing Plan is to minimize inappropriate use of local streets, thereby minimizing the intrusion of truck traffic into residential and other sensitive areas.

3.5.2 TRANSPORTATION OF HAZARDOUS MATERIALS

Achievement of the goal of effectively identifying routes for hazardous material (HazMats) requires factoring into the decision: population density; type of highway; emergency response capabilities; terrain/environmental factors; accident statistics; and other parameters. Clearly, such a process of identifying multiple routing alternatives and comparing them across numerous factors can involve complicated, time-consuming, and expensive evaluation of each alternative. Based on guidance developed for the FHWA by the National Highway Institute (NHI), focusing on a few reasonable routes will eliminate options that have little chance of meeting stringent goals and reduce the commitment of funds.[3] The following basic criteria provide an appropriate framework for identifying HazMats routing:

- Minimize population exposure to HazMats shipments to the extent feasible;
- Identify routes for HazMats shipments that are consistent with standards of roadway and community safety;
- Assure satisfaction of intercommunity connections, while minimizing local traffic concerns;
- Assure, to the extent feasible, the availability of critical service routes;
- Utilize non-routing strategies to the extent feasible;
- Minimize costs to implement, administer, and enforce established HazMats routing requirements; and
- Assure consistency of application with adjacent communities and State and Federal programs.

As the study area roadway network is only partially complete at this time and will incorporate in the future a more extensive arterial infrastructure, one objective of this Truck Routing Plan is to identify safe routes and assure connectivity with the SHS. The second objective is to identify service routes, the maintenance of which would be critical to the social and economic activities of the community.

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1 Ogden, Kenneth Wade, "Urban Goods Movement and Its Relation to Planning" in *Proceedings of the Urban Goods and Freight Forecasting Conference* (Washington, D.C.: FHWA and TMIP, forthcoming, 1998, 2-1 to 2-14) in Casa Grande SATS Final Report, 07-02-07, pg. 38.

2 Capelle, Russell B., "Commodity Flows and Freight Transportation" in Chapter 3 of the Institute of Transportation Engineers *Transportation Planning Handbook*, 2nd Edition (Washington, D.C.: Institute of Transportation Engineers, 1999) pg. 25

3 Federal Highway Administration, US Department of Transportation, Publication FHWA-HI-97-004, *Highway Routing of Hazardous Materials: Guidelines for Applying Criteria*, NHI Course No. 38064, November, 1996.

3.5.3 OVERWEIGHT TRUCKS ROUTES

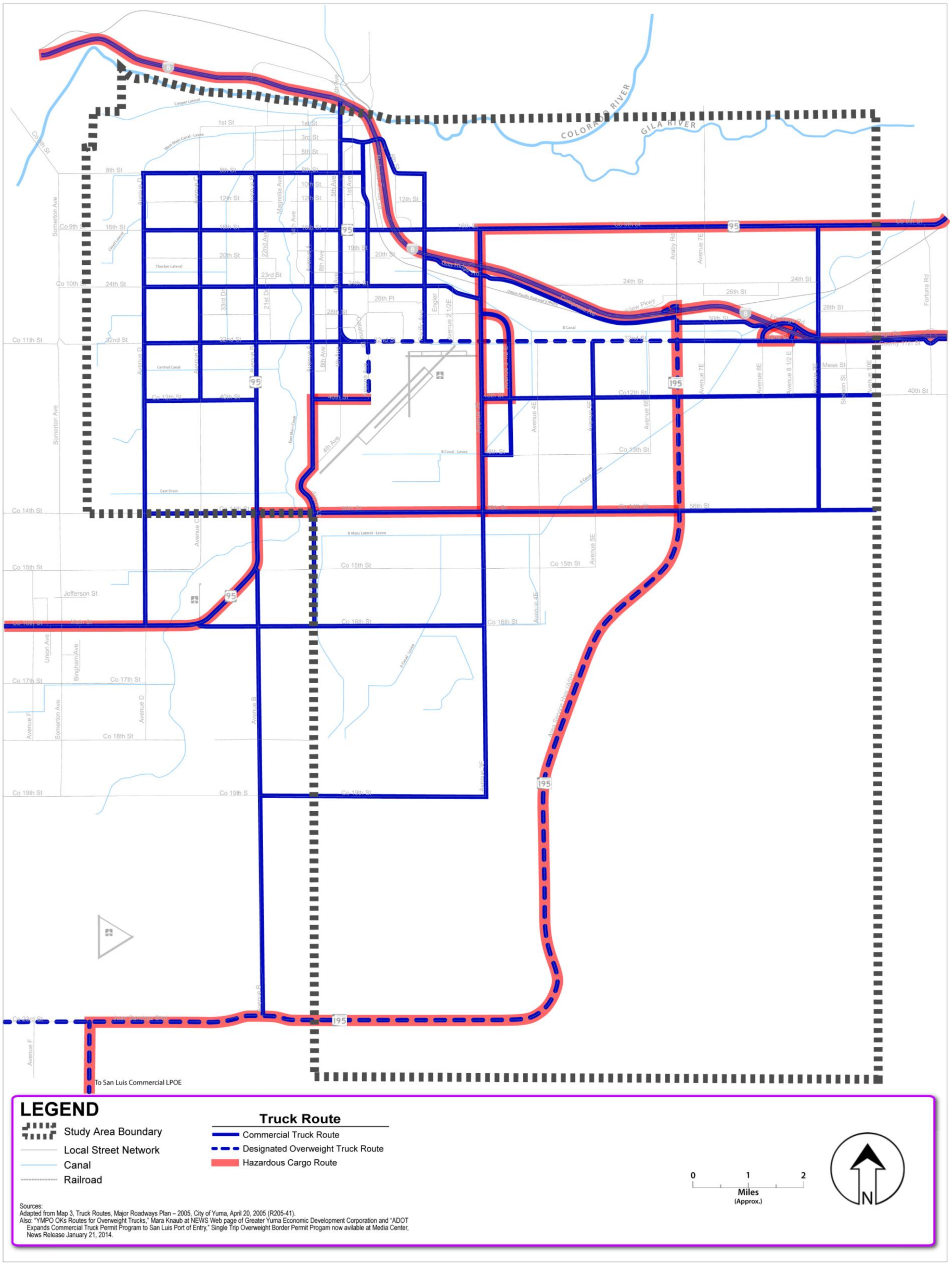
The Truck Routing Plan continues to incorporate the routes approved for overweight trucks, as illustrated in Figure 11. This route includes SR-195 between E. 32nd Street and the study area boundary east of San Luis. ADOT permits for travel on this route increase the weight limits for commercial trucks from 80,000 pounds to 90,800 pounds. This permit allows produce from Mexico to be off-loaded into warehouses located in the commercial zone of the Arizona International Port of Entry, which is defined by a 25-mile radius from the Arizona-Mexico Border. The cost of the permit of $75 is split with 50 percent going to ADOT, 25 percent to Yuma County, and 25 percent divided between Yuma and San Luis. The permit cost aids in maintaining roadways incorporated in designated routes. Prior to the cost-sharing agreement enacted into law in 2012, Yuma County and affected cities restricted the use of roadways for overweight trucks, which resulted in trucks being directed toward ports of entry at Mexicali/Calexico and Nogales/Nogales.

Overweight truck routes are designated by local jurisdictions, not ADOT, and new routes may be instituted if changing economic conditions warrant. As of this time, no new routes are anticipated. YMPO considered up to 20 such routes, but determined that adding routes could present additional burdens on local funding levels, due to additional maintenance requirements. Also, the agency desired to complete a thorough study of the roadway system to the structural integrity of bridges and other infrastructure elements relative to the extra weight and level of expected use.

3.5.4 TRUCK ROUTING PLAN MAP

Figure 19 shows the roadways incorporated in the Buildout Truck Routing Plan. This map shows an expanded truck route system that will serve all the key arterial roadways in the study area. This will facilitate more efficient and consistent truck movements in service to the community. The map also shows expansion of the HazMats routes to better accommodate the transport needs of industry and commerce, which is expected to increase as Buildout occurs.

FIGURE 19 – TRUCK ROUTING PLAN



Sources:
Adapted from Map 3, Truck Routes, Major Roadways Plan – 2005, City of Yuma, April 20, 2005 (R205-41).
Also: "YMPO OKs Routes for Overweight Trucks," Mara Knaub at NEWS Web page of Greater Yuma Economic Development Corporation and "ADOT Expands Commercial Truck Permit Program to San Luis Port of Entry," Single Trip Overweight Border Permit Progam now avilable at Media Center, News Release January 21, 2014.

4.0 IMPLEMENTATION PLAN

The implementation plan identifies proposed phasing of recommended improvements corresponding to the anticipated timing and need for improvements. Projects have been identified for implementation relative to near-term (5 years), mid-term (10 years), and Buildout planning horizons.

4.1 NEAR-TERM (5-YEAR) IMPROVEMENT PLAN

Near-term improvements have been identified based on the following criteria:

- Projects currently underway,
- Projects currently being designed,
- Projects for which right-of-way has already been acquired,
- Projects addressing existing deficiencies,
- Projects identified in the YMPO RTP for 2014-2018, and
- Transit service enhancements included in the YCIPTA *Five-Year Short-Range Transit Plan*.

4.1.1 ROADWAY PROJECTS

Near-term roadway projects would include all programmed improvements, as illustrated in **Figure 12** and described in section 3.1.1. Each of the recommended roadway widening and construction projects should adhere to the City's standard roadway cross sections and include sidewalks and center left-turn lanes/medians as may be appropriate to roadway classification. Bike lanes also should be constructed on those facilities illustrated in **Figure 16**. Because standard details for a 4-lane Collector do not exist, the cross section for a 4-lane Minor Arterial shall apply.

4.1.2 INTERSECTION PROJECTS

Near-term intersection projects would include all programmed improvements, as illustrated in **Figure 12** and described in Section 3.1.1. Additional near-term intersection improvements have been identified for analyzed locations currently operating at poor levels of service. The additional recommended improvements will also serve long-range travel demand and include:

24TH STREET AND AVENUE B

- Single right-turn bays eastbound and southbound
- Dual left-turn bays on all approaches
- Widening northbound and southbound approaches to provide an additional through lane through the intersection;

32ND STREET AND BIG CURVE

- Add northbound left-turn bay
- Restripe existing northbound shared through-left lane to create an exclusive through lane
- Revise signal phasing to remove northbound/southbound split phasing.

4.1.3 TRANSIT PROJECTS

YCIPTA's *Five-Year Short-Range Transit Plan* details near-term changes to the current YCAT service to improve the efficiency and effectiveness of public transit in the study area. Refer to the discussion in Section 3.2 and **Figure 15** for a summary of near-term, i.e., "planned," service improvements, as well as potential long-term improvements identified to support Buildout conditions.

4.1.4 BICYCLE PROJECTS

The locations of recommended bike routes, bike lanes, shared use paths, and shared use trails are illustrated in **Figures 16 and 17**. Bike routes depicted in **Figure 16** should be appropriately signed. Other near-term priorities for expanding the study area bicycle network are listed below and highlighted in **Figure 17**.

- A shared use path would be constructed along the Thacker Lateral south from the existing shared use path along the Colorado River Levee. This facility would follow the lateral south to 22nd Street, and then continue south to 32nd Street within an existing canal right-of-way directly on an alignment directly east of 33rd Drive.
- A bike lane would be constructed on Pacific Avenue that would connect the Colorado River Levee shared use path with 12th Street and bike lanes in the eastern portion of the study area.
- A shared use path would be constructed along 40th Street and connected to the East Main Canal; ultimately, this shared use path would extend north of 40th Street along Avenue A providing access to Kofa High School north of 32nd Street.

4.1.5 PEDESTRIAN PROJECTS

The locations within strategic corridors of the study area that have pedestrian deficiencies – specifically, a lack of sidewalks – are illustrated in **Figure 18**. The construction of sidewalks in these locations would complete the continuity of the pedestrian network. The following segments should be constructed as part of the near-term implementation plan:

- Avenue A between Rosewood Drive and 32nd Street;
- West side of 4th Avenue north of 1st Street;
- 4th Avenue between 32nd Street and 40th Street;
- Arizona Avenue between 10th Street and 16th Street;
- Pacific Avenue between 8th Street and 12th Street;
- East side of Pacific Avenue between Crowder Avenue and 24th Street;
- Pacific Avenue between Palo Verde Street and 32nd Street; and
- 32nd Street between Big Curve and Avenue 3 E.

Finally, construction of sidewalks along Avenue 3 E between 16th Street and the B Canal/24th Street should be included with the proposed near-term widening of Avenue 3 E.

In addition to these sidewalk construction projects, an ADA transition plan should be developed to identify the appropriate timeline for reconstruction of non-ADA compliant driveways and intersections. Within the strategic corridors alone, a total of nearly 900 driveways and 500 intersection corners were found to be non-compliant. Reconstruction of these locations would cost an estimated $2.9 million dollars.

Finally, RSAs should be conducted for the following corridors:

- 8th Street between Avenue B and 4th Avenue;
- 16th Street between Avenue A and Arizona Avenue; and
- 4th Avenue between 3rd Street and 12th Street.

4.1.6 ESTIMATED COST OF NEAR-TERM IMPROVEMENTS

The estimated cost of projects identified for near-term implementation is approximately $86 Million. **Attachment 2** provides detailed planning-level cost estimates for each recommended improvement project.

4.2 MID-TERM (10-YEAR) IMPROVEMENT PLAN

Mid-term improvements are shown in **Figure 20**. These projects have been identified based on the following criteria:

- Projects identified in the YMPO RTP for 2019-2023; and
- Projects improving capacity and connectivity to areas of existing development

4.2.1 ROADWAY PROJECTS

Mid-term roadway projects include:

- Widening of 32nd Street between Avenue B and Big Curve as a 6-lane Principal Arterial;
- Construction of Avenue 3½ E between Avenue 3 E and 48th Street as a 4-lane Minor Arterial; and
- Reconstruction/construction of 40th Street between Avenue 3 E and Avenue 10 E as a 4-lane Minor Arterial

Each of the recommended widening and roadway construction projects should adhere to the City's standard roadway cross sections, which include sidewalks, bike lanes, and center left-turn lanes/medians. As indicated by the cross sections, bike lanes should be constructed as these roadway projects go forward (refer to **Figure 17**, also the Complete Streets discussion presented in Section 4.4).

4.2.2 INTERSECTION PROJECTS

Mid-term intersection projects include:

24TH STREET AND PACIFIC AVENUE

- Single right-turn bays for all directions
- Dual left-turn bays for all directions;

32ND STREET AND PACIFIC AVENUE

- Eastbound dual left-turn bays
- Southbound dual right-turn and dual left-turn bays.

4.2.3 ESTIMATED COST OF MID-TERM IMPROVEMENTS

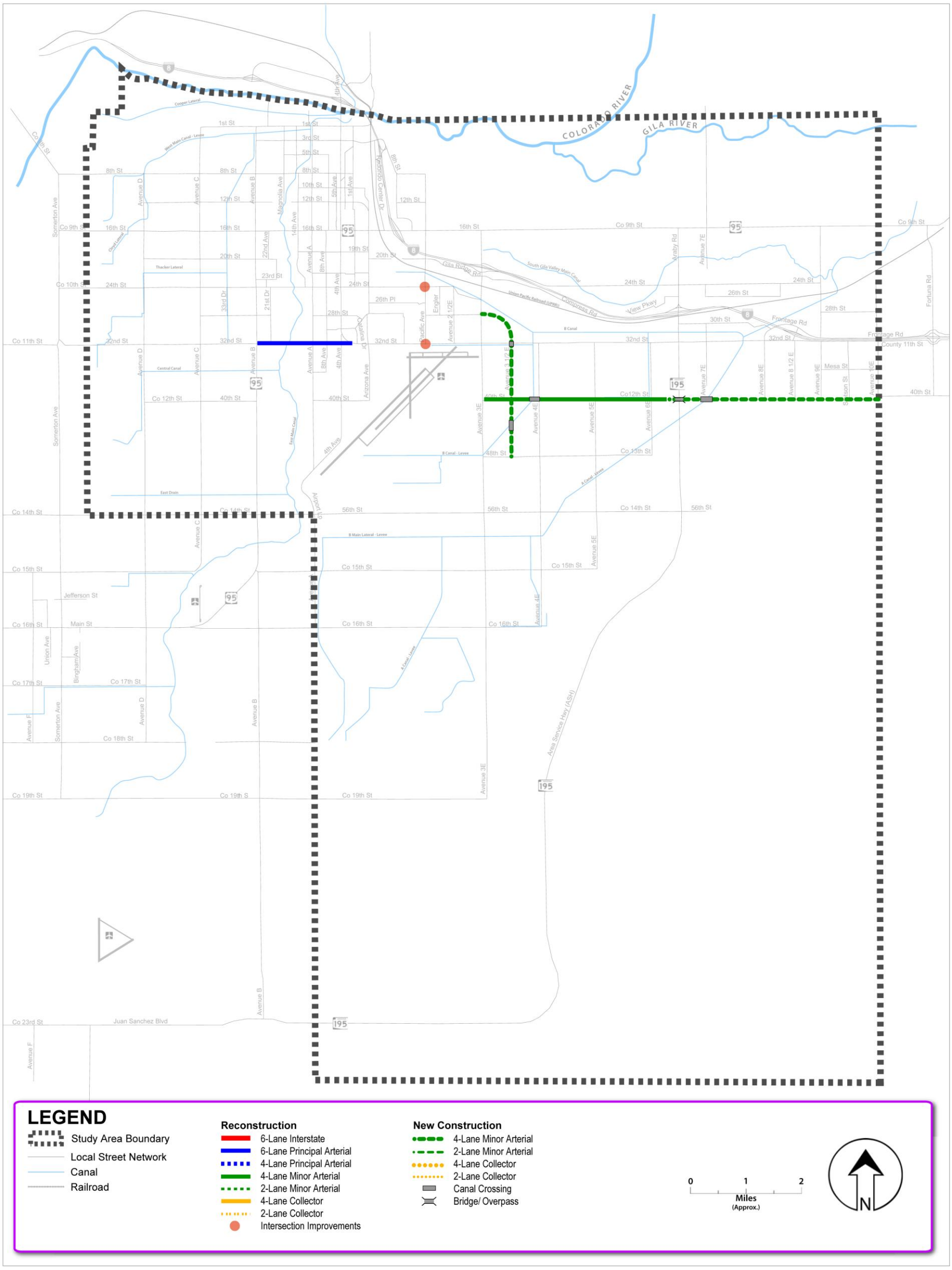
The estimated cost of projects identified for mid-term implementation is approximately $72 Million. **Attachment 2** provides detailed planning-level cost estimates for each recommended improvement project.

4.3 BUILDOUT (10+ YEAR) IMPROVEMENT PLAN

Buildout improvements include all remaining projects not identified for near-term or mid-term implementation (**Figure 21**). These projects primarily consist of projects providing capacity and connectivity to future growth areas, such as the Foothills east of the study area and Estancia in the southern portion of the study area. The timing of the projects will be dependent on the timing of expected future development activity.

The estimated cost for each of the remaining projects recommended for construction as the study area builds out is $402 Million. **Attachment 2** provides detailed planning-level cost estimates for each recommended improvement project.

FIGURE 20 – RECOMMENDED MID-TERM IMPROVEMENTS



LEGEND

- Study Area Boundary
- Local Street Network
- Canal
- Railroad

Reconstruction

- 6-Lane Interstate
- 6-Lane Principal Arterial
- 4-Lane Principal Arterial
- 4-Lane Minor Arterial
- 2-Lane Minor Arterial
- 4-Lane Collector
- 2-Lane Collector
- Intersection Improvements

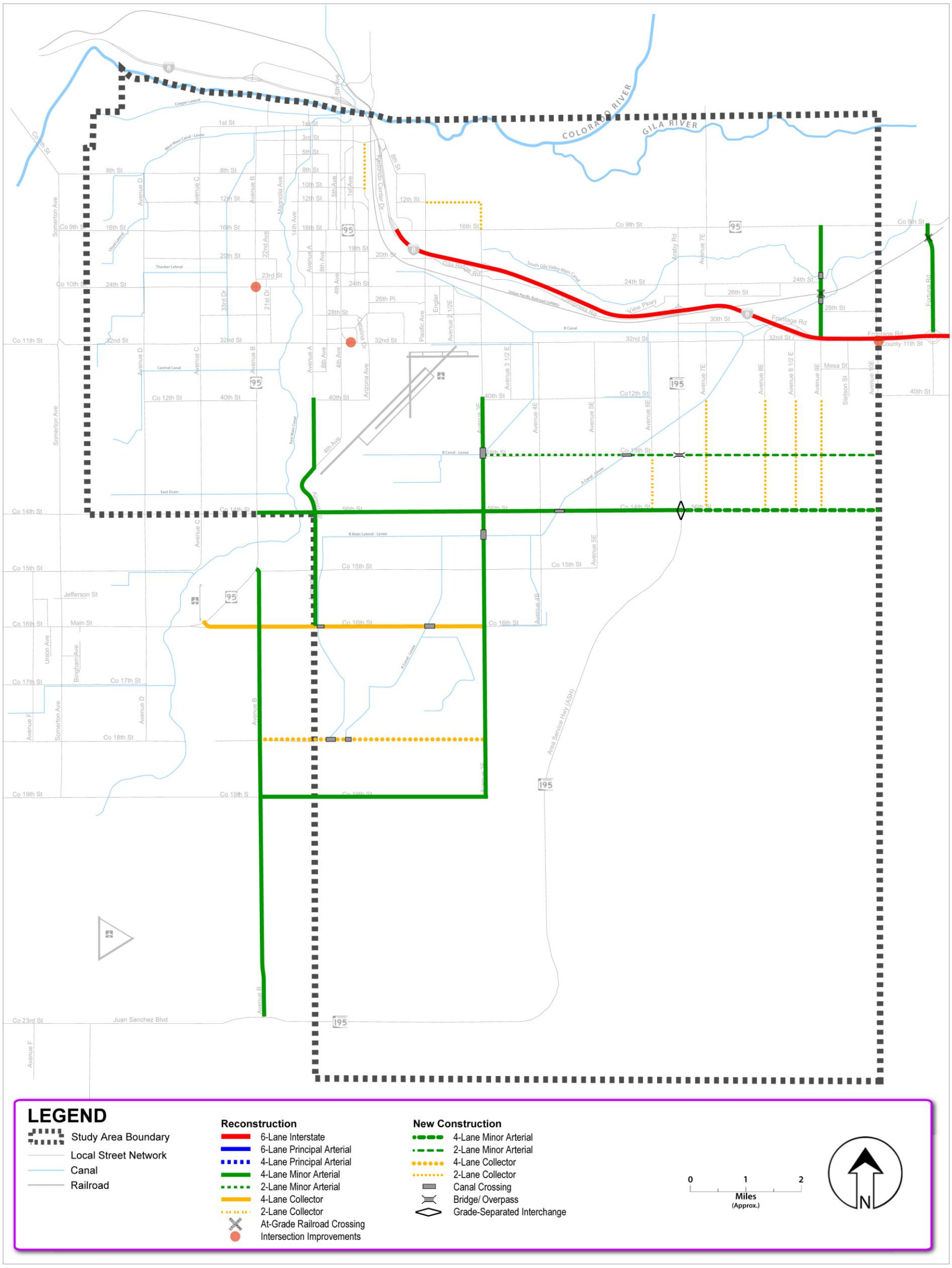
New Construction

- 4-Lane Minor Arterial
- 2-Lane Minor Arterial
- 4-Lane Collector
- 2-Lane Collector
- Canal Crossing
- Bridge/ Overpass

0 1 2 Miles (Approx.)

N

FIGURE 21 – RECOMMENDED LONG-TERM IMPROVEMENTS



4.4 COMPLETE STREETS

The objective of Complete Streets is to develop integrated, connected networks of streets that are safe and accessible for all people, regardless of age, ability, income, ethnicity, or chosen mode of travel. The Complete Streets concept aims to balance the needs of motorists, pedestrians, bicyclists, transit vehicles, emergency responders, and goods movement (trucks). This is accomplished through designs to include traffic lanes, bicycle lanes, parking, and sidewalks. Adequate lighting, shade, signing, and other facilities, such as special accommodations for people with disabilities, also are integral to the concept of Complete Streets. The Complete Streets concept also means a paradigm shift in the transportation planning process, as it gives greater emphasis to an integrated system of mobility-oriented policies and projects.

Implementation of Complete Streets policies does not mean that every street should be reconstructed to include public transit, wide sidewalks, designated bike facilities, and transit-oriented development (TOD). The objective is to examine the principles of Complete Streets and apply them, as appropriate within the framework of community goals, vision, and resources, to create incrementally, over time, a multimodal transportation system to accommodate all travel needs of system users. Evaluating the City's transportation system from this perspective facilitates a deeper look at the growing demand placed on the City's local roadways and other transportation modes.

The FHWA has entered into partnerships at the national level to stimulate and support more awareness of and investment in transportation choices in conjunction with initiatives to create healthy, safe, and walkable neighborhoods. The FHWA Complete Streets approach typically embraces: sidewalks; bike facilities (or wide, paved shoulders); shared-use paths; pedestrian-friendly accommodations, including median islands, accessible pedestrian signals, and curb extensions; and transit facilities, including designated bus lanes and safe, accessible transit stops. FHWA developed Bicycle and Pedestrian Guidance that explains how and when FHWA will require or encourage the accommodation of pedestrians and bicyclists in Federal-aid highway projects. Their Web page (www.fhwa.dot.gov/environment/bikeped/bp-guid.htm) discusses the Safe Routes to School program, explains how context sensitive solution applies the Complete Streets concept, and defines the expected roles of state governments, metropolitan planning organizations, local governments, and transit operators.

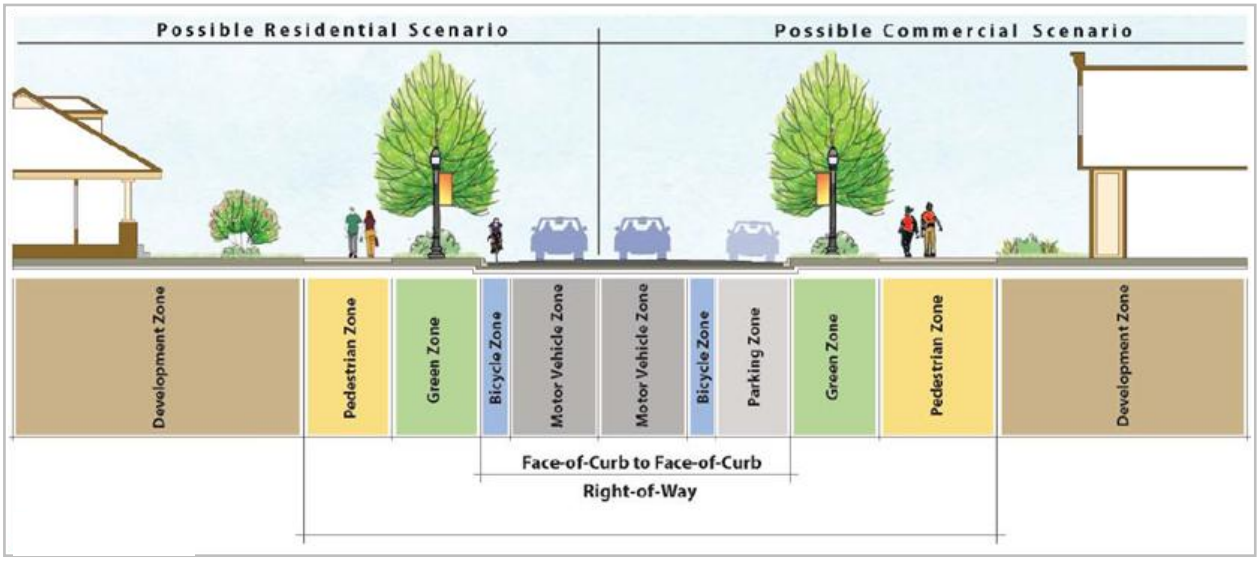
The FHWA discussion of the Complete Streets concept includes a graphic from the City of Charlotte, North Carolina, Urban Street Design Guidelines depicting how the concept can anticipate and accommodate the needs of all road users in the community (**Figure 22**).

A Complete Streets program would ideally include policies guiding the installation of new elements in the streetscape, such as:

- Bicycle lanes, as components of all street cross sections;
- Wide sidewalks that may be used by bicyclists;
- Separation of sidewalks from the curb and traffic;
- Provision of transit shelters; and
- Greater use of landscaping and hardscapes (e.g., benches, planters, art, etc.).

The study area is characterized by a continuum of development patterns, ranging from dense urban residential and commercial development to widely dispersed, low-density rural and range development. Certain qualities and characteristics are represented within this range.

FIGURE 22 – COMPLETE STREET SCENARIOS



Source: Federal Highway Administration > Publications > Public Roads > Vol. 74 · No. 1 > Street Design: Part 1— Complete Streets, Publication FHWA-HRT-10-004, July/August, 2010, Vol. 74 – No. 1.

4.4.1 URBAN AREAS

Urban areas generally are characterized by mix of commercial, residential, civic activity areas, and public/semi-public services. These areas also often present a mixture of structural heights and variety of spatial contexts. The density of development typically is very dense and very supportive of multi-modal transportation systems. The urban areas usually include pedestrian facilities (e.g., sidewalks) within roadway right-of-way; however, often there is no separation between the sidewalk and street traffic. Also, bicycle accommodations generally are absent, but the density and closeness of activities is conducive to bicycling between locations. The network of streets and sidewalks often is complemented by transit service and central transfer centers where multiple bus routes are available for travel to many destinations.

4.4.2 SUBURBAN AREAS

Suburban vary widely in character, with generally a less dense development pattern and high dependence on automobiles for daily travel. These areas present different challenges, because development can occur in pockets often times disconnected with a greater consistency in structure height, aesthetics, and spatial context. The lower density of suburban areas works against efficient and effective bicycling and walking between destinations, but these areas offer opportunities (and the need) for developing complete street designs. While transit services often are provided in suburban areas, the service reflects the low density of development and, therefore, access to transit can sometimes be problematic. The automobile orientation of the transportation network typically requires additional planning to create safer, more efficient transportation opportunities for bicyclists and pedestrians, and enhanced accessibility for transit users.

4.4.3 RURAL AREAS

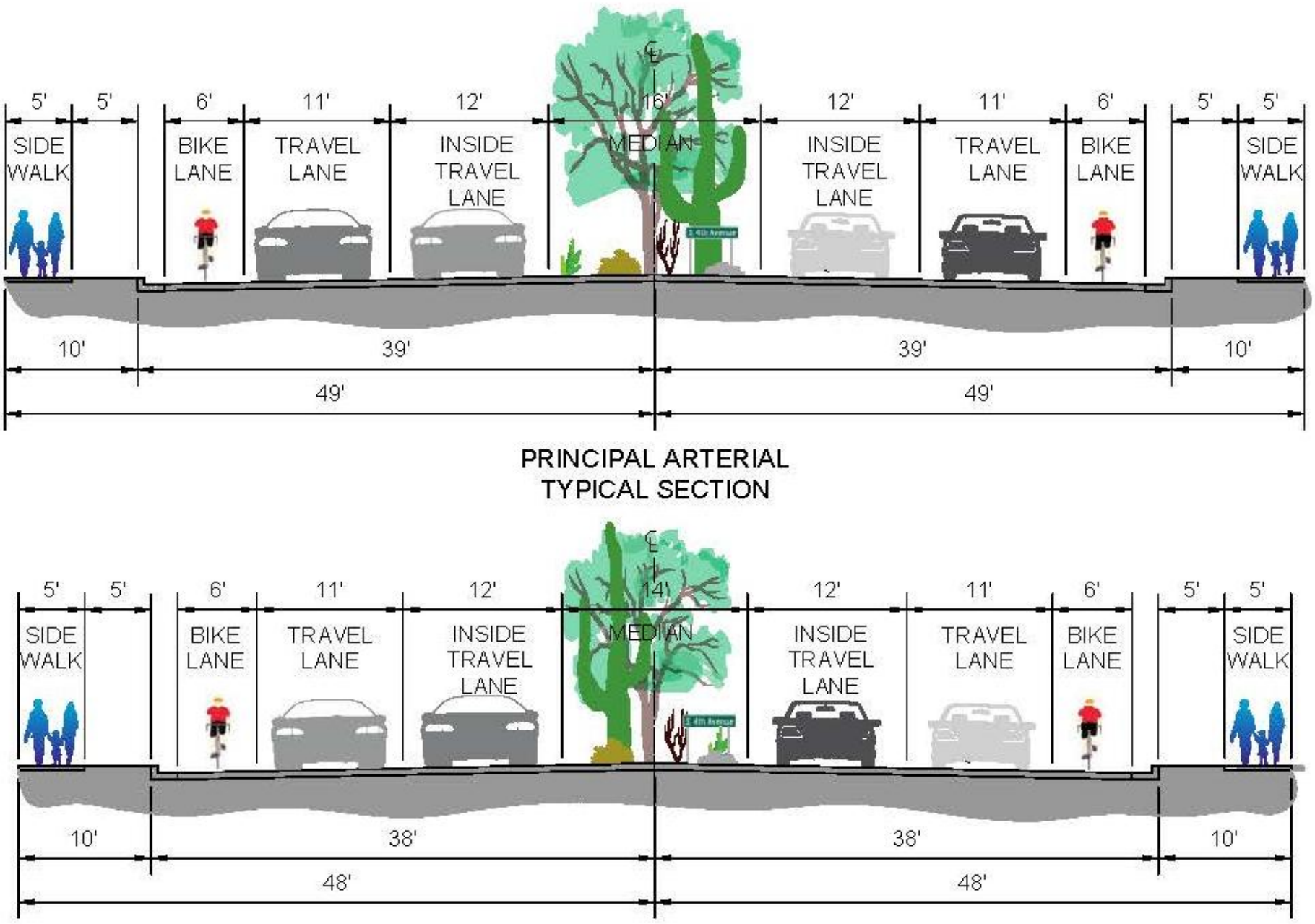
Rural areas, generally located beyond the suburban areas, are distinguished by greater separation of developments, reflecting an intent or desire of residents to retain the natural, wide-open character of the area. Rural areas are characterized by very low-density development, and development primarily is oriented to residential and uses dependent of large amounts of land, such as agriculture. Nevertheless, rural development may include isolated subdivisions and the occasional commercial/industrial use. Long stretches of road are interrupted by the occasional cross street or a driveway, but these long stretches of road also make bicycling "in the countryside" and attractive recreational activity. This presents potential conflicts with pedestrians and bicyclists alike and requires drivers to be more alert. Roadway design needs to take into consideration the activities of motorist, bicyclists, and pedestrians, which may be occurring on narrower two-lane facilities with sight distance constraints.

4.4.4 APPLICABILITY OF COMPLETE STREETS CONCEPT

The process of planning, designing, and creating complete streets requires a focus on making it possible for motorists, pedestrians, bicyclists, and transit riders to travel together safely as they move between points in the study area. The process also needs to incorporate attention to: safety, mobility, accessibility, quality of life, and sustainability as streets design is conceived and streets operations are evaluated. Similar objectives are required when reconstruction and new construction of street intersections is undertaken. It is at intersections that the movements of motorists, pedestrians, bicyclists, and transit users come into most direct conflict. Designs that minimize potential modal conflicts, along streets and at intersections, represent the overarching goal of Complete Streets.

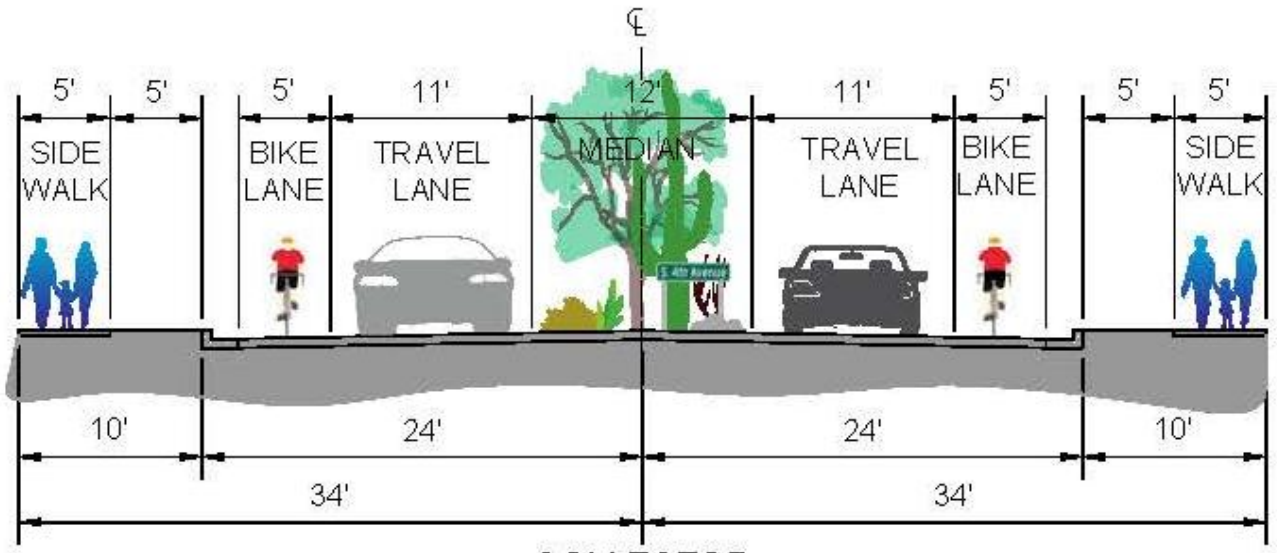
The Roadway System Plan identifies a network of streets to accommodate travel demand expected under Buildout conditions. Buildout conditions imply expansive growth of population and, therefore, travel demand also can be expected to increase for other modes. The Transit System Plan offers a future modal operating scheme that will facilitate greater mobility, flexibility, and accessibility of movements between and among the many different origins and destinations within the City. The Bicycle System Plan reflects the goal of the City to create a comprehensive bicycle facility network that fully complements the roadway network and offers a realistic alternative for commute-to-work trips. The Pedestrian System Plan is focused on strategic travel corridors with heavy travel demand, but does not preclude design innovations in conjunction with all City streets that promote greater safety and security for pedestrian movements. Currently, the City's roadway cross-section standards provide for inclusion of bicycle and pedestrian facilities within the required right-of-way. However, the standards do not include the desired separation of sidewalks and other pedestrian zones from the curb and passing traffic. Therefore, within the context of this TMP, alternative cross sections have been developed to illustrate how this separation could be provided within existing, or even lesser, right-of-way requirements. **Figure 23** illustrates these alternative cross sections.

FIGURE 23 – COMPLETE STREETS ALTERNATIVE ROADWAY CROSS SECTIONS



PRINCIPAL ARTERIAL
TYPICAL SECTION

MINOR ARTERIAL
TYPICAL SECTION



COLLECTOR
TYPICAL SECTION

NOTE: Typical sections for Rural facilities exclude the curb and gutter in favor of direct drainage to a side ditch or a drainage chute to surface drainage along side the roadway. A curb-and-gutter element may be appropriate in more densely developed rural conditions. Culverts would be included, where necessary, to accommodate cross drainage. Landscaping and other stablilization methods are used to control erosion of the roadway shoulder, which permits runoff to reach the side ditch (or center ditch, if the roadway is divided). Also, sidewalks generally are an optional feature, again depending on whether the density of developoment and antifipated demand in the area would warrant this type of feature.

ATTACHMENTS

Attachment 1

LIST OF CONSTRAINED ROADWAY CROSS SECTIONS

Roadway	Segment	Lanes
10th Street	Avenue A to 5th Avenue	2
12th Avenue	Water Street to 1st Street	2
12th Street	Avenue A to Arizona Avenue	2
12th Street	Avenue A to Avenue B	2
12th Street	Avenue B to Avenue C	4
14th Avenue	8th Street to 24th Street	2
14th Street	4th Avenue to 7th Avenue	2
15th Avenue	1st Street to 8th Street	2
16th Street	Arizona Avenue to Pacific Avenue	5
16th Street	Avenue A to Avenue B	5
16th Street	Avenue B to Avenue D	5
19th Street	Arizona Avenue to Avenue A	2
19th Street	Avenue A to Elks Lane	2
1st Avenue	8th Street to 26th Street	2
1st Avenue	1st Street to 8th Street	2
1st Street	4th Avenue to Avenue B	5
1st Street	Gila Street to 4th Avenue	2
20th Drive	20th Street to 23rd Street	2
20th Street	Arizona Avenue to Pacific Avenue	2
20th Street	Avenue B to Avenue C	2
20th Street	Magnolia Avenue to Avenue B	2
20th Street	Magnolia Avenue to Avenue C	2
21st Drive	24th Street to 32nd Street	2
22nd Avenue	16th Street to 20th Street	2
22nd Avenue	Water Street to 1st Street	2
22nd Drive	23rd Street to 24th Street	2
22nd Street	Arizona Avenue to Avenue A	2
24th Street	Arizona Avenue to Pacific Avenue	5
24th Street	Pacific Avenue to Avenue 3E	5
26th Place	Arizona Avenue to Pacific Avenue	2
27th Street	21st Drive to 18th Avenue	2
28th Street	21st Drive to Avenue B	2
28th Street	45th Avenue to Avenue D	3
28th Street	Avenue A to Palo Verde Street	2

Roadway	Segment	Lanes
30th Street	21st Drive to 18th Avenue	2
32nd Street	Arizona Avenue to Pacific Avenue	6
33rd Drive	16th Street to 20th Street	2
33rd Drive	16th Street to 24th Street	3
33rd Drive	24th Street to 28th Street	3
36th Drive	20th Street to 22nd Lane	2
37th Avenue	22nd Lane to 24th Street	2
3rd Avenue	8th Street to 15th Street	2
3rd Street	4th Avenue to Avenue B	2
45th Avenue	12th Street to 16th Street	2
4th Avenue	1st Street to 6th Street	5
5th Avenue	6th Street to 14th Street	2
5th Street	4th Avenue to Magnolia Avenue	2
6th Street	4th Avenue to 5th Avenue	2
7th Avenue	5th Street to 16th Street	2
8th Avenue	16th Street to 24th Street	2
8th Avenue	24th Street to 32nd Street	2
8th Street	4th Avenue to Avenue C	5
8th Street	4th Avenue to Redondo Center Dr	2
Arizona Avenue	24th Street to 32nd Street	2
Arizona Avenue	Giss Parkway to 16th Street	new
Avenue A	16th Street to 24th Street	5
Avenue A	1st Street to 8th Street	2/3
Avenue A	24th Street to 32nd Street	5
Avenue A	8th Street to 16th Street	5
Avenue B	1st Street to 8th Street	3
Avenue B	8th Street to 16th Street	5
Avenue C	16th Street to 24th Street	4
Avenue C	1st Street to 8th Street	3
Avenue C	8th Street to 16th Street	5
Barkley Ranch Ave	28th Street to 32nd Street	2
Catalina Drive	8th Avenue to 32nd Street	2
Engler Avenue	24th Street to Palo Verde Street	2

Roadway	Segment	Lanes
Giss Parkway	4th Avenue to I-8	4
Giss Parkway	I-8 to Interchange East	6
Madison Avenue	1st Street to Giss Parkway	2
Magnolia Avenue	1st Street to 8th Street	2
Main Street	1st Street to Giss Parkway	2
Naples Avenue	16th Street to 20th Street	2
Orange Avenue	1st Avenue to 8th Street	4
Pacific Avenue	16th Street to 32nd Street	5
Palm Avenue	8th Street to 12th Street	2
Palo Verde Street	Arizona Avenue to Pacific Avenue	2
Palo Verde Street	Catalina Drive to Arizona Avenue	2
Pima Lane	8th Street to 16th Street	2
San Marcos Drive	Pacific Avenue to Engler Avenue	2
Winsor Avenue	Palo Verde Street to 32nd Street	2

Attachment 2

DETAILED DERIVATION OF PLANNING LEVEL COSTS

Near-Term (5 Year) Improvements

Name	Location	Description	Quantity/Length		Unit Cost ($M/unit))	Project Cost ($M)
Roadway						
1st Street	Avenue B to 4th Avenue	2 lanes with center median	1.50	mile	$3.00	$4.50
8th Street	Avenue D to Avenue C	widen to 4 lanes	1.00	mile	$5.00	$5.00
24th Street	45th Avenue to Avenue C	widen to 4 lanes	0.50	mile	$5.00	$2.50
24th Street	Avenue C to Avenue B	reconstructed 4 lane road			*	$2.35
28th Street	Avenue C to Avenue B	reconstructed 2 lane road			*	$1.58
28th Street	45th Avenue to Avenue C	reconstructed 2 lane road	0.50	mile	$2.00	$1.00
Frontage Road	Avenue 9 E to Fortuna Road	reconstructed 2 lane road	2.00	mile	$2.00	$4.00
County 11th Street	Avenue 8 1/2 E to Forutna Road	reconstructed 2 lane road	2.50	mile	$2.00	$5.00
Avenue C	24th Street to 32nd Street	widen to 4 lanes	1.00	mile	$5.00	$5.00
4th Avenue	32nd Street to 40th Street	reconstructed 2 lane road	1.00	mile	$2.00	$2.00
Avenue 3 E	16th Street to B Canal	widen to 4 lanes	1.24	mile	$5.00	$6.20
Avenue 10 E	County 11th Street to 40th Street	reconstructed 2 lane road			*	$0.21
Bicycle						
Thacker Lateral	West Main Canal to 32nd Street	Shared Used Path	4.00	mile	$0.70	$2.80
Pacific Ave	12th Street to Colorado River Levee	Shared Used Path	0.75	mile	$0.70	$0.53
Avenue A	40th Street/East Main Canal to North of 32nd Street	Shared Used Path	1.50	mile	$0.70	$1.05
Pedestrian						
Avenue A	Rosewood Drive to 32nd Street	Sidewalk on Arterial	0.20	mile	$0.53	$0.11
4th Avenue	North of 1st Street	Sidewalk on Arterial	0.27	mile	$0.53	$0.14
4th Avenue	32nd Street to 40th Street	Sidewalk on Collector	1.93	mile	$0.32	$0.61
Arizona Avenue	10th Street to 16th Street	Sidewalk on Arterial	1.20	mile	$0.53	$0.64
Pacific Avenue	8th Street to 12th Street	Sidewalk on Arterial	0.92	mile	$0.53	$0.49
Pacific Avenue	16th Street to 24th Street	Sidewalk on Arterial	0.73	mile	$0.53	$0.39
Pacific Avenue	28th Street to 32nd Street	Sidewalk on Arterial	0.31	mile	$0.53	$0.16
32nd Street	Big Curve to Avenue 3 E	Sidewalk on Arterial	2.25	mile	$0.53	$1.19
Intersection						
24th Street & S. Avenue B		Signals	1.00	int.	$0.25	$0.25
		Turn Lanes	5.00	lane	$0.35	$1.75
		Widened Approaches	2.00	appr.	$0.70	$1.40
32nd Street & Big Curve		Signals	1.00	int.	$0.25	$0.25
		Turn Lanes	1.00	lane	$0.35	$0.35
I-8 & Araby Road		Roundabouts**	2.00	int.	$0.25	$0.50
16th Street & 4th Avenue					*	$6.97
32nd Street & Avenue 7 E		Turn Lanes			*	$0.20
32nd Street & Avenue 8 E		Turn Lanes			*	$0.20
4th Avenue & Big Curve		Turn Lanes			*	$0.18
24th Street & 1st Avenue		Turn Lanes			*	$0.73
16th Street & Pacific Avenue		Turn Lanes			*	$0.35
32nd Street & Arizona Avenue		Turn Lanes			*	$0.36
20th Street & 45th Avenue		Turn Lanes			*	$0.37
24th Street & Arizona Avenue		Turn Lanes			*	$0.58
32nd Street & Pacific Avenue		Turn Lanes			*	$0.93
18th Street & Avenue C		Signals			*	$0.37
32nd Street & Avenue B		Signals			*	$0.91
32nd Street & Avenue 5 E		Turn Lanes			*	$0.40
Avenue B & 16th Street		Turn Lanes	1.00	lane	$0.35	$0.35
Total Near-Term Improvement Project Costs						**$85.95**
* Costs derived from City of Yuma 2014-2018 Capital Improvement Program						
** Costs adapted from FHWA Case Study FHWA-SA-09-018						

Mid-Term (10 Year) Improvements

Name	Extent	Description	Quantity/Length		Unit Cost ($M/mi)	Project Cost ($M)
Roadway						
32nd Street	Avenue B to Big Curve	widen to 6 lanes	1.66	mile	$7.00	$11.62
Avenue 3 1/2 E	Avenue 3 E to 48th Street	new/widened/reconstructed 4 lane road	2.80	mile	$5.00	$14.00
	Canal Bridge at 44th Street	quantities in 100'	1.00	100'	$1.00	$1.00
40th Street	Avenue 3 E to Avenue 10 E	new/widened 4 lane road	7.00	mile	$5.00	$35.00
	Overpass at SR-195	quantities in 100'	5.20	100'	$1.00	$5.20
	Canal Bridge East of Avenue 5 1/2 E	quantities in 100'	1.20	100'	$1.00	$1.20
Intersection						
24th Street & Pacific		Signals	1.00	int.	$0.25	$0.25
		Turn Lanes	8.00	lane	$0.35	$2.80
32nd Street & Pacific		Signals	1.00	int.	$0.25	$0.25
		Turn Lanes	3.00	lane	$0.35	$1.05
Total Mid-Term Improvement Project Costs						**$72.37**

Buildout (10+ Year) Improvements						
Name	Extent	Description	Quantity/Length		Unit Cost ($M/mi)	Project Cost ($M)
Roadway						
Avenue 7 E	40th Street to 56th Street	new 2 lane road	2.00	mile	$2.00	$4.00
Avenue 8 E	40th Street to 56th Street	new 2 lane road	2.00	mile	$2.00	$4.00
Avenue 8 1/2 E	40th Street to 56th Street	new 2 lane road	2.00	mile	$2.00	$4.00
Avenue 9 E	40th Street to 56th Street	new 2 lane road	2.00	mile	$2.00	$4.00
48th Street	Avenue 5 1/2 E to Avenue 10 E	new 2 lane road	5.00	mile	$2.00	$10.00
	Canal Bridge East of Avenue 5 1/2 E	quantities in 100'	1.00	100'	$1.00	$1.00
	Overpass at SR-195	quantities in 100'	5.20	100'	$1.00	$5.20
56th Street	SR-195 to Avenue 10E	new 4 lane road	4.00	mile	$5.00	$20.00
56th Street	Avenue A to SR-195	widened 4 lane road	6.50	mile	$5.00	$32.50
County 16th Street	US-95 to Avenue 3 E	widened 4 lane road	5.10	mile	$5.00	$25.50
County 18th Street	Avenue B to Avenue 3 E	widen to 4 lanes	4.00	mile	$5.00	$20.00
County 19th Street	Avenue B to Avenue 3 E	widened 4 lane road	4.00	mile	$5.00	$20.00
12th Street	Pacific Avenue to Avenue 3 E	new 2 lane road	1.00	mile	$2.00	$2.00
	Canal Bridge at Magnolia	quantities in 100'	1.00	100'	$1.00	$1.00
Avenue 3 E	12th Street to US-95	reconstruct/new 2 lane road	0.50	mile	$2.00	$1.00
Avenue B	US-95 to SR-195	widened 4 lane road	7.90	mile	$5.00	$39.50
Avenue A	40th Street to County 16th Street	widened 4 lane road	4.25	mile	$5.00	$21.25
Avenue 3 E	40th Street to County 19th Street	widened 4 lane road	7.00	mile	$5.00	$35.00
Avenue 9 E	US-95 to I-8 N. Frontage Road	widened 4 lane road	3.75	mile	$5.00	$18.75
Interstate 8	US-95 to Foothills Boulevard	widened 6 lane interstate	12.10	mile	$7.20	$87.12
48th Street	Avenue 3 E to Avenue 5 1/2 E	reconstructed 2 lane road	2.50	mile	$2.00	$5.00
Avenue 6 E	48th Street to 56th Street	reconstructed 2 lane road	1.00	mile	$2.00	$2.00
Bicycle						
East Drain	Avenue C to East Main Canal	Shared Used Path	1.56	mile	$0.70	$1.09
Central Canal	Avenue C to East Main Canal	Shared Used Path	1.40	mile	$0.70	$0.98
US 95	County 15th Street to East Main Canal	Shared Used Path	0.50	mile	$0.70	$0.35
32nd Street	4th Avenue to Big Curve	Shared Used Path	0.17	mile	$0.70	$0.12
32nd Street	Arizona Avenue to Pacific Avenue	Shared Used Path	1.03	mile	$0.70	$0.72
32nd Street	East of Ave 8 1/2 E to Ave 9 E	Shared Used Path	0.40	mile	$0.70	$0.28
Canal B 5.5 E	Avene 3 E to Ave 4 E	Shared Used Path	1.00	mile	$0.70	$0.70
Ave 4 E	Canal B 5.5 E to 32nd Street	Shared Used Path	1.50	mile	$0.70	$1.05
B 3.7 Lateral	Pacific Avenue to Mary Avenue	Shared Used Path	0.52	mile	$0.70	$0.36
B 3.7 Lateral	Avenue 3E to County 10 1/2 Street	Shared Used Path	0.52	mile	$0.70	$0.36
Engler Avenue	24th Street to Palo Verde Street	Shared Used Path	0.50	mile	$0.70	$0.35
Redondo Center Drive	16th Street to 3rd Street	Shared Used Path	2.32	mile	$0.70	$1.62
West Main Canal	Avenue B to Avenue A	Shared Used Path	0.97	mile	$0.70	$0.68
Central Stub Number Two Drain	16th Street to 24th Street	Shared Used Path	1.00	mile	$0.70	$0.70
Central Drain	Central Stub Number Two Drain to Avenue C	Shared Used Path	0.75	mile	$0.70	$0.53
45th Avenue	Central Drain to 28th Street/Barkley Ranch	Shared Used Path	0.97	mile	$0.70	$0.68
Avenue D	24th Street to 28th Street	Shared Used Path	0.50	mile	$0.70	$0.35
County 15th Street	US 95 to Avenue 4 E	Shared Use Trail	5.10	mile	$0.50	$2.55
Avenue 4 E	County 15th Street to 56th Street	Shared Use Trail	1.00	mile	$0.50	$0.50
56th Street	Avenue 4 E to Avenue 5 E	Shared Use Trail	1.00	mile	$0.50	$0.50
Avenue 5 E	56th Street to 48th Street	Shared Use Trail	1.00	mile	$0.50	$0.50
48th Street	Avenue 5 E to Avenue 6 E	Shared Use Trail	1.00	mile	$0.50	$0.50
Avenue 3 E	County 15th Street to Canal B 5.5 E	Shared Use Trail	2.50	mile	$0.50	$1.25
Avenue 7 E	Avenue 7 E to Gila River	Shared Use Trail	2.20	mile	$0.50	$1.10
32nd Street	Avenue 3 E to Avenue 7 1/2 E	Shared Used Path	4.50	mile	$0.70	$3.15
East Main Canal	US 95 to 40th Street	Shared Used Path	3.34	mile	$0.70	$2.34
Colorado/Gila River	Colorado River Levee to Avenue 10 E	Shared Use Trail	11.10	mile	$0.50	$5.55
Pedestrian						
32nd Street	Avenue B to Big Curve	Sidewalk on Arterial	1.31	mile	$0.53	$0.69
16th Street	Pacific Avenue to Engler Avenue	Sidewalk on Arterial	0.48	mile	$0.53	$0.25
Avenue 3 E	16th Street to 32nd Street	Sidewalk on Arterial	3.31	mile	$0.53	$1.75
40th Street	Avenue 3 E to Avenue 10 E	Sidewalk on Arterial	13.36	mile	$0.53	$7.05
Intersection						
Avenue 10 E & I-8 S. Frontage Road		Signals	1.00	int.	$0.25	$0.25
		Turn Lanes	2.00	lane	$0.35	$0.70
Total Buildout Improvement Project Costs						**$402.38**