

Final Report



Transportation Needs for the Foothills and Mesa Del Sol Areas

Yuma County, AZ



ADOT Planning Assistance for Rural Areas

ADOT Project MPD 14-11(D)

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INTRODUCTION

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1.0 INTRODUCTION

This chapter provides an overview of the contents of this report and the framework within which information and data are presented.

1.1 PROJECT OVERVIEW

The Transportation Needs Study (Study) is a planning effort undertaken cooperatively by Yuma County and the Multimodal Planning Division (MPD) of the Arizona Department of Transportation (ADOT). It has been funded and supported through the Planning Assistance for Rural Areas (PARA) program of ADOT. The Study addresses the needs of multiple jurisdictions, as well as the needs of neighborhoods within these jurisdictions. It encompasses a mix of uses within developed and undeveloped zoning areas of the Mesa Del Sol and Foothills areas, which are located as shown in Figure 1.1.

1.2 STUDY FRAMEWORK

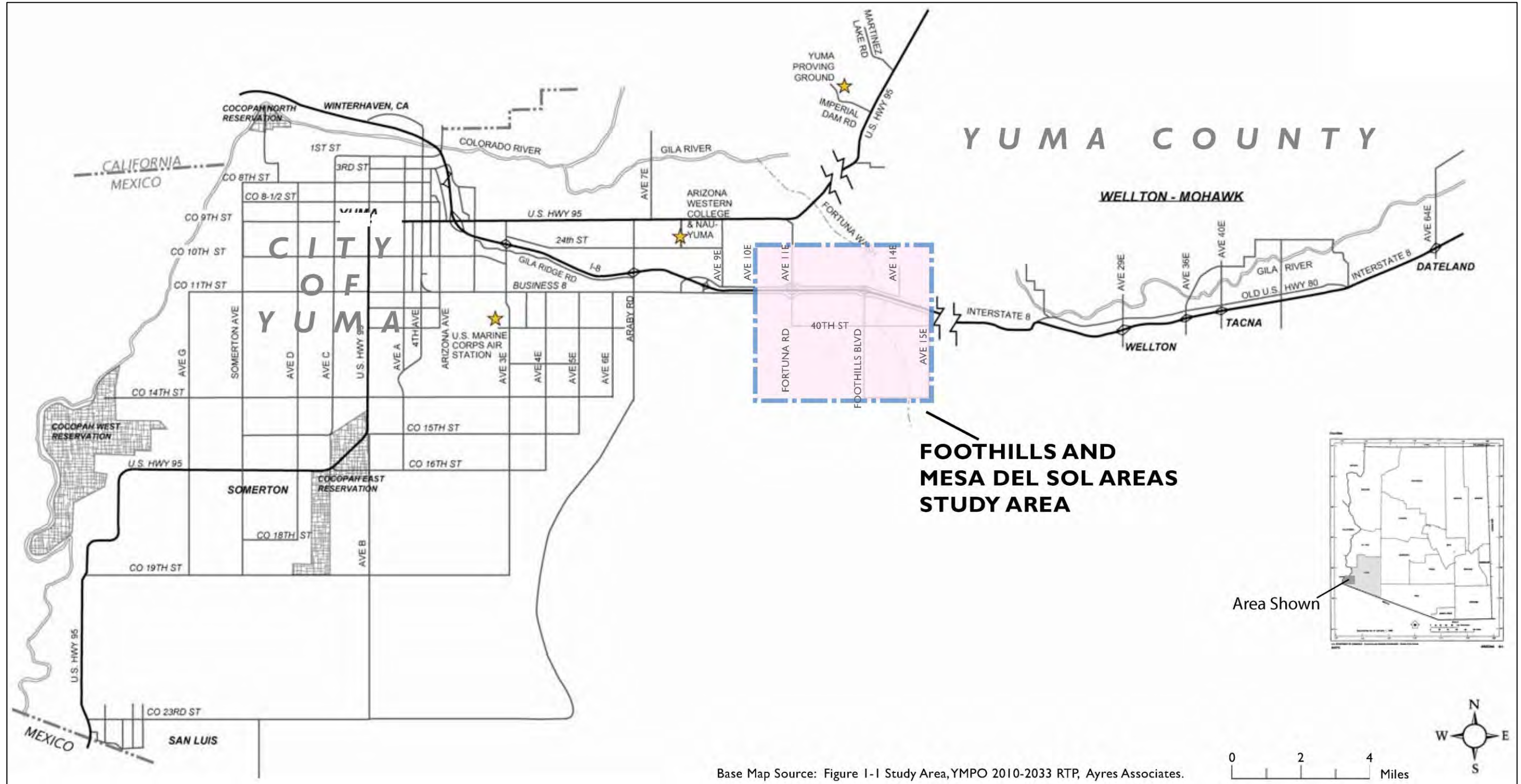
Based on the most recent Census data available for 2010, the study area has a year-round population of approximately 26,000 persons. Given the large stock of vacant homes reported in the Census, the study area population increases to 47,000 persons with the influx of seasonal residents – winter visitors – during the months of October through April. This increase in the study area population does not account for other winter visitors that may come for just a few days or several weeks to escape the colder climates. The Yuma Visitors Bureau web site reports the Yuma metropolitan area has “more than 23,000 spots in RV parks and resorts and nearly 4,000 hotel rooms.” Therefore, the potential exists for the study area to have a resident population (permanent and temporary) between October and April approaching or exceeding 60,000 persons.

The seasonal addition to the resident population impacts the existing road network, study area intersections, as well as Interstate 8 (I-8) interchanges at South Fortuna Road and South Foothills Boulevard. This report identifies potential roadway and multimodal improvement requirements to meet the growing population and changing land uses, improve mobility and safety, and encourage sensible and sustainable development that supports the current and projected land uses in the General Plan. Attention also has been given to future crossings of major drainage features and relevant flood control measures. The principal focus of this report is to address the most critical transportation planning needs identified by Yuma County and by the ADOT Yuma Engineering District Office

The feasibility of funding and implementing needed improvements has been assessed over five-, ten-, and twenty-year periods, as well as potential Buildout of the study area. “Buildout” refers to the condition of full utilization of developable land and is considered to be likely post-2030. Buildout conditions are defined in terms of future population and employment expected to be located within each transportation analysis zone (TAZ), based on planned or zoned densities. Thus, it principally is an estimate of the potential development far into the future, and decisions may be made that change the current planning or zoning criteria.

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FIGURE 1.1
VICINITY MAP



Base Map Source: Figure I-1 Study Area, YMPO 2010-2033 RTP, Ayres Associates.

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This Final Report contains a refined *Multimodal Transportation Improvement Plan* with recommended projects to address the ultimate Buildout of the area as well as the five-, ten-, and twenty-year planning horizons. The Plan encompasses local roads, as well as opportunities for developing alternate modes of travel, such as transit services, pedestrian paths, and bicycle routes.

An extensive public participation program was undertaken as part of this Study. Input and feedback obtained through this program has allowed Yuma County and ADOT to actively incorporate local priorities into the Plan and identify an appropriate program for improvements. It is anticipated that extensive public participation in the planning process will result in more support from the community for funding transportation improvements.

1.3 STUDY AREA

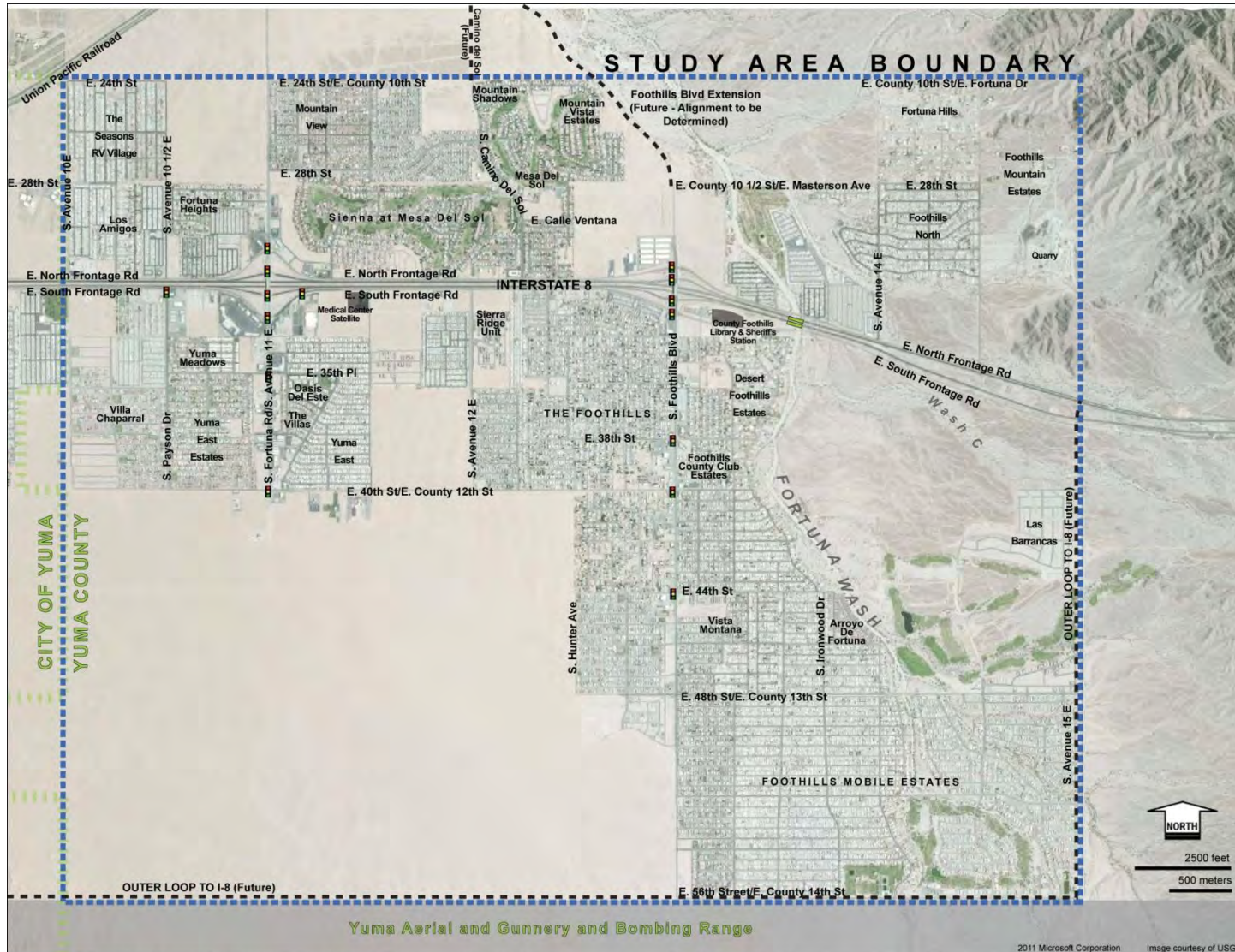
The study area encompasses 20 square miles approximately 11 miles east of downtown Yuma (Figure 1.2). It is bounded by East 28th Street/East County 10th Street on the north (one mile north of I-8), South Avenue 15E on the east, East 56th Street/East County 14th Street on the south (three miles south of I-8), and South Avenue 10E on the west. South Avenue 10E is the eastern boundary of the City of Yuma.

Between South Avenue 10E and South Foothills Boulevard, the vast majority of development is located within one mile north and south of I-8, except for a small portion that drops one mile below East 40th Street/East County 12th Street between South Hunter Avenue and South Foothills Boulevard. This area includes, among others: The Seasons RV Village, Los Amigos, Fortuna Heights, Mountain View, Mountain Shadows, Mountain Vista Estates, Daybreak, Mesa Del Sol, Sienna at Mesa Del Sol, Villa Chaparral, Yuma Meadows, Yuma East Estates, Oasis Del Este, The Villas, Yuma East, Sierra Ridge Unit, and The Foothills.

The study area east of South Foothills Boulevard, extends south of I-8 three miles to East 56th Street/East County 14th Street and one mile north of I-8 to Fortuna Drive/East County 10th Street. This portion of the study area includes: Fortuna Hills, Foothills North, Foothills Mountain Estates, Desert Foothills Estates, Foothills Country Club Estates, Vista Montana, Arroyo De Fortuna, Las Barrancas, and Foothills Mobile Estates. Fortuna Wash is an important physical feature in this portion of the study area, running south to north, ultimately merging with the Gila River approximately four miles north of the study area.

I-8, which is maintained by ADOT, is a high-capacity freeway facility supporting east-west through and local travel within the study area. I-8 has been developed with frontage roads, which facilitates access to commercial development and residential communities abutting this segment of the National Highway System (NHS). The freeway frontage roads, which are maintained by Yuma County, provide access to fronting parcels and support local east and west travel within the study area. There are two I-8 interchanges in the study area providing regional access. One is located at South Fortuna Road (South Avenue 11E); the other is located at South Foothills Boulevard (South Avenue 13E). Although not in the study area, US 95, located two

FIGURE 1.2
STUDY AREA: FOOTHILLS AND MESA DEL SOL AREAS



Source: Interpreted from Figure 1 (12-01-2010), Scope of Work, Task Assignment MPD 14-11(D), Transportation Needs for the Foothills and Mesa Del Sol Areas, Multimodal Planning Division, Arizona Department of Transportation, 18 February, 2011, confirmed through local review.

miles north of I-8 and accessed via South Fortuna Road, provides a viable alternative for east-west travel between the study area and the City of Yuma (refer to Figure 1.1).

1.4 ORGANIZATION OF THIS REPORT

This Final Report presents information regarding the general social, physical, multi-modal transportation, and environmental conditions of the study area, including information relating to special topics of interest to the County and ADOT. In addition, it presents an evaluation of the highway network, identifying current mobility deficiencies and establishing the basis for determining future transportation needs. It also presents an evaluation of alternative improvement plans developed to resolve transportation network deficiencies. These alternatives are defined by specific projects and strategies associated with both roadway and non-motorized modes of travel to address deficiencies and special transportation needs of the study area. Ultimately, this foundational information and data provides the basis for a program of capital improvement projects to be implemented during the next 20 years.

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RELATED STUDIES AND REPORTS

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2.0 REVIEW OF RELATED STUDIES AND REPORTS

Previous transportation, community, and regional planning efforts have been directed at developing a roadway network to efficiently, effectively, and safely accommodate future travel demand in the study area. Summaries of recent and relevant studies and reports reviewed and considered during conduct of this study are presented in this chapter.

2.1 YMPO REGIONAL TRANSPORTATION PLAN, 2010-2033

(April, 2010)

The Yuma Metropolitan Planning Organization (YMPO) serves as a coordinating body for local, state, and federal agencies on traffic, transportation, air quality conformity, and related issues in Yuma County. The primary study area for the Regional Transportation Plan (RTP) covers 5,522 square miles in the southwestern portion of Yuma County and includes: the Cities of Yuma, Somerton, and San Luis; the Town of Wellton; the Cocopah Indian Tribe; and several unincorporated communities. The Foothills and Mesa Del Sol areas are part of the RTP study area.

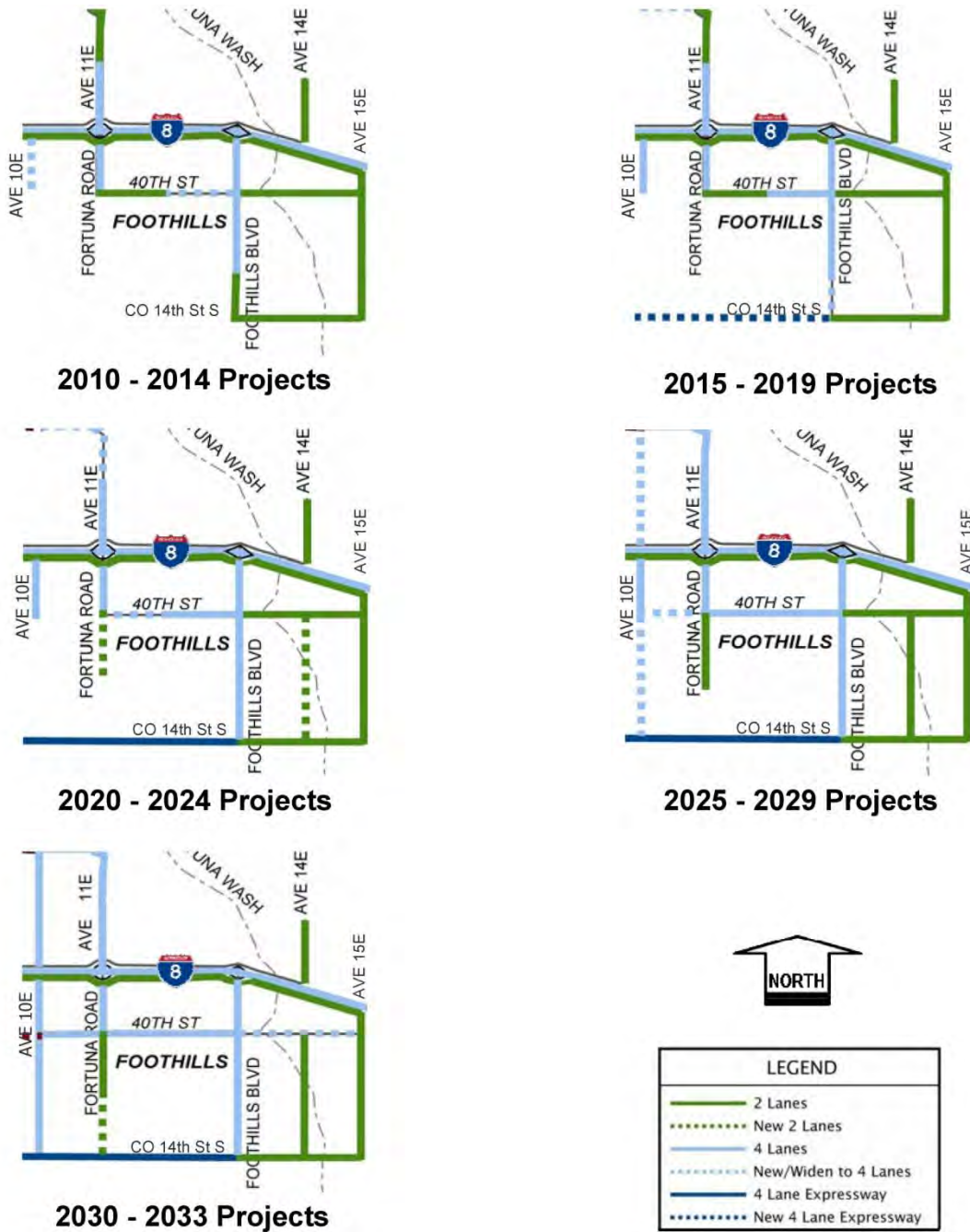
The YMPO RTP, 2010-2033 is a multi-modal plan that prioritizes investments in public transportation, bicycling, and walking to promote health, environmental quality, and mobility for those who do not have access to cars. The 2010-2033 RTP builds upon the findings and conclusions of the 2006-2029 RTP. An important goal of the RTP is to satisfy "...the need to develop a regional plan that is environmentally sensitive, reduces greenhouse gases, and incorporates the latest technology to maximize the investment in the region."

The 2010-2033 RTP documents the modeling process employed to assess transportation system conditions, including identifying the existing and future conditions forming the basis of the travel forecasting model and the RTP. Existing and future conditions documented in the RTP includes: socio-economic data, travel characteristics, functional classification, truck routes, traffic volumes, and volume-to-capacity ratios for study area roadways. The RTP addresses four elements of the regional transportation system: Roadways, Transit services, Pedestrians, and Bicycles.

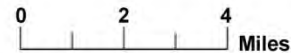
2.1.1 ROADWAY ELEMENT OF THE YMPO RTP

The Roadway Element notes: "Despite the current economic conditions, population and employment growth will continue and it is important that improvements to the roadway system accommodate that growth at an acceptable level of service." The Roadway Element includes maps showing proposed improvements for five implementation periods between 2010 and 2033. Excerpts from these maps showing proposed improvements in the study area are presented in Figure 2.1. Figure 2.1 reflects the combination of projects included in the 2033 Base Roadway Network and additional projects, addressing "...capacity needs, mobility, and grid continuity not met by the 2033 base network within the financial constraints of the RTP." The Roadway Element

**FIGURE 2.1
YMPO RTP RECOMMENDED ROADWAY IMPROVEMENTS FOR THE STUDY AREA**



NOTE: The solid lines represent improvements that are already in place during the particular period and the dashed lines represent improvements to be implemented during the period.



Source: Extracted from Figures IV-1 through IV-5, 2033 Regional Transportation Plan Final Report, Yuma Metropolitan Planning Organization (YMPO), April, 2010.

includes a variety of projects with associated estimated costs, including: widening streets, new street construction, new interchanges, and reconstruction of existing interchanges and intersections. The RTP notes: “Although the project list is presented in five-year periods, from a revenue standpoint, only the first five-year period is typically described as programmed and the anticipated revenues are more reliable. Beyond the first five years, the revenue is less predictable and priorities can change.” Proposed improvements specifically relevant to this study are cited below:

- Four lanes on East 40th Street/East County 12th Street from South Fortuna Road to South Avenue 15E; and
- Four lane expressway on East 56th Street/East County 14th Street from SR 195 to South Foothills Blvd.

2.1.2 TRANSIT DEVELOPMENT PLAN OF THE YMPO RTP

This document, adopted by the Executive Board in May 2003, is a resource outlining a plan for future transit use throughout Yuma County. An updated version of the regional Transit Element is incorporated in the 2010-2033 RTP. The Transit Element consists of a Short-Range Plan, Vehicle Replacement Schedule, Long-Range Plan, and an analysis of revenue requirements and sources. In addition to recommendations for improving management and coordination, the Short-Range Plan calls for increased service frequency on seven existing routes and nine new Local Circulator routes, four of which would serve the Fortuna Foothills and Mesa Del Sol areas. Additional detail regarding this planned service expansion is presented in Section 6.4.

Service improvements will be dependent on the availability of funding. The Plan also includes recommendations for the purchase of ten new buses, two vans for paratransit service, and landscaping and amenity improvements at the Yuma Palms Shopping Center Transit Center. The ultimate goal is to develop a multi-modal transit service facility more centrally located.

The Long-Range Transit Plan recognizes the fixed-route bus service will remain the backbone of the Yuma County Area Transit (YCAT) system. This Plan proposes expansion of the system to include a full range of express, local, cross-town, and neighborhood circulator service. New routes and reconfiguration of the system to improve connectivity is the long-term goal. Improvements to paratransit services and adoption of Intelligent Transportation Systems (ITS), such Automatic Vehicle Location (AVL), signal priority systems, and “Smart Card” fare collection systems, are contemplated improvements. Planned capital improvements include: acquisition of rights-of-way for bus pullouts and stop amenities; and development of park-and-ride (P&R) lots, intermodal transit hubs, queue jumper lanes, and new maintenance facilities.

2.1.3 PEDESTRIAN ELEMENT OF THE YMPO RTP

The Pedestrian Element establishes guidance for development of a safe and effective environment for pedestrians. This guidance includes recommendations to: upgrade pedestrian facilities on major and minor arterials, coordinate pedestrian facilities with transit services, establish Safe Routes to School (SRTS), and assure access in

accordance with the Americans with Disabilities Act (ADA). The *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, published by the American Association of State Highway and Planning Officials (AASHTO), is cited as a key resource.

2.1.4 BICYCLE ELEMENT OF THE YMPO RTP

The Bicycle Element contemplates a system of linear facilities and nodes that will: (1) improve accessibility for bicyclists to regional destination points within the YMPO jurisdiction area; (2) increase bicycle use within the YMPO region through recognition and awareness; and (3) improve non-motorized use and safety within the YMPO region. The Bicycle Element recommends additional bicycle facilities that build on existing YMPO plans, the City of Yuma Bicycle Facilities Plan, and the City of Somerton Shared-Use Pathway and Trails Master Plan.

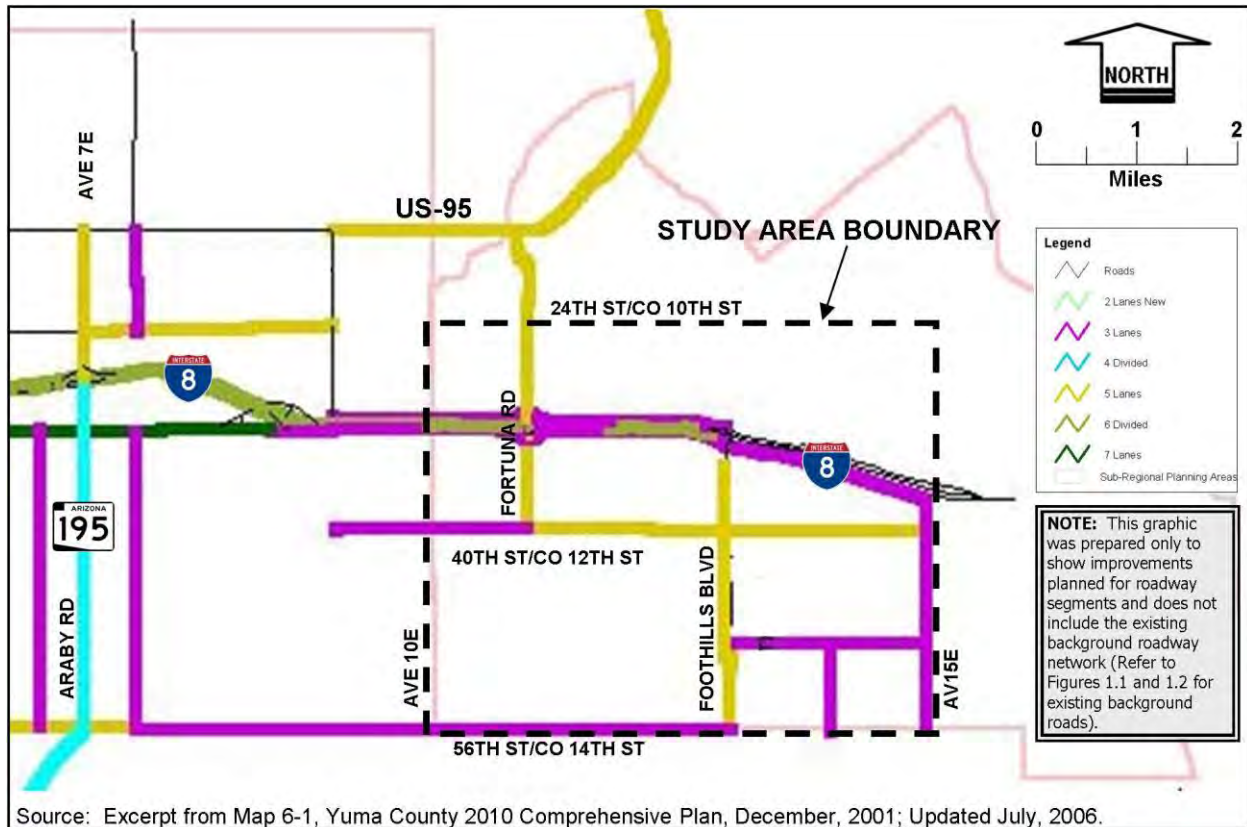
2.2 YUMA COUNTY 2010 COMPREHENSIVE PLAN

(December, 2001; Updated July, 2006)

This Plan has been developed in response to Arizona's *Growing Smarter Act* and *Growing Smarter Plus*. Under *Growing Smarter Plus*, each Arizona county must prepare and adopt a ten-year comprehensive plan. The Plan is intended to "accomplish a coordinated, adjusted and harmonious development of the area of jurisdiction." Specifically, such a Plan is formulated to provide guidelines for future land use development. The Circulation Element of the Yuma County 2010 Comprehensive Plan states "...the capacity and level of service of the existing transportation network must be enhanced." It provides an overview of past actions to improve transportation in the County. With respect to future investments in the transportation system, the Circulation Element notes that "...existing transportation plans address and prioritize projects." Still, seven critical issues are highlighted for attention. Two of these issues apply directly to this study: (1) improving access and traffic flow to/from the Foothills, and (2) protection for visual corridors.

The first issue draws attention to the "...increased housing and commercial development in the Foothills..." that has resulted in "...more congestion and a general reduction in the level of service of roads." Extension of East 56th Street/ East County 14th Street to the west is proposed to relieve congestion (Figure 2.2). This extension would tie into SR 195, which also is referenced as Area Service Highway (ASH). SR 195 consists of Juan Sanchez Boulevard/West County 23rd Street South and Araby Road. The highway, constructed along the western edge of the Barry M. Goldwater Range, currently provides a direct link between I-8 and four destinations in southwest Yuma County: City of San Luis; City of San Luis Rio Colorado, Sonora, Mexico; San Luis I Land Port of Entry (LPOE) in the City of San Luis; and San Luis II LPOE, five miles east of the city. Ultimately, the plan is to continue approximately 1.5 miles north of I-8 to connect with US 95. The second issue focuses on preserving the rural character of sensitive areas and "resource lands." Potential impacts on the aesthetic qualities of Fortuna Wash and views of the Gila Mountains located directly east of the study area are particularly relevant to this study. Visual corridors have been designated and guidelines are being developed to aid in protecting sensitive resources.

**FIGURE 2.2
PLANNED ROADWAY IMPROVEMENTS: YUMA COUNTY 2010 COMPREHENSIVE PLAN**



2.3 FOOTHILLS AREA BACKGROUND STUDY

(November, 2006)

This study was completed in 2006 to assist in the updating of the Yuma County 2010 Comprehensive Plan. It details current conditions of the planning area and how the area has changed in the past five years. This document is a valuable source of information regarding: topography; soils; community facilities; transportation; demographics; housing; and land ownership. The study highlights two major transportation improvement projects scheduled for the Foothills Planning Area: widening the North and South Frontage Roads of I-8 between South Avenue 9E and South Foothills Blvd; and extension of East 56th Street/East County 14th Street from South Avenue 7E to South Foothills Blvd. The latter project is of particular significance, as it will be an entirely new route linking the Foothills with the City of Yuma. As such, it will be an alternate route to I-8 for travel between the two areas. (Refer to Section 2.2, Yuma County 2010 Comprehensive Plan above).

2.4 FOOTHILLS PLANNING AREA CITIZEN ADVISORY GROUP REPORT

(September, 2007)

This report, like the Foothills Area Background Study, specifically was created to support the Yuma County 2010 Comprehensive Plan update process. The activities of the Citizen Advisory Group (CAG) followed publication of the Foothills Area Background Study (November, 2006), summarized above. The CAG was formed to review the Comprehensive Plan and provide information and comments regarding matters of interest to the residents and businesses in the Foothills Planning Area. With respect to the review of transportation issues, the CAG "...overwhelmingly identified..." extension of East 40th Street/East County 12th Street westward to connect with South Avenue 8E in the City of Yuma as the most important transportation need. This extension would create better connectivity between the Foothills area and the City of Yuma, offering a realistic alternative to I-8 as an east-west facility. The group also recommended "...development of a network of multi-use paths separate from roadways in the Foothills."

The CAG recommended 20 changes to the Goals, Policies, and Objectives outlined in the Yuma County 2010 Comprehensive Plan. During this review, several areas were discussed that are particularly pertinent to and have ramifications for traffic operations and transportation needs in the Foothills and Mesa Del Sol areas:

- Reduce traffic congestion;
- Improve the timing of traffic signals;
- Improve public transportation in the Foothills with handicapped accessible facilities;
- Expansion of commercial zoning beyond South Fortuna Road, South Foothills Boulevard, and the I-8 Frontage Roads;
- Lower density residential development; and
- Limit development to small businesses.

The first three directly address the transportation system, its performance, and mobility provided by it. The latter three can influence the effectiveness of a transportation system by altering travel demand.

2.5 CITY OF YUMA 2012 GENERAL PLAN

(Draft, February 1, 2011)

This Plan was developed in response to Arizona's *Growing Smarter Act* and *Growing Smarter Plus*. Under *Growing Smarter Plus*, each Arizona municipal jurisdiction must prepare and adopt a ten-year General Plan. The City of Yuma eastern city limit is South Avenue 10E, which is the western limit of the study area adopted for this study of transportation needs for the Foothills and Mesa Del Sol areas. Therefore, the Plan's contents are relevant to this study, particularly the Transportation Element. The Transportation Element establishes "...a coordinated multi-modal system designed to work with the locations of homes, businesses, and other land uses." The Transportation Element:

- (1) provides information regarding the existing transportation system;
- (2) presents an analysis and evaluation of proposed facility types and locations;
- (3) sets forth goals, objectives, and policies to guide development of a coordinated, safe, and interrelated transportation system; and
- (4) establishes a phased action plan.

The Transportation Element addresses existing and desired future conditions relating to: major roadways, public transit, bicycling, air travel, and railroad operations.

The Growth Areas Element identifies the Araby Road and Interstate 8 area as being focused on I-8, the new SR 195, East 32nd Street, and East 24th Street. I-8, SR 195, and East 32nd Street are designated as “Gateway Routes.” It is noted that as growth and development continue in this area, additional capacity will be required on east-west facilities. Activity in this growth area is particularly attractive to persons in the Foothills area, and the Plan anticipates there will be a significant amount of regional through traffic in the future. Specific to this matter, East 40th Street/East County 12th Street between South Avenue 3½ E and South Fortuna Road is highlighted as a Principal Arterial with the implication that this roadway will need to be improved in the future.

2.6 JOINT LAND USE PLAN: LAND USE ELEMENT AMENDMENT

(September 1996; Revised February 2007)

This document represents the combined efforts of the City of Yuma and Yuma County. The objective of the Joint Land Use Plan is to:

- Create a common “blue print” of land uses and land use development policies for future economic growth and development of lands within the incorporated area of the City of Yuma and the unincorporated areas around the City; and
- Establish a foundation for (1) achieving compatible land use activities in the vicinity of the Marine Corps Air Station (MCAS) – Yuma and Yuma International Airport, and (2) protecting the primary economic assets of the area – agriculture, the MCAS, and tourism.

The Plan, which is comprised of a land use map to guide planning commissioners and elected officials in their deliberations on development opportunities and zoning actions, amends the respective City and County General Plans. The map identifies various types of land uses (e.g., residential, commercial, industrial) anticipated in the future and establishes corresponding general development intensities and population densities. It also includes policies to further goals and objectives and presents an Implementation Plan.

The Plan recognizes that “recent urban development in the eastern part of the planning area has occurred along the major transportation corridors, particularly Interstate 8. This is also the location identified in public involvement activities and discussions with City and County staff as a promising area for new development.” This Plan provides information regarding land uses directly west of South Avenue 10 E, the western boundary of the study area defined for this current study.

2.7 CITY OF YUMA BICYCLE FACILITIES MASTER PLAN

(April 1, 2009)

This Master Plan is an update of the 1995 Bicycle Element of the City's General Plan. The documents provides an overview of existing bicycle facilities in the City, outlines facilities and programs for improvements, establishes phased goals to effect implementation of the Master Plan, and establishes design standards for future bicycle facilities. This Master Plan is one of the starting points for the YMPO Regional Bicycle Element, as discussed above. The existing City system of bicycle facilities consists of 44 miles of routes, lanes, paths, and multi-use paths. Today, there are bike paths along several local streets directly west of the study area between South Avenue 9E and South Avenue 10E.

As defined by the Plan, a Bike Path is a facility physically separated from motorized traffic for used by bicyclists. A Bike Path exists along South Avenue 10E (the western boundary of the study area) between East 40th Street/East County 12th Street and East 48th Street/East County 13th Street. This Bike Path continues west on East 48th Street to South Avenue 8E. A Bike Lane is defined by a portion of a roadway designated for bicycle use by striping, signing, and pavement markings. There is an existing Bike Lane along one-quarter of a mile of East 28th Street west of South Avenue 10E. It provides access from the study area to Sunrise Elementary School and Ron Watson Middle School. The City's Master Plan proposes that a Bike Lane be established along South Avenue 10 E between East 48th Street and East 24th Street. Bike Lanes connecting South Avenue 10E with South Avenue 9E are proposed on East 28th Street and East 40th Street.

2.8 YUMA REGIONAL TRANSIT STUDY

(Ongoing, August, 2011)

The Yuma Regional Transit Study was undertaken to identify transit needs in the southwestern portion of Yuma County, which is the primary location of the County's population centers. This Study resulted in a recommended transit system and an Implementation Plan. The planning horizon for the study is ten (10) years. It established the principal administrative and operating framework for the Yuma County Intergovernmental Public Transportation Authority (YCIPTA), which was formed by the Yuma County Board of Supervisors under Resolution No. 10-52, adopted December 13, 2010. Prior to formation of the YCIPTA, the YMPO had assumed operation and administration of the Yuma County Area Transit (YCAT) system and the Dial-A-Ride (DAR) service.

This Study provides a comprehensive assessment of current conditions associated with the transit system operations in the Greater Yuma Area, which includes the study area. The assessment of current conditions includes an on-board survey and community survey to determine the use and demand for transit services. Based on an analysis of projected future conditions, goals and objectives were identified and at least three transit service development scenarios were formulated. Thorough analysis of potential future operating and administrative scenarios were relied on to formulate an Implementation Plan that permitted the YMPO to turn the transit system over to the

YCIPTA in 2011. Once YCIPTA receives grantee status, it will become an autonomous board; at the current time, the authority operates as a subsidiary organization of the YMPO. Grantee status is expected to be gained in June/July 2012.

2.9 DRAINAGE FACILITY INVENTORY MEMO, FoothILLS MASTER DRAINAGE PLAN UPDATE

(August 2011)

An update of the Foothills Master Drainage Plan is underway. The Drainage Facility Inventory Memo provides a detailed record of existing drainage facilities. This inventory includes the name, location, dimension, capacity, and condition of each major drainage facility. As the update proceeds, the flow conveyance and estimated hydraulic capacity of inventoried facilities within the Foothills will be assessed. The results of this assessment will be useful in evaluating the potential impacts of roadway improvements on drainage and designing crossings that will minimize occurrences of flooding both upstream and downstream. This information will be particularly valuable in the development of future all-weather crossings of Fortuna Wash.

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EXISTING CONDITIONS

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3.0 EXISTING CONDITIONS

The Yuma County 2010 Comprehensive Plan and other available plans and studies contain substantial information regarding the existing conditions and characteristics of the Foothills Sub-Regional Planning Area within which lies the whole of the Foothills and Mesa Del Sol study area. This information has been reviewed by the officials and citizens of the County and the sub-regional planning area. Therefore, the documents provide a credible source for understanding the current make-up of social, economic, physical, and environmental facets of the study area. This chapter presents a discussion of existing conditions in the study area, as available from available sources, augmented with additional detail specific to the Foothills and Mesa Del Sol areas through field surveys and Internet research.

3.1 EXISTING LAND USE PATTERN

Figure 3.1 illustrates the generalized existing land use in the study area, based on an assessment of aerial photography currently available on the Internet. The pattern clearly shows a dominance of residential land uses throughout the study area. There are more than 5,000 acres of developed residential land, representing approximately 40 percent of the study area's 12,800 acres. Some open space areas are included in this estimate, particularly the golf course at the Mesa Del Sol Golf Club and the Foothills Golf Course and Foothills Par 3 Golf Course, which are integrated with area housing.

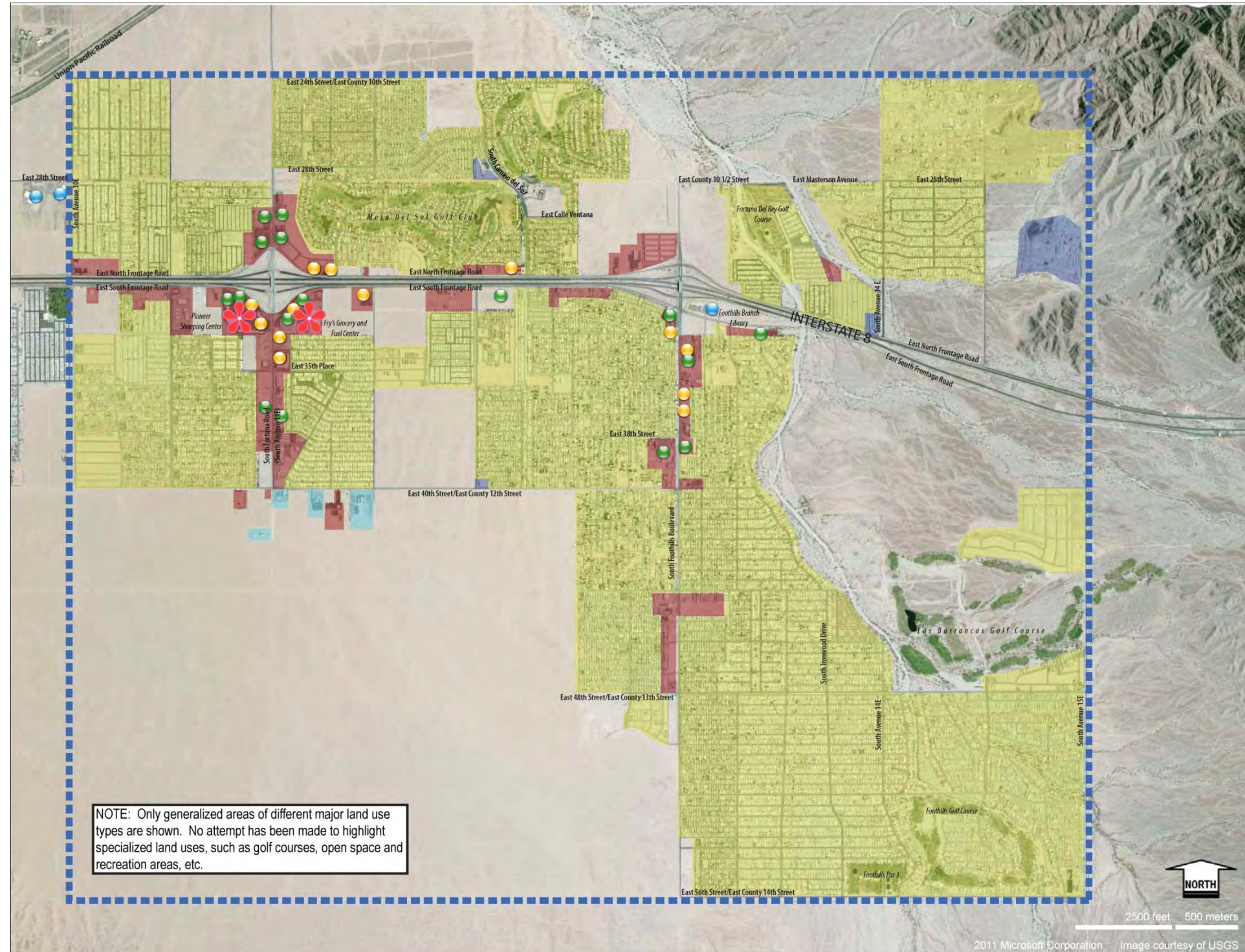
Commercial land uses are concentrated around the I-8/South Fortuna Road Traffic Interchange, along South Fortuna Road south of this interchange to East 40th Street/East 12th Street, and the northwest quadrant of the intersection of East 40th Street/East County 12th Street and South Foothills Boulevard, extending north along South Foothills Boulevard to East 34th Street. There are a number of separated, independent areas of commercial development along the I-8 South Frontage Road and a couple of sites on the I-8 North Frontage Road. Some other commercial areas are scattered around the study area, the largest and most notable of these being along East 44th Street at South Foothills Boulevard and south along South Foothills Boulevard.

The only notable industrial land use in the study area is the quarry located east of South Avenue 14½E and south of East 29th Street at the base of the North Gila Mountains. A few small industrial-type land uses (principally water supply sites) are scattered around the study area.

The area north of East County 10½ Street/Masterson Avenue and east of South Foothills Boulevard is open space associated with the Fortuna Wash floodplain. Another large area of open space/undeveloped land is bounded by Fortuna Wash on the west, I-8 on the North, South Avenue 15E on the east, and East 48th Street/East County 13th Street on the south. The southwest portion of the study area – south of East 40th Street/East County 12th Street and west of South Foothills Boulevard – remains largely undeveloped. There is other undeveloped land scattered around the study area, some of which are one-quarter-mile square parcels.

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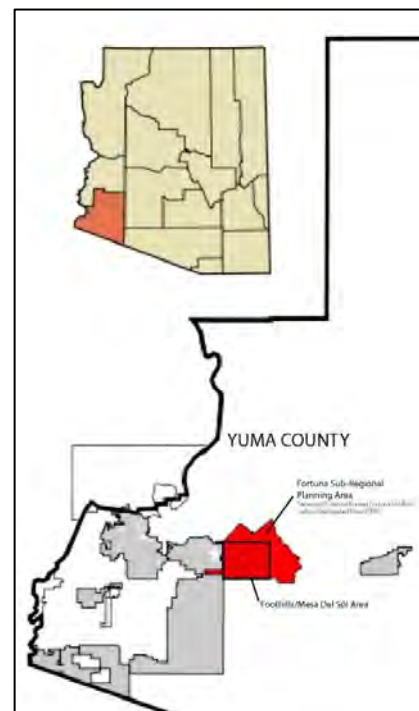
FIGURE 3.1
GENERALIZED EXISTING LAND USE PATTERN



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3.2 CURRENT SOCIOECONOMIC PROFILE

The Comprehensive Plan provides population and household profiles for the Foothills Sub-Regional Planning Area. It is important to note that the data provided in the Comprehensive Plan has been collected and reported using US Census Bureau sources for the Fortuna Foothills Census-Designated Place (CDP). The CDP is a geographic unit that roughly corresponds to the Foothills Sub-Regional Planning Area; being slightly larger, as depicted in the graphic at right. Although both areas are larger than the study area adopted for this transportation needs study, the study area accounts for the bulk of all existing development. Because there is very little development/occupancy of the sub-region outside the study area, the sub-regional data are indicative of population and housing characteristics of the study area.



3.2.1 POPULATION AND HOUSING

The Foothills sub-region historically has been a prime destination for winter visitors, who temporarily occupy specialized accommodations for travelers, especially recreational vehicles (RVs). Historically, Mobile Home and Recreational Vehicle (RV) Parks represented 75% of the housing in the Foothills Sub-Regional Planning Area. However, during the 1990s and continuing today, there has been a marked increase in the number of permanent residents occupying site-built homes. For example, the Mesa Del Sol development on the north side of I-8 between South Fortuna Road and South Foothills Boulevard contains planned, mixed-use housing that includes traditional, site-built apartments, duplexes, condominiums, and single-family homes. In addition, the area has experienced an increase in commercial activities providing supportive goods and services. This growth trend is expected to continue. A profile of the population is shown in Table 3.1.

**TABLE 3.1
FOOTHILLS POPULATION PROFILE**

Information Category	Reported Value
Permanent Residents in 1990:	7,737
Permanent Residents in 2000:	20,478
Permanent Residents in 2010:	26,265
Population Increase 1990 – 2000:	165%
Population Increase 2000 – 2010:	28%
Median Age of Residents in 2000:	62.9 years
Percentage of Fortuna Foothills Residents 65 to 74 Years of Age in 2000:	28.5%

Source: Information for Fortuna Foothills Census-Designated Place (FFCDP) provided in the Yuma County 2010 Comprehensive Plan supplemented with 2010 Census results, as available.

The Year 2010 population reported by the US Census Bureau reflects a growth of 28 percent during the period 2000 – 2010, which represents a significant decrease in growth from the 165% change experienced in the preceding decade. Housing data reveals a similar trend (see household profile below in Table 3.2). Significant growth in the number of housing units (115%) and the number of households (164%) was recorded for the period 1990 – 2000. Data for the Year 2000, as reported in the Comprehensive Plan, indicates 93% of housing in the CDP was owner-occupied, but 26% of housing was classified as seasonal-use. This information verifies the proposition that there are significant fluctuations in the number of residents in the sub-region and study area during the year. Expansion of a similar magnitude in housing was not experienced after the Year 2000; the increase in the number of housing units was only 45% in the period 2000 – 2010.

**TABLE 3.2
FOOTHILLS HOUSEHOLD PROFILE**

Information Category	Reported Value
Number of Housing Units in 1990:	6,957
Number of Housing Units in 2000:	14,961
Number of Housing Units in 2010:	21,642
Increase in Number of Housing Units 1990 – 2000:	115%
Increase in Number of Housing Units 2000 – 2010:	45%
Number of Occupied Housing Units 2010:	12,006
Number of Vacant Housing Units 2010:	9,636
Number of Households in 1990:	3,647
Number of Households in 2000:	9,652
Increase in Number of Households 1990 – 2000:	164%
Share of Owner-Occupied Housing 2000: 93%	93%

Source: Information provided in the Yuma County 2010 Comprehensive Plan supplemented with 2010 Census results, as available.

3.2.2 EMPLOYMENT

The *Foothills Planning Area Background Study* provides the following information regarding employment in the study area. The planning area and, therefore, the study area...

...is primarily a retirement and bedroom community. This is reflected in the types of business establishments that are predominate in the area. Construction, retail trade, and accommodation and food service are the most prominent industries in the area. Notable is the lack of business establishments and jobs that are related to agriculture. This scarcity makes the Foothills Planning Area unique in Yuma County where agriculture plays a central economic role.

The number of people employed by business establishment[s] in the Foothills Planning Area nearly doubled between 1998 and 2004.... During

the same period of time, the total payroll of business establishments divided by total payroll adjusted for inflation grew by 46%. These numbers indicate that both the number of jobs and what people are getting paid are growing at a fast pace in the Foothills Planning Area.¹

The majority of employment is within the Private, Non-Agriculture sector (61%), with the Government sector accounting for another 23%. The largest percentage of Foothills Planning Area residents are employed in retail trades, followed closely by educational, health and social services. Overall, 76% of Foothills Planning Area residents are employed in what can broadly be termed service industries. Given that there is no major industrial or agricultural activity in the Foothills Planning Area, the predominance of people being employed in service industries is a logical finding. A profile of the employment by sector is shown in Table 3.3.

**TABLE 3.3
MAJOR CATEGORIES OF EMPLOYMENT**

Employment Category	Jobs
Agriculture	206
Private, Non-Agriculture	2,630
Government	971
Self-Employed	317
Not For Profit	180
Total Employment	4,304

Source: Foothills Planning Area Background Study, November, 2002

During work accomplished in support of the YMPO Travel Demand Model Update in 2009, 33 TAZs were defined for the Foothills/Mesa Del Sol study area. Population and employment values were developed for each TAZ. Given that agricultural areas included for the Foothills Planning area are located north of and outside the study area and beyond these TAZs, it can reasonably be assumed that employment in the study area in 2002 would reflect the total less agriculture jobs. Therefore, an estimate of approximately 4,100 jobs in the study area was established for the Year 2002.

The *Foothills Planning Area Background Study* indicates that retail trades account for the largest percentage of Foothills Planning Area residents' employment, followed closely by educational, health and social services. Employment in the Foothills Planning Area has been spurred by expansion of the commercial sector. "Between 2000 and September 18, 2006, 84 commercial building permits on 62 parcels were issued in the Foothills Planning Area." The *Foothills Planning Area Background Study* states that most new commercial structures were constructed along South Fortuna Road, South Foothills Boulevard, and the I-8 Frontage Roads. The great majority of new commercial structures were located within a mile of the South Fortuna Road and South Foothills Boulevard interchanges with I-8.

¹ Foothills Planning Area Background Study, November, 2002.

The YMPO Travel Demand Model Update accomplished in 2009 developed employment estimates for different categories based on the 33 TAZs in the study area, as shown in Table 3.4. The mix of employment is different, although the combined total for Retail and Services – 2,749 – is similar to the total identified in 2002 for Private Non-Agriculture – 2,630. The key difference is in the presence of Industry and Manufacturing employment, which was not represented in the 2002 estimate prepared for the *Foothills Planning Area Background Study*. The estimates prepared for the Year 2009 by YMPO indicate a similar number of employees – 4,187 – in the 33 TAZs making up the study area, representing a slight increase over 2002. Overall, then, employment in the study area has not changed significantly since the 2002 study, but it has been redefined.

**TABLE 3.4
MAJOR CATEGORIES OF EMPLOYMENT**

Employment Category	Jobs
Retail	1,683
Office	260
Services	1,066
Public	245
Industry	245
Manufacturing	688
Total Employment	4,187

Source: Socioeconomic Dataset, YMPO Travel Demand Model 2009 Update.

3.3 ENVIRONMENTAL OVERVIEW

Expansive growth being experienced in Arizona presents significant natural environmental and cultural resource issues and concerns relative to planning and developing transportation infrastructure improvements. The State of Arizona, through its various offices and agencies, including ADOT, has completed a number of studies and efforts to help ensure there is an active awareness of environmental and cultural resources during the planning of state facilities. As an example, the Arizona’s Wildlife Linkages Assessment completed in 2002 examined key habitat linkages to help agencies account for and conserve wildlife and natural ecosystems. This assessment has been particularly critical in planning state highway facilities, as these facilities tend to create lengthy, linear barriers to wildlife movements – movement that may be critical to the viability of a habitat area. Additionally, the Safe, Accountable, Flexible, Efficient Transportation Equity: A Legacy for Users Act (SAFETEA-LU) mandates greater environmental consideration when developing regional transportation plans.

This section provides a brief overview of the physical, natural, and cultural resources that should be accounted for as the transportation system in the Foothills & Mesa Del Sol study area is planned and developed. This overview also will help ADOT by providing the data necessary to complete any early coordination activities that may be needed to successfully determine the level of, and ultimately complete, environmental documentation required under the National Environmental Policy Act of 1969 (NEPA).

3.3.1 PHYSICAL CONDITIONS OVERVIEW

This section addresses the physical structural characteristics of the study area relative to topography and soils.

TOPOGRAPHY

The topography of the study area is generally flat, sloping from approximately 450 feet above mean sea level (AMSL) in the southeastern corner to approximately 230 feet AMSL in the northwestern corner. The highest elevations of the study area – exceeding 500 feet AMSL – are located at the base of the Gila Mountains in the northeastern corner of the study area. Fortuna Wash flows through the eastern portion of the study area, generally following the overall slope from the southeastern corner and exiting the study area on the eastern side of the Mesa Del Sol development. Almost all existing development is located on the western side of Fortuna Wash, although the Fortuna del Rey Golf Course, Las Barrancas Golf Course, and Foothills Golf Course constructed east of the wash, are attracting residential development. The Foothills Planning Area does not contain any significant portion of the Colorado or Gila River Valleys.

SOILS

A large portion of existing development north and south of I-8 has occurred on Rosistas Sand and Rosistas-Ligurta Complex soils west of Fortuna Wash. Surface runoff particularly associated with Rosistas Sand is very slow and the hazard of blowing soil is high. Thus, the soil is severely limited for recreational development, due to its texture. This soil also is severely limited for use in association with sewage lagoons because of seepage. A large portion of development south of East 44th Street, east of South Hunter Avenue, west of Fortuna Wash has occurred on soils classified as Dateland Fine Sandy Loam. This soil type is well drained and well suited for urban development. Development on land along the west side of Fortuna Wash and between Fortuna Wash and the Gila Mountains has taken place on soils mostly classified as Ligurta-Cristobal Complex. This soil type associated with old alluvial fans is well drained, but development is moderately limited due to shrink-swell potential and moderately slow permeability with respect to septic tank fields.

3.3.2 NATURAL RESOURCE OVERVIEW

As an area develops, it is highly recommended to avoid natural resource impacts. However, there are times when completing a transportation project where no other alternatives exist, so minimizing or mitigating impacts can become necessary. This natural resource overview identifies potential impacts that will be evaluated in greater detail as projects move forward toward implementation and development.

VEGETATION

Transportation projects affect vegetation directly through construction impacts and indirectly through changes in environmental settings and can hinder or stimulate the recovery of affected plants. This section identifies general vegetative concerns relative to transportation project development and sensitive species that can be harmed by such projects.

GENERAL

The predominant vegetation type in the study area outside of urbanized developments is the Sonoran Creosotebush-Bursage Scrub. This almost ubiquitous vegetative group develops on level-to-gently sloping soils of generally silty or sandy texture. It is comprised of very open, evenly-spaced, low-diversity stands of shrubs 11 to 35 inches (0.3–0.9 meters) tall, containing a few scattered trees and a variety of cactus species. According to the *Foothills Planning Area Background Study*, “perennial cover is usually 10–20%, but in wet years annual plants may provide 100% cover.” Fortuna Wash and tributary desert washes and floodplains as well as existing residential and commercial development interrupt large patches of Sonoran Creosotebush-Bursage Scrub.

SPECIAL STATUS SPECIES

Yuma County and the study area are located within the Sonoran Desert physiographic province. The Sonoran Desert is home to a variety of unique Colorado River and Arizona Uplands plant communities. Continuing development is diminishing the native Sonoran desert plants, and water use practices are threatening some wetland species. The number of invasive weed species is increasing in some areas. There are no vegetative species in the study area listed in the County as “Threatened” or “Endangered.” However, there are “Species of Concern.” These include: Dune Spurge, Gander’s Cryptantha, Dune Sunflower and Sand Food. Additional research and field reconnaissance will be necessary to evaluate potential impacts on these species by transportation improvement projects, as they are implemented.

WILDLIFE

The presence of sensitive wildlife species and the general movement of wildlife resources of the State can be impacted by transportation improvements projects. This section presents information regarding potential wildlife impacts in the study area.

ARIZONA WILDLIFE LINKAGES

During the middle of the past decade, ADOT engaged in a partnership with other state and federal agencies and organizations to develop a preliminary statewide linkage assessment. The result, *Arizona’s Wildlife Linkages Assessment*, identifies important wildlife habitat connectivity areas, or linkage zones, as well as the associated threats. The Arizona Wildlife Linkages Workgroup that completed the Assessment represented the first serious effort to establish wildlife connectivity “on the map” and create a comprehensive inventory of connectivity needs throughout the state. The important realization of the Workgroup was that to protect the safe movement of people and plan for a future transportation network that includes wildlife, a blueprint was needed for accounting for Arizona’s remaining wildlife habitats and wildlife movements. The Workgroup’s Assessment is designed to promote the conservation or restoration of linkages in areas important for wildlife movement. The Assessment is viewed as a valuable tool to support all types and levels of planning, including development, transportation, wildlife management, and conservation.

Arizona's Wildlife Linkages Assessment identifies the study area as being mostly contained within what is termed a "Fracture Zone", as shown in Figure 3.2. Fracture zones are defined as areas of reduced permeability between habitat blocks, i.e., wildlife movements are impeded. Habitat blocks are important wildlife areas that can reasonably be expected to remain wild for at least 50 years. The fracture zones are largely State Land, urbanized areas and other private holdings, and transportation corridors (e.g., roads, canals, railroads) that limit or prevent animal movement, or threaten to do so in the foreseeable future. Most fracture zones, due to the extent and manner of development actions, need significant restoration to function as reliable linkages, which are considered critical to wildlife movement. The Assessment seeks to provide guidance to State departments responsible for public projects, resource agencies, and conservation groups for protecting and enhancing washes, streams, and rivers, which are seen as major corridors in all areas of fracture zones. The Assessment also focuses on implementing, where feasible, improvements to culverts and bridges to promote wildlife permeability.

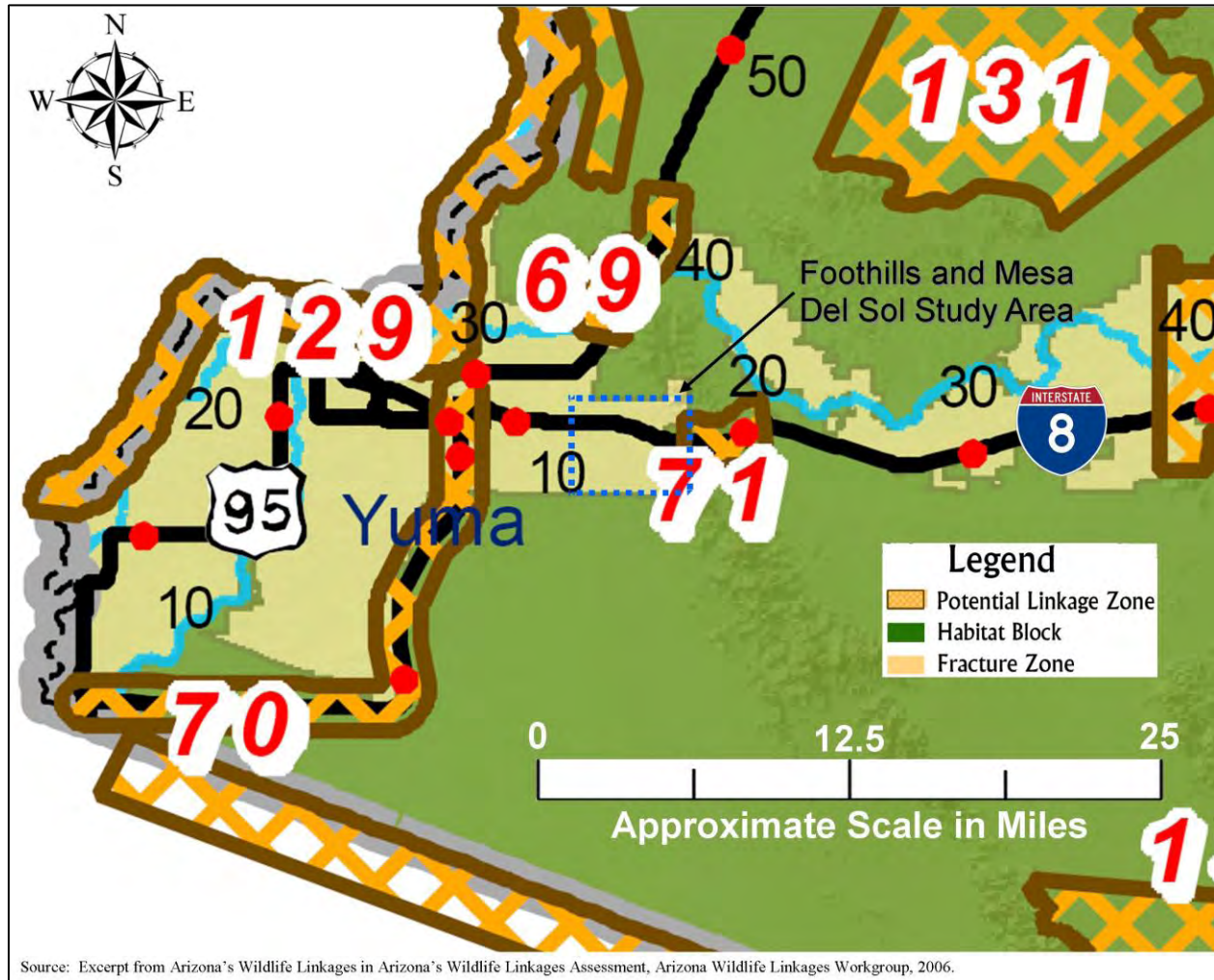
Directly east of the study area, and illustrated in Figure 3.2, is Potential Linkage Zone No. 71. A Linkage Zone is "a portion or subset of the Fracture Zone or Habitat Block identified as an area critical to wildlife movement. Threats must be managed, if connectivity is to be maintained or restored." This Zone, identified as the North-South Gila Mountains, is characterized by Lower Colorado River Sonoran Desertshrub. The US Bureau of Land Management (BLM) owns 92 percent of the land area in the Zone. State Trust Lands, under the control of the Arizona State Land Department (ASLD), account for another six percent, and the remainder is under private ownership. Identified species in this zone include:

Sensitive Species Associated with Wildlife Linkage No. 71

Arizona Chuckwalla *Sauromalus ater*
Banded Gila Monster *Heloderma suspectum cinctum*
Big Free-tailed Bat *Nyctinomops macrotus*
Bighorn Sheep *Ovis Canadensis*
California Leaf-Nosed Bat *Macrotus californicus*
Cave Myotis *Myotis velifer acia*
Desert Rosy Boa *Charina trivirgata gr*
Greater Western Mastiff Bat *Eumops perotis californicus*
Long-legged Myotis *Myotis volans*
Mountain Lion *Felis concolor*
Pale Townsend's Big-Eared Bat *Corynorhinus townsendii pallescens*
Pocketed Free-Tailed Bat *Nyctinomops femorosaccus*
Pronghorn *Antilocapra americana ulatum*
Spotted Bat *Euderma mac*
Yuma Clapper Rail *Rallus longirostris yumanensis*
Yuma Myotis *Myotis yumanensis*
Yuman Desert Fringe-Toed Lizard *Uma notata rufopunctata*

Source: Arizona's Wildlife Linkages Assessment, Arizona Wildlife Linkages Workgroup, 2006.

**FIGURE 3.2
STUDY AREA WILDLIFE LINKAGES**



The Arizona Wildlife Linkages Workgroup identified border security issues, highway development (specifically I-8), railroad facilities and operations, and urbanization as the principal threats to wildlife in this zone. It also developed a means to assist in identifying proposed potential linkage zones for immediate action. Linkages with the highest ecological value coupled with the most pressing threats were given the highest priority for consideration. Linkage Zone No. 71 was identified as a priority linkage among 28 cited for the highest priority consideration out of 152 Linkage Zones identified around the State.

SPECIES OF CONCERN, THREATENED, OR ENDANGERED

Yuma County is home to diverse wildlife ranging from big game to reptiles and amphibians. The Federal Endangered Species Act (ESA) lists threatened and endangered species found in the County. Included on the list are: Big Horn Sheep, Pronghorn Sonoran Antelope, American Peregrine Falcon, Yuma Clapper Rail,

Southwestern Willow Flycatcher, Brown Pelican, Razor Back Sucker, and Desert Tortoise. The Yuma County Comprehensive Plan notes that the Arizona Game and Fish Department (AzGFD) Species of Concern List documents species that are of "concern" but do not have official status as an Endangered Species. This list has been reproduced in the Technical Appendices.

In addition, AzGFD has designated special habitat management areas for the Flat-tailed Horned Lizard, Big Horn Sheep, Sonoran Pronghorn Antelope, and Sonoran Desert Tortoise within the Barry M. Goldwater Range immediately south of and contiguous with the study area. As development proposals and roadway improvements proceed, care should be taken to understand and preserve wildlife habitat and habitat linkages. Additional research and field reconnaissance will be necessary as transportation improvement projects are moved toward implementation. An AzGFD listing Special Status Species in Yuma County is provided in the Technical Appendices.

WATER RESOURCES

There are two primary water resources of interest relative to development of transportation projects: floodplains and wetlands. This section provides a brief summary of these two resources as they pertain to the study area.

FLOODPLAINS

Floodplains and wetlands are environmentally sensitive resources that must be considered in the evaluation of transportation improvements. The majority of the study area is located within the Dome Valley/Wellton watershed, which is the lower portion of the larger Gila River watershed. The southwestern corner of the study area is located within the City of Yuma, Foothills area, and South County, which forms the Yuma Desert watershed. Fortuna Wash is ephemeral and flows only in response to major precipitation events, flowing into the Gila River approximately two miles north of US 95. The City of Yuma 2006 Parks and Recreation Facility Plan cites Fortuna Wash as an example of open space that can "...serve a variety of park and recreational purposes that wouldn't be possible in proximity to development...."

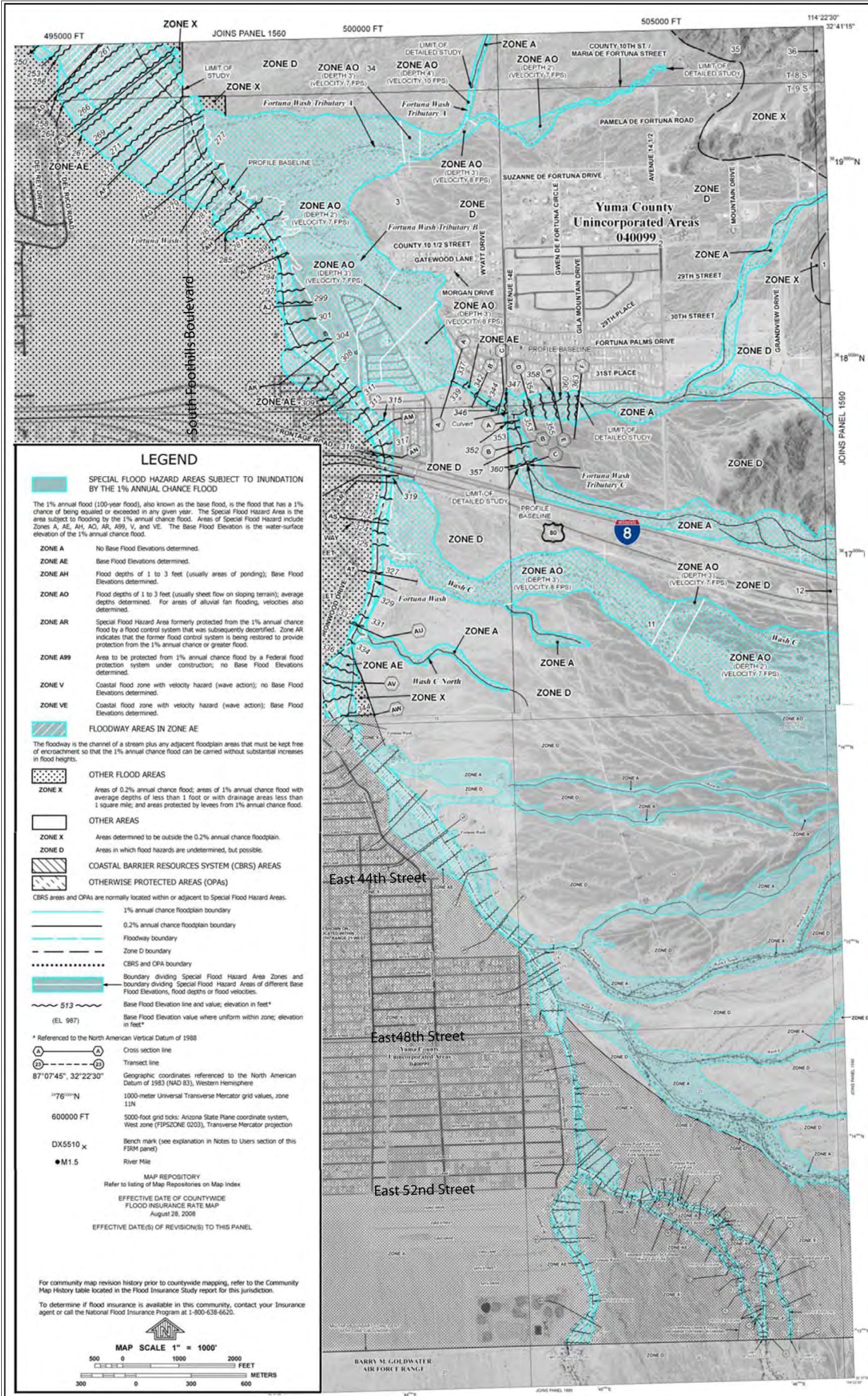
Figure 3.3 is a composite showing the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Fortuna Wash. The majority of the upper reaches are designated as Zone A and D, meaning flooding is likely but determinations have yet to be formalized. Immediately proximate to the center of the wash, flood elevations have been determined, and these areas must be kept free of encroachment. Wash C, which flows parallel to and south of I-8, is designated Zone AO, meaning flood depths of one to three feet have been determined. North of I-8 flood zones mostly have been identified and flood depths determined (Zone AO). In addition, the specific range of flooding has been determined in Zone AE, where no encroachment is permitted.

WETLANDS

A search using the National Wetland Inventory (NWI) database did not identify any known wetlands or areas of interest within the study area. As projects are defined, particularly affecting Fortuna Wash and tributary washes, early coordination with the US

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FIGURE 3.3 FLOODPLAIN AREAS



NFIP

PANELS 1569E & 1570

FIRM

FLOOD INSURANCE RATE MAP

YUMA COUNTY, ARIZONA AND INCORPORATED AREAS

PANELS 1569 & 1570 OF 2950

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
YUMA COUNTY	040099	1569	E
YUMA COUNTY	040099	1570	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
04027C1569E
04027C1570E

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

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Army Corps of Engineers (USACE) is encouraged to maximize communication to the permitting agency and minimize review time.

3.3.3 CULTURAL RESOURCE OVERVIEW

Cultural resources is a broad term that encompasses archaeological resources and historic sites. Each highway project involves a cultural resource assessment which includes a records search and on-site surveys to identify possible sites. As project development proceeds, coordination will be accomplished with the State Historic Preservation Office (SHPO) to determine if a cultural resources investigation is necessary. Consultation is made with the SHPO, Native American tribes and agencies, and land resource agencies to make sure that findings and conclusions satisfy local and federal laws, including Section 106 of the National Historic Preservation Act (NHPA). If sites are found, mitigation involves avoidance or data recovery.

The only known cultural resource of relevance in the study area is the Juan Bautista de Anza Trail. The BLM is actively developing a continuous multi-use path for the Anza Trail across Arizona. The potential routes under evaluation are north of I-8 near the Gila River, approximately three miles north of and outside the study area. Although not a formal constituent part of the trail, I-8 is designated by the National Park Service as a segment of the “Auto Tour Route,” providing access to historic sites, interpretive sites, and a visitor center in Yuma. Two other trails have been identified by Yuma County for recognition as part of the County’s Open Space and Recreational Resources Planning (see Open Space and Recreation below).

Beyond the Juan Bautista de Anza Trail, other cultural resources may be present in the study area that are yet unknown. SHPO consultations associated with projects that are implemented in the future may result in the identification of additional resources. Depending on the potential impact, appropriate actions will be identified at that time to avoid or mitigate those impacts.

3.3.4 SENSITIVE ISSUES AND/OR FEATURES

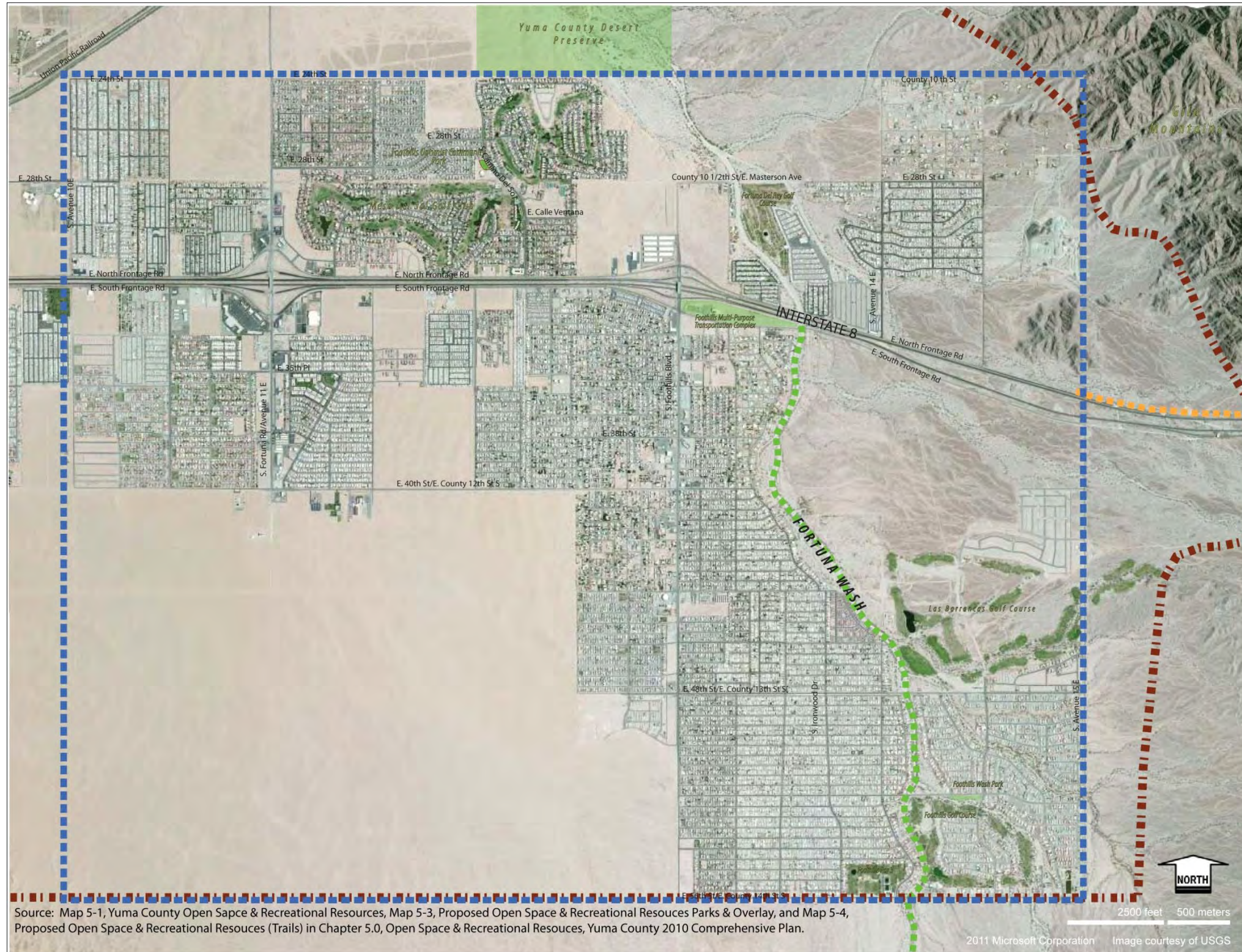
Within the study area, there are certain other issues and/or features that are particularly sensitive with respect to socioeconomic and environmental conditions and concerns. This section highlights these issues and/or features to ensure project planning and definition of improvements with respect to their special status and sensitivity.

OPEN SPACE AND RECREATION

Chapter 5, *Open Space and Recreational Resources*, of the Yuma County 2010 Comprehensive Plan identifies several locations within the study area that exist today for open space or recreational purposes. There are also proposals for additional sites to be developed in the future. These areas and their proposed use must be considered in defining improvements to the transportation system in the study area (Figure 3.4).

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FIGURE 3.4
TRAILS AND OPEN SPACE & RECREATIONAL RESOURCES



LEGEND

- ■ ■ ■ Study Area Boundary
- Trails**
- ■ ■ ■ Multi-Use Trail (Equestrian & Non-Motorized)
- ■ ■ ■ Camino del Diablo Historic Trail
- ■ ■ ■ Telegraph Pass Historic Trail
- Open Space & Recreational Resources**
- Existing Community Park
- Golf Course
- Proposed Open Space

Source: Map 5-1, Yuma County Open Sapce & Recreational Resources, Map 5-3, Proposed Open Space & Recreational Resouces Parks & Overlay, and Map 5-4, Proposed Open Space & Recreational Resouces (Trails) in Chapter 5.0, Open Space & Recreational Resources, Yuma County 2010 Comprehensive Plan.

2500 feet 500 meters

2011 Microsoft Corporation Image courtesy of USGS

Prepared by Wilson & Company, October 11, 2011.

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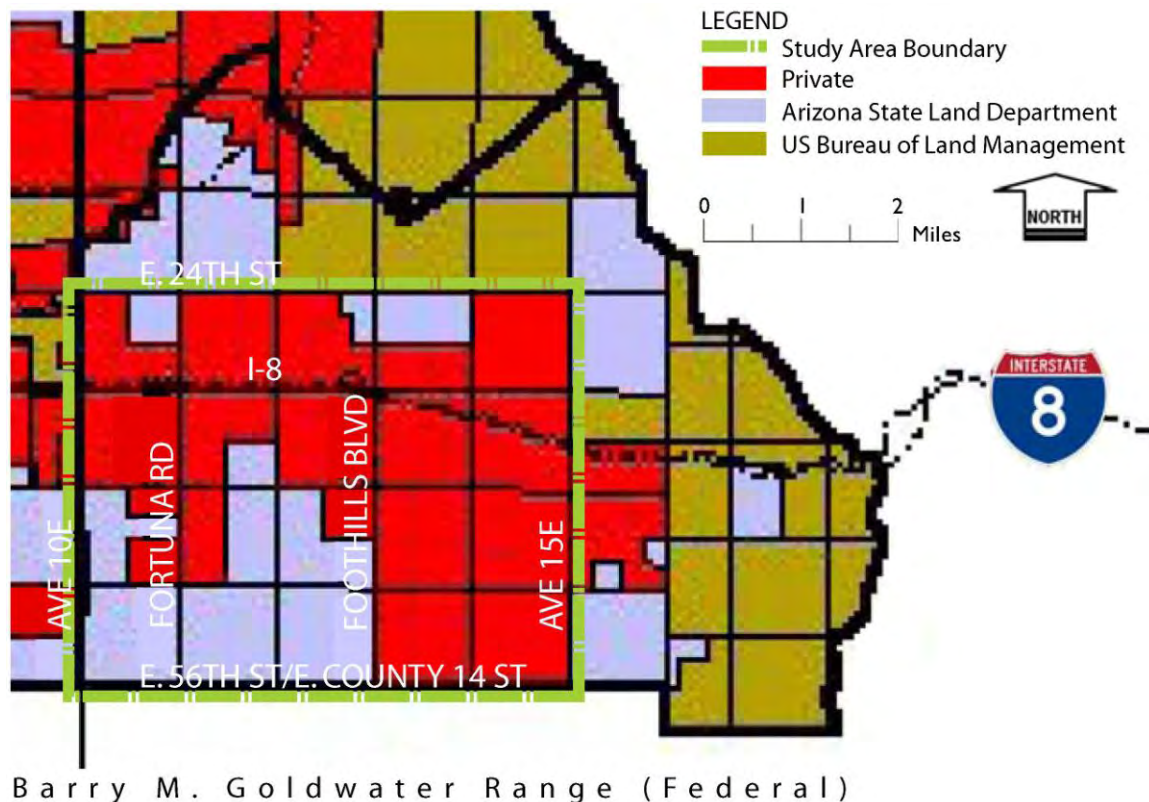
- **Open Space Overlay – Gila Mountains:** Identifies 62,000+ acres of the Gila Mountains directly east of the study area as open space.
- **Foothills Wash Park:** This is a 4.5-acre parcel on the south side of East 52nd Street directly west of South Avenue 14½E situated on the north edge of Foothills Wash and the Foothills Golf Course.
- **Foothills Multi-Purpose Transportation Complex:** The southeast quadrant of the I-8/South Foothills Boulevard interchange is owned by ADOT. This 20-acre parcel situated between I-8 main lanes and South Frontage Road is designated as the future site for a multipurpose transportation complex.
- **Foothills Optimist Community Park:** This 3.8-acre park is located on the west side of South Camino Del Sol directly north of the Mesa Del Sol Golf Club.
- **Yuma County Desert Preserve:** This 549-acre site, owned by the BLM is proposed as an area for preferred trails with limited access. It is located directly north of the study area, being contiguous with East 24th Street/East County 10th Street and bounded by extensions of the alignments of South Camino Del Sol on the west and South Foothills Boulevard on the east.
- **Multi-Use (Equestrian and Non-Motorized) Trail System:** A portion of this regional trail system is planned to run along the southern edge of the study area in the vicinity of East 56th Street/East County 14th Street.
- **El Camino Del Diablo Historic Trail:** El Camino Del Diablo (The Devil's Highway) is an historic trail, originally connecting Caborca, Sonora, to the Spanish colonies of California. Jesuit Padre Eusebio Francisco Kino pioneered the trail from 1699-1701. The most difficult stretch of the trail was the 130-mile stretch from Sonoyta, Sonora, to what is now Yuma, Arizona.²
- **Telegraph Pass Historic Trail:** Telegraph Pass is the principal route through the Gila Mountains directly east of the study area. The eastbound lanes of I-8 were constructed following the existing route of US 80 built in 1948. The westbound lanes generally follow an earlier alignment of US 80 constructed in 1928. They criss-cross in the midst of the Gila Mountains. The actual Telegraph Pass Trail starts at the base of the Gila Mountains (approximate elevation: 480 feet) near the I-8 North Frontage Road and ends at an elevation of over 1,600 feet overlooking I-8 and Fortuna Wash.

STATE TRUST LANDS

Arizona has approximately 9.28 million surface acres of State Trust Lands, which are administered by the ASLD. State Trust lands are not public lands. These lands are held in a public Trust to support education in the State. The Trust Lands were established through the State Enabling Act, passed June 20, 1910, which allowed the Territory of Arizona to prepare for statehood. The Enabling Act assigned Section 2 and 32 of each township to be held in Trust for the common schools. The Trust operated by

² From informational page submitted by Bill Kirchner, March 22, 2010, at <http://www.hmdb.org/marker.asp?marker=28968>.

FIGURE 3.5
LAND OWNERSHIP IN THE STUDY AREA



ASLD accomplishes its mission through the sale and lease of Trust lands for grazing, agriculture, municipal, school site, residential, commercial and open space purposes. The sale or lease of State Trust Lands also results in local economic stimulation. In addition, the ASLD has programs to support environmental protection, forest health and fire suppression, and range land management.

Figure 3.5 shows that all land within the study area not in private hands is held by the ASLD under its mandate for State Trust Lands.

ENVIRONMENTAL JUSTICE (EJ)

“Title VI of the Civil Rights Act of 1964” and subsequent related statutes have been passed to “prohibit discrimination on the basis of race, color, national origin, age, sex, and disability in association with any program or activity receiving federal financial assistance”. Executive Order 12898, *Federal Actions To Address Environmental Justice In Minority Populations And Low-Income Populations*, dated February 11, 1994, directs Federal agencies (and programs and activities receiving federal financial assistance) to “...make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” “Disproportionately high and adverse” effects means the effect(s) of the proposed action:

- (1) is (are) predominately borne by a minority population and/or a low-income population, or
- (2) will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

There are three fundamental environmental justice principles:

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

U.S. DOT Order (5610.2), addressing “Environmental Justice in Minority and Low-Income Populations,” defines Minority and Low-Income Populations as ...”any readily identifiable groups ... who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy or activity.” The Order identifies four minority groups:

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

Additionally, the U.S. DOT Order specifies “Low Income” as a person whose median household income is at or below the Department of Health and Human Services poverty guidelines.

An assessment of the socioeconomic composition of the study area was based on data available from the U.S. Census Bureau. Population information is available from the recent 2010 Census; however, income information is only available for the period 2005-2009 within the framework of the American Community Survey (ACS). Information regarding the former is reported for nine Census Tracts identified for the 2010 Census. Information regarding the latter is available for three Census Tracts used to collect and record information for the 2000-2009 period that formed the Fortuna Hills Census-Designated Place (CDP).

The standard of disproportionate effects relative to race/ethnicity has been examined by comparing the representation of race/ethnicity within relevant Census Tracts to that of a larger socioeconomic region, in this case the Yuma Census County Division (CCD). The CCD is an appropriate unit for this purpose, as it encompasses most of the urbanized portion of Yuma County. Figure 3.6 depicts the distribution of race/ethnicity in nine Census Tracts entirely within or coincident with the study area. The figure reveals there is no notable representation of minority people groups in any of the Census Tracts, although minority people groups represent approximately 27.5 percent of the population of the CCD. Table 3.5 reveals there are two Census Tracts where minority population groups are present in slightly greater proportions than in the CCD; however, representation is not disproportional. Therefore, it can be concluded that Minority Populations would not be disproportionately affected by projects undertaken to improve transportation systems and services within the study area.

Figure 3.7 displays the Median Household Income in each of three Census Tracts used for reporting prior to the 2010 Census. In this case, the Median Household Income of Yuma County for the period 2005-2009 was adopted for comparison. Average Median Household Income for the County was slightly less than \$39,000. The Median Household Income reported for each of the three Census Tracts coincident with the study area was greater than that reported for the County. Therefore, it can be concluded that the study area does not have a concentration of Low-Income Populations that potentially would be disproportionately affected by projects undertaken to improve transportation systems and services.

3.4 EXISTING TRANSPORTATION SYSTEM

The Yuma County multi-modal transportation system is comprised of state and local roadways to effectively move goods and people. The backbone of the roadway network in the study area is I-8, a four-lane, high-capacity freeway, which is supplemented on both sides with frontage roads providing access to adjacent parcels. I-8 transects the northern half of the study area and plays an important regional and sub-regional role in the transportation system.

The region is served by all transportation modes and is actively developing plans to embrace and foster these modes. At a statewide level, communities in the study area are actively engaged in evaluating opportunities for transit service. This section of the report describes the existing transportation system within the study area and the several communities comprising it. For purposes of this study, the term “Existing” refers to the conditions on the system in April 2010, when this study commenced.

3.4.1 YUMA COUNTY TRANSPORTATION ELEMENTS

The Yuma County 2010 Comprehensive Plan currently in effect, and the City of Yuma 2012 General Plan, provide frameworks for community and transportation system development.³ They stipulate goals for the community, specify objectives to accomplish the goals, and establish technical and policy guidance for land use, transportation, and

³ Yuma County is in the process of preparing a 2020 Comprehensive Plan and it remains in Draft status at this time.

FIGURE 3.6
STUDY AREA RACIAL/ETHNIC DISTRIBUTION

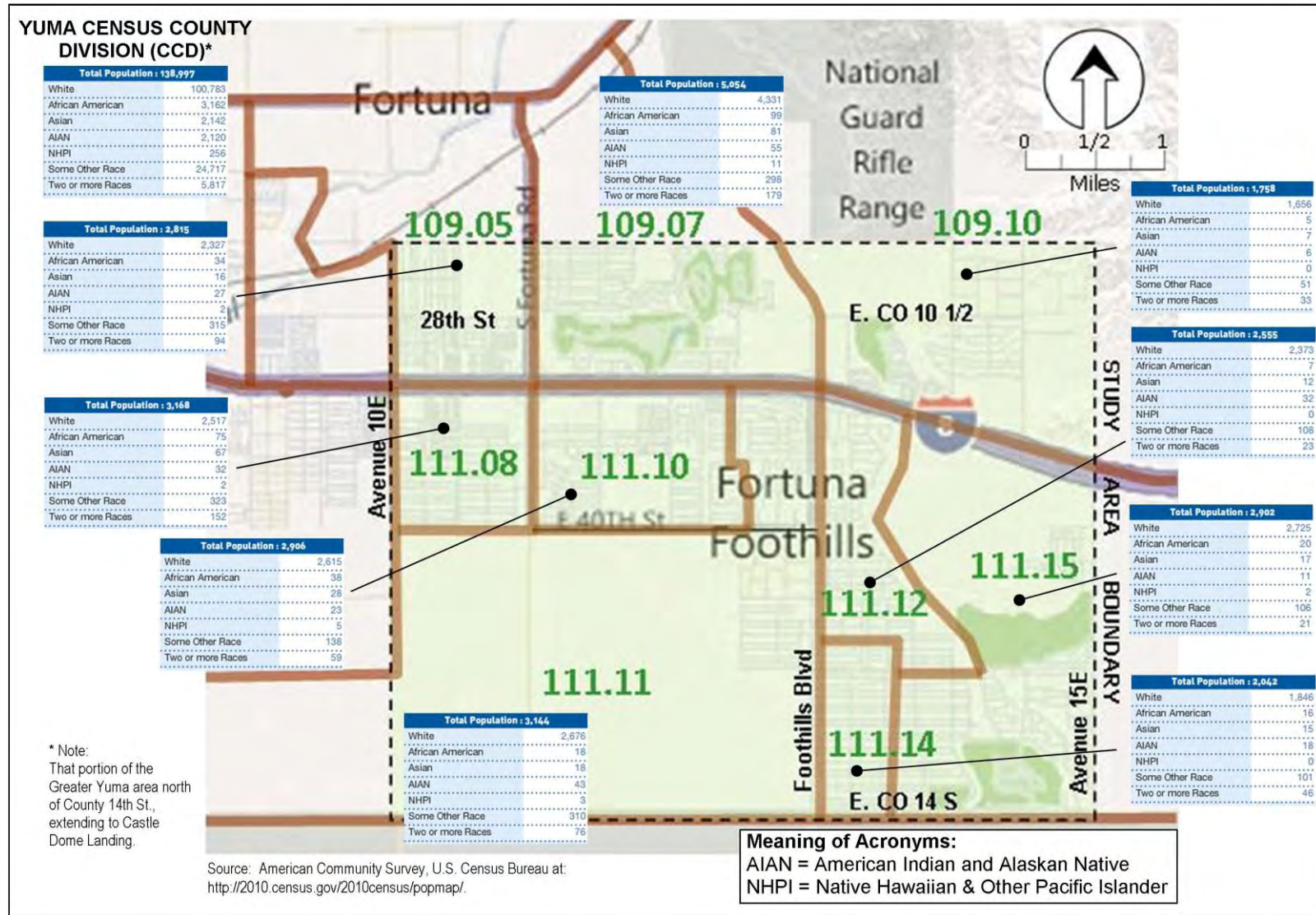


TABLE 3.5
ENVIRONMENTAL JUSTICE POPULATION GROUPS BY CENSUS TRACT

Population Group	Yuma Census County Division (CCD)	Share of CCD Population	Tract 109.05	Share of Tract Population	Tract 109.07	Share of Tract Population	Tract 109.10	Share of Tract Population	Tract 111.08	Share of Tract Population	Tract 111.10	Share of Tract Population	Tract 111.11	Share of Tract Population	Tract 111.12	Share of Tract Population	Tract 111.14	Share of Tract Population	Tract 111.15	Share of Tract Population
White	100,783	72.51%	2,327	82.66%	4,331	85.69%	1,656	94.20%	2,517	79.45%	2,615	89.99%	2,676	85.11%	2,373	92.88%	1,846	90.40%	2,725	93.90%
African American	3,162	2.27%	34	1.21%	99	1.96%	5	0.28%	75	2.37%	38	1.31%	18	0.57%	7	0.27%	16	0.78%	20	0.69%
Asian	2,142	1.54%	16	0.57%	81	1.60%	7	0.40%	67	2.11%	28	0.96%	18	0.57%	12	0.47%	15	0.73%	17	0.59%
AIAN	2,120	1.53%	27	0.96%	55	1.09%	6	0.34%	32	1.01%	23	0.79%	43	1.37%	32	1.25%	18	0.88%	11	0.38%
NHPI	256	0.18%	2	0.07%	11	0.22%	0	0.00%	2	0.06%	5	0.17%	3	0.10%	0	0.00%	0	0.00%	2	0.07%
Some Other Race	24,717	17.78%	315	11.19%	298	5.90%	51	2.90%	323	10.20%	138	4.75%	310	9.86%	108	4.23%	101	4.95%	106	3.65%
Two or More Races	5,817	4.18%	94	3.34%	179	3.54%	33	1.88%	152	4.80%	59	2.03%	76	2.42%	23	0.90%	46	2.25%	21	0.72%
Total Population	138,997	100%	2,815	100%	5,054	100%	1,758	100%	3,168	100%	2,906	100%	3,144	100%	2,555	100%	2,042	100%	2,902	100%

Differential Share Relative to the Yuma Census County Division (CCD)									
White	10.16%	13.19%	21.69%	6.94%	17.48%	12.61%	20.37%	17.89%	21.39%
African American	-1.07%	-0.32%	-1.99%	0.09%	-0.97%	-1.70%	-2.00%	-1.49%	-1.59%
Asian	-0.97%	0.06%	-1.14%	0.57%	-0.58%	-0.97%	-1.07%	-0.81%	-0.96%
AIAN	-0.57%	-0.44%	-1.18%	-0.52%	-0.73%	-0.16%	-0.27%	-0.64%	-1.15%
NHPI	-0.11%	0.03%	-0.18%	-0.12%	-0.01%	-0.09%	-0.18%	-0.18%	-0.12%
Some Other Race	-6.59%	-11.89%	-14.88%	-7.59%	-13.03%	-7.92%	-13.56%	-12.84%	-14.13%
Two or More Races	-0.85%	-0.64%	-2.31%	0.61%	-2.15%	-1.77%	-3.28%	-1.93%	-3.46%

Prepared by Wilson & Company, November 2011.

NOTES:

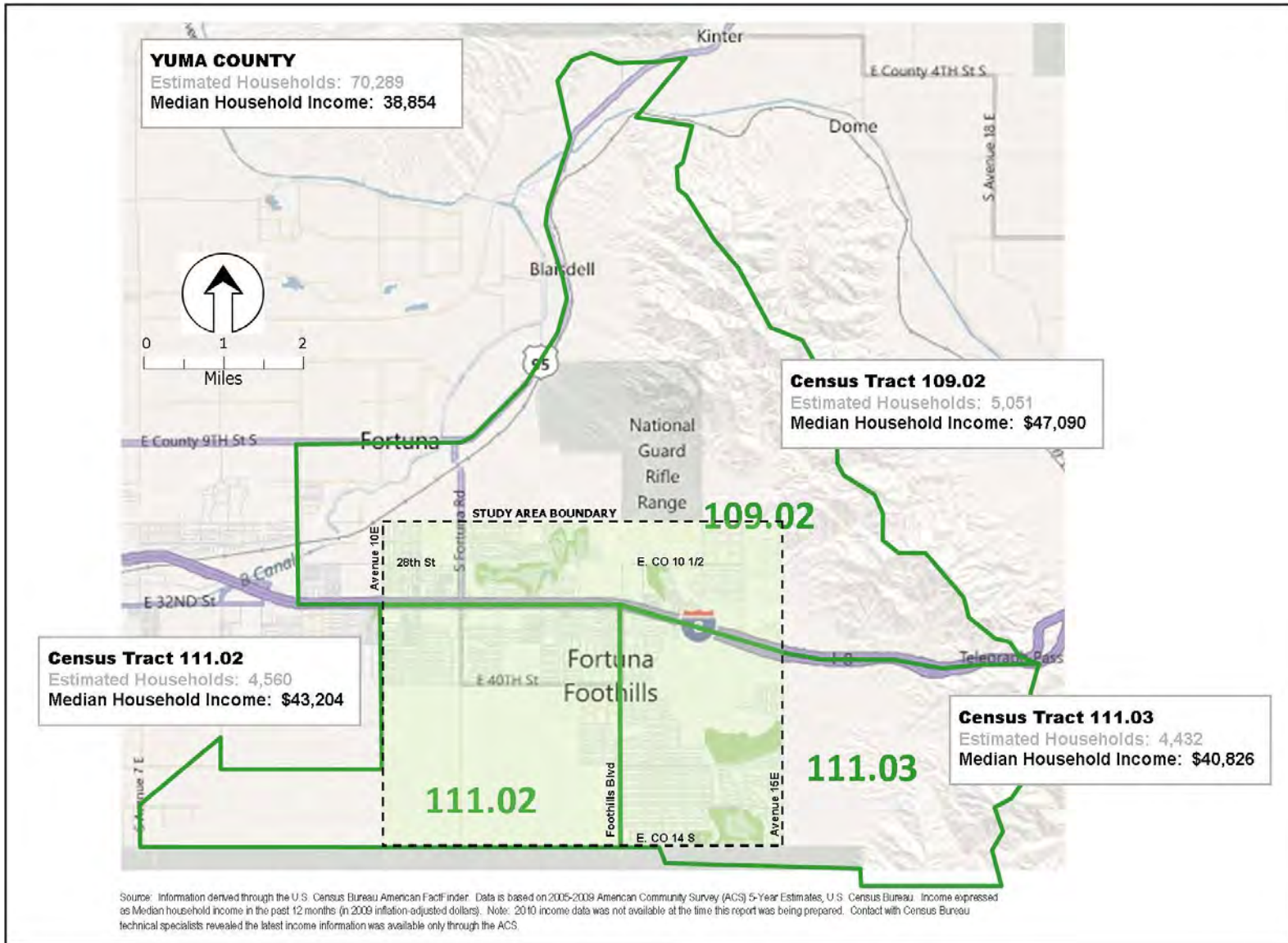
AIAN refers to American Indian and Alaskan Native.

NHPI refers to Native Hawaiian & other Pacific Islander.

Shading indicates representation of the Population Group within the Census Tract is greater than the proportionate share within the CCD.

Source: American Community Survey, U.S. Census Bureau at <http://2010.census.gov/2010census/popmap/>.

**FIGURE 3.7
STUDY AREA MEDIAN HOUSEHOLD INCOME DISTRIBUTION**



other community development decisions. These plans are required by the State of Arizona to provide a framework for rational community growth and must be updated every ten years.

Recently, the State of Arizona mandated additional Comprehensive Plan elements as part of *Growing Smarter Plus*. Historically, Land Use and Circulation were the only two elements required by the State in developing Comprehensive Plans. The new mandates require five additional elements, including:

- Environmental Planning;
- Open Space;
- Water Resources;
- Cost of Development; and
- Growth Areas.

These elements are foundational in developing a plan for a balanced transportation system, which is why the information in the preceding sections has been reviewed and included herein.

The YMPO 2010-2033 RTP incorporates relevant elements of the two plans cited above into a unified plan for the Yuma Metropolitan Area, including points east along I-8. This Transportation Needs Study is intended to supplement the community planning process by providing a perspective on the uses and needs of the regional transportation facilities serving the study area. Too often, local access takes precedence over mobility, particularly when a community is trying to vie for economic development opportunities or sustain or establish economic and social practices.

When adequate alternative facilities, i.e., route options, are not in place, the result often is undue congestion on the primary street network. This imbalance between desired mobility, property access, and facility function is very common, particularly in smaller communities. A related side effect of excessive access or lack of route options is a reduction in safety and capacity not only for motorists but also for pedestrians and cyclists. A particular concern in this regard is the action of turning vehicles involved in ingress/egress to fronting properties. The focus of the RTP, therefore, is a balanced transportation system that will support and sustain efficient and effective mobility and access within the study area. At the same time, it addresses the critical nature of I-8 as a facility serving regional, state, and interstate mobility needs.

3.4.2 STUDY AREA ROADWAY NETWORK

The roadway network in the study area consists of key roadways connecting major activity centers, commercial centers, and residential communities. Today, I-8 and its frontage roads form the primary connecting travel facility within the study area. However, there are several lesser facilities, such as South Fortuna Road, South Foothills Boulevard, and East 40th Street/East County 12th Street, that provide connectivity within and between community areas. Most connections are accommodated with two-lane paved roadways with shoulders and ditches for drainage. Within some portions of the study area, roadways are improved to include curb and gutter, turn lanes, or additional through-lane capacity. Most local access roads in

residential areas are paved and have a curb and gutter cross-section. This section highlights conditions of the existing roadway network and how well the network operates under current traffic demands.

3.4.3 PHYSICAL ROADWAY ELEMENTS

The physical roadway elements are characterized by roadway type, size, and purpose. Bridges are required to ensure connectivity, and traffic control elements (e.g., traffic signals and signs) are intended to control vehicular flow and ensure operational efficiency. Additionally, there are overarching responsibilities for maintenance and operations of roadway facilities. These responsibilities in the study area are divided between ADOT and Yuma County, which coordinate system maintenance and improvements with the YMPO.

JURISDICTIONAL RESPONSIBILITIES

ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT)

ADOT has primary responsibility for maintaining connectivity within the State Highway System. State Routes are the primary means to travel between urbanized areas and provide vital access to urbanized areas for rural sections of Yuma County. At the state program level, there is also a hierarchy of roadways, including the National Highway System (NHS), which includes the Interstate Highway System (IHS) as well as other roads important to the nation's economy, defense, and mobility. The NHS was developed by the US Department of Transportation (USDOT) in cooperation with the states, local officials, and metropolitan planning organizations (MPOs).

Although the IHS is the premier component of the NHS, the NHS consists mostly of two-lane roads. Approximately 98 percent of all roads designated within the NHS already have been built. The 160,000 miles (256,000 kilometers) that comprise the NHS account for only four percent of the nation's roads, yet these roads are vital to industry, commerce, and social interaction. They carry more than 40 percent of all highway traffic, 75 percent of heavy truck traffic, and 90 percent of tourist traffic.

The advantage of NHS is that it encourages states to focus on a limited number of high-priority routes and concentrate on improving them with Federal-Aid Highway Program (FAHP) funds. At the same time, states can incorporate design and construction improvements that address their traffic needs safely and efficiently. States also can make operational changes, such as instituting a program to locate and remove stalled vehicles that are impeding smooth traffic flow. States can employ available technological improvements, such as Intelligent Transportation Systems (ITS), as well as access management to help reduce congestion and keep traffic moving without major roadway expansion.

The YMPO RTP identifies I-8 as being in the U.S. Strategic Highway Network (STRAHNET). The STRAHNET system includes highways providing access, continuity, and emergency transportation for the movement of personnel and equipment in support of U.S. military operations in both times of peace and war. The STRAHNET system has been designated by the Federal Highway Administration (FHWA) in partnership with the Department of Defense (DOD). STRAHNET is a key component of the country's

strategic defense policy. South Avenue 3E, which connects I-8 with the MCAS also is included in the STRAHNET system.

At the local level, I-8 is the primary transportation facility of the NHS within the study area and moves the greatest proportion of traffic. In fact, this route practically serves as the primary or “Main Street” within the Foothills and Mesa Del Sol communities. As such, I-8 plays a very significant role in regional and sub-regional mobility within the study area. This is the only roadway in the study area included in the State Highway System.

YUMA COUNTY

Yuma County maintains region-serving non-NHS roadways that traverse the study area, particularly South Fortuna Road and South Foothills Boulevard, and most of the local roadways. South Fortuna Road and South Foothills Boulevard, which provide interchange access to I-8, play a major role in connecting key portions of the study area and assuring access to community resources. Other roadways are primary routes of travel, facilitating the collection and distribution of vehicular traffic relative to the many activity centers in the study area. The location and capacity of these facilities are influenced by the local land use decisions and, therefore, they are the most critical components of the transportation system relative to local mobility.

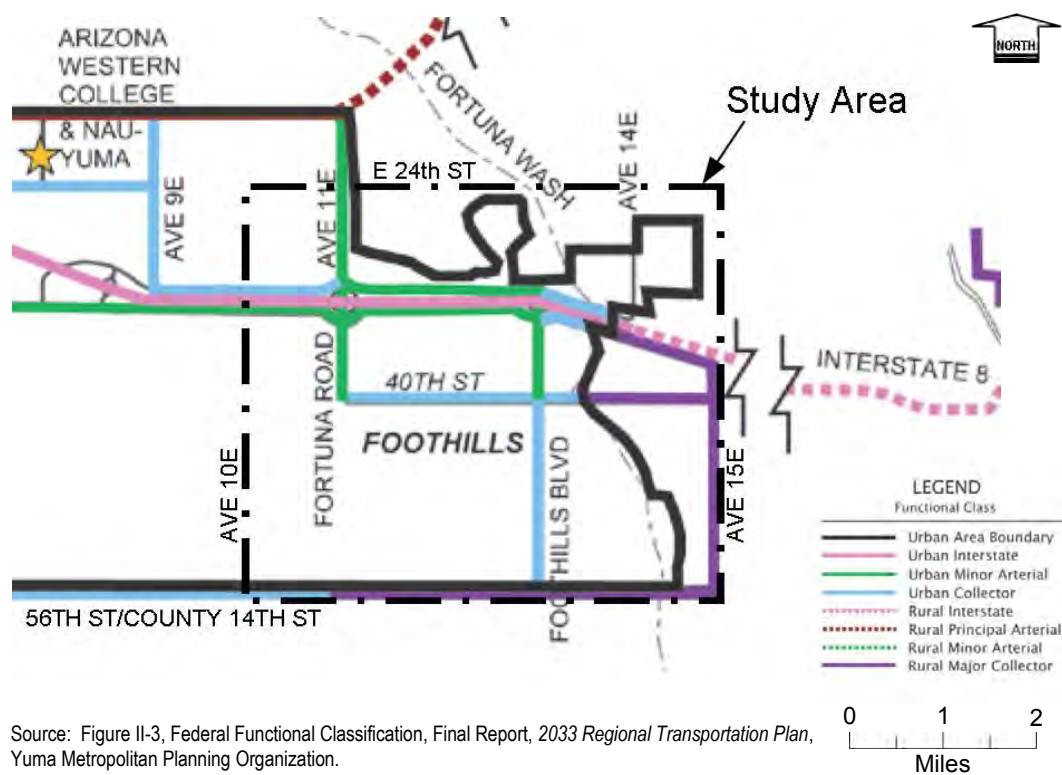
FUNCTIONAL CLASSIFICATION

The transportation system is made up of varying roadway types having different functions within the framework of mobility and access. The different roadway types support both urban and rural travel. Therefore, functional classification of roadways is a critical component of effective transportation planning. Functional classification designations were developed to help manage mobility and access. Providing facilities that are meant to move traffic and commerce must be in balance with other facilities where key connectivity and local access are needed.

Eight functional classifications have been adopted to identify the role of major streets and highways in the study area. The classifications depend on the character of traffic and mobility associated with each facility and surrounding land uses as well as the necessary level of access. The Arizona Functional Classification Guidelines published by ADOT provide the basis for the following definitions of roadway functional classifications relevant to this study. These have been applied by the YMPO in its current RTP. Figure 3.8 identifies the functional classification of major highways and streets in the study area. A description of the principal characteristics of each class follows.

- 1. Urban Interstate:** The Urban Interstate facility falls within the Urban Principal Arterial classification. These facilities typically are multi-lane, high-speed divided roadways with the primary function of providing the greatest mobility for through movement. These facilities support large volumes of traffic efficiently by assuring minimal interference to through movements. Access to Urban Interstate and other freeways is controlled; utilizing traffic interchanges at crossing roadways,

FIGURE 3.8
STUDY AREA MAJOR ROADWAY FUNCTIONAL CLASSIFICATION



Source: Figure II-3, Federal Functional Classification, Final Report, 2033 Regional Transportation Plan, Yuma Metropolitan Planning Organization.

usually other Principal Arterials. The spacing for access to this class of facility is typically one mile, but may be more frequent in highly developed areas. Urban Principal Arterials serve major activity centers with direct access to adjacent land being purely incidental. Limiting access aids in maintaining the integrity of the roadway by reducing interference, allowing a major portion of traffic to pass through the area. I-8, between South Avenue 10E and South Avenue 14½E (Fortuna Wash) is the only Urban Interstate facility in the study area.

2. **Urban Minor Arterial:** These facilities connect with Rural Minor Arterials and Collectors to support trips of moderate length at the county level, but they can accommodate longer trips within the community. Posted speed limits usually are lower than those established for Principal Arterials; therefore, Urban Minor Arterials generally have four lanes with a center left-turn lane, but support lower travel mobility. The spacing of Urban Minor Arterials can be developed at intervals of less than one-half mile in highly developed areas. South Fortuna Road and South Foothills Boulevard (north of East 40th Street/East County 12th Street) are prime examples of Urban Minor Arterials in the study area.
3. **Urban Collector:** Urban Collectors in highly developed areas are generally four-lane facilities with a center left-turn lane. These facilities have the purpose of providing local street network access to the arterial system of roadways. They may penetrate residential neighborhoods; therefore, the level of access is greater than

facilities with a higher classification. Urban Collectors provide direct access for commercial and multi-family residential traffic to the transportation system. South Foothills Boulevard, south of East 40th Street/East County 12th Street, is a prime example of an Urban Collector.

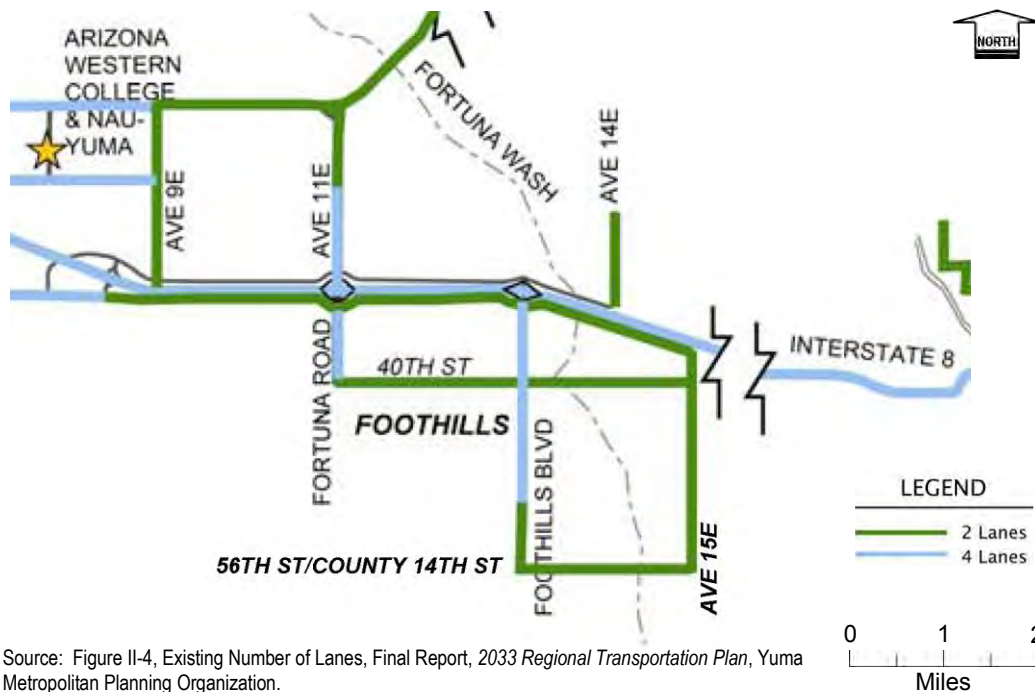
4. **Rural Interstate:** Like the Urban Interstate, these facilities serve as the principal corridors for interstate and statewide travel supporting long-distance trips and the very highest volumes. They provide minimal interference to through movement. I-8, east of South Avenue 14½E (Fortuna Wash) is the only Rural Interstate facility in the study area.
5. **Rural Principal Arterial:** This functional classification of roadways includes all interstates (as noted earlier) and serves urban areas with a population of 50,000 or more and a large majority of urban areas with a population of 25,000 or more. The Rural Principal Arterial system provides an integrated network without stub connections, except where unusual geographic or traffic flow conditions dictate (e.g., international borders and coastal cities).
6. **Rural Minor Arterial:** These facilities serve most larger communities not served by the Principal Arterial system as well as major traffic generators attracting travel over long distances (though shorter than associated with the Principal Arterial system). Rural Minor Arterials support interstate and intercounty travel of regional importance at relatively high speeds with minimum interference to through movement. All roadways not on the Principal or Minor Arterial system are on the Collector system.
7. **Rural Major Collector:** The Rural Major Collector generally is two lanes with the purpose of supporting travel of intracounty and regional importance, as opposed to statewide movements. These facilities provide connectivity between Minor Collectors and the local street network to the Minor Arterial network. They accommodate shorter distance trips and posted speed limits tend to be more moderate than those of the arterial system. Rural Major Collectors generally provide direct access to commercial and larger residential developments. A prime example of this type facility in the study area is South Avenue 15E.
8. **Local Streets:** Local streets, which are not a prime focus of this study, provide direct access to abutting or adjacent properties and have the greatest amount of access allowed. Through traffic is discouraged on local roadways and posted speeds are lowest. Local roadways have not been evaluated as part of this Transportation Plan.

Figure 3.9 illustrates the number of lanes for each major facility included in the study area's roadway network.

REGIONALLY SIGNIFICANT ROUTES

A Regionally Significant Route (RSR) may be an interstate, principal arterial, or a collector street. Within the study area, the YMPO RTP identifies South Fortuna Road (Avenue 11E) and I-8 as Regionally Significant Routes. This type of route or roadway facility serves regional transportation and mobility needs.

FIGURE 3.9
EXISTING PRIMARY ROADWAY NETWORK TRAVEL LANES

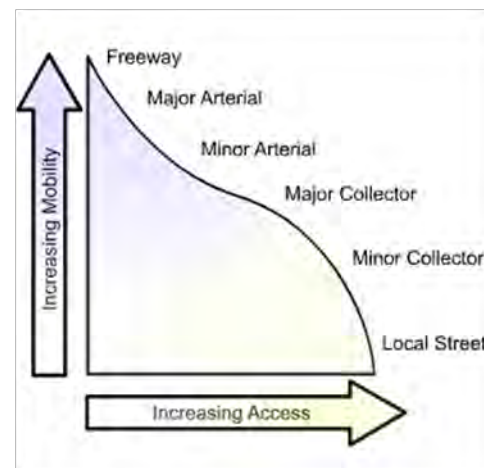


Source: Figure II-4, Existing Number of Lanes, Final Report, 2033 Regional Transportation Plan, Yuma Metropolitan Planning Organization.

ACCESS MANAGEMENT

CONCEPT AND PURPOSE

According to the FHWA’s Access Management Website “access management (AM) is the proactive management of vehicular access points to land parcels adjacent to all manner of roadways. Good access management promotes safe and efficient use of the transportation network.” This philosophy of roadway design and development (shown pictorially at right) provides an important means of maintaining the operational viability of the various classes of facilities and, therefore, community mobility. FHWA identifies five key techniques that state and local governments can use to control access to highways, major arterials, and other roadways:



Source: http://ops.fhwa.dot.gov/access_mgmt/index.htm

- **Access Spacing:** increasing the distance between traffic signals improves the flow of traffic on major arterials, reduces congestion, and improves air quality for heavily traveled corridors.
- **Driveway Spacing:** Fewer driveways spaced further apart allows for more orderly merging of traffic and presents fewer challenges to drivers.

- **Safe Turning Lanes:** dedicated left- and right-turn, indirect left-turns and U-turns, and roundabouts keep through-traffic flowing. Roundabouts represent an opportunity to reduce an intersection with many conflict points or a severe crash history (T-bone crashes) to one that operates with fewer conflict points and less severe crashes (sideswipes) if they occur.
- **Median Treatments:** two-way left-turn lanes (TWLTL) and nontraversable, raised medians are examples of some of the most effective means to regulate access and reduce crashes.
- **Right-of-Way Management:** as it pertains to R/W reservation for future widenings, good sight distance, access location, and other access-related issues.

The result of combining all these techniques essentially is defined in the TRB 2003, *Access Management Manual*, as the “systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway.” Application of the best practices of access management has benefits for motorists, bicyclists, pedestrians, transit riders, business people, government agencies, and communities. The desired outcomes of access management relative to highway operations are:

- Creation of a safer operating environment for vehicular and pedestrian traffic;
- Provisions allowing motorists to operate vehicles with fewer delays, less fuel consumption, and fewer emissions;
- Provisions for reasonable access to abutting (i.e., fronting) properties;
- Maintenance of the functional integrity and efficiency of the roadway, helping to protect the investment of taxpayer dollars;
- Assured coordination between land use and transportation decisions; and
- Assurance that highways are used for the purposes (functions) for which they are designed.

STATE ROADS

The necessity of access management to preserve the function, efficiency, and safety of federal and state highways increasingly has been recognized throughout the United States and in Arizona. Without access management, highways intended as through routes gradually degrade to local service routes, due to areas becoming developed or urbanized. ADOT has initiated development of a Statewide Access Management Plan for the State Highway System in accordance with the policies of the Arizona State Transportation Board. The focus of this effort is to develop an access management classification system for State Highways and publish a comprehensive access management manual to provide uniform guidance for access management decisions throughout the state. Currently, this ADOT transportation planning process is in abeyance, due to Executive Order of the Governor and legislative action prohibiting the making of new administrative rules.

In the meantime, access permitting for State highways currently is carried out pursuant to ARS 28-7053, which prohibits unauthorized encroachments on State highways. For an encroachment to be lawful, it must be authorized by the Director of ADOT. The Director has adopted administrative rules (regulations) governing encroachments.

These rules are published as Arizona Administrative Code, R17-3-501, Highway Encroachments and Permits, which includes access connections to state highways. The rule states that each encroachment requires a permit. Permits for driveway access to a state highway (referred to as encroachments) may be granted by ADOT's Engineering Districts through delegation from the Director. Upon initiation of the formal rulemaking process relating to the Statewide Access Management Plan, ADOT will solicit public comment on the Program. The Traffic Engineering Group of ADOT's Intermodal Transportation Division oversees the Arizona Access Management Program in its present form.

LOCAL ROADS

Yuma County Subdivision Regulations provide guidance for the design and development of all subdivision of land. While these regulations are not specifically focused on access management, sections address the need to ensure adequate traffic circulation and minimizing cut-through traffic. Section 4.5, Access to Subdivision, states: "Access to subdivisions from arterial roads and major collectors shall be limited to maintain traffic capacity, encourage smooth traffic flow and limit the use of local streets to local traffic." This section also states: "Subdivision access roads shall be spaced according to Public Works Standards or the standards of the jurisdiction that is responsible for the operation and maintenance of the arterial road or major collector."

TRAFFIC CONTROL INVENTORY

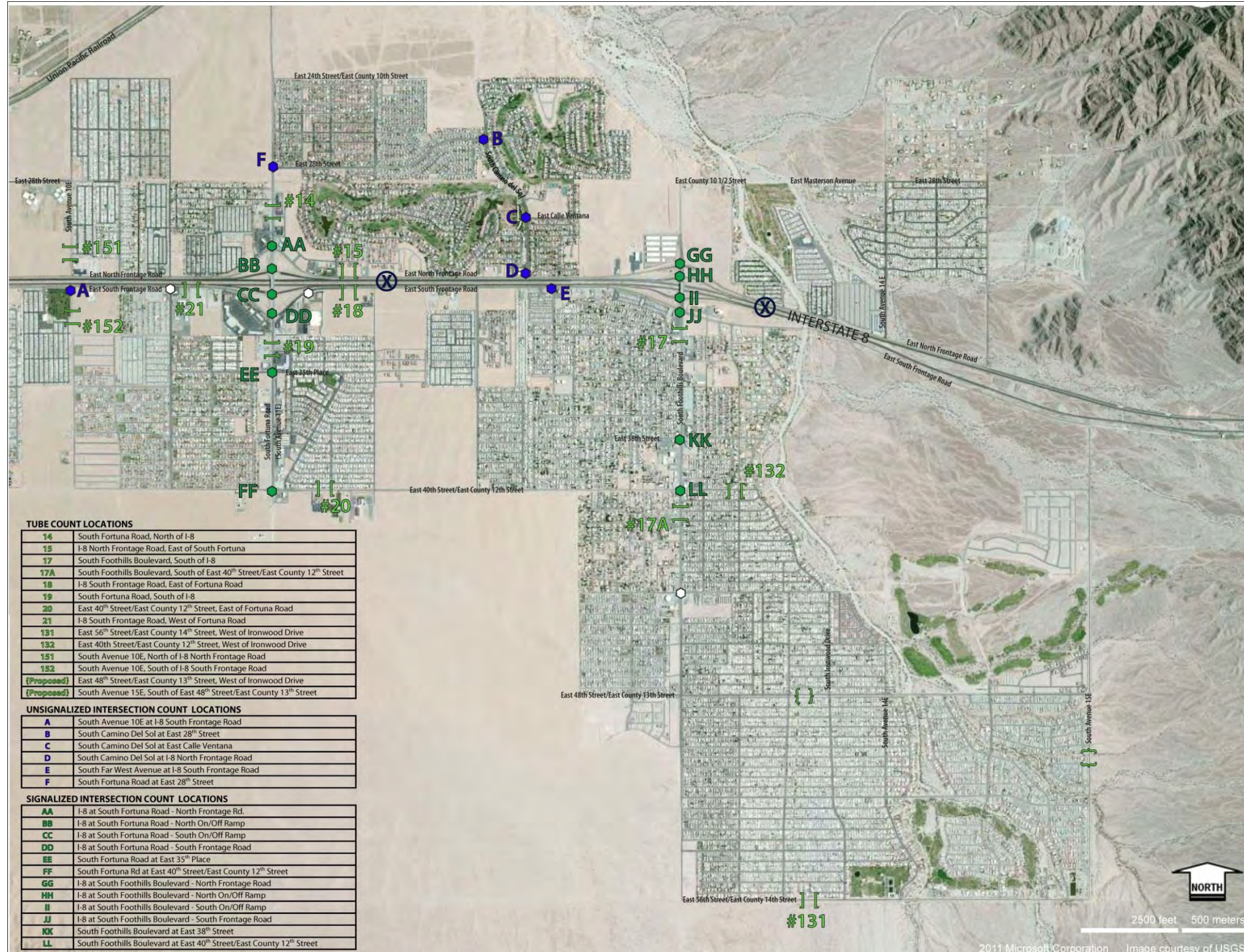
Intersection traffic control is the primary method for maintaining orderly traffic flow within a roadway network, particularly along facilities with higher traffic volumes. The most significant of these facilities in the study area are: I-8; South Fortuna Road; segments of the I-8 Frontage Road system; and South Foothills Boulevard between I-8 and East 40th Street/East County 12th Street. Current intersection traffic control within the study area includes traffic signals and STOP or YIELD signs at intersections. Transportation officials in Arizona and throughout the nation are examining other traffic control options, such as the modern roundabout, to obtain potentially greater capacity and proven safety benefits.

An inventory was completed to identify the signalized intersection locations within the study area. The majority of signalized intersections were identified for the purpose of conducting turning-movement counts. Other key unsignalized intersections were identified for the same purpose. In addition, a number of locations along roadways were identified for the purpose of conducting tube counts, i.e., counting vehicles passing a specific point. All signalized intersections in the study area are listed below; Figure 3.10 shows the locations of these intersections as well as other locations where traffic counts were conducted. Counts were conducted in April 2011.

- I-8 South Frontage Road at Payson Drive (west of South Fortuna Road)
- I-8 at South Fortuna Road (South Ave 11E) at:
 - North Frontage Road
 - North On/Off Ramp
 - South On/Off Ramp
 - South Frontage Road

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FIGURE 3.10
ROADWAY AND INTERSECTION TRAFFIC COUNT LOCATIONS



LEGEND

Traffic Count Locations

- Project-Related Tube Counts
- ADOT Traffic Counts

Intersection Turning-Movement Count Locations

- Unsignalized Intersections
- Signalized Intersections
- Signalized Intersection Not Counted

TUBE COUNT LOCATIONS

14	South Fortuna Road, North of I-8
15	I-8 North Frontage Road, East of South Fortuna
17	South Foothills Boulevard, South of I-8
17A	South Foothills Boulevard, South of East 40 th Street/East County 12 th Street
18	I-8 South Frontage Road, East of Fortuna Road
19	South Fortuna Road, South of I-8
20	East 40 th Street/East County 12 th Street, East of Fortuna Road
21	I-8 South Frontage Road, West of Fortuna Road
151	East 56 th Street/East County 14 th Street, West of Ironwood Drive
152	East 40 th Street/East County 12 th Street, West of Ironwood Drive
151	South Avenue 10E, North of I-8 North Frontage Road
152	South Avenue 10E, South of I-8 South Frontage Road
[Proposed]	East 48 th Street/East County 13 th Street, West of Ironwood Drive
[Proposed]	South Avenue 15E, South of East 48 th Street/East County 13 th Street

UNSIGNALIZED INTERSECTION COUNT LOCATIONS

A	South Avenue 10E at I-8 South Frontage Road
B	South Camino Del Sol at East 28 th Street
C	South Camino Del Sol at East Calle Ventana
D	South Camino Del Sol at I-8 North Frontage Road
E	South Far West Avenue at I-8 South Frontage Road
F	South Fortuna Road at East 28 th Street

SIGNALIZED INTERSECTION COUNT LOCATIONS

AA	I-8 at South Fortuna Road - North Frontage Rd.
BB	I-8 at South Fortuna Road - North On/Off Ramp
CC	I-8 at South Fortuna Road - South On/Off Ramp
DD	I-8 at South Fortuna Road - South Frontage Road
EE	South Fortuna Road at East 35 th Place
FF	South Fortuna Rd at East 40 th Street/East County 12 th Street
GG	I-8 at South Foothills Boulevard - North Frontage Road
HH	I-8 at South Foothills Boulevard - North On/Off Ramp
II	I-8 at South Foothills Boulevard - South On/Off Ramp
JJ	I-8 at South Foothills Boulevard - South Frontage Road
KK	South Foothills Boulevard at East 38 th Street
LL	South Foothills Boulevard at East 40 th Street/East County 12 th Street

2011 Microsoft Corporation Image courtesy of USGS

Prepared by Wilson & Company, October 11, 2011.

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- South Fortuna Road (South Ave 11E) at:
 - East 35th Place
 - East 40th Street/East County 12th Street
- I-8 South Frontage Road at Fry's Entrance Drive (Fortuna Commons SC)
- I-8 at South Foothills Boulevard at:
 - North Frontage Road
 - North On/Off Ramp
 - South On/Off Ramp
 - South Frontage Road
- South Foothills Boulevard at:
 - East 38th Street
 - East 40th Street/East County 12th Street
 - East 44th Street
 - East 48th Street/East County 13th Street (Proposed).

3.4.4 ROADWAY NETWORK OPERATIONAL ASSESSMENT

Traffic operations for this Transportation Needs Study have been evaluated relative to the primary roadway segments to ensure there is adequate high-level capacity to handle regional and sub-regional travel demands. Roadway segments have been examined at a planning level to compare existing facilities capacity with forecasted daily traffic demand.

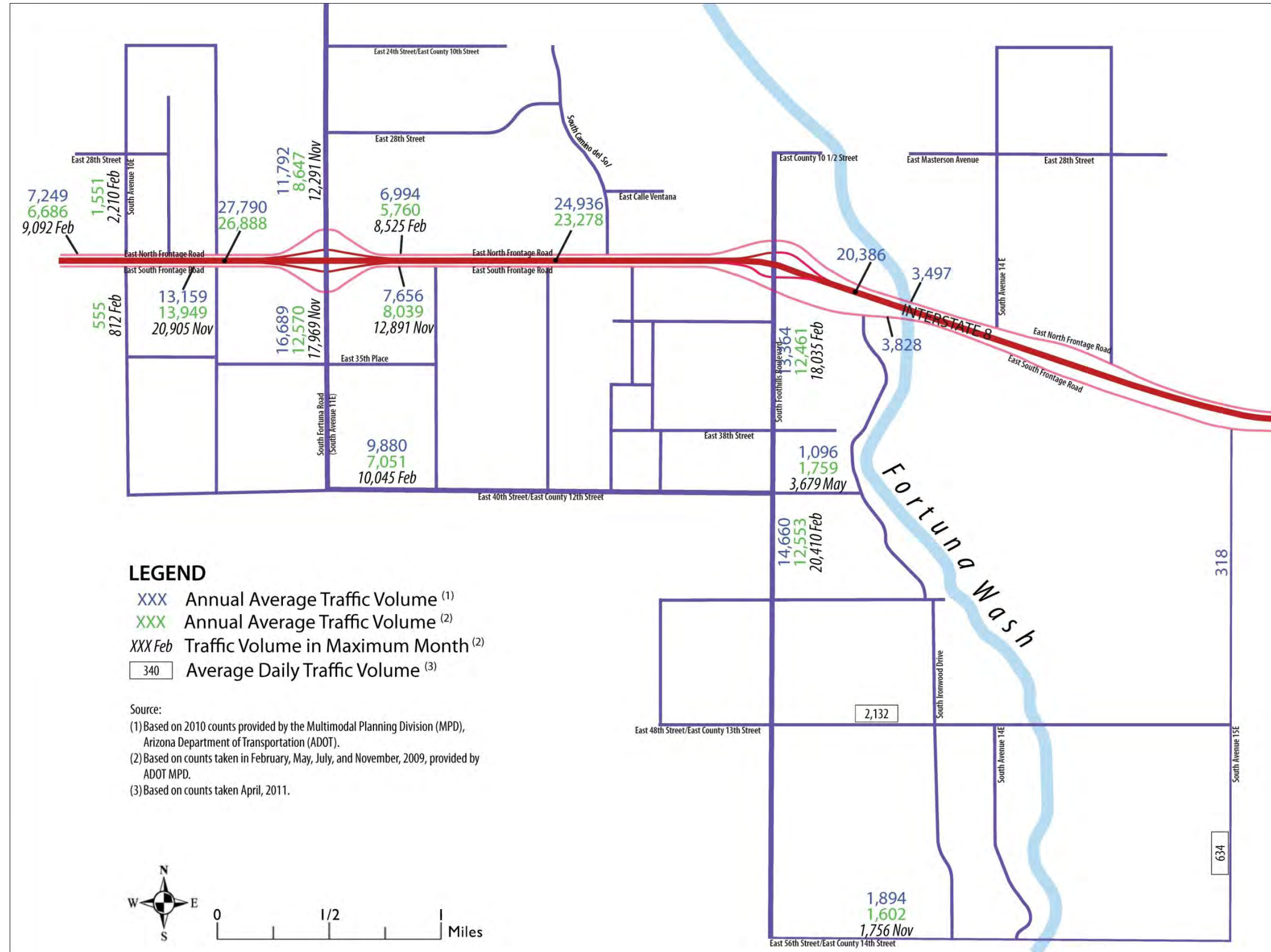
As shown in Figure 3.11, the highest volumes clearly are associated with I-8, where the average traffic load is 23,000 to almost 27,000 vehicles per day (vpd). Based on annual average daily volumes, the study area's busiest streets generally are about one-half or less of the traffic volumes occurring on I-8. For example, South Fortuna Road, South Foothills Boulevard, and the I-8 South Frontage Road (west of Fortuna Road) average 12-14,000 vpd. East 40th Street/ East County 12th Street, east of South Fortuna Road, averages approximately 7,000 vpd.

Nevertheless, seasonal highs associated with roadways in the study area result in traffic volumes varying considerably from the annual averages. The highest volumes reported on South Foothills Boulevard (south of East 40th Street/East County 12th Street) and the I-8 South Frontage Road (west of South Fortuna Road) in February and November, respectively, exceeded 20,000 vpd. The recorded traffic volume on South Fortuna Road, south of I-8, reached 17,969 vpd in November, compared to the annual average of 12,570. The extreme changes in traffic volumes amount to an average increase of 54 percent on study area roadways, based on recorded traffic in November and February. The greatest increase (109%) was recorded on East 40th Street/East County 12th Street, east of South Foothills Boulevard (although the actual volumes on this roadway segment were relatively small). The lowest increase (36%) in the core portion of the study area occurred on the I-8 North Frontage Road, east of South Avenue 10E.

A summary of peak-hour intersection turn movements at selected key intersections in the study area are provided in Figure 3.12. The collected data provided the foundation for analyzing traffic operations and identifying current capacity needs in the study area.

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FIGURE 3.11
2009 TRAFFIC VOLUMES ON SELECTED STUDY AREA ROADWAY SEGMENTS



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FIGURE 3.12
PEAK-HOUR INTERSECTION COUNTS AT SELECTED KEY STUDY AREA INTERSECTIONS: 2011

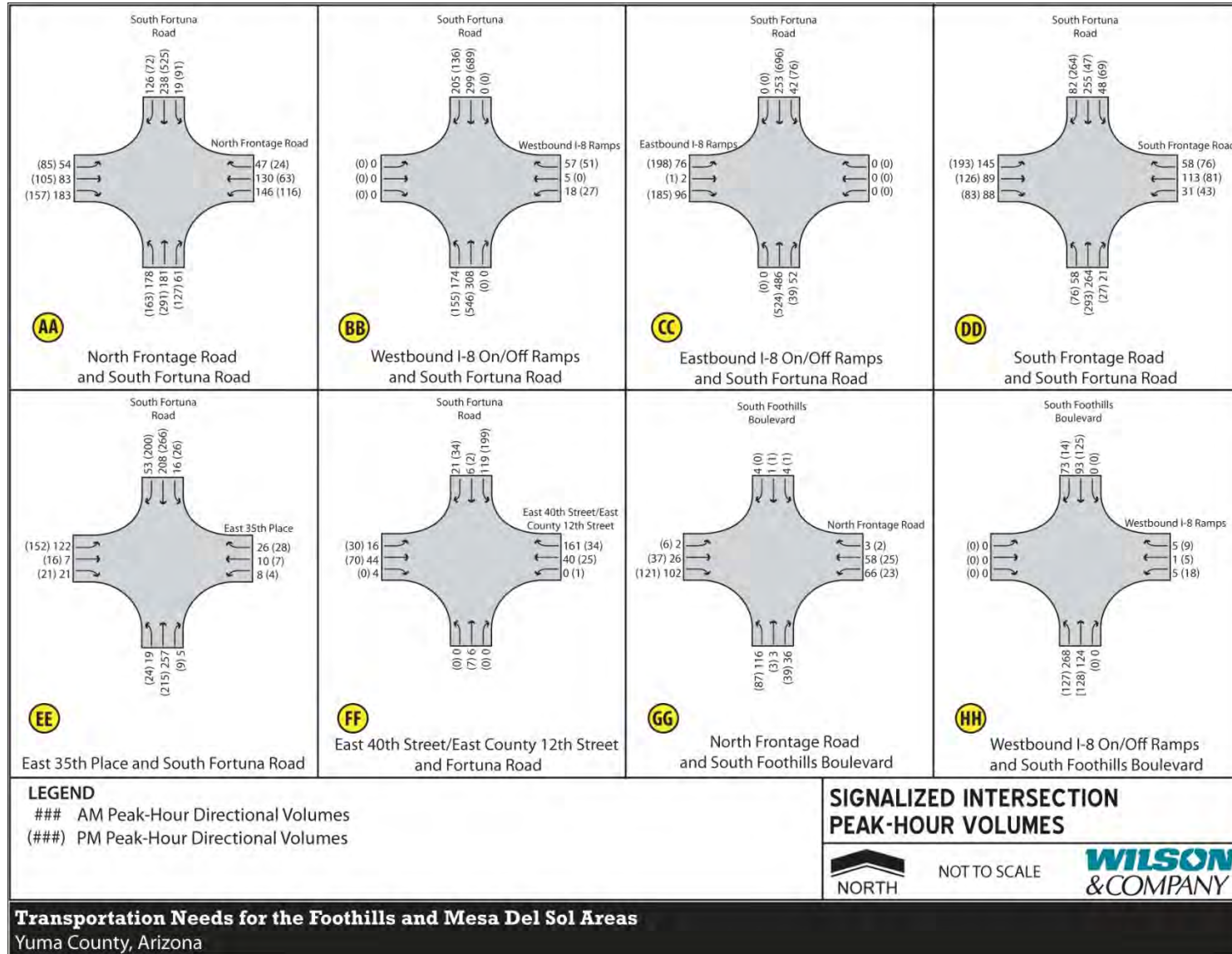


FIGURE 3.12 (CONT.)
PEAK-HOUR INTERSECTION COUNTS AT SELECTED KEY STUDY AREA INTERSECTIONS: 2011

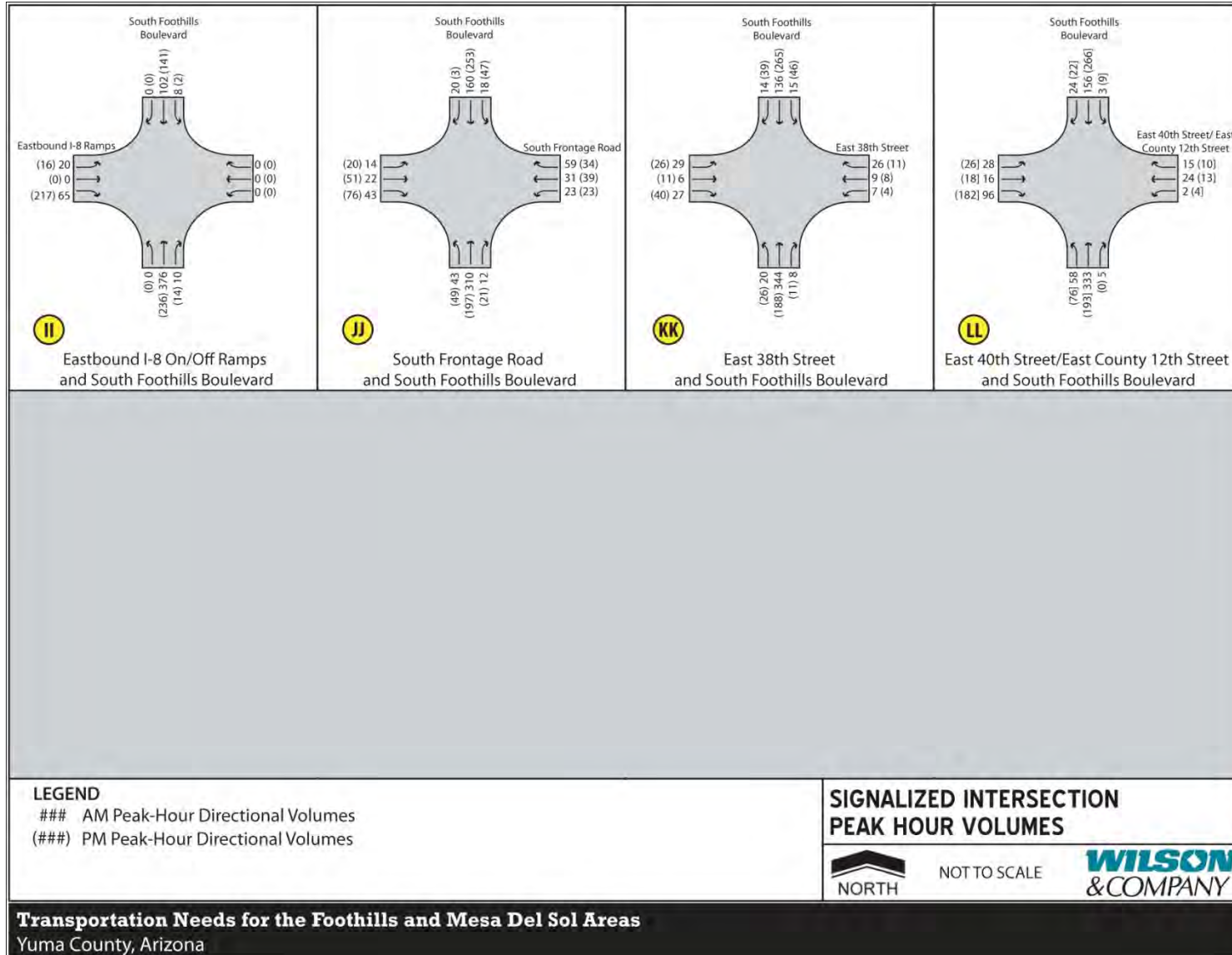
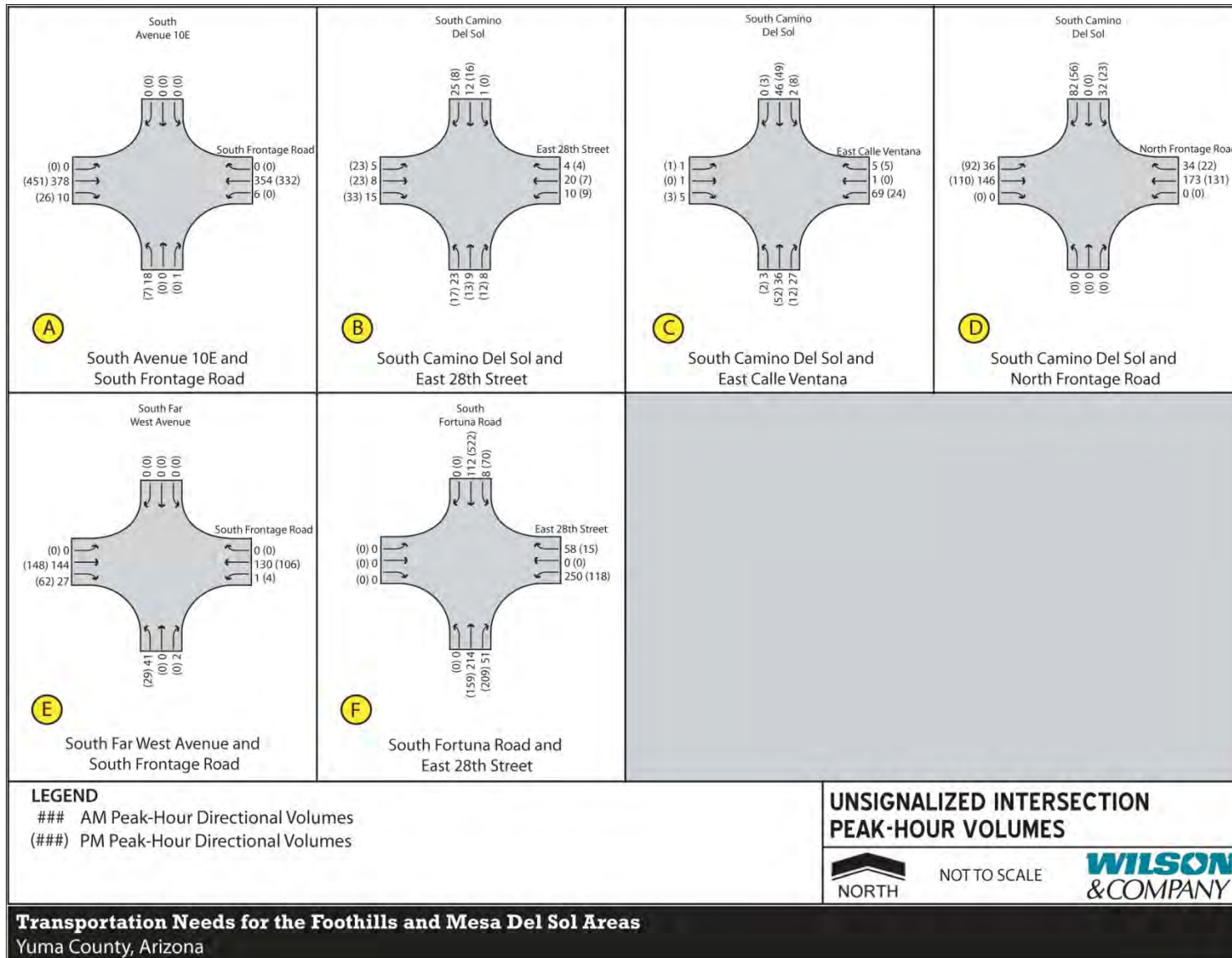


FIGURE 3.12 (CONT.)
PEAK-HOUR INTERSECTION COUNTS AT SELECTED KEY STUDY AREA INTERSECTIONS: 2011

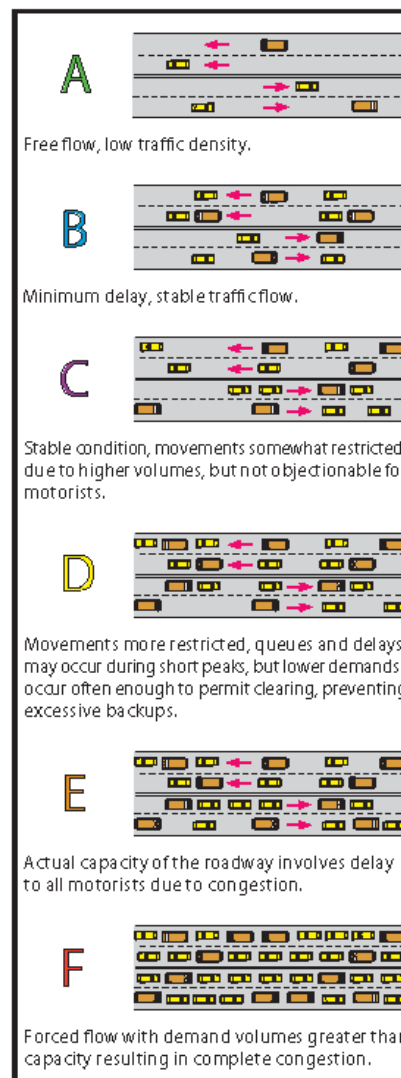


LEVEL OF SERVICE ANALYSIS

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. As defined in the Highway Capacity Manual 2010 (HCM2010), LOS is a qualitative measure describing operating conditions associated with a traffic stream. Six levels of service are defined using letters, with LOS A representing the best operating condition and LOS F the worst. Each LOS represents a range of operating conditions and the driver’s perception of these conditions, which are graphically depicted in the figure at right. The various levels of service are generally defined as follows:

- **LOS A** represents free flow.
- **LOS B** is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable.
- **LOS C** is in the range of stable flow, but marks the beginning of the range in which the operation of individual users becomes significantly affected by others.
- **LOS D** represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.
- **LOS E** represents operating conditions at or near the capacity level. All speeds are reduced to a low but relatively uniform value.
- **LOS F** is used to define 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.

**Highway
Level of Service (LOS)**



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

LEVEL OF SERVICE CRITERIA

ROADWAYS

Table 3.6 summarizes the functional classifications of roadways within the study area and identifies the associated roadway capacities based on level of access, traffic signal spacing, and design standards.

**TABLE 3.6
FUNCTIONAL CLASSIFICATION CAPACITIES**

Functional Classification	Number of Lanes	Daily Capacity
Interstate	4	42,600
Minor Arterial	2	18,000
	4	36,000
Major Collector	2	14,000
Collector	4	26,800
	2	13,400
Minor Collector	2	10,800

Source: YMPO Travel Demand Model capacities by facility type.

LOS for a roadway segment is defined in terms of the ratio of daily traffic volumes to daily capacity (v/c). Table 3.7 details the LOS criteria for roadway segments.

**TABLE 3.7
LEVEL OF SERVICE FOR ROADWAY SEGMENTS**

Level of Service	v/c ratio
A	≤ 0.50
B	0.51-0.60
C	0.61-0.72
D	0.73-0.84
E	0.85-1.0
F	> 1.0

Source: Highway Capacity Manual, 5th Edition, Transportation Research Board (TRB), 2010.

SIGNALIZED INTERSECTIONS

Operating conditions are defined in terms of the average total vehicle delay of all movements through an intersection, usually in seconds per vehicle. According to HCM2010,

“...vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. LOS associated with signalized intersections is derived through an operations analysis that measures many variables, including signal phasing (i.e., progression of movements through the intersection), signal cycle length, lane geometry, and traffic volumes. Specifically, LOS criteria are stated in terms of average control delay per vehicle during a specified time period (for example, the PM peak hour).”

Traffic control delay is that portion of total vehicular delay attributed to traffic signal operations and includes initial deceleration, queue move up time, stopped delay, and acceleration delay. Table 3.8 details the LOS criteria for signalized intersections.

TABLE 3.8
LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS

Level of Service	Average Control Delay (sec./veh.)	General Description
A	≤ 10.0	Free Flow
B	> 10.0 and ≤ 20.0	Stable Flow (slight delays)
C	> 20.0 and ≤ 35.0	Stable flow (acceptable delays)
D	> 35.0 and ≤ 55.0	Approaching unstable flow (tolerable delay, occasionally wait)
E	> 55.0 and ≤ 80.0	Unstable flow (intolerable delay)
F	> 80.0	Forced flow (jammed)

Source: Highway Capacity Manual, 5th Edition, Transportation Research Board (TRB), 2010.

UNSIGNALIZED INTERSECTIONS

For all-way and side-street stop-controlled intersections, traffic control delay incorporates time associated with deceleration, acceleration, stopping, and moving up in the queue. Table 3.9 summarizes the relationship between the average control delay and LOS for unsignalized intersections.

TABLE 3.9
LEVEL OF SERVICE FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Average Control Delay (sec./veh.)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

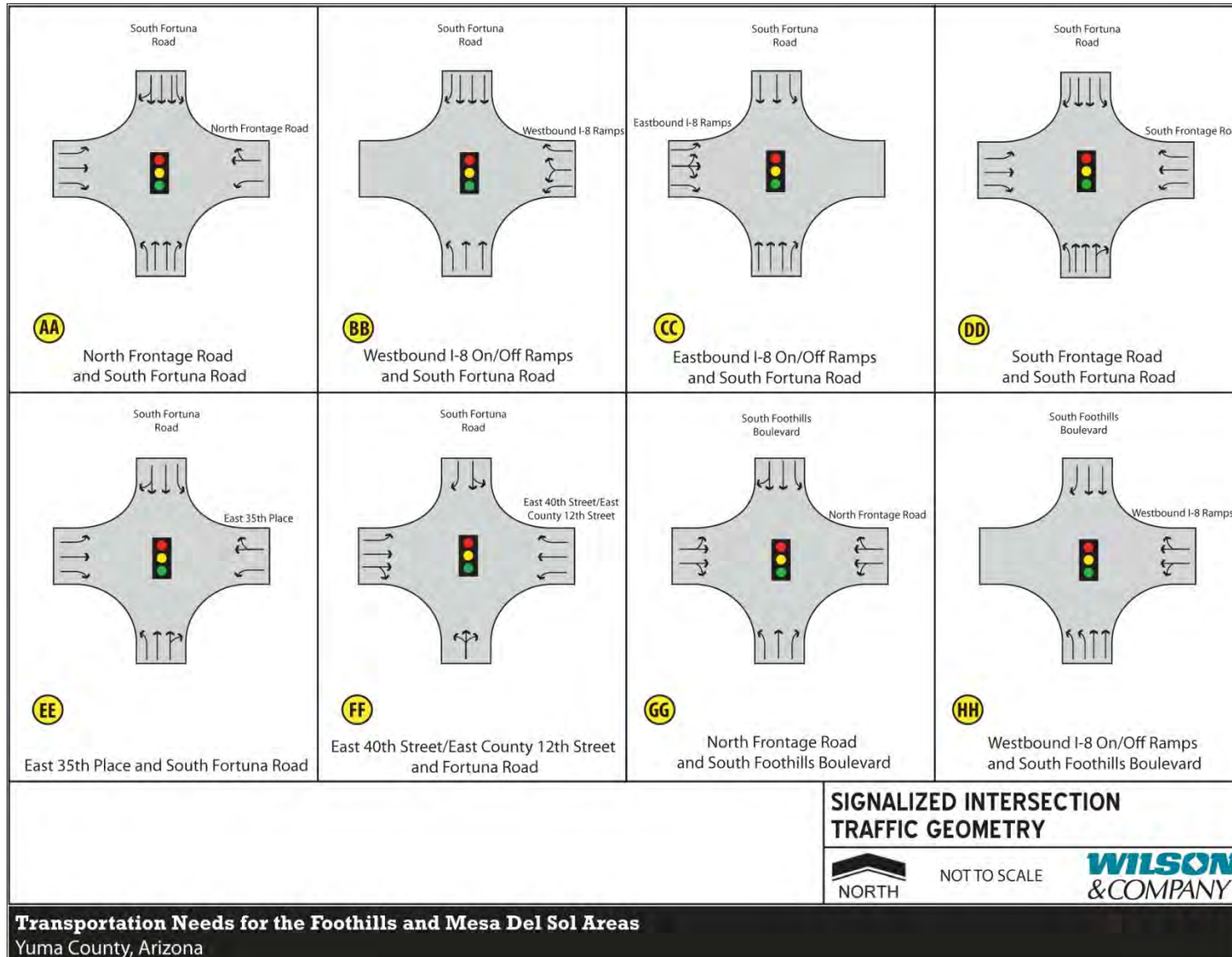
Source: Highway Capacity Manual, 5th Edition, Transportation Research Board (TRB), 2010.

LEVEL OF SERVICE ANALYSIS RESULTS

AM and PM peak-hour LOS has been analyzed for 18 intersections within the study area, using turning-movement counts presented earlier in Figures 3.10 and 3.12. The number/naming convention established in those figures have been maintained for this LOS analysis. Methodologies presented in the HCM2010 were applied, and the intersections were evaluated using the *Synchro* (Version 7.0) traffic simulation software, which permits analysis of overall LOS for signalized intersections and all-way and stop-controlled operations at unsignalized intersections. Figure 3.13 illustrates the lane geometry and traffic control for each analyzed intersection.

The results of the LOS analysis of signalized intersections are presented in Table 3.10. As a general conclusion, the Eastbound and Westbound approaches do not perform as well as the Northbound and Southbound approaches for all intersections evaluated. However, none of the intersections are performing at less than LOS B, and no approach

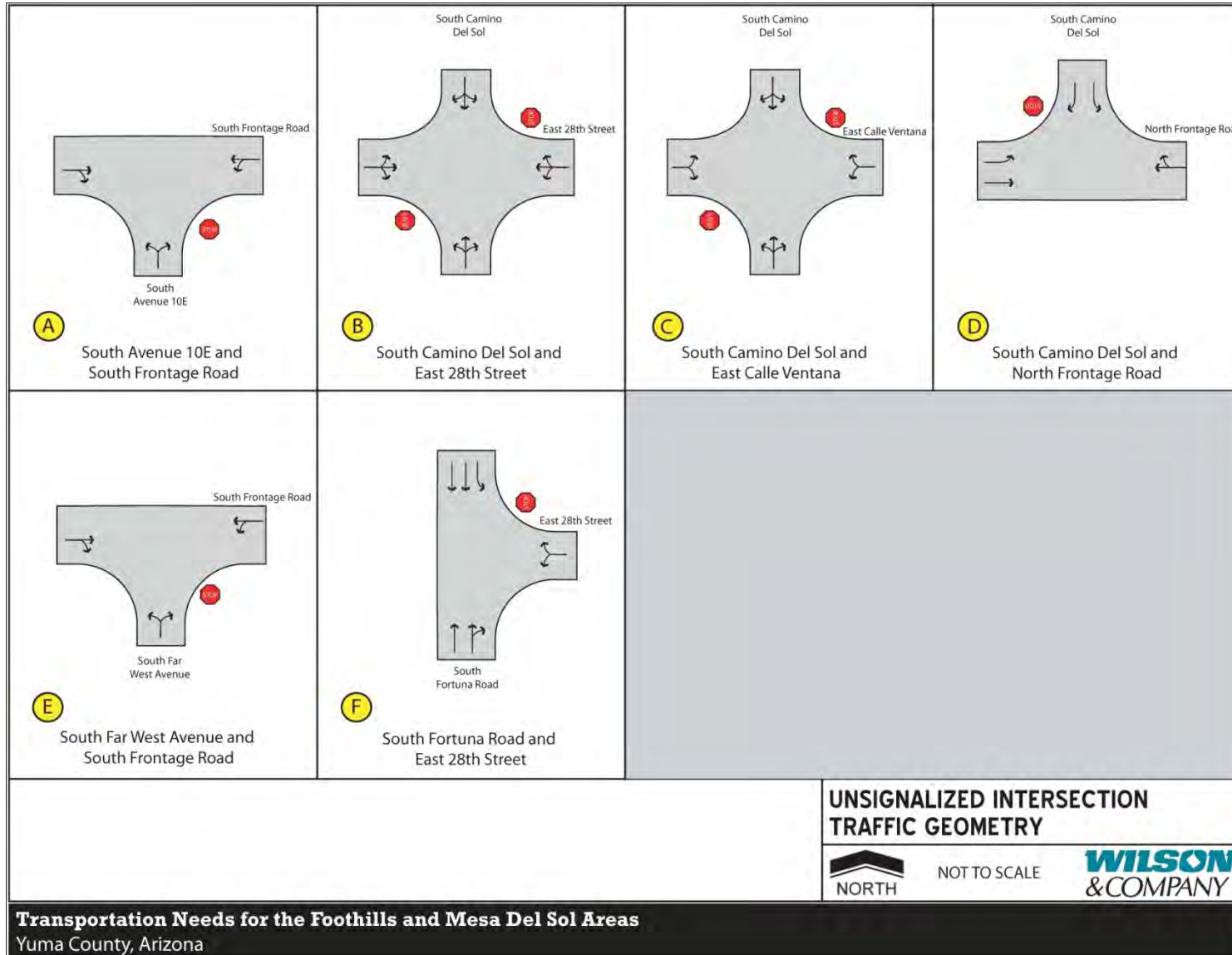
FIGURE 3.13
LANE GEOMETRIES AND TRAFFIC CONTROL FOR KEY STUDY AREA INTERSECTIONS: 2011



**FIGURE 3.13 (CONT.)
LANE GEOMETRIES AND TRAFFIC CONTROL FOR KEY STUDY AREA INTERSECTIONS: 2011**



FIGURE 3.13 (CONT.)
LANE GEOMETRIES AND TRAFFIC CONTROL FOR KEY STUDY AREA INTERSECTIONS: 2011



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TABLE 3.10
LEVEL OF SERVICE ANALYSIS FOR SIGNALIZED INTERSECTIONS: EXISTING CONDITIONS

ID	Signalized Intersection Name	Metric	Northbound			Southbound			Eastbound			Westbound		
			Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn
AA	I-8 North Frontage Road & South Fortuna Road	Volume-to-Capacity (v/c)	0.351 (0.393)	0.167 (0.302)	0.11 (0.261)	0.039 (0.182)	0.182 (0.448)	0.281 (0.453)	0.152 (0.207)	0 (0)	0.73 (0.711)	0.326 (0.287)	0 (0)	0.52 (0.327)
		Avg. Approach Delay (sec/veh)	11.9 (14.5)			16.6 (16.4)			24.6 (23.9)			20.1 (20.2)		
		Approach LOS	B (B)			B (B)			C (C)			C (C)		
		Avg. Intersection Delay (sec/veh)	17.7 (17.5)											
		Intersection LOS	B (B)											
BB	I-8 Westbound On/Off Ramps and South Fortuna Road	Volume-to-Capacity (v/c)	0.266 (0.305)	0.205 (0.29)	0 (0)	0 (0)	0.168 (0.403)	0.371 (0.236)	0 (0)	0 (0)	0 (0)	0.143 (0.205)	0.014 (0)	0.187 (0.194)
		Avg. Approach Delay (sec/veh)	5.6 (5.2)			11.3 (10.9)			-			19.2 (20.4)		
		Approach LOS	A (A)			B (B)			-			B (C)		
		Avg. Intersection Delay (sec/veh)	9 (8.9)											
		Intersection LOS	A (A)											
CC	I-8 Eastbound On/Off Ramps and South Fortuna Road	Volume-to-Capacity (v/c)	0 (0)	0.237 (0.271)	0.081 (0.065)	0.076 (0.136)	0.142 (0.36)	0 (0)	0 (0)	0 (0)	0.413 (0.728)	0 (0)	0 (0)	0 (0)
		Approach Delay (sec)	8 (9.3)			4.2 (5.1)			17.4 (20)			-		
		Approach LOS	A (A)			A (A)			B (B)			-		
		Intersection Delay (sec)	8.4 (9.8)											
		Intersection LOS	A (A)											
DD	I-8 South Frontage Road and South Fortuna Road	Volume-to-Capacity (v/c)	0.109 (0.188)	0.212 (0.198)	0.216 (0.203)	0.097 (0.133)	0.218 (0.504)	0.165 (0.543)	0.364 (0.455)	0 (0)	0.286 (0.325)	0.086 (0.117)	0.503 (0.368)	0.304 (0.406)
		Approach Delay (sec)	13.1 (13.5)			13.4 (15.8)			17.5 (18.7)			23.4 (23.3)		
		Approach LOS	B (B)			B (B)			B (B)			C (C)		
		Intersection Delay (sec)	15.8 (16.8)											
		Intersection LOS	B (B)											
EE	East 35th Place & South Fortuna Road	Volume-to-Capacity (v/c)	0.035 (0.055)	0.187 (0.165)	0.187 (0.166)	0.029 (0.045)	0.191 (0.388)	0.198 (0.343)	0 (0)	0 (0)	0.05 (0.05)	0.016 (0.008)	0 (0)	0.083 (0.081)
		Approach Delay (sec)	9.3 (9.7)			9.5 (10.8)			14.5 (15)			12.9 (13.1)		
		Approach LOS	A (A)			A (B)			B (B)			B (B)		
		Intersection Delay (sec)	10.6 (11.4)											
		Intersection LOS	B (B)											
FF	East 40th Street/East County 12th Street and South Fortuna Road	Volume-to-Capacity (v/c)	0 (0)	0.007 (0.008)	0 (0)	0.224 (0.357)	0 (0)	0.03 (0.048)	0 (0)	0 (0)	0.084 (0)	0 (0.003)	0.137 (0.094)	0.647 (0.591)
		Approach Delay (sec)	4.4 (4.2)			5.1 (5.6)			11.2 (11.4)			12.8 (12.7)		
		Approach LOS	A (A)			A (A)			B (B)			B (B)		
		Intersection Delay (sec)	9.7 (9)											
		Intersection LOS	A (A)											
GG	North Frontage Road and South Foothills Boulevard	Volume-to-Capacity (v/c)	0.191 (0.18)	0.007 (0.006)	0.102 (0.099)	0.008 (0.002)	0.002 (0.001)	0.011 (0)	0 (0)	0 (0)	0.172 (0.203)	0.411 (0.126)	0 (0)	0.081 (0.041)
		Approach Delay (sec)	12.6 (10.6)			11.9 (9.9)			6 (6.8)			13.7 (11.9)		
		Approach LOS	B (B)			B (A)			A (A)			B (B)		
		Intersection Delay (sec)	10.7 (9)											
		Intersection LOS	B (A)											
HH	I-8 Westbound On/Off Ramps and South Foothills Boulevard	Volume-to-Capacity (v/c)	0.598 (0.364)	0.06 (0.065)	0 (0)	0 (0)	0.104 (0.123)	0.162 (0.031)	0 (0)	0 (0)	0 (0)	0.032 (0.125)	0 (0)	0.24 (0.163)
		Approach Delay (sec)	9.9 (8)			8.1 (7.9)			-			16.9 (15.9)		
		Approach LOS	A (A)			A (A)			-			B (B)		
		Intersection Delay (sec)	9.5 (8.5)											
		Intersection LOS	A (A)											
II	I-8 Eastbound On/Off Ramps and South Foothills Boulevard	Volume-to-Capacity (v/c)	0 (0)	0.191 (0.141)	0.192 (0.143)	0.013 (0.003)	0.075 (0.116)	0 (0)	0 (0)	0 (0)	0.461 (0.79)	0 (0)	0 (0)	0 (0)
		Approach Delay (sec)	4.3 (5.3)			4.1 (5.3)			10.4 (11.4)			-		
		Approach LOS	A (A)			A (A)			B (B)			-		
		Intersection Delay (sec)	5.1 (7.6)											
		Intersection LOS	A (A)											
JJ	South Frontage Road and South Foothills Boulevard	Volume-to-Capacity (v/c)	0.063 (0.085)	0.241 (0.165)	0.242 (0.168)	0.031 (0.075)	0.111 (0.232)	0.114 (0.232)	0 (0)	0 (0)	0.211 (0.344)	0.143 (0.124)	0 (0)	0.29 (0.208)
		Approach Delay (sec)	5.1 (5.2)			4.9 (5.3)			9.3 (9.5)			9.4 (9.2)		
		Approach LOS	A (A)			A (A)			A (A)			A (A)		
		Intersection Delay (sec)	6.2 (6.4)											
		Intersection LOS	A (A)											
KK	East 38th Street and South Foothills Boulevard	Volume-to-Capacity (v/c)	0.038 (0.059)	0.232 (0.134)	0.232 (0.136)	0.035 (0.095)	0.1 (0.201)	0.102 (0.205)	0 (0)	0 (0)	0.192 (0.293)	0.022 (0.013)	0.054 (0.05)	0.185 (0.081)
		Approach Delay (sec)	6 (6.1)			6 (6.4)			14.4 (14.8)			14.2 (14.4)		
		Approach LOS	A (A)			A (A)			B (B)			B (B)		
		Intersection Delay (sec)	7.3 (7.5)											
		Intersection LOS	A (A)											
LL	East 40th Street/East County 12th Street and South Foothills Boulevard	Volume-to-Capacity (v/c)	0.214 (0.164)	0.209 (0.134)	0.21 (0)	0.006 (0.016)	0.134 (0.228)	0.138 (0.231)	0 (0)	0 (0)	0.596 (0.688)	0.008 (0.017)	0 (0)	0.193 (0.073)
		Approach Delay (sec)	5.5 (6.9)			7.4 (8.8)			16.5 (15.8)			15.1 (13.9)		
		Approach LOS	A (A)			A (A)			B (B)			B (B)		
		Intersection Delay (sec)	8.2 (10.2)											
		Intersection LOS	A (B)											

Prepared by Wilson & Company, July, 2011.

Source: Synchro 7 Traffic Simulation based on 2011 intersection traffic supplemented with 2010 counts provide by the Yuma Metropolitan Planning Organization (YMPO).

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to any intersection is performing worse than LOS C. It should be noted, however, that this table represents average delay for individual intersections, and does not reflect the compounded delays that drivers may experience travelling through a series of closely spaced intersections, such as along Fortuna Road at the frontage roads and interchange. When passing through this series of intersections, drivers are more likely sensitive to the compounded delay that is experienced. For example, compounding the average southbound delay at each intersection would result in an average delay of over 48 seconds.

The results of the analysis of unsignalized intersections are presented in Table 3.11. This table shows that all unsignalized intersections analyzed are performing at LOS A in both the AM and PM peak hours.

**TABLE 3.11
LEVEL OF SERVICE ANALYSIS FOR UNSIGNALIZED INTERSECTIONS: EXISTING CONDITIONS**

ID	Signalized Intersection Name	Metric	Northbound			Southbound			Eastbound			Westbound		
			Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn
A	South Frontage Road and South Avenue 10E	Volume-to-Capacity (w/c)	0.06 (0.02)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.25 (0.3)	0 (0)	0 (0)	0.01 (0)	0 (0)
		Avg. Approach Delay (sec/veh)	15.8 (16.4)			-			-			0.2 -		
		Approach LOS	C (C)			-			-			-		
		Avg. Intersection Delay (sec/veh)	0.5 (0.1)											
		Intersection LOS	A (A)											
B	East 28th Street and South Camino Del Sol	Volume-to-Capacity (w/c)	0 (0)	0.08 (0.12)	0 (0)	0.01 (0.07)	0.04 (0.17)	0 (0)	0 (0)	0 (0)	0 (0)	0.45 (0.27)	0 (0)	0 (0)
		Avg. Approach Delay (sec/veh)	-			0.5 (1)			-			13.6 (14)		
		Approach LOS	-			-			-			B (B)		
		Avg. Intersection Delay (sec/veh)	6.1 (2.2)											
		Intersection LOS	A (A)											
C	East Calle Ventana and South Camino Del Sol	Volume-to-Capacity (w/c)	0 (0)	0.02 (0.01)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.03 (0.09)	0 (0)	0 (0)	0.05 (0.03)	0 (0)
		Avg. Approach Delay (sec/veh)	4.3 (3)			0.2 -			9.1 (9.3)			9.6 (9.4)		
		Approach LOS	-			-			A (A)			A (A)		
		Avg. Intersection Delay (sec/veh)	5.4 (6.4)											
		Intersection LOS	A (A)											
D	North Frontage Road and South Camino Del Sol	Volume-to-Capacity (w/c)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0.01)	0 (0)	0 (0)	0.01 (0)	0 (0)	0 (0)	0.1 (0.04)	0 (0)
		Avg. Approach Delay (sec/veh)	0.3 (0.1)			0.3 (1)			8.8 (8.8)			9.7 (9.6)		
		Approach LOS	-			-			A (A)			A (A)		
		Avg. Intersection Delay (sec/veh)	4.2 (1.9)											
		Intersection LOS	A (A)											
E	South Frontage Road and South Far West Avenue	Volume-to-Capacity (w/c)	0 (0)	0 (0)	0 (0)	0.06 (0.05)	0 (0)	0.11 (0.07)	0.03 (0.07)	0.09 (0.07)	0 (0)	0 (0)	0.13 (0.1)	0 (0)
		Avg. Approach Delay (sec/veh)	-			10.4 (10.2)			1.5 (3.5)			-		
		Approach LOS	-			B (B)			-			-		
		Avg. Intersection Delay (sec/veh)	2.9 (3.5)											
		Intersection LOS	A (A)											
F	East 28th Street and South Fortuna Road	Volume-to-Capacity (w/c)	0.07 (0.05)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.11 (0.13)	0 (0)	0 (0)	0 (0)	0 (0)
		Avg. Approach Delay (sec/veh)	10.6 (10.6)			-			-			0.1 (0.3)		
		Approach LOS	B (B)			-			-			-		
		Avg. Intersection Delay (sec/veh)	1.4 (1)											
		Intersection LOS	A (A)											

Prepared by Wilson & Company, July 2011.

Source: Synchro 7 Traffic Simulation based on 2011 intersection traffic supplemented with 2010 counts provide by the Yuma Metropolitan Planning Organization (YMPO).

Full printouts of the *Synchro 7* traffic simulation results are provided for both the signalized and unsignalized intersections in the Technical Appendices.

3.5 SAFETY ASSESSMENT

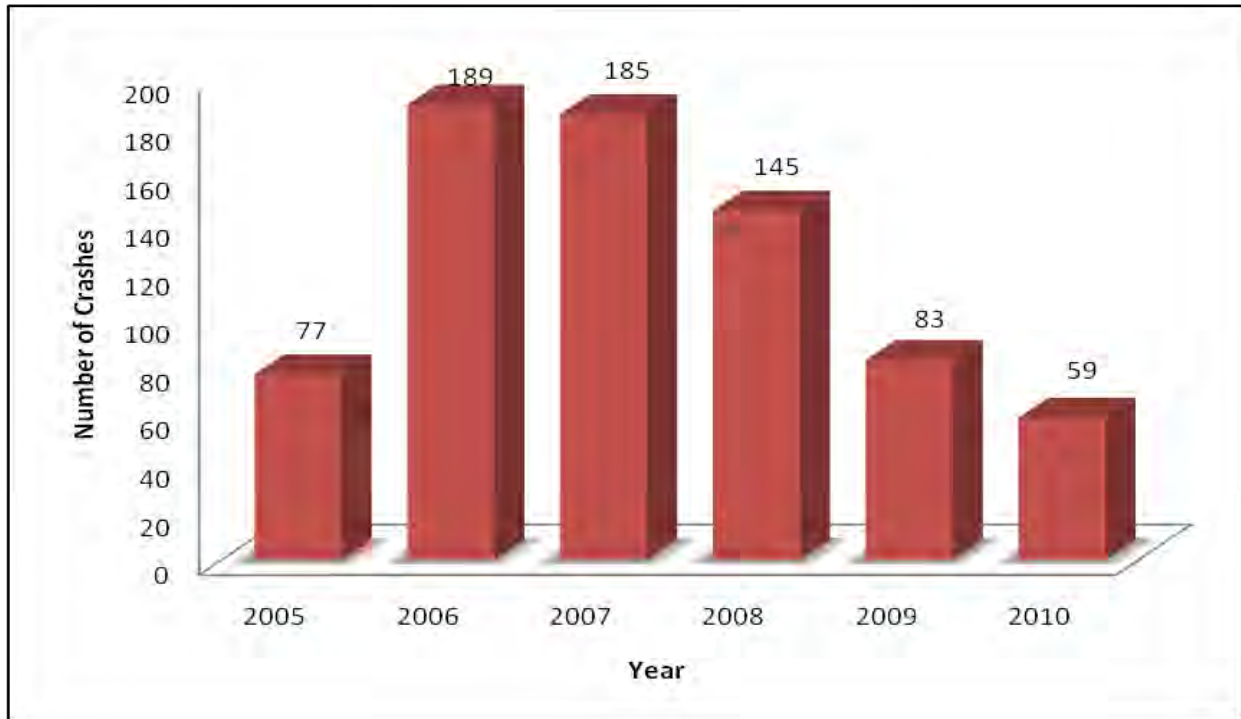
Analysis of the number of crashes and the characteristics of crashes (e.g., time of occurrence, type of collision, weather conditions, etc.) aids in identifying how safe a roadway or intersection is for vehicle operations. Generally, when vehicular crashes are examined over several years, patterns may be revealed that identify geometric deficiencies, capacity issues, access control issues, or traffic control issues. Data was obtained from ADOT's Accident Location Identification Surveillance System (ALISS) database for the period August 2005 through August 2010. During this six-year period, a total of 738 crashes occurred in the study area.

Figure 3.14 graphically displays the number of crashes by year for the reported period. The five-month period reported for 2005 indicates the potential number of crashes for the year (185, annualized trend) was similar to years 2006 and 2007. A definite downward trend in the number of crashes followed in 2008 and 2009. The annualized trend for the eight months of 2010 indicates 88 crashes, which would be a slight increase over 2009.

Figure 3.15 illustrates the location of crashes in the study area during the period August 2005 through August 2010. As shown in the figure, major travel corridors account for the majority of crashes in the study area, specifically, South Fortuna Road (South Avenue 11E), South Foothills Boulevard (South Avenue 13E), and the South Frontage and North Frontage roads of I-8, particularly between South Avenue 10E and South Fortuna Road.

Figure 3.16 summarizes study area crashes during the same period by collision type, injury severity, collision manner, and intersection type. The charts show that over 55% of all crashes occurred at an intersection or where there was driveway access. Most collisions (67.2%) involved two or more motor vehicles; however, single-vehicle crashes represented 26 percent of all crashes. Only two percent of reported motor vehicle collisions involved a pedestrian or bicyclist. Nevertheless, the severity of such crashes

FIGURE 3.14
STUDY AREA CRASHES BETWEEN 2005 AND 2010



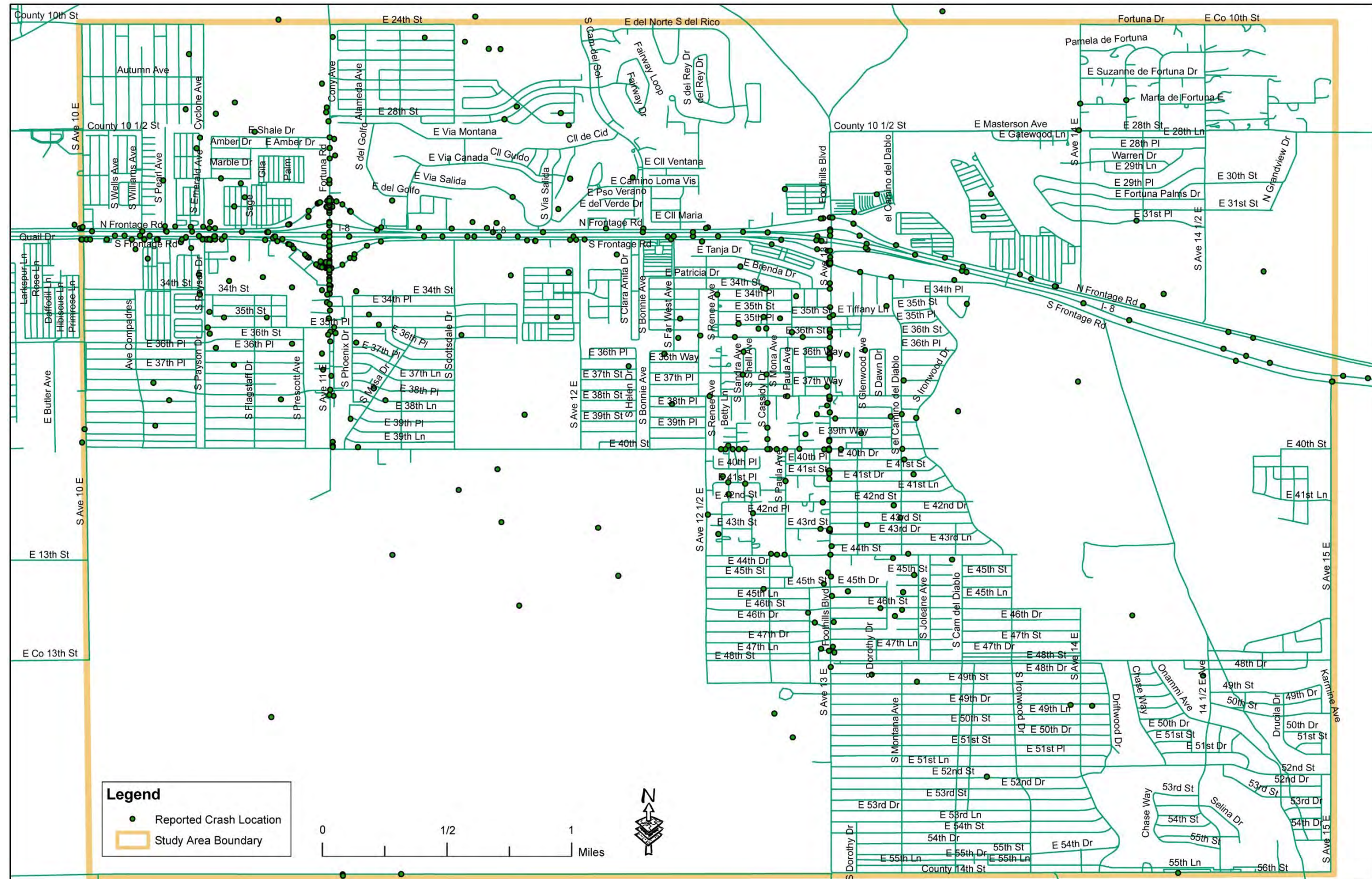
Prepared by Wilson & Company, July 2011.

Note: Years 2005 and 2010 reflect partial year reporting.

Source: Accident Location Information Surveillance System (ALISS), Arizona Department of Transportation (ADOT) Multimodal Planning Division, August 2005 through August 2010.

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FIGURE 3.15
STUDY AREA CRASH LOCATIONS: AUGUST 2005 THROUGH AUGUST 2010

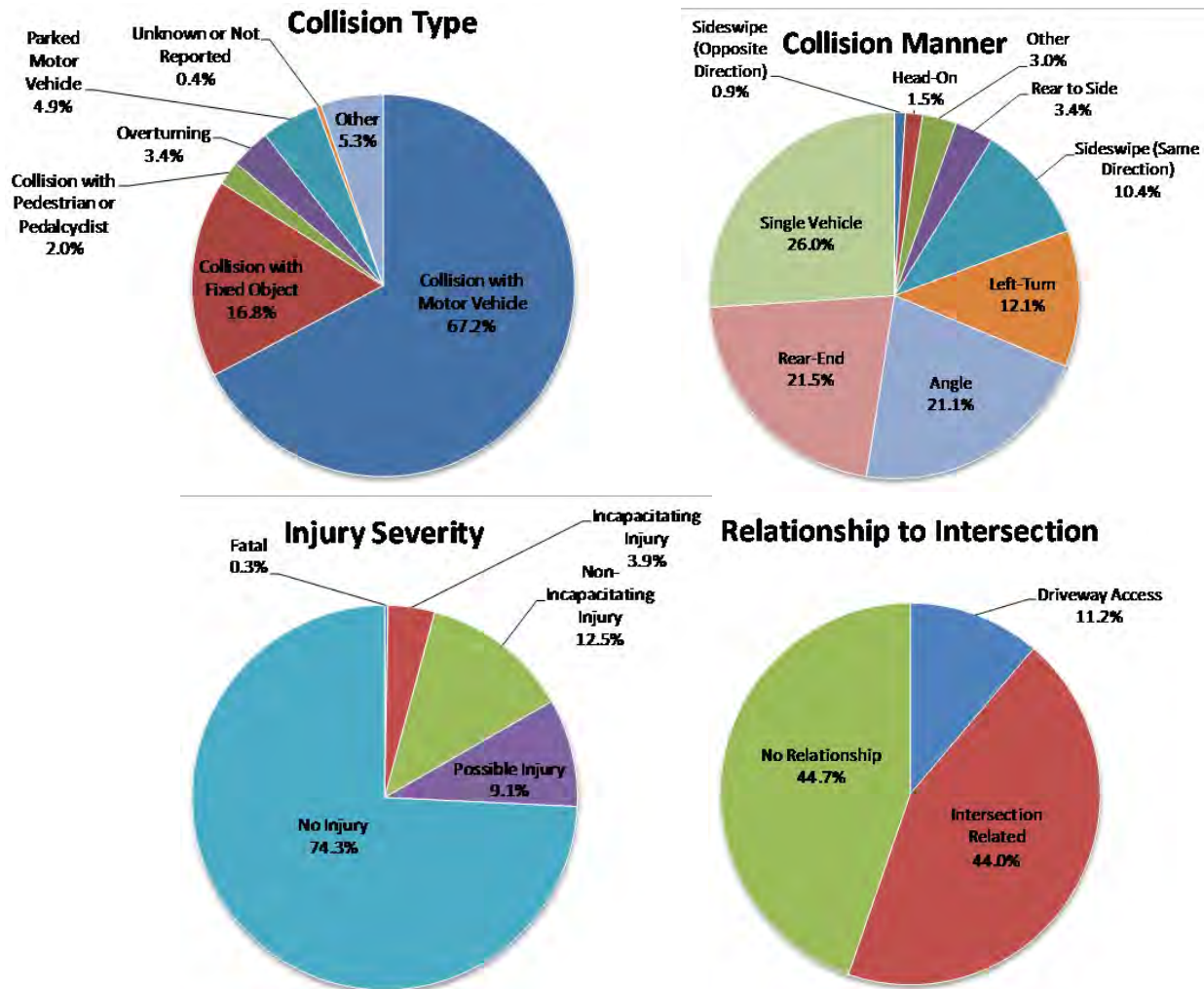


Source: Accident Location Information Surveillance System (ALISS). Arizona Department of Transportation (ADOT) Multimodal Planning Division. August 2005 through August 2010.

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is much greater than a motor vehicle/motor vehicle crash. Case in point, the recently released ADOT Bicycle Safety Action Plan reveals that no injury occurs only 15 percent of the time in a motor vehicle/bicycle crash.⁴

**FIGURE 3.16
STUDY AREA CRASH CHARACTERISTICS BETWEEN 2005 AND 2010**



Source: Accident Location Information Surveillance System (ALISS), Arizona Department of Transportation (ADOT) Multimodal Planning Division, August 2005 through August 2010.

In contrast, Figure 3.16 indicates no injuries occurred 74.3 percent of the time relative to the population of crashes reported, which largely involved only motor vehicles. Out of the total of 738 crashes, 190 crashes (25.7%) resulted in varying degrees of injury to the person or persons involved compared to 85 percent for a motor vehicle/bicycle

⁴ Figure 14, Statewide and State Highway Motor Vehicle-Bicycle Crashes, 2004-2008, Crash Injury Severity, Working Paper 1 – Profile of Bicycle Safety in Arizona, Bicycle Safety Action Plan, ADOT Bicycle Safety Action Plan, December 27, 2010, Updated October 3, 2011.

crash. There were two fatal crashes reported during the period analyzed: one involving a pedestrian and another at a railroad crossing. Detailed information involving severity of injuries to pedestrians is not available in the same form as presented above for bicycles. However, it is likely that the ratio of injury to no injury (85% v. 15%) associated with motor vehicle/bicycle crashes is similar to or even higher for pedestrians.

As noted above, the mapping of crash locations shown in Figure 3.15 revealed the majority of crashes during the reported period occurred along the I-8 frontage roads, Fortuna Road, and Foothills Boulevard. Therefore, additional review of crash data along segments with a high number of crashes was conducted. The results of this review are summarized in Table 3.12. Detailed data for each segment is presented in the Technical Appendices.

**TABLE 3.12
SUMMARY OF CRASH DATA FOR KEY ROADWAY SEGMENTS**

Roadway Segment	Year						Total
	2005	2006	2007	2008	2009	2010	
I-8 North Frontage Road: South Avenue 10E to South Fortuna Road (South Avenue 11E)	1	8	5	4	3	0	21
I-8 North Frontage Road: South Fortuna Road (South Avenue 11E) to South Foothills Boulevard (South Avenue 13E)	2	9	5	4	0	1	21
I-8 North Frontage Road: South Foothills Boulevard (South Avenue 13E) to South Avenue 15E	1	1	2	2	1	3	10
I-8 South Frontage Road: South Avenue 10E to South Fortuna Road (South Avenue 11E)	5	25	12	15	9	5	71
I-8 South Frontage Road: South Fortuna Road (South Avenue 11E) to South Foothills Boulevard (South Avenue 13E)	5	6	4	8	1	3	27
South Frontage Road: South Foothills Boulevard (South Avenue 13E) to South Avenue 15E	1	2	0	0	0	1	4
South Fortuna Road: South of the I-8 South Frontage Road	1	11	10	4	2	4	32
South Fortuna Road: Between the North and South Frontage Roads of I-8	16	29	21	17	32	16	131
South Fortuna Road: North of the I-8 North Frontage Road	2	4	4	5	3	3	21
South Foothills Boulevard: South of the I-8 South Frontage Road	1	2	4	4	1	3	15
South Foothills Boulevard: Between the North and South Frontage Roads of I-8	2	6	4	8	2	2	24
Totals	37*	103	71	71	54	41**	377

Prepared by Wilson & Company, July 2011.

* Not a full calendar year; includes only August through December. Annualized estimate = 89.

** Not a full calendar year; includes only January through August. Annualized estimate = 62.

Source: Accident Location Information Surveillance System (ALISS), Arizona Department of Transportation (ADOT) Multimodal Planning Division, August 2005 through August 2010.

Table 3.12 shows 377 or 51.1 percent of the 738 total crashes in the study area were concentrated on the eleven roadway segments identified. Overall, the number of crashes on these segments has decreased from a high of 103 in 2006 to only 54 in 2009 – a decrease of 48 percent. This is consistent with the crash history of the study area as a whole, which had a 56 percent decrease. Still, it is much better than Arizona’s statewide trend, which showed a decrease from more than 143,000 crashes in 2006 to fewer than 110,000 crashes in 2009 – a decrease of 23 percent.⁵ There is no one specific reason for this trend, particularly as the number of vehicle miles traveled in Arizona (and likely the study area) remained relatively constant between 2006 and 2009.⁶

Focusing on the eleven roadway segments highlighted in Table 3.12, the segment of South Fortuna Road between the two I-8 frontage roads accounted for the highest number of crashes – 131 – and, unlike the other segments, actually had a spike in the number of crashes in 2009. The segment with the next highest number of crashes – South Frontage Road: South Avenue 10E to South Fortuna Road (South Avenue 11E) – is located in the same general area. Interestingly, the number of crashes on the segment of South Fortuna Road north of the I-8 North Frontage Road has remained relatively constant in the range of three to five crashes per year between 2006 and 2009.

The majority of crashes on the eleven segments evaluated in detail were rear-end, right-angle, and left-turn collisions. These types of collisions are typical on roadway segments with closely spaced signalized intersections and unsignalized driveway access points, two design characteristics prevalent along these segments. There also were several single-vehicle collisions along the North and South Frontage roads of I-8 between South Avenue 10E and South Fortuna Road (South Avenue 11E), which can be an indicator of poor roadside clearance.

Often, a better indicator of roadway safety is the crash rate or frequency of crashes for roadway segments expressed in terms of crashes per million vehicle miles (mvm) traveled. The statewide average crash rate for the period 2006 through 2009 was 2.05 crashes/mvm (512,016 crashes divided by 249,628 mvm).⁷ Table 3.13 shows the crash rates for the eleven key roadway segments in the study area. Rates on four of the segments are higher than the statewide average. These rates were calculated using the number of crashes reported (refer to Table 3.12) and existing traffic volumes for each segment as defined by the travel demand model network developed for this study.

⁵ Table 1-2, Licensed Drivers, Motor Vehicle Registrations and Crash History in Arizona, Section I – Highlights and Historical Trends, Arizona Motor Vehicles Crash Facts 2009, Arizona Department of Transportation (ADOT), September 29, 2010.

⁶ Ibid. Table 1-3, Historical Trends – Arizona and the United States.

⁷ Ibid. Table 1-2, Licensed Drivers, Motor Vehicle Registrations and Crash History in Arizona and Table 1-3, Historical Trends – Arizona and the United States. Rates are based on motor vehicle operations only.

**TABLE 3.13
CRASH RATES FOR KEY ROADWAY SEGMENTS**

Roadway Segment	Crash Rate (crashes per million vehicle miles)
I-8 North Frontage Road: South Avenue 10E to South Fortuna Road (South Avenue 11E)	1.20
I-8 North Frontage Road: South Fortuna Road (South Avenue 11E) to South Foothills Boulevard (South Avenue 13E)	0.66
I-8 North Frontage Road: South Foothills Boulevard (South Avenue 13E) to South Avenue 15E	1.09
I-8 South Frontage Road: South Avenue 10E to South Fortuna Road (South Avenue 11E)	4.23
I-8 South Frontage Road: South Fortuna Road (South Avenue 11E) to South Foothills Boulevard (South Avenue 13E)	0.74
South Frontage Road: South Foothills Boulevard (South Avenue 13E) to South Avenue 15E	0.22
South Fortuna Road: South of the I-8 South Frontage Road	2.29
South Fortuna Road: Between the North and South Frontage Roads of I-8	12.17
South Fortuna Road: North of the I-8 North Frontage Road	1.96
South Foothills Boulevard: South of the I-8 South Frontage Road	0.87
South Foothills Boulevard: Between the North and South Frontage Roads of I-8	4.24

Prepared by Wilson & Company, July 2011.

Source: Number of accidents reported in Table 5.7, Summary of Crash Data for Key Roadway Segments compared to existing traffic volumes by roadway segment as defined in the travel demand model network developed for this study. Crash data from Accident Location Information Surveillance System (ALISS), Arizona Department of Transportation (ADOT) Multimodal Planning Division, August 2005 through August 2010.

As indicated previously, the statewide average crash rate was 2.05 crashes/mvm. Crash rates in excess of this may be indicative of the presence of physical or operational deficiencies and, therefore, measures may potentially exist to reduce the frequency of crashes. Calculated crash rates shown in Table 3.13 indicate the following segments exceed this rate:

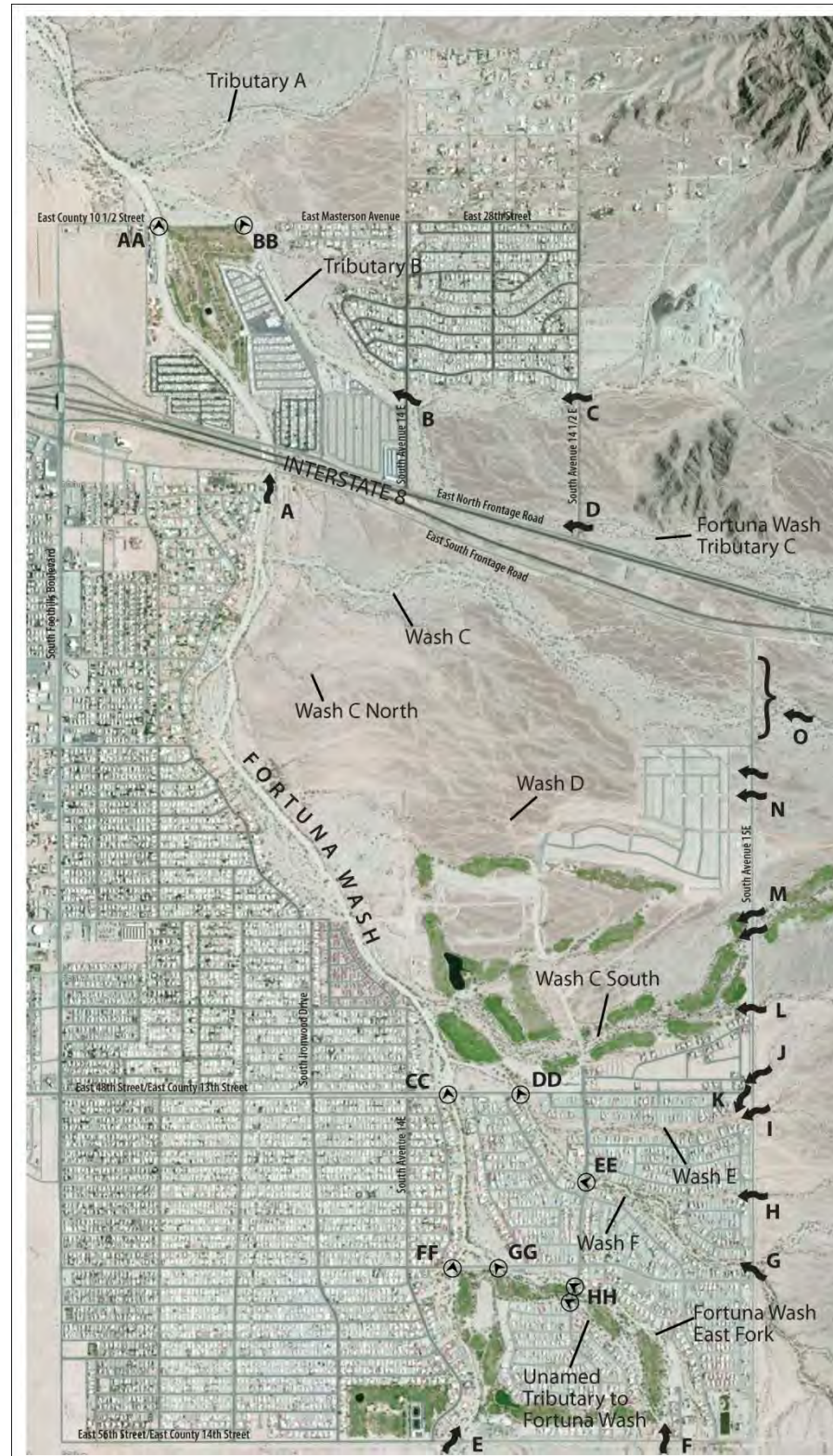
- I-8 South Frontage Road between South Avenue 10E and South Fortuna Road (South Avenue 11E);
- South Fortuna Road: South of the I-8 South Frontage Road;
- South Fortuna Road: between the two I-8 frontage roads; and
- South Foothills Boulevard between the two I-8 frontage roads.

When alternative improvements are investigated along these roadways, potential safety improvements will also need to be considered. A more detailed safety evaluation will be required with the future study of any proposed roadway improvements.

3.6 CROSSINGS OF FORTUNA WASH DRAINAGE NETWORK

Fortuna Wash and a network of tributaries drains the study area from south to north. Currently, there are two major east-west roadways with all-weather crossings of Fortuna Wash: I-8 and I-8 Frontage Roads and East 56th Street/East County 14th Street. The only other roadway with all-weather crossings in the study area is South Avenue 15E, a north-south facility. In addition to the all-weather crossings, numerous at-grade, dry-weather riverbed crossings exist to support mobility in the study area. All-weather and dry-weather crossings of Fortuna Wash and its tributaries are listed in and shown in Figure 3.17.

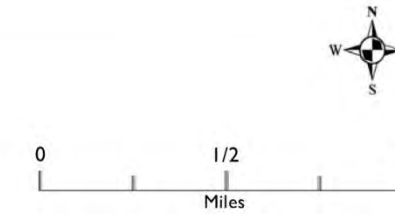
FIGURE 3.17
ROADWAY CROSSINGS OF FORTUNA WASH DRAINAGE NETWORK



LEGEND

- All-Weather Crossing**
A Crossing Identifier
 Crossing Location*
- Dry-Weather Crossing**
AA Crossing Identifier
 Crossing Location*

* Arrow indicates general direction of drainage



Roadway	Drainage Network Component	Location	Type of Crossing
All-Weather Crossings			
A: I-8 and Frontage Roads	Fortuna Wash	Between South Foothills Boulevard and South Avenue 14E	Bridges
B: South Avenue 14E	Tributary B	Between Fortuna de Oro RV Park and East 31 st Place;	Culvert
C: South Avenue 14½ E	Tributary B	South of East 31 st Place	Culvert
D: South Avenue 14½ E	Tributary C	North of the I-8 North Frontage Road	Culvert
E: East 56 th Street/East County 14 th Street	Fortuna Wash	East of South Avenue 14 E and west of the Foothills Golf Course	Culvert
F: East 56 th Street/East County 14 th Street	Fortuna Wash East Fork	East of Foothills Golf Course and west of Schechert Way	Culvert
G: South Avenue 15E	Wash F	Between Drucila Drive and East 52 nd Street	Culvert
H: South Avenue 15E	Tributary to Wash F	Between East 50 th Street and East 50 th Drive	Culvert
I: South Avenue 15E	Wash E	South of East 48 th Street/East County 13 th Street	Culvert
J: South Avenue 15E	Tributary to Wash E	North of East 48 th Street/East County 13 th Street	Culvert
K: East 48 th Street/East County 13 th Street	Tributary to Wash E	West of South Avenue 15E	Culvert
L: South Avenue 15E	Tributary to Wash C South	North of East 46 th Loop	Culvert
M: South Avenue 15E	Wash C South	Within Las Barrancas Golf Course	Culverts (Two)
N: South Avenue 15E	Wash D	North of East 41 st Lane	Culverts (Two)
O: South Avenue 15E	Wash C	Between north edge of Las Barrancas Subdivision and I-8 South Frontage Road	Multiple Culverts
At-Grade, Dry-Weather Crossings			
AA: East County 10½ Street	Fortuna Wash	West of Fortuna Del Rey Golf Course	Unimproved Surface
BB: East County 10½ Street/East Masterson Avenue	Tributary B	East of Fortuna Del Rey Golf Course	Unimproved Surface
CC: East 48 th Street/East County 13 th Street	Fortuna Wash	Between South Driftwood Drive and South Chase Way	Paved Roadway
DD: East 48 th Street/East County 13 th Street	Wash F	East of Onammi Aven	Paved Roadway
EE: South Avenue 14½E Street	Wash F	Between East 50 th Street and Onammi Avenue	Paved Roadway
FF: East 52 nd Street	Fortuna Wash	East of Driftwood Drive	Paved Roadway
GG: East 52 nd Street	Fortuna Wash East Fork	West of Chase Way	Paved Roadway
HH: South Avenue 14½E Street	Fortuna Wash East Fork and Unnamed Tributary	Between East 52 nd Street and East 53 rd Street	Paved Roadway

Prepared by Wilson & Company, July 2011.

Source: Identity of Drainage Network Component – Index Map, Foothills Master Drainage Plan Update, Yuma County, August, 2011. Drainage locations – Aerial photo review, Bing Maps, Wilson & Company.

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Given that there are only two all-weather crossings of Fortuna Wash on major east-west roadways in the study area, in the future it will be critical to provide additional all-weather crossings to facilitate east-west travel during major precipitation events.

3.7 ALTERNATIVE MODAL ELEMENTS

A Transportation Needs Study not only serves to identify capacity requirements for vehicular traffic, it also identifies how to move people, goods, and services. It is a guidance document that helps provide information to the community as decisions are being made. Planning for and delivering a multi-modal transportation system generally involves coordination with multiple state, regional, and local agencies to ensure the correct stakeholders are involved as facilities and services are being planned.

3.7.1 TRANSIT SERVICE

Transit service in the Greater Yuma Area has grown from a new transit service in the late 1990s offering only paratransit service. Paratransit refers to transit service that operates in response to calls from passengers or their agents to the transit operator. It also is called Dial-A-Ride (DAR) and demand-responsive (DR) service. The fixed-route Yuma County Area Transit (YCAT) system evolved from the locally-funded DAR service. The YMPO today owns, administers, and operates (through a contractor – First Transit) the current mix of demand-responsive and fixed-route services provided in the Greater Yuma Area. As noted in Chapter 2, formation of the YCIPTA in December of 2010 will permit the YMPO to divest its administrative and operational responsibilities and focus on regional planning.

FIXED-ROUTE SERVICE

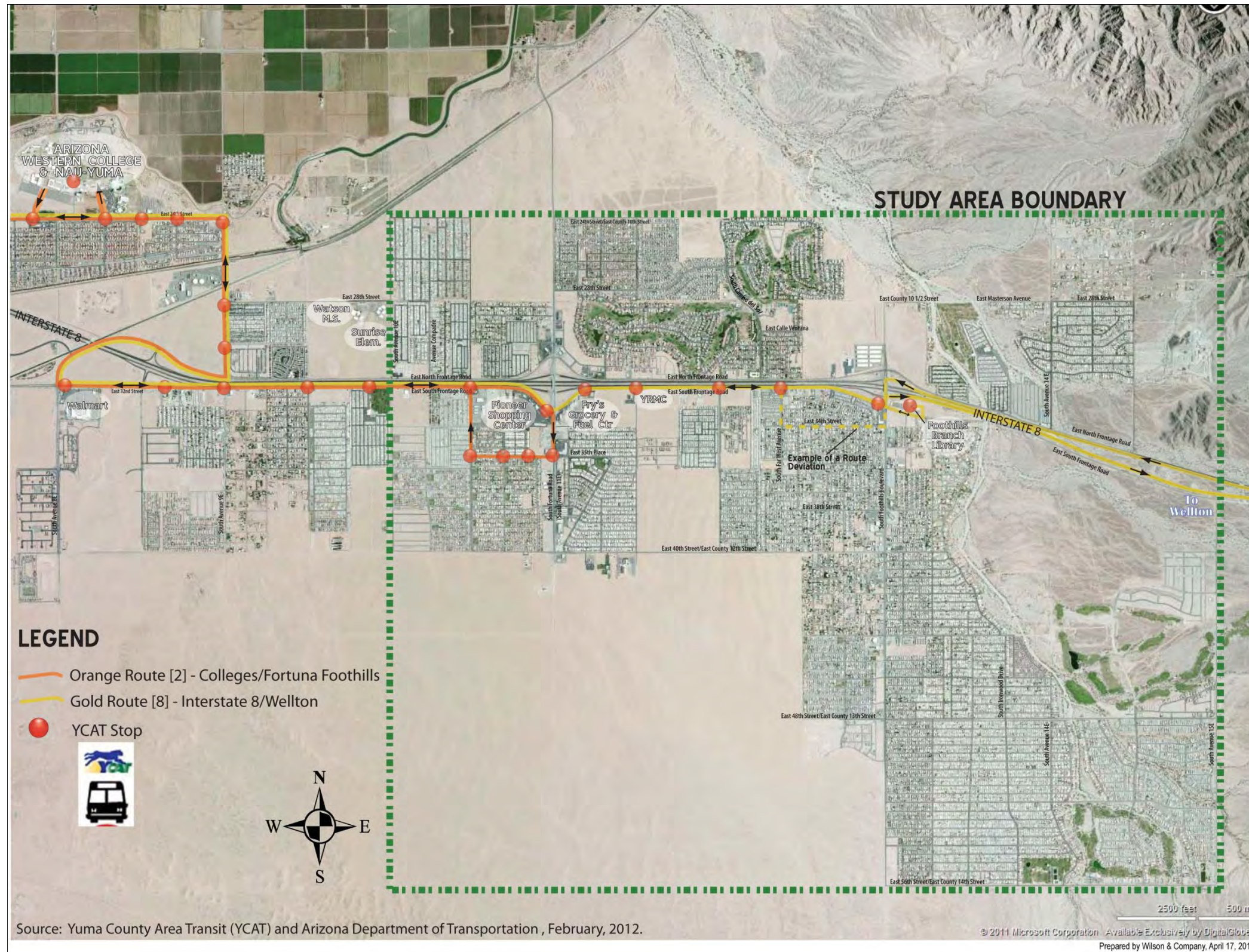
As of 2007, the YCAT system was providing fixed-route service on seven routes serving the City of Yuma and Yuma County areas. Four mobility services were offered, using four different types of vehicles: Passport; MST-2; Easy Rider; and Cut Away. All accommodated wheel chairs and service animals. All vehicle types are equipped to accommodate bicyclists. The system provided enhanced travel flexibility for all residents in the Greater Yuma Area.

Since then, service adjustments were made in response to negative revenue impacts associated with the national, even global, economic recession and reduced ridership. Nevertheless, the YMPO Web site indicates ridership recovered somewhat, growing 17.3 percent from March 2008 to March 2009 with nearly 30,000 passengers using the YCAT service in March 2009. A report on Fiscal Year (FY) 2009 operations revealed an operating cost of \$1.9 million to serve approximately 323,000 trips.

In August, 2010, the Yuma City Council voted to end all financial support of YCAT and DAR services. In response, the YMPO Transit Sub-Committee recommended, and the YMPO Board approved, suspending service on the Red and Blue routes. The Orange Route, which originally served the entire study area was truncated at South Fortuna Road; a new Gold Route now serves the full study area from South Avenue 10E to South Avenue 15E. As shown in Figure 3.18, the Orange and Gold routes enter the

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FIGURE 3.18
ORANGE AND GOLD ROUTES, YUMA COUNTY AREA TRANSIT (YCAT)



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west side of the study area on the South Frontage Road at South Avenue 10E. Both routes continue east to South Fortuna Road. The Orange Route – Colleges/Fortuna Foothills [2] – initiates a return loop at South Fortuna Road. The route goes south on South Fortuna Road, then travels west on East 35th Place. It turns to the north at South Payson Drive and returns to the South Frontage Road, where it heads west and exits the study area at South Avenue 10E. The Gold Route – Interstate 8/Wellton [8] – continues east of South Fortuna Road along the I-8 South Frontage Road to South Foothills Boulevard. This route is a “flex route,” which permits drivers to deviate to pick up/drop off transit patrons. The route continues east from South Foothills Boulevard to the community of Wellton. It follows the same route in the west direction, returning from Wellton on I-8 and continuing on the South Frontage Road, leaving the study area at South Avenue 10E. An example of a route deviation is shown in Figure 3.18 following South Far West Avenue then turning east on East 34th Street to South Foothills Boulevard.

The basic one-way fare is \$2.00 for YCAT service with multiple options for reduced fares, based on multiple ride passes and passenger eligibility. An additional fare of \$2.00 is charged for route deviation service associated with the Gold Route.

DIAL-A-RIDE (DAR)/ADA PARATRANSIT SERVICE

DAR services have been provided in many communities to assure that persons without a means of transportation and with special mobility needs are able to access community services and facilities. This paratransit service is available solely to people with disabilities or seniors over the age of 60. Thus, this service provides curb-to-curb, pick-up/drop-off for individuals with disabilities, who cannot use the fixed-route system. However, the Americans with Disabilities Act (ADA) guidelines require that DAR service must be comparable to fixed-route service, which has been mandated to accommodate persons with special mobility needs. Disabled individuals interested in taking advantage of this service must apply and be found eligible according to ADA guidelines.

The DAR/ADA service reported a total of 34,000 riders in October, 2007. The service is supported with an annual operating budget of \$2.0 million. In FY 2009, almost 37,000 riders were served at a cost of \$1.4 million. Currently, the DAR/ADA paratransit service is available on Monday through Friday – 5:30 AM to 7:30 PM, and on Saturdays from 9:30 AM to 6:30 PM. The service area of the DAR/ADA paratransit component is restricted to three quarters ($\frac{3}{4}$) of a mile on either side of a route that is part of the fixed-route service.

The basic one-way fare for DAR/ADA paratransit service is \$4.00. The rider or his/her representative must make a reservation at least 24 hours in advance. Reservations may be made up to seven (7) days in advance in accordance with ADA guidelines. The DAR/ADA service area is within a $\frac{3}{4}$ -mile radius of YCAT bus routes operating during the time of request, which generally provides coverage from the City of San Luis and the City of Somerton through the City of Yuma and the Foothills and Mesa Del Sol study area to the Town of Wellton.

3.7.2 PEDESTRIAN ACCOMMODATIONS

There is a general lack of sidewalks in the study area, although much of the single-family housing areas incorporate space along the roadways where sidewalks could be constructed. In the study area for the period August 2005 through August 2010, there were five crashes involving pedestrians; one resulted in a fatality. Therefore, greater emphasis on improving and providing safe and secure pedestrian accommodations is of primary importance to the Foothills and Mesa Del Sol areas of Yuma County. Developing a network of sidewalks and paths within the communities would provide opportunities to walk or otherwise operate a non-motorized vehicle (e.g., wheel chair, bicycle) to a near-by destination instead of driving. The dominant grid street pattern within the study area would benefit from sidewalks to promote pedestrian mobility. Sidewalks have been constructed as part of the two I-8 interchanges, but they have no connectivity to other parts of the study area.

3.7.3 BICYCLE FACILITIES

In the study area for the period August 2005 through August 2010, there were 10 crashes involving bicycles; only two (20%) resulted in no injuries. The Bicycle Safety Action Plan recently completed by ADOT involved an in-depth evaluation of the frequency and cause of bicycle fatal and injury crashes associated with the State Highway System in Arizona. Based on this evaluation, the Plan recommends improvements, programs, and strategies, that upon implementation, will reduce such crashes. Potential countermeasures include: engineering solutions, education of bicyclists and motorists, and improving enforcement of laws and regulations.

Arizona's Bicycle Safety Action Plan highlights in graphic form Fatal State Highway Bicyclist Crashes for the period 2004 – 2008. This graphic identifies the proportion of fatalities by four different types of areas, ranging from rural to large urbanized with a population of 200,000 or more. The YMPO region is considered a large urbanized area with population exceeding 200,000. A fatality rate of 33 percent was associated with this type of geographic area. Thus, it is appropriate that the Circulation Element of the Yuma County 2010 Comprehensive Plan identifies improvement of bicycle facilities to be a "critical issue." There is recognition of "...a growing demand and interest for access to safe and efficient bicycle facilities throughout the county." The Circulation Element also notes, "There is a need to incorporate provisions into existing infrastructure, roadway and non-motorized plans to accommodate this mode of transportation." The recently adopted Yuma County 2020 Comprehensive Plan goes one step further, stating under Circulation Policies and Priorities that "Yuma County will encourage road design, construction or reconstruction to better accommodate pedestrian and bicycle traffic."

Safe bicycle facilities are especially important for individuals who do not drive, which is particularly relevant for the large number of elderly persons in the study area. Based on mapping available in the YMPO RTP, there are no formal, dedicated bicycle or pedestrian routes, trails, paths, or lanes within the study area. Bikely.com identifies a 446-mile (717.9-km) "Sea-to-Saguaro" bike route that begins in San Diego, California, and ends in Tucson, Arizona. The route follows the I-8 North Frontage Road through

the study area to South Foothills Boulevard, where it transitions to I-8; however, this route does not serve the day-to-day mobility needs of study area residents.

3.8 FREIGHT SERVICES

Both truck and railroad freight services and facilities have developed in the Greater Yuma Area in response to the east-west connection provided by rail facilities and I-8 as well as the vast agricultural investments associated with the Lower Colorado River and Imperial Valley in California.

3.8.1 TRUCKING

Yuma County and ADOT currently have no truck restrictions on study area roadways. Information about trucking activity in the study area is available through documents prepared during the Arizona Multimodal Freight Study, specifically Technical Memoranda Nos. 2 and 3. This study reports that I-8, an east-west facility, has a comparatively lower volume of truck travel relative to I-10 farther north. “One reason for this could be the grades and curves encountered on I-8 in California west of El Centro that many truckers would want to avoid.”⁸ The average annual daily truck volume reported in February, 2008, was 5,001 to 10,000 trucks per day. At the time, truck traffic accounted for 12.8% to 21% of the total daily traffic volume on I-8 through the study area. The level of service provided by I-8 through Yuma County is not lower than ‘C’, which means there is adequate capacity for growth in trucking services through the study area.

The new Arizona Highway 195 (SR 195) links I-8 to both border crossings in San Luis and San Luis Rio Colorado in Sonora, Mexico. An ongoing study undertaken by ADOT has evaluated alternative routes for extending SR 195 to US 95 and moved into the engineering and environmental assessment phase. This link will provide access from the commercial port of entry at San Luis to US 95, a major north-south highway through western Arizona. It will further facilitate goods movement between the United States and Mexico and provide an additional, enhanced travel corridor directly west of the study area.

3.8.2 RAIL FREIGHT

The Union Pacific Railroad (UPRR) Sunset Route traverses Yuma County and passes within 300 feet of the northeastern corner of the study area. The line crosses Fortuna Road approximately three-quarters of a mile north of East 24th Street/East County 10th Street and one-third mile south of Fortuna Road’s connection to US 95. This important route is UPRR’s primary line between the Ports of Los Angeles/Long Beach and Texas, the southeast, and Midwest, as well as Mexico through either El Paso or Laredo, the principal U.S./Mexico rail border crossings. The UPRR is experiencing significant growth in rail freight traffic on this route, and the number of daily trains is expected to reach 100 or more by the year 2013. In response to the growth in rail freight demand, UPRR is in the process of double-tracking the entire line between Los

⁸ Arizona Multimodal Freight Analysis Study, Technical Memorandum #2: Assessment of Arizona’s Existing Freight Infrastructure, ADOT/Wilbur Smith Associates, February 2008, Pg. 10.

Angeles and El Paso. This expansion, when completed, will create a new set of challenges for the region’s transportation system. Added train operations potentially could affect, i.e., create additional delays, for study area residents using US 95 as an access route to the City of Yuma and points west, as an alternative to I-8.

As a response to potential opportunities associated with interstate rail freight services operated by UPRR, the YMPO recently initiated a study to examine freight and multimodal opportunities for the Yuma Region. The overall goal of this study “...is to recommend a feasible rail corridor, identify opportunities for freight-related economic development, increased mobility and access for freight movements throughout the study area.”⁹ Although the expansion of rail freight services does not directly affect the study area, any expansion in such service that may increase truck traffic on I-8 could have a potential effect on this major regional highway.

⁹ Request for Proposals, Consultant Services for Yuma County Rail Corridor Study, Yuma Metropolitan Planning Organization (YMPO), September 2011.

COMMITTED AND PLANNED IMPROVEMENTS

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4.0 COMMITTED AND PLANNED TRANSPORTATION IMPROVEMENTS

This section identifies and summarizes committed and planned roadway improvements for Yuma County and, specifically, the Fortuna Foothills and Mesa Del Sol study area.

4.1 CONTEXT

Plans and programs relevant to the study area have been reviewed to identify “committed” and “planned” roadway improvements. Committed roadway improvements (and other relevant) projects were identified within the ADOT Tentative 2012-2016 Five-Year Transportation Facilities Construction Program, the ADOT 2011-2014 State Transportation Improvement Program (STIP), the YMPO FY 2011-2016 Transportation Improvement Program (TIP), the 2011-2016 Yuma County Capital Improvement Plan (CIP), and in the 2011-2016 City of Yuma CIP. The first year of each program identifies projects for which funds have been committed. Planned projects are those listed in subsequent years of the programs that may be initiated as part of a fiscally-constrained, long-range improvement plan – no funding commitments have been adopted. Table 6.1 provides a summary of projects funded through FY 2016. A brief discussion of funding programs follows.

4.2 FUNDING PROGRAMS

Transportation improvements in the study area may be funded through the State of Arizona, Yuma County, and/or the YMPO. This section addresses these three sources of funds.

4.2.1 ADOT STATE TRANSPORTATION IMPROVEMENT PROGRAM

All highway and transit projects to be funded under Title 23, Federal-Aid Highways and the Federal Transit Act, must be included in the federally-approved STIP. Projects in the STIP must be consistent with the Statewide Long-Range Transportation Plan and the Transportation Improvement Program (TIP) of the metropolitan planning organization (MPO). The STIP and TIP must reflect funding and priorities for programming, including transportation enhancements.

As shown in Table 6.1, ADOT roadway improvement projects for the Fortuna Foothills and Mesa Del Sol study area are programmed in the most recent available ADOT FY 2011-2014 STIP. Approximately \$3.1 million is planned for expenditure in 2012 and 2013 to reconstruct the I-8 South Frontage Road, an Urban Minor Arterial, between South Avenue 9E and South Avenue 11E. An additional \$636,000 is planned for disbursement in 2012 to cover improvements at the I-8/South Fortuna Road Traffic Interchange.

ADOT also is the primary conduit for funds to support transit facility development and operations. Planning, capital purchase, and operating funding assistance for urban areas over 50,000 population comes through the Federal Transit Administration (FTA)

Section 5303 Program (planning) and Section 5307 Urbanized Area Formula Funding

**TABLE 4.1
COMMITTED AND PLANNED TRANSPORTATION-RELATED CAPITAL IMPROVEMENT PROJECTS**

Source	Project Name	Funding (000's)				
		FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
ROADWAY IMPROVEMENTS						
ADOT STIP	Reconstruct I-8 South Frontage Road	2,072	1,020	--	--	--
ADOT STIP	I-8/South Fortuna Road Traffic Interchange Improvements	636	--	--	--	--
Yuma County CIP	I-8 North & South Frontage Road Widening, South Avenue 10E to South Avenue 13E	2,897	--	400	600	400
Yuma County CIP	Signal: South Foothills Boulevard at East 48 th Street/East County 13 th Street	113	--	--	--	--

Prepared by Wilson & Company, July, 2011.

Program (capital and operating assistance). Funds are passed through to the MPOs and allocated in accordance with short- and long-range transportation planning and programming in their defined study area. The ADOT STIP includes approximately \$1.8 million for transit funding assistance to the Yuma area through FY 2014.

4.2.2 YMPO TRANSPORTATION IMPROVEMENT PROGRAM

The YMPO has responsibility for conducting the area-wide continuing, comprehensive, and cooperative transportation system planning program and must maintain the regional transportation system plan and short-range Transportation Improvement Program (TIP). The YMPO TIP is a multi-year, multi-agency listing of transportation improvement projects determined eligible for federal funding. The TIP is developed and adopted in conformance with all applicable requirements of 23 U.S.C. 134, as amended by the Safe, Accountable, Flexible, and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU) 2005 and the 1990 Clean Air Act (CAA) Amendments. Adoption of the TIP and supporting planning documents is a prerequisite for receipt of both federal transit and federal highway funding, which flows through the YMPO, which has Direct Grantee Status for the region and its members.

Each of the projects proposed for implementation is consistent with the YMPO RTP, which is updated every four years to create fully coordinated, countywide transportation improvement program.

4.2.3 YUMA COUNTY TRANSPORTATION CAPITAL IMPROVEMENT PROJECTS

On an annual basis, the Yuma County Board of Supervisors approves funding for the first year of its Five-Year CIP. This first year is referred to as the CIP, as funding has been approved to be used for specified capital projects. Based on review of the FY 2012-2016 CIP, Yuma County has committed approximately \$3 million in FY 2012 to support widening of the I-8 South Frontage Road and installation of a traffic signal at South Foothills Boulevard/48th Street intersection. Additional planned expenditures

totaling \$1.4 million have been identified in FY 2014 through FY 2016 for continuing improvements of the I-8 South Frontage Road.

4.3 BASE FUTURE ROADWAY NETWORK

The Base Study Area roadway network is defined by the existing roadway system plus any improvements supported by authorized funding – committed improvements – and improvements identified in adopted plans ultimately expected to be implemented. This roadway network is referred to as the Existing-Plus-Committed (E+C) system. The base study area roadway network was defined for Years 2020, 2030, and Buildout. The principal components of the E+C roadway system are shown in Figures 4.1-4.3. As indicated in the figure, all new roadway segments in the study were assumed to consist of two travel lanes for purposes of the base conditions analysis.

Outside of the study area, improvements included in the YMPO 2033 RTP network were assumed to be in place for all future analysis years for purposes of this analysis.

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FIGURE 4.1
EXISTING-PLUS-COMMITTED ROADWAY NETWORK: YEAR 2020 NUMBER OF THROUGH LANES

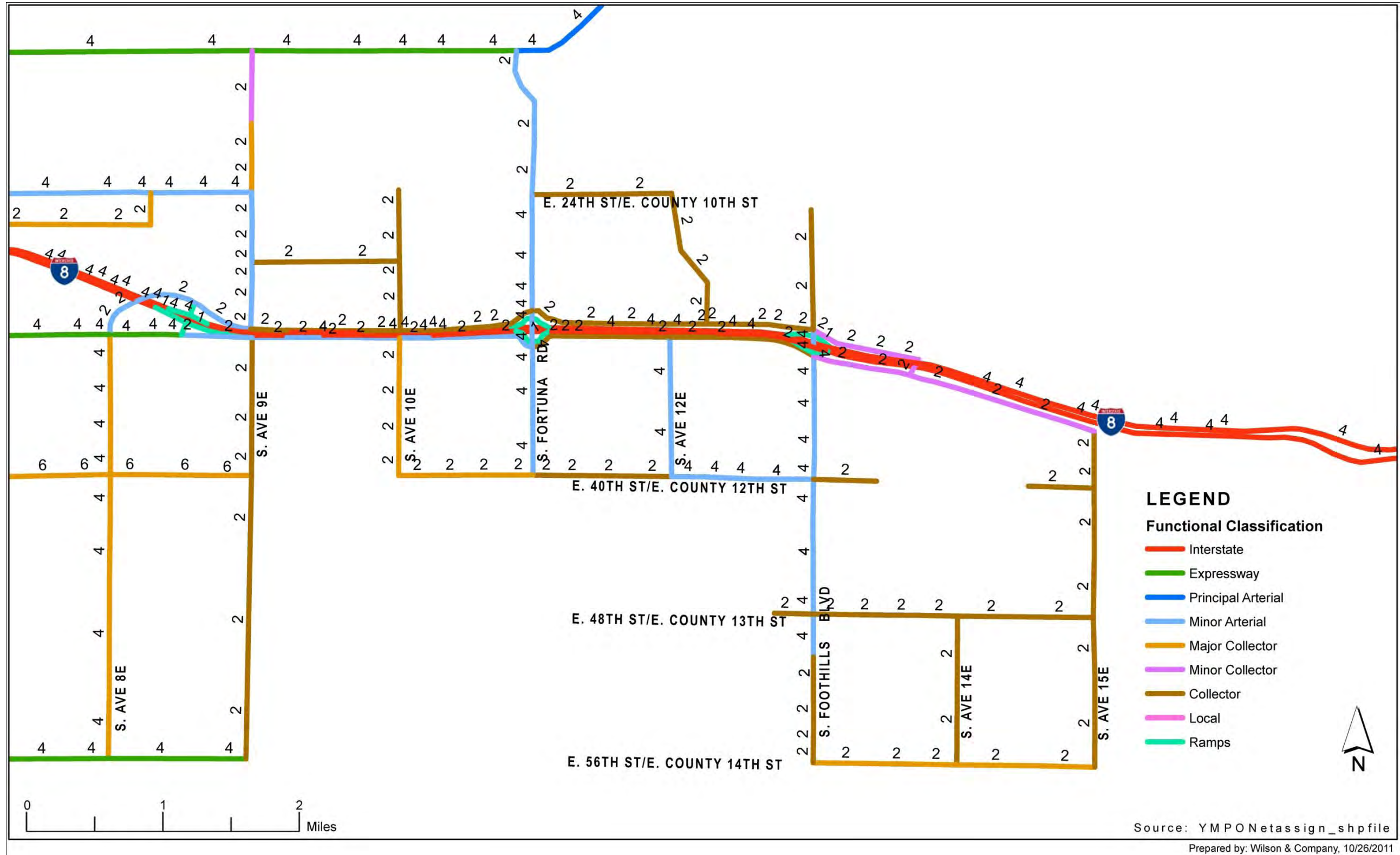


FIGURE 4.2
EXISTING-PLUS-COMMITTED ROADWAY NETWORK: YEAR 2030 NUMBER OF THROUGH LANES

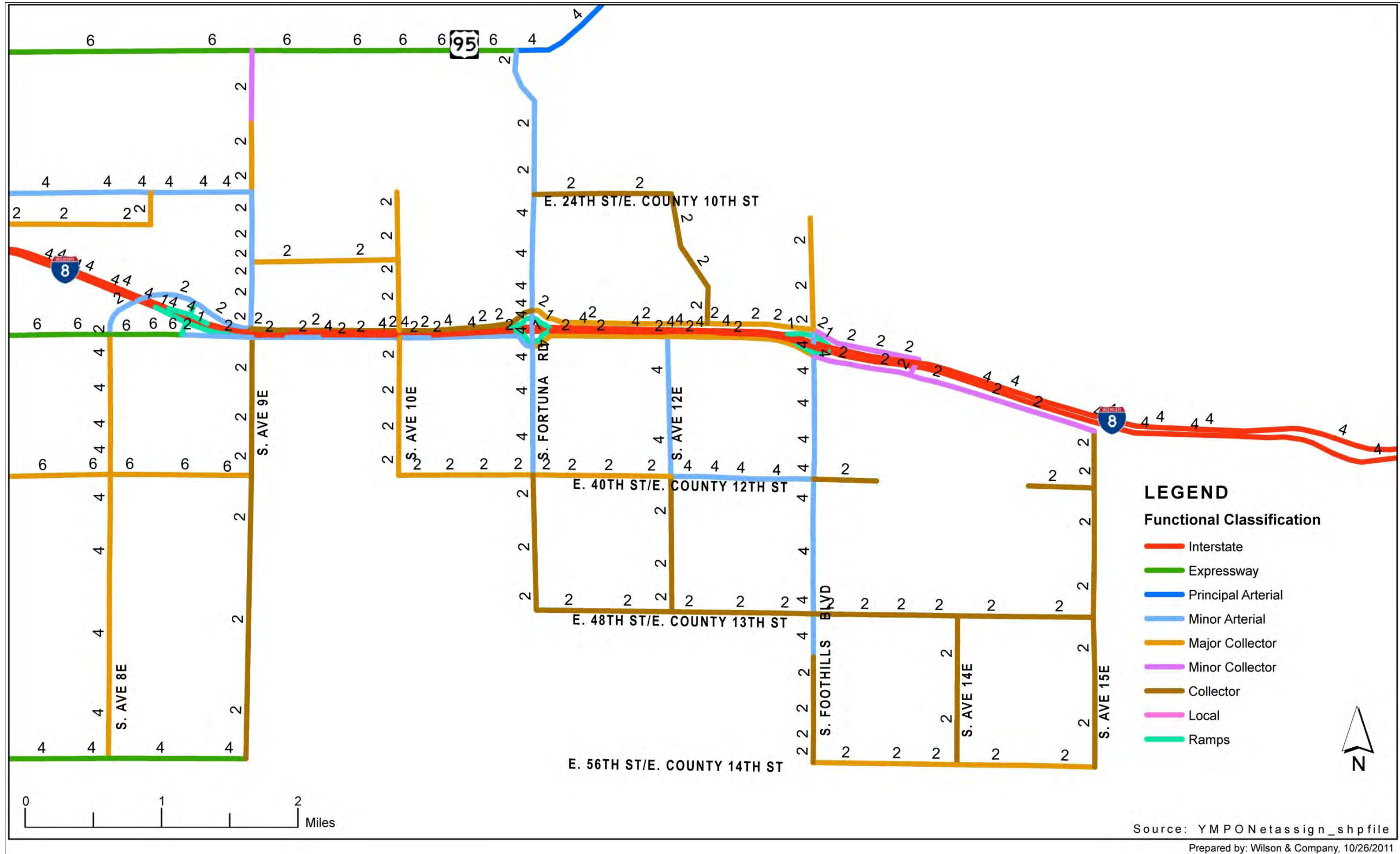
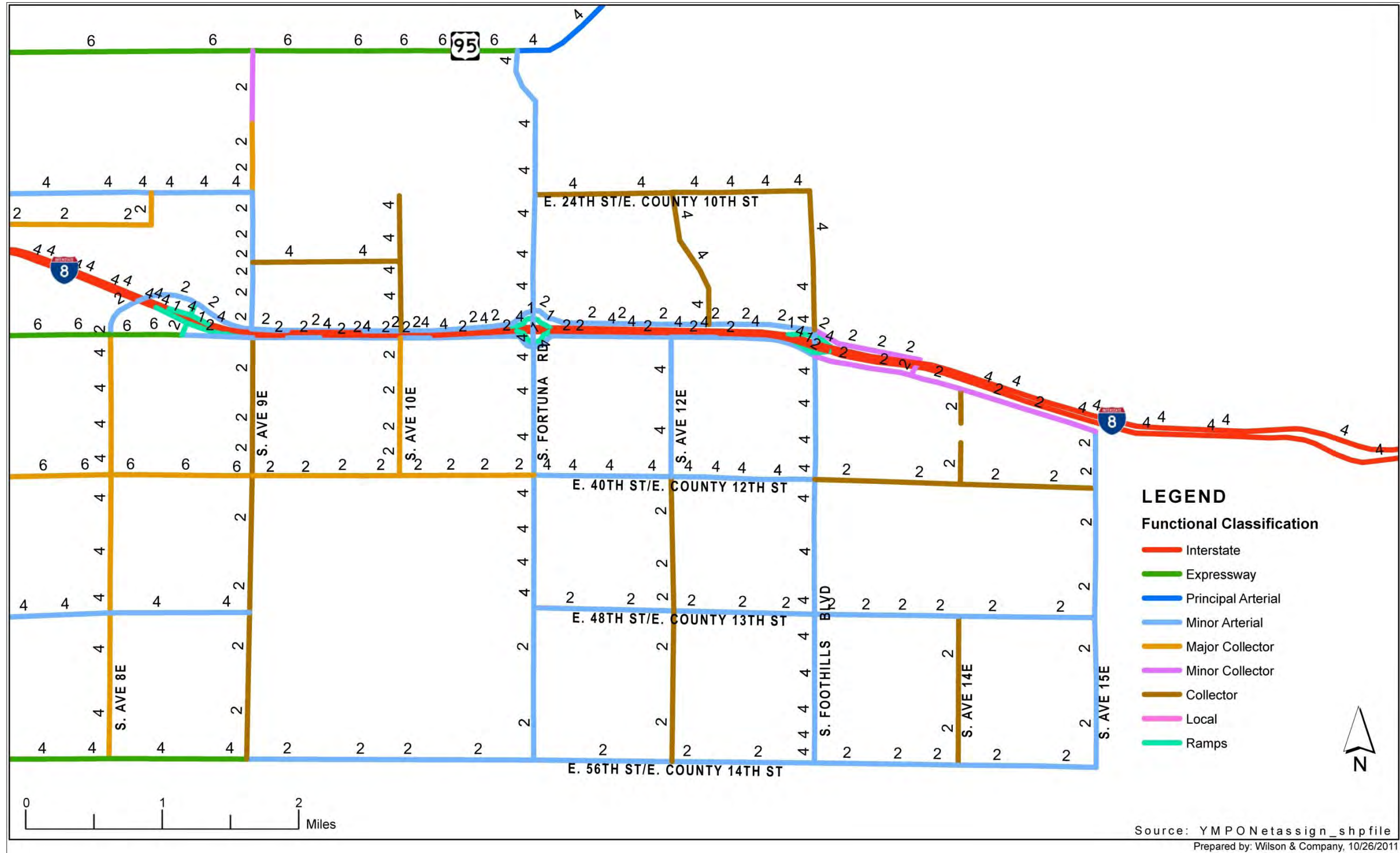


FIGURE 4.3
EXISTING-PLUS-COMMITTED ROADWAY NETWORK: BUILDOUT NUMBER OF THROUGH LANES



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FORECAST OF FUTURE CONDITIONS

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5.0 FORECAST OF FUTURE CONDITIONS

This chapter examines the anticipated future land use pattern in the study area and establishes area growth assumptions that influence forecasts of future travel demand. It also addresses expectations for travel demand and needs of the transportation system to accommodate that demand. In addition, information is provided relating to the future status and operations of alternative modes of transportation, including transit service, bicycle facilities, and accommodations of pedestrian movements.

5.1 FUTURE LAND USE PATTERNS

Figure 7-1 illustrates the proposed land use pattern adopted for the Foothills Sub-Regional Planning Area. The pattern of land uses shown is based on specific guidelines, goals, and objectives identified during the development of the Yuma County 2020 Comprehensive Plan:

- Consistency with existing development and zoning patterns and anticipated expansion of the commercial core on South Foothills Boulevard and South Avenue 11E and the I-8 corridor.
- Preservation of agriculture north and west of US 95, as shown by the Agriculture/Rural Preservation (A-RP) designation.
- Agriculture/Rural Residential (A-RR) north of I-8 and lower density residential zones at the base of the Gila Mountains in the eastern portion of the sub-region.
- New commercial growth zones are located along South Foothills Boulevard at East 56th Street/East County 14th Street and between East 44th and East 47th streets. Lands between the Fortuna Wash and I-8 are designated Mixed Use Residential (R-MU), which allows for a combination of commercial and residential uses for this transition zone.
- The Urban Density Residential (R-UD) designation is shown in the areas currently platted, which generally are east of South Foothills Boulevard, north of East 44th Street, and proximate to the core commercial areas.
- Lower density Suburban Density Residential (R-SD) is designated further from the core commercial areas, typically south of East 44th Street and west of South Foothills Boulevard.
- Open Space & Recreational Resource (OS/RR) lands primarily are incorporated in the Gila Mountain overlay and washes that transect the area. The Gila Mountains have slope, depth, and bedrock problems that preclude development and urbanization and washes are subject to periodic inundation.

There are a number of planning considerations addressed in the Comprehensive Plan for the Foothills Sub-Regional Planning Area. Most significantly, the sub-region has experienced rapid residential growth and development trends in the sub-region indicate expansion will continue. Expansion of residential land use south of I-8 and east to Fortuna Wash is focusing on low-density manufactured home and recreational

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vehicle(RV) subdivisions as well as RV parks. Land zoned for 6,000-square-foot home sites is plentiful and is particularly available west of South Avenue 12E. Commercial and office facility growth is occurring along I-8 and the South Fortuna Road and South Foothills Boulevard interchanges with I-8. Future residential growth should approach the boundary of the Barry M. Goldwater Range (BMGR) at East 56th Street/East County 14th Street. Expansion into the northern Foothills is severely restricted by the Gila Mountains and other physical and soil constraints.

Table 5.1 compares the land uses predominant in 2001 with the land use pattern recommended in the 2010 Comprehensive Plan to accommodate future trends. The acreage shown for Designated Future Land Use is reflected in Table 5.1 below.

**TABLE 5.1
LAND USE ACREAGE IN THE FOOTHILLS SUB-REGIONAL PLANNING AREA:
2001 & DESIGNATED FUTURE BUILDOUT**

Land Use	Year 2001 ^(a)	Designated Future ^(b)
Residential	5,236	13,650
Commercial	850	1,166
Industrial	126	0 ⁽²⁾
Federal Lands	11,069	--
State Lands	8,319	--
Open Space	-- ⁽¹⁾	9,333
Agricultural	--	851
Total	25,600	25,600

NOTES:

- (1) -- Indicates no jobs were listed for this category by the identified source.
- (2) No occurrence of industrial land use is anticipated, according to the identified source.

Sources:

- (a) Table 4D.4 Foothills Sub-Regional Planning Area Existing Private Land Use Designation, Foothills Sub-Regional Planning Area, Yuma County 2010 Comprehensive Plan.
- (b) Table 4D.5 Foothills Sub-Regional Planning Area Designated Land Use & Acreage, Foothills Sub-Regional Planning Area, Yuma County 2010 Comprehensive Plan. Quantities shown represent recommendations and designations for future development developed and adopted in the Foothills Planning Area Citizen Advisory Group Report, prepared in support of efforts by the Long-Range Planning Staff of the Yuma County Department of Development Services to update the Yuma County 2010 Comprehensive Plan.

Table 5.1 reveals a substantial difference between the Year 2001 land uses and the designated future or planned land uses. The difference is particularly pronounced in the Residential, Industrial, Open Space, and Agricultural categories. These differences result from assumptions regarding the future conversion of State and Federal lands, which had historically been excluded from County land use plans. This was done to ensure designations that meet the desires of County residents on lands subject to conversion to private ownership.

5.2 AREA GROWTH ASSUMPTIONS

Area growth assumptions have been based on the latest planning documents available for the study area, as published by Yuma County and the YMPO. Buildout assumptions developed for this study were developed by determining the maximum development potential defined by the Yuma County Zoning Ordinance.

5.2.1 TRAVEL DEMAND MODELING METHODOLOGY

Travel demand models used to evaluate potential future changes in traffic volumes on a roadway network rely on an understanding of the land use pattern and how that pattern will change over time. The TransCAD transportation planning software employed for this study is capable of estimating the travel demand of an area's population by estimating the potential trips generated by and attracted to predefined zones. These transportation analysis zones (TAZs), as they are called, are defined geographically and statistically as inputs to this travel forecasting software, permitting the modeling of likely conditions in the future. Thus, the transportation planner is able to use TransCAD to predict changes in travel patterns and, therefore, utilization of the roadway network in response to anticipated changes in regional development, demographics, and roadway facilities. Although the modeling process supported by TransCAD includes in addition to forecasts of traditional automobile and truck traffic, the ability to examine changes in other modes and choices between modes, the emphasis for the Foothills and Mesa del Sol study area is the roadway network.

5.2.2 MODEL FORECASTING INPUTS

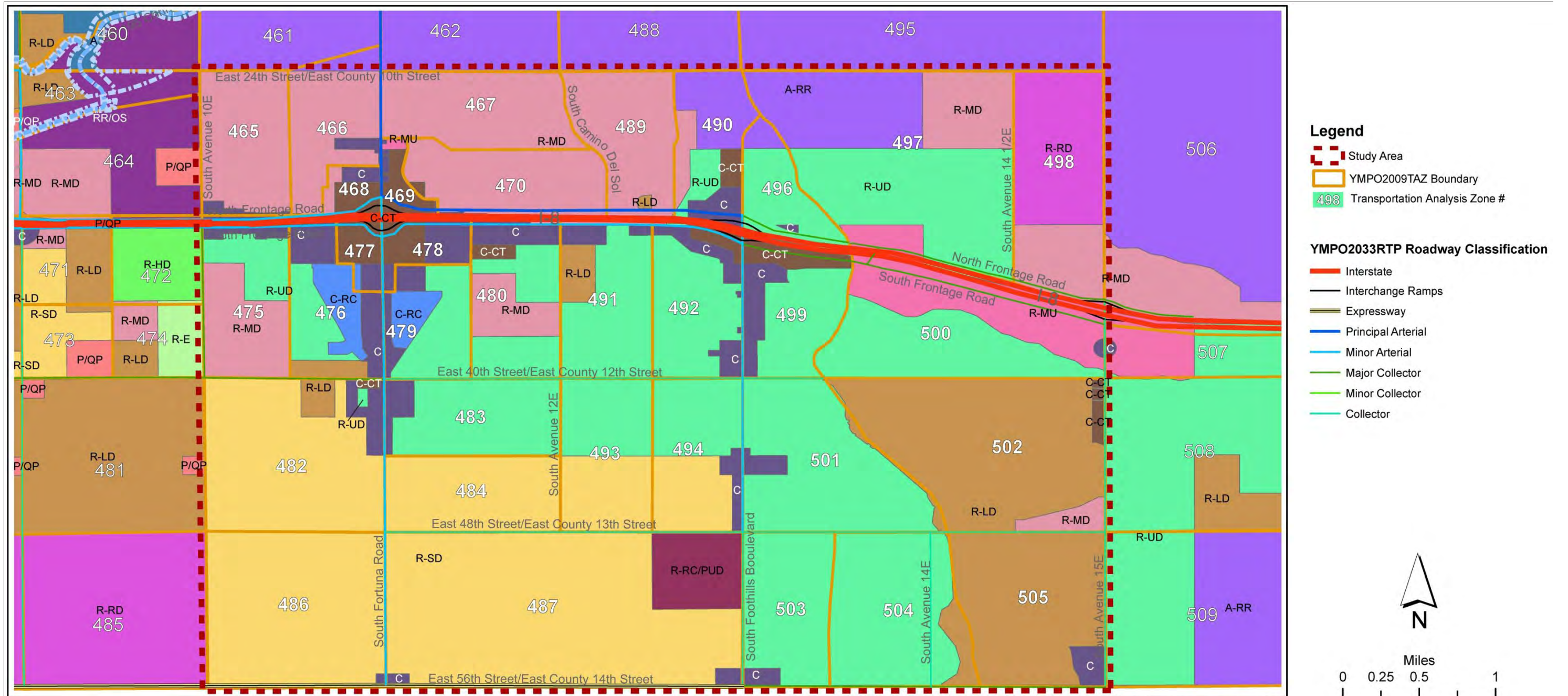
This transportation needs study required an evaluation of current or existing conditions within the roadway network, forecast conditions for interim years 2020 and 2030, and an estimate of anticipated conditions under "Buildout" conditions. Buildout refers to the condition of full utilization of developable land and is considered to be likely post 2030. Buildout conditions are defined in terms of future population and employment expected to be located within each TAZ, based on planned or zoned densities. Thus, it principally is an estimate of the potential development far into the future, and decisions may be made that change the current planning or zoning criteria.

Population and employment locates in direct response to land development. Therefore, potential land development to define Buildout conditions in the study area was estimated for each of the TAZs already identified for the regional travel demand model and is shown in Figure 5.2. Development densities for each of the land use types shown in Figure 5.2 were determined from the County Zoning Ordinance.¹⁰ These densities then were used to derive the number of dwelling units (DUs) expected to be developed in accordance with residential zoning in any particular TAZ and the number of employees expected to be located in the commercial zones. Desired densities specified in the *Foothills Planning Area Background Study*, prepared in support of the Yuma County Comprehensive Plan, also were taken into account.

First, the area of the separate and distinct land use zones was measured. For the residential zones, the measured area was translated into an estimate of dwelling units (DUs). This was accomplished by applying the number of units per acre, as determined from the County Zoning Ordinance along with this general assumption: 20 percent of the land area would be devoted to roads and common areas, and lot coverage for one DU (based on the remaining area) could be no more than 50 percent. Commercial zones were translated into an estimate of employment using a similar methodology.

¹⁰ Yuma County Zoning Ordinance, Effective September 25, 2006, with Amendments through April 8, 2011.

Figure 5.2
Transportation Analysis Zones and Planned Land Use



Prepared by Wilson & Company, June 2011.

Legend: Land Use Type

Agricultural / Rural Development	Agriculture/Industrial	Estate Residential	Low Density Residential	Non Conformity	Retirement Community / Planned Unit Development	Urban Density Residential
Agricultural / Rural Preservation	Business Park	Government Lands	Medium Density Residential	Open Space & Recreational Resources	Rural Density Residential	Water
Agricultural / Rural Residential	Commercial	Heavy Industrial	Mixed Use	Public/Quasi Public	Sensitive Areas & Resource Lands	Cocopah Reservation
Agriculture	Commercial / Residential	High Density Residential	Mixed Use Industrial	Resort, Recreation & Open Space	Suburban Density Residential	Rural Residential
	Commercial / Trade	Industrial	Mixed Use Residential		Transportation, Communications & Utilities	

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Instead of DUs being the unit of measure, commercial development was estimated in terms of square footage allowed for each land use type under the ordinance. The results of this process are shown in Table 5.2. Table 5.2 reveals that at Buildout the study area will approach 50,000 DUs. This value is used in the modeling process to estimate the number of trips originating in each TAZ with a residential component. Table 5.2 also shows an estimated 10,000 employees or jobs associated with approximately 800 acres of commercial development.

The base estimate of Buildout conditions prepared following this methodology was combined within a second table, comparing the population and employment estimates by TAZ established for the years 2009 and 2030 within the framework of the YMPO RTP. In most cases, Buildout values were greater than the existing 2009 and future 2030 values used for the YMPO Update. However, there were variances resulting from clear evidence of development displayed in aerials photographs and strict interpretation of the potential associated with stipulations of the zoning ordinance. A comparative table was submitted for review to County planning officials to permit local knowledge and understanding to give weight to the estimates. Some modifications were made, which substantiated the need to have and benefit from a local review.

Subsequent review and allocation of growth to support the modeling process required an update of the number of DUs used as the control total for Buildout conditions. During this process, it was determined that a substantial number of TAZs were already at Buildout. Assuming no major renewal action would remove and replace existing development, certain adjustments were necessary to assure a reliable estimate for existing conditions. Therefore, a physical rooftop count of dwelling units in the study area was undertaken by examining the latest available aerial photography. This count was used to verify the magnitude of estimates for each TAZ. Adjustments were made to the original 2009 estimates prepared for the RTP to attain an estimate for 2011.

Overall, the process followed provides a reasonable estimation of population and employment in the study area under existing and Buildout Conditions. Interim-year 2020 and 2030 forecasts were established by assuming 50 percent of the remaining developable land would be developed by 2020 and 75 percent would be developed by 2030. Growth was allocated first to developed TAZs with existing transportation and other infrastructure. There were a greater number of adjustments made with respect to the commercial development; however, this would seem appropriate in that commercial development is less standardized, more sensitive to market dynamics, and perhaps requires more specific locational choices. The result of this process is shown in Table 5.3. Maps have been prepared depicting the projected future growth pattern of the study area. These maps are presented in the Technical Appendices.

TABLE 5.2
DERIVATION OF THE ESTIMATE OF BUILDOUT CONDITIONS

TAZ	Dwelling Units	Gross Commercial Acreage			Total	Employment (12 Emps/Ac)
		Commercial	Commercial / Residential (C-RC)	Commercial / Trade (C-CT)		
465	1,920	14.85	--	--	14.85	178
466	1,140	12.58	--	--	12.58	151
467	1,710	--	--	--	0.00	0
468	486	7.02	--	14.52	21.54	258
469	--	7.04	--	34.01	41.05	493
470	708	--	--	--	0.00	0
475	2,172	17.16	--	--	17.16	206
476	1,386	58.30	**	--	58.30	700
477	--	14.80	--	26.00	40.80	490
478	--	43.00	--	26.00	69.00	828
479	1,134	26.18	**	--	26.18	314
480	1,482	35.00	--	19.20	54.20	650
482	565	38.40	--	6.40	44.80	538
483	1,944	51.00	--	--	51.00	612
484	256	--	--	--	0.00	0
486	508	6.40	--	--	6.40	77
487	1,458	19.20	--	--	19.20	230
489	767	--	--	--	0.00	0
490	402	38.40	--	28.57	66.97	804
491	1,973	32.00	--	--	32.00	384
492	2,106	30.71	--	3.80	34.51	414
493	1,280	--	--	--	0.00	0
494	1,254	23.80	--	--	23.80	286
496	918	2.00	--	--	2.00	24
497	4,753	--	--	--	0.00	0
498	733	--	--	--	0.00	0
499	1,242	41.27	--	45.25	86.52	1,038
500	5,408	6.40	--	--	6.40	77
501	3,456	18.39	--	--	18.39	221
502	2,076	--	--	19.20	19.20	230
503	2,268	12.80	--	--	12.80	154
504	3,096	--	--	--	0.00	0
505	1,260	25.60	--	--	25.60	307
Total Study Area	49,861	582.30	0.00	222.95	805.25	9,663

** This area is fully developed with residential units and, therefore, counted in DUs.

Source:

Densities used to derive this table of values were taken from *Foothills Planning Area Background Study*, "Comprehensive Plan," and calibrated against actual ground conditions using Bing Maps. The general assumption was that 20% of the area is and will be devoted to roads and common areas and the lot coverage for one dwelling unit (based on the remaining area) is 50%.

Prepared by: Wilson & Company, 06/16/2011.

TABLE 5.3
COMPARISON OF 2011, 2020, 2030, AND BUILDOUT ESTIMATES
OF POPULATION AND EMPLOYMENT IN THE STUDY AREA

TAZ	Estimated 2011		Interim 2020 ⁽¹⁾		Interim 2030 ⁽²⁾		County Recommended ⁽³⁾	
	Population (DUs)	Employment	Population (DUs)	Employment	Population (DUs)	Employment	Population (DUs)	Employment
465	1,600	257	1,920	257	1,920	257	1,920	257
466	555	2	1,140	151	1,140	151	1,140	151
467	1,100	30	1,710	30	1,710	30	1,710	30
468	460	1	695	258	695	258	695	258
469	0	180	54	493	54	493	54	493
470	450	636	708	636	708	636	708	636
475	1,540	148	2,172	216	2,172	216	2,172	216
476	770	369	376	700	376	700	376	700
477	0	567	--	567	--	567	--	567
478	0	243	16	828	16	828	16	828
479	930	122	1,134	314	1,134	314	1,134	314
480	510	61	1,482	650	1,482	650	1,482	650
482	0	12	0	12	0	12	565	538
483	0	13	0	13	0	13	1,944	612
484	0	0	0	0	0	0	256	0
486	0	0	0	0	0	0	508	77
487	20	0	20	0	20	0	1,458	230
489	710	147	767	147	767	322	767	322
490	50	24	50	24	402	804	402	804
491	1,440	17	1,973	17	1,973	384	1,973	384
492	1,025	738	2,106	738	2,106	738	2,106	738
493	0	0	0	0	0	0	1,280	0
494	870	154	1,254	280	1,254	280	1,254	280
496	540	15	540	15	918	24	918	24
497	2,160	7	3,457	7	4,753	7	4,753	7
498	20	0	20	0	350	0	350	0
499	505	239	1,242	1,038	1,242	1,038	1,242	1,038
500	0	41	0	41	5,408	77	5,408	77
501	2,500	101	3,456	221	3,456	221	3,456	221
502	30	0	2,076	0	2,076	230	2,076	230
503	1,500	11	2,268	11	2,268	154	2,268	154
504	1,600	2	3,096	2	3,096	2	3,096	2
505	1,100	50	1,260	50	1,260	307	1,260	307
TOTAL	21,985	4,187	34,992	7,716	42,756	9,713	48,747	11,144

Prepared by: Wilson & Company, 08/25/2011.

Notes:

TAZ = Transportation Analysis Zone.

DUs = Dwelling Units, which provides an measure of development for a given area that can be translated into population (Persons/DU) for modeling purposes.

Source:

(1) YMPO Travel Demand Model 2009 Update

(2) Assumes 75% of the potential development will have occurred by 2030, if the TAZ is not fully developed prior to that time.

(3) Values derived through assessment of potential development with Buildout based on land use and zoning. **Bold** highlighting identifies values different from Estimated Buildout provided by Yuma

5.3 FUTURE ROADWAY FACILITIES

This section establishes the definition of the future roadway network to be the basis for testing network performance and evaluating potential deficiencies.

5.3.1 FUNCTIONAL CLASSIFICATION OF THE ROADWAY NETWORK

The functional classification of streets forming the base study area roadway network was depicted in Figure 4.1. Functional classification of roadways is a critical component of effective transportation planning. The functional classification designations adopted in the YMPO RTP guide future mobility and access decisions regarding the location and type of new facilities.

Functional classification of the roadway network is meant to establish a balance among the various facilities serving the community, assuring connectivity where it is needed and an acceptable level of accessibility to surrounding land uses. Thus, each physical roadway segment forming the E+C roadway network must be characterized by type and size, the purpose it serves, and how traffic is controlled. If appropriate, bridges necessary to establish connectivity also must be identified.

Definition of the E+C network also reflects overarching responsibilities for maintenance and operations, which are divided up between ADOT and Yuma County. As alternatives are developed, tested, and assessed, the current functional classification of roadways in the network will be assessed to ensure performance, system role, and classification are consistent. It is important to note that the local street system, which facilitates direct access to abutting properties, is not part of this transportation needs assessment.

5.3.2 YEARS 2020, 2030, AND BUILDOUT EXISTING-PLUS-COMMITTED ROADWAY NETWORK

The base future E+C roadway network is made up of varying types of facilities that provide a hierarchy of mobility and access. As development within the Foothills and Mesa Del Sol progresses, there will be an increase in the population and commercial activity. The roadway network must change and grow, as appropriate, to meet additional travel demands. The roadway network of the study area and its capacity to move automobile and truck traffic must increase to accommodate increasing traffic volumes, particularly on major arterial facilities. Due to the high concentration of traffic in certain sectors of the study area and the role of I-8 to support interstate travel, the timing and adequacy of street improvements are critical. In addition, the central nature of I-8 and its major role as a high-capacity, east-west travel corridor creates a potential need for additional capacity on arterial and collector roadways.

5.4 TRANSIT SERVICE EXPANSION POTENTIAL

As noted earlier, YCAT provides public transportation to the citizens of the Greater Yuma Area. Both the YCAT service and DAR/ADA service are administered and funded by the YMPO. YMPO owns all transit service vehicles and leases the transit system maintenance facility at East 14th Street and South Atlantic Avenue. The system is operated under a private contract with First Transit, which resides in and operates the

maintenance center. As discussed earlier, it is anticipated that YCIPTA will assume administration of transit services after anticipated grantee status in June/July 2012.

5.4.1 FORECAST DEMAND

The YMPO 2033 RTP identifies a level of need for local and regional transit services in Yuma County. The need was determined through the use of three transit demand forecasting models. The results of applying the three models are presented in Table 5.4.

**TABLE 5.4
POPULATION GROWTH AND TRANSIT DEMAND FORECAST**

	2000	2033
Population Growth Projection		
Elderly (Above Age 60)	33,855 ⁽¹⁾	67,356 ⁽²⁾
Disabled (Below Age 60)	149,687 ⁽¹⁾	297,810 ⁽²⁾
Poverty (Below Age 60)	157,758 ⁽¹⁾	313,868 ⁽²⁾
Annual Trip Demand Forecast		
Ridership	341,300	679,034
APTNA Model	4,136,009	8,228,799
Peterson & Smith Model	3,276,025	6,517,817
Elderly & Disabled Model	10,382,910	20,657,325

(1) U.S. Census Bureau.

(2) 2033 Population calculated by extrapolating 2000 figures, based on projected growth identified by the Yuma Metropolitan Planning Organization (YMPO) for the period 2000-2033.

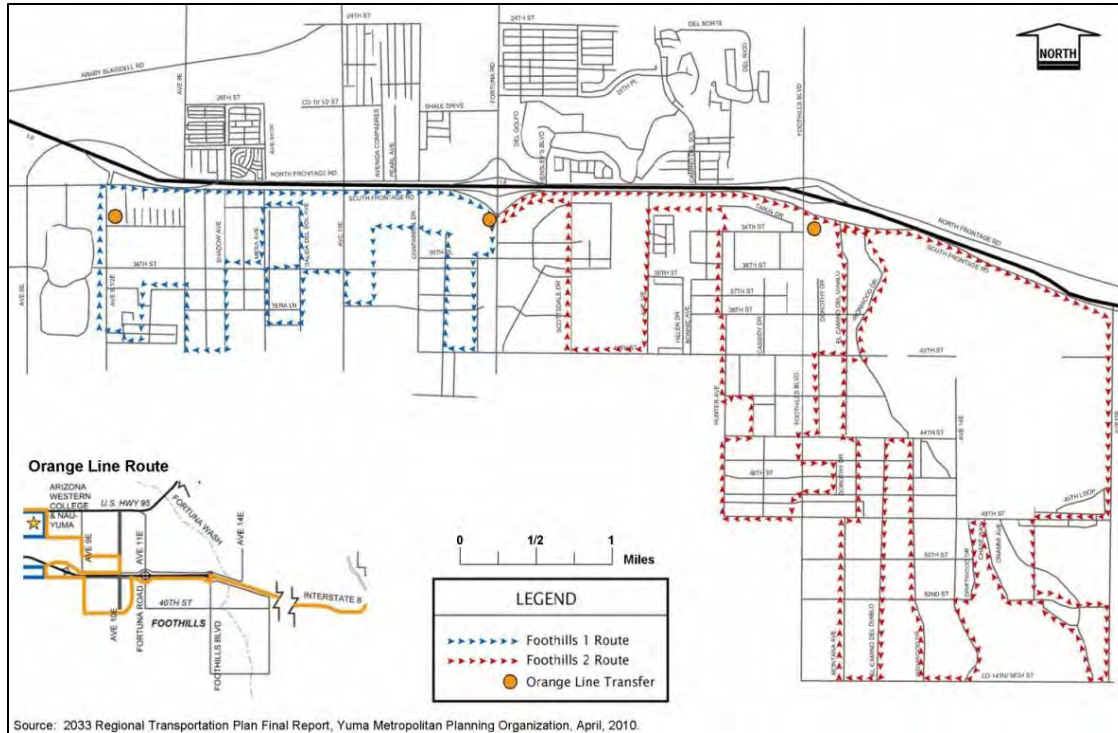
Source: Table II-14, 20333 Regional Transportation Plan

5.4.2 PROPOSED SERVICE IMPROVEMENTS

The YMPO RTP Update, finalized April, 2010, contains short-term and long-range plans for improving the regional transit system. Despite extreme actions undertaken in August, 2010, as noted earlier, these plans offer a reasonable roadmap for future transit services subsequent to recovery of the local economy from the recent recession. Operational recommendations in the two plans offer incremental service improvements, which can be reevaluated and adjusted according to the level of success of each plan to ensure transit service effectiveness in the long term.

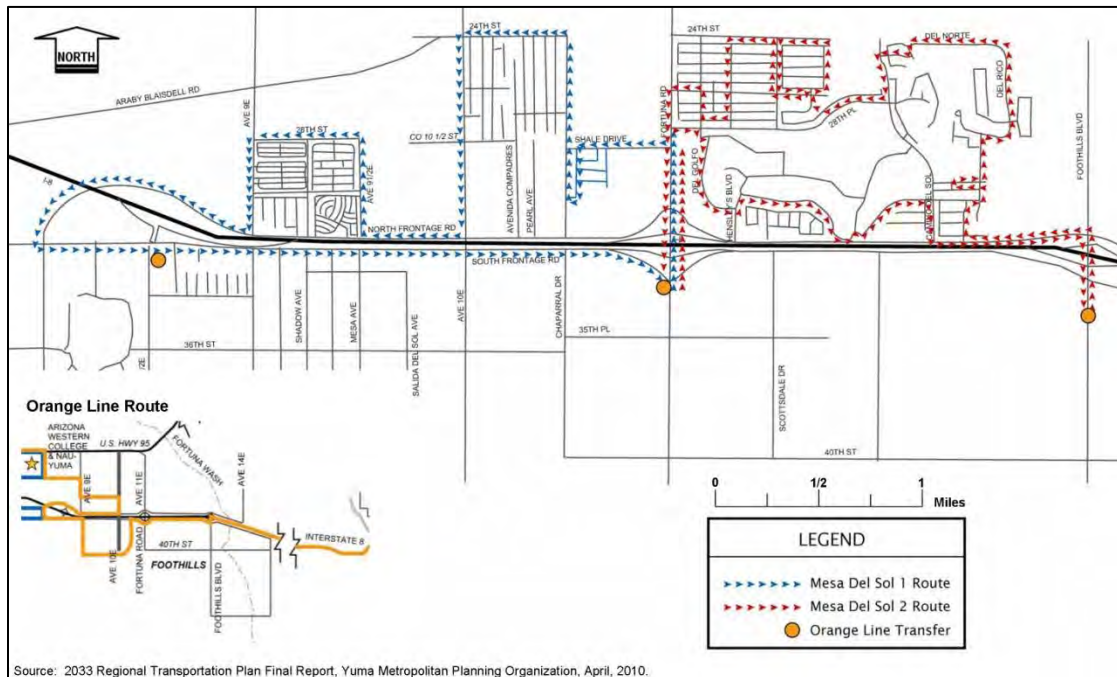
The recommended RTP improvements in the short-term plan include two routes operating in the Foothills and two routes serving the Mesa Del Sol area, as shown in Figures 5.3 and 5.4. The RTP recognizes these routes are preliminary and can be implemented one at a time as funding becomes available and priorities are established.

**FIGURE 5.3
PLANNED FUTURE FOOTHILLS CIRCULATOR ROUTES**



Source: 2033 Regional Transportation Plan Final Report, Yuma Metropolitan Planning Organization, April, 2010.

**FIGURE 5.4
PLANNED FUTURE MESA DEL SOL CIRCULATOR ROUTES**



Source: 2033 Regional Transportation Plan Final Report, Yuma Metropolitan Planning Organization, April, 2010.

5.5 PROPOSED BICYCLE AND PEDESTRIAN FACILITIES

The YMPO RTP recognizes that non-motorized transportation modes can reduce congestion and enhance mobility within the region. Thus, there is an objective to create bicycle- and pedestrian-friendly facilities to provide transportation choices.

5.5.1 PEDESTRIAN ACCOMMODATIONS

The YMPO RTP cites the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities as the source for facility design to accommodate pedestrian travel. Along arterials not in a central business district (CBD), the Guide recommends sidewalk widths of six to eight feet with a buffer strip provided between the sidewalk and the curb. The buffer strip would be developed with indigenous, drought-tolerant landscaping and various hardscape elements (e.g., pavers, furniture, etc.). Sidewalk widths of eight to ten feet are desirable in locations where the sidewalk is flush against the curb. The recommended design parameters for the buffer is two to four feet along local or collector streets and five to six feet along arterial or major streets. The following improvement goals are applicable to new facilities identified through this needs assessment:

- Provide a system that connects residential origin points with regional destination points.
- Identify the need for sidewalks or sidewalk upgrades along major and minor arterials in urban areas.
- Encourage the coordination of pedestrian facilities with public transit.
- Coordinate with area schools to establish Safe Routes to School.
- Incorporate local standards for pedestrian facilities as appropriate.

5.5.2 BICYCLE ACCOMMODATIONS

The YMPO RTP identifies goals and actions “...to establish a system of linear facilities and nodes that will provide for safe and convenient travel in the YMPO region.” The recommendations for new facilities build on existing plans and facilities. The following improvement actions are applicable to new facilities identified through this needs assessment:

- Connect the Foothills with downtown Yuma and regional shopping centers by supporting City of Yuma plans.
- Provide a continuous route from the Foothills area to the border in San Luis. This should be in the form of shared use paths or bike lanes.
- Coordinate bicycle facilities with public transit.
- Connect to alternative transportation modes with nodes in San Luis, Foothills, Wellton, Somerton, and Yuma Palms Center. A node shall provide parking, water, bike lockers, and other amenities, as deemed appropriate.
- Incorporate national standards for bicycle facilities, as appropriate.

5.6 TRAVEL DEMAND ANALYSIS

The purpose of this section is to present the travel forecasts for future roadway networks. Future year traffic forecasts were developed for the study area using the travel demand model, as described in Section 5.2. Output from the travel demand model permits evaluation and analysis of roadway segments.

Information presented includes Year 2020, Year 2030, and Buildout traffic assignments on the Existing Plus Committed (E+C) base networks. These assignments are based on the corresponding projections of households and employment. Travel demand model assignments have been developed to reveal where future deficiencies may exist, if additional improvements are not implemented beyond those defined by the E+C roadway network. The assignments also provide a basis for testing and evaluating different network improvement scenarios, which will be the subject Chapter 6.

5.6.1 YEAR 2020 TRAFFIC FORECASTS AND NETWORK PERFORMANCE


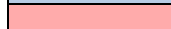
Table 5.5 provides a detailed comparison of Year 2020 forecast volumes to roadway capacity for key study area roadway segments. Figure 5.5 depicts Year 2020 traffic forecasts throughout the study area. Figure 5.6 shows the expected performance of the E+C roadway network in Year 2020, reflecting the results shown in Table 5.5. Forecast traffic volumes will be at or exceeding the capacity of the following facilities:

- I-8 North Frontage Road between South Avenue 10E and South Foothills Boulevard
- I-8 South Frontage Road between South Fortuna Road and South Foothills Boulevard
- I-8 South Frontage Road between South Avenue 14E and South Avenue 15E
- East 40th Street/East County 12th Street between South Fortuna Road and South Avenue 12E
- East 48th Street/East County 13th Street between South Foothills Boulevard and South Avenue 15E
- East 56th Street/East County 14th Street between South Foothills Boulevard & South Avenue 15E
- South Fortuna Road between the I-8 frontage roads
- South Foothills Boulevard between the I-8 frontage roads
- South Foothills Boulevard between East 40th Street/East County 12th Street and East 56th Street/East County 14th Street
- South Avenue 15E between the I-8 South Frontage Road and East 48th Street/East County 13th Street.

TABLE 5.5
NETWORK PERFORMANCE: YEAR 2020
E+C ROADWAY NETWORK

Road Name	From	To	Lanes	Class	Lane Capacity	Daily Volume	Capacity	v/c Ratio	LOS
East-West Facilities									
N Frontage Rd	Avenue 10 E	Fortuna Rd	2	Collector	6,700	15,700	13,400	1.17	F
N Frontage Rd	Fortuna Rd	Foothills Blvd	2	Collector	6,700	12,400	13,400	0.93	E
N Frontage Rd	Foothills Blvd	Avenue 14 E	2	Minor Collector	5,400	6,300	10,800	0.58	B
I-8 Westbound	Avenue 10 E	Fortuna Rd	2	Interstate	21,300	34,500	42,600	0.81	D
I-8 Westbound	Fortuna Rd	Foothills Blvd	2	Interstate	21,300	32,000	42,600	0.75	D
I-8 Westbound	Foothills Blvd	Avenue 15 E	2	Interstate	21,300	16,400	42,600	0.38	A
I-8 Eastbound	Avenue 10 E	Fortuna Rd	2	Interstate	21,300	36,000	42,600	0.85	E
I-8 Eastbound	Fortuna Rd	Foothills Blvd	2	Interstate	21,300	32,000	42,600	0.75	D
I-8 Eastbound	Foothills Blvd	Avenue 15 E	2	Interstate	21,300	16,400	42,600	0.38	A
S Frontage Rd	Avenue 10 E	Fortuna Rd	2	Minor Arterial	9,000	10,900	18,000	0.61	B
S Frontage Rd	Fortuna Rd	Foothills Blvd	2	Collector	6,700	15,700	13,400	1.17	F
S Frontage Rd	Foothills Blvd	Avenue 14 E	2	Minor Collector	5,400	8,000	10,800	0.74	D
S Frontage Rd	Avenue 14 E	Avenue 15 E	2	Minor Collector	5,400	12,100	10,800	1.12	F
40th St/Co 12th St	Avenue 10 E	Fortuna Rd	2	Major Collector	7,000	7,000	14,000	0.50	A
40th St/Co 12th St	Fortuna Rd	Avenue 12E	2	Collector	6,700	14,900	13,400	1.11	F
40th St/Co 12th St	Avenue 12E	Foothills Blvd	4	Minor Arterial	9,000	23,000	36,000	0.64	C
40th St/Co 12th St	Foothills Blvd	Avenue 14 E	2	Collector	6,700	12,300	13,400	0.92	E
40th St/Co 12th St	Avenue 14 E	Avenue 15 E	2	Collector	6,700	2,900	13,400	0.22	A
48th St/Co 13th St	Fortuna Rd	Foothills Blvd	2	Collector	6,700	1,400	13,400	0.10	A
48th St/Co 13th St	Foothills Blvd	Avenue 14 E	2	Collector	6,700	16,400	13,400	1.22	F
48th St/Co 13th St	Avenue 14 E	Avenue 15 E	2	Collector	6,700	15,300	13,400	1.14	F
56th St/Co 14th St	Foothills Blvd	Avenue 14 E	2	Major Collector	7,000	12,500	14,000	0.89	E
56th St/Co 14th St	Avenue 14 E	Avenue 15 E	2	Major Collector	7,000	11,100	14,000	0.79	D
North-South Facilities									
Avenue 10 E	S Frontage Rd	CO 12th	2	Major Collector	7,000	7,500	14,000	0.54	B
Fortuna Rd	E County 10 St	N Frontage Rd	4	Minor Arterial	9,000	22,200	36,000	0.62	C
Fortuna Rd	N Frontage Rd	S Frontage Rd	4	Minor Arterial	9,000	34,100	36,000	0.95	E
Fortuna Rd	S Frontage Rd	40th St/ Co 12th St	4	Minor Arterial	9,000	22,900	36,000	0.64	C
Foothills Blvd	N Frontage Rd	S Frontage Rd	4	Minor Arterial	9,000	43,700	36,000	1.21	F
Foothills Blvd	S Frontage Rd	40th St/Co 12th St	4	Minor Arterial	9,000	27,800	36,000	0.77	D
Foothills Blvd	48th St/Co 13th St	40th St/Co 12th St	4	Minor Arterial	9,000	32,900	36,000	0.91	E
Foothills Blvd	56th St/Co 14th St	48th St/Co 13th St	2	Collector	6,700	16,900	13,400	1.26	F
Avenue 14 E	56th St/Co 14th St	48th St/Co 13th St	2	Collector	6,700	4,600	13,400	0.34	A
Avenue 15 E	S Frontage Rd	40th St/Co 12th St	2	Collector	6,700	12,600	13,400	0.94	E
Avenue 15 E	48th St/Co 13th St	40th St/Co 12th St	2	Collector	6,700	16,700	13,400	1.25	F
Avenue 15 E	56th St/Co 14th St	48th St/Co 13th St	2	Collector	6,700	9,200	13,400	0.69	C

Prepared by Wilson & Company, November 2011.

 Indicates segments operating at LOS E
 Indicates segments operating at LOS F

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FIGURE 5.5
STUDY AREA TRAFFIC FORECASTS: YEAR 2020 E + C ROADWAY NETWORK

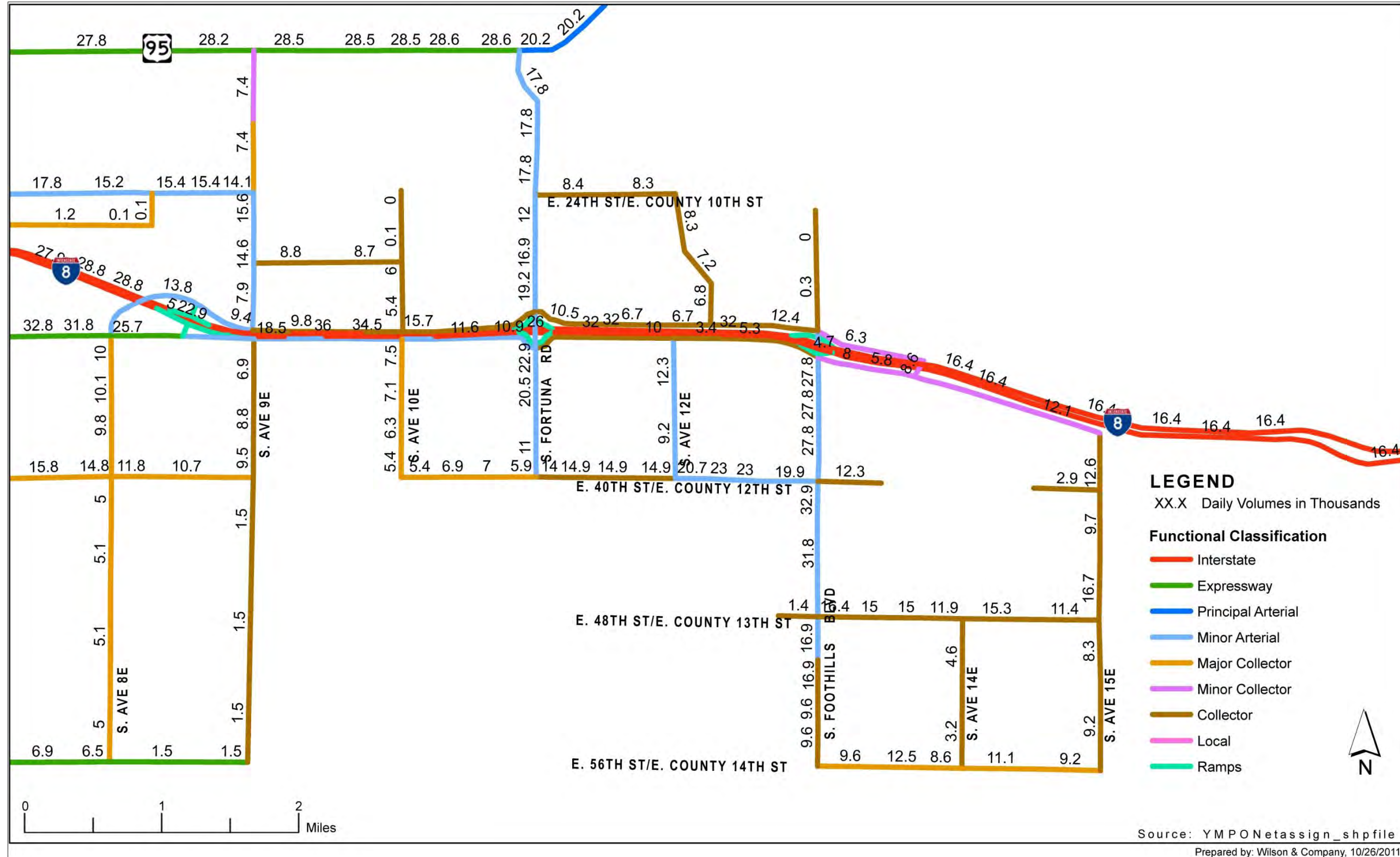
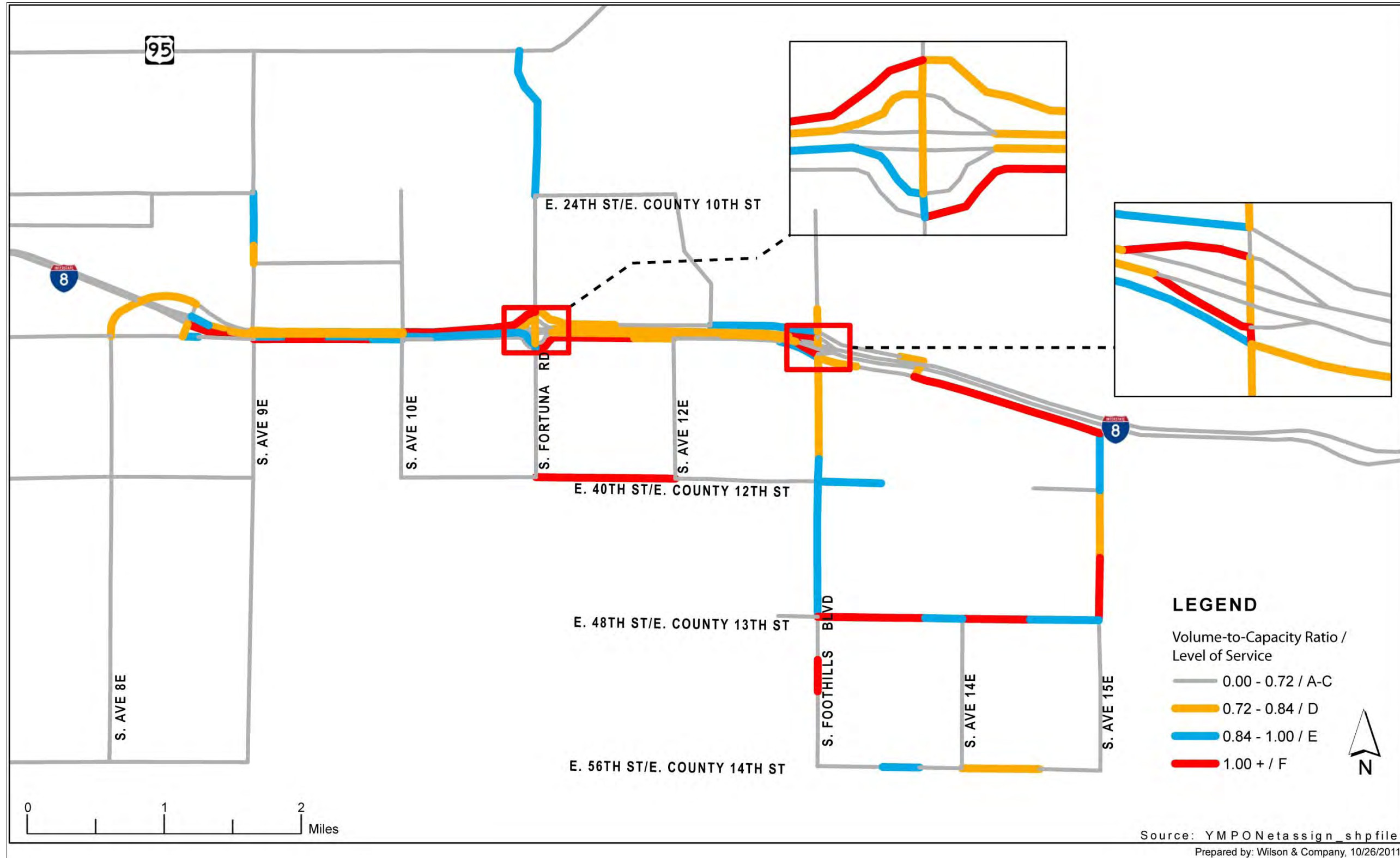


FIGURE 5.6
STUDY AREA NETWORK PERFORMANCE: YEAR 2020 E + C ROADWAY NETWORK



5.6.2 YEAR 2030 TRAFFIC FORECASTS AND NETWORK PERFORMANCE

Table 5.6 provides a comparison of Year 2030 forecast volumes to the capacity of key study area roadway segments. Figure 5.7 depicts Year 2030 traffic forecasts throughout the study area. Figure 5.8 shows the expected performance of the E+C roadway network in Year 2030, reflecting the results shown in Table 5.6.

Forecast traffic volumes will be at or exceeding the capacity of the following facilities:

- I-8 North Frontage Road between South Avenue 10E and South Avenue 14E
- I-8 South Frontage Road between South Fortuna Road and South Avenue 15E
- East 40th Street/East County 12th Street between South Fortuna Road and South Avenue 12E
- East 48th Street/East County 13th Street between South Fortuna Road and South Avenue 15E
- East 56th Street/East County 14th Street between South Foothills Boulevard and South Avenue 15E
- South Fortuna Road between the I-8 frontage roads
- South Fortuna Road between East 40th Street/East County 12th Street and East 48th Street/East County 13th Street
- South Foothills Boulevard between the north and south frontage roads
- South Foothills Boulevard between East 40th Street/East County 12th Street and East 56th Street/East County 14th Street
- South Avenue 15E between the I-8 South Frontage Road and East 56th Street/East County 14th Street.

TABLE 5.6
NETWORK PERFORMANCE: YEAR 2030
E+C ROADWAY NETWORK

Road Name	From	To	Lanes	Class	Lane Capacity	Daily Volume	Capacity	v/c Ratio	LOS
East-West Facilities									
N Frontage Rd	Avenue 10 E	Fortuna Rd	2	Collector	6,700	18,100	13,400	1.35	F
N Frontage Rd	Fortuna Rd	Foothills Blvd	2	Collector	6,700	12,400	13,400	0.93	E
N Frontage Rd	Foothills Blvd	Avenue 14 E	2	Minor Collector	5,400	9,900	10,800	0.92	E
I-8 Westbound	Avenue 10 E	Fortuna Rd	2	Interstate	21,300	38,100	42,600	0.89	E
I-8 Westbound	Fortuna Rd	Foothills Blvd	2	Interstate	21,300	34,500	42,600	0.81	D
I-8 Westbound	Foothills Blvd	Avenue 15 E	2	Interstate	21,300	19,400	42,600	0.46	A
I-8 Eastbound	Avenue 10 E	Fortuna Rd	2	Interstate	21,300	39,700	42,600	0.93	E
I-8 Eastbound	Fortuna Rd	Foothills Blvd	2	Interstate	21,300	34,600	42,600	0.81	D
I-8 Eastbound	Foothills Blvd	Avenue 15 E	2	Interstate	21,300	19,400	42,600	0.46	A
S Frontage Rd	Avenue 10 E	Fortuna Rd	2	Minor Arterial	9,000	11,700	18,000	0.65	C
S Frontage Rd	Fortuna Rd	Foothills Blvd	2	Major Collector	6,700	13,700	14,000	0.98	E
S Frontage Rd	Foothills Blvd	Avenue 14 E	2	Minor Collector	5,400	9,900	10,800	0.92	E
S Frontage Rd	Avenue 14 E	Avenue 15 E	2	Minor Collector	5,400	16,200	10,800	1.50	F
40th St/Co 12th St	Avenue 10 E	Fortuna Rd	2	Major Collector	7,000	8,300	14,000	0.59	B
40th St/Co 12th St	Fortuna Rd	Avenue 12 E	2	Major Collector	7,000	13,700	14,000	0.98	E
40th St/Co 12th St	Avenue 12 E	Foothills Blvd	4	Minor Arterial	9,000	23,200	36,000	0.64	C
40th St/Co 12th St	Foothills Blvd	Avenue 14 E	2	Collector	6,700	10,900	13,400	0.81	D
40th St/Co 12th St	Avenue 14 E	Avenue 15 E	2	Collector	6,700	1,600	13,400	0.12	A
48th St/Co 13th St	Fortuna Rd	Foothills Blvd	2	Collector	6,700	13,300	13,400	0.99	E
48th St/Co 13th St	Foothills Blvd	Avenue 14 E	2	Collector	6,700	13,700	13,400	1.02	F
48th St/Co 13th St	Avenue 14 E	Avenue 15 E	2	Collector	6,700	22,200	13,400	1.66	F
56th St/Co 14th St	Foothills Blvd	Avenue 14 E	2	Major Collector	7,000	16,900	14,000	1.21	F
56th St/Co 14th St	Avenue 14 E	Avenue 15 E	2	Major Collector	7,000	15,400	14,000	1.10	F
North-South Facilities									
Avenue 10 E	S Frontage Rd	CO 12th	2	Major Collector	7,000	8,800	14,000	0.63	C
Fortuna Rd	County 10th E	N Frontage Rd	4	Minor Arterial	9,000	21,500	36,000	0.60	B
Fortuna Rd	N Frontage Rd	S Frontage Rd	4	Minor Arterial	9,000	36,600	36,000	1.02	F
Fortuna Rd	S Frontage Rd	40th St/Co 12th St	4	Minor Arterial	9,000	25,200	36,000	0.70	C
Fortuna Rd	40th St/Co 12th St	48th St/Co 13th St	2	Collector	6,700	13,400	13,400	1.00	E
Foothills Blvd	N Frontage Rd	S Frontage Rd	4	Minor Arterial	9,000	45,400	36,000	1.26	F
Foothills Blvd	S Frontage Rd	40th St/Co 12th St	4	Minor Arterial	9,000	28,300	36,000	0.79	D
Foothills Blvd	40th St/Co 12th St	48th St/Co 13th St	4	Minor Arterial	9,000	30,600	36,000	0.85	E
Foothills Blvd	48th St/Co 13th St	56th St/Co 14th St	2	Collector	6,700	21,500	13,400	1.60	F
Avenue 14 E	48th St/Co 13th St	56th St/Co 14th St	2	Collector	6,700	8,200	13,400	0.61	C
Avenue 15 E	S Frontage Rd	40th St/Co 12th St	2	Collector	6,700	22,900	13,400	1.71	F
Avenue 15 E	40th St/Co 12th St	48th St/Co 13th St	2	Collector	6,700	28,200	13,400	2.10	F
Avenue 15 E	48th St/Co 13th St	56th St/Co 14th St	2	Collector	6,700	15,400	13,400	1.15	F

Prepared by Wilson & Company, November 2011.

	Indicates segments operating at LOS E
	Indicates segments operating at LOS F

FIGURE 5.7
STUDY AREA TRAFFIC FORECASTS: YEAR 2030 E + C ROADWAY NETWORK

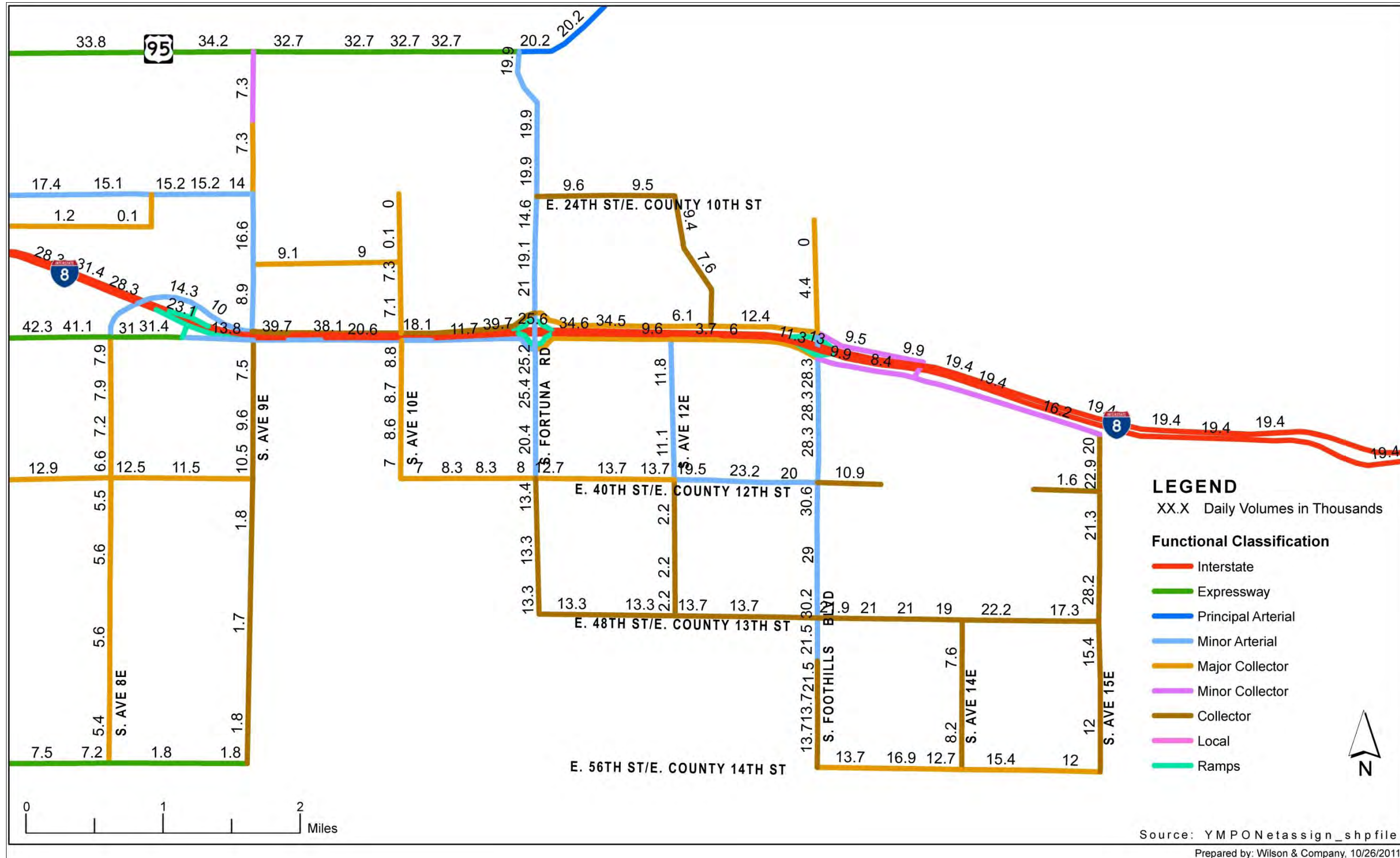
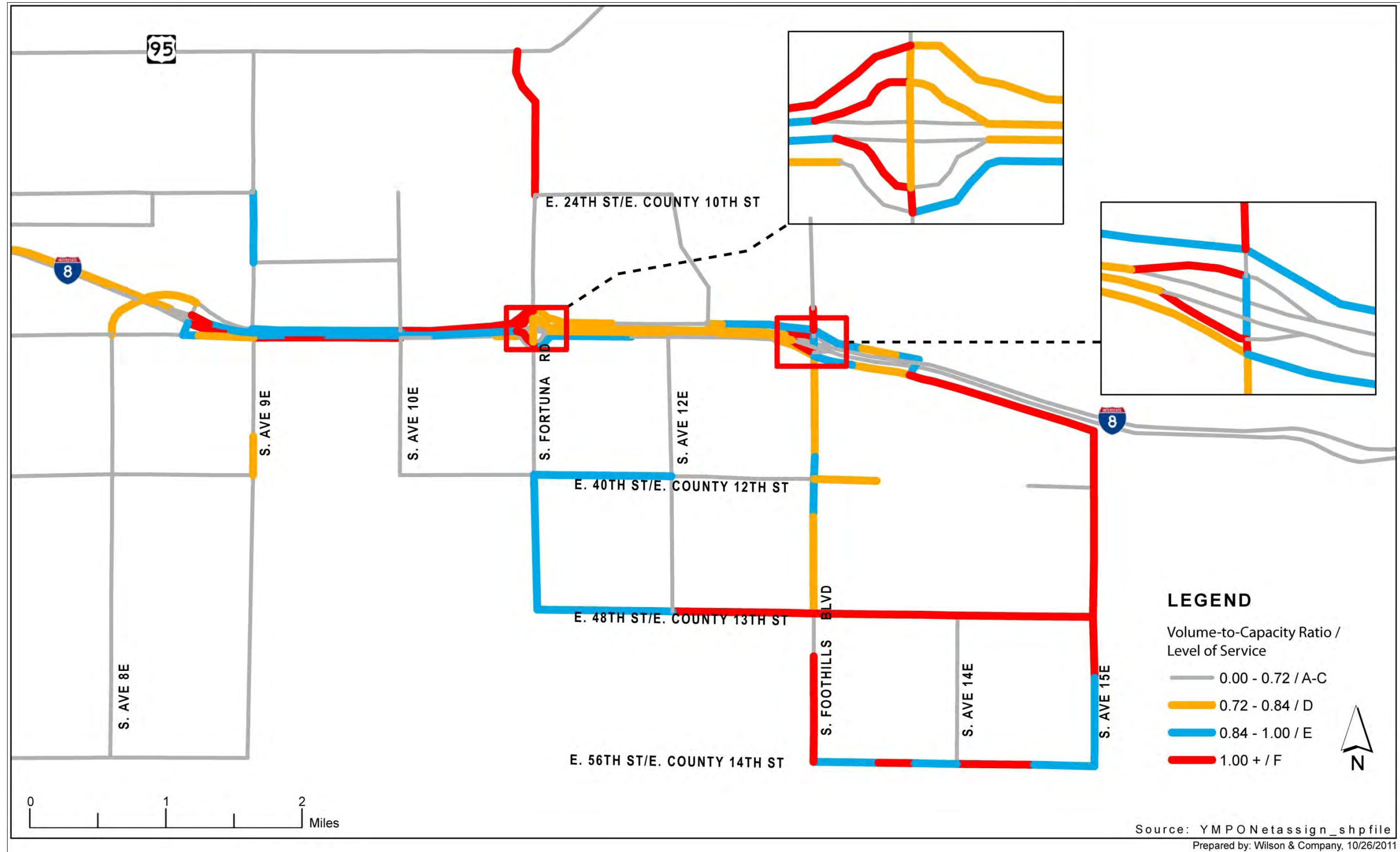


FIGURE 5.8
STUDY AREA NETWORK PERFORMANCE: YEAR 2030 E + C ROADWAY NETWORK



5.6.3 BUILDOUT TRAFFIC FORECASTS & NETWORK PERFORMANCE

Table 5.7 compares forecast Buildout volumes to the roadway capacity of key study area roadway segments. Figure 5.9 depicts Buildout traffic forecasts throughout the study area. Figure 5.10 shows the expected performance of the E+C roadway network at Buildout, reflecting the results shown in Table 5.7.

Forecast traffic volumes will be at or exceeding the capacity of the following facilities:

- I-8 North Frontage Road between South Avenue 10E and South Fortuna Road
- South Frontage Road between South Avenue 10E and South Avenue 14E
- East 40th Street/East County 12th Street between Avenue 10E and South Fortuna Road
- East 40th Street/East County 12th Street between South Foothills Boulevard and South Avenue 14E
- East 48th Street/East County 13th Street between South Foothills Boulevard and South Avenue 15E
- East 56th Street/East County 14th Street between South Avenue 10E and South Fortuna Road
- East 56th Street/East County 14th Street between South Foothills Boulevard and South Avenue 14E
- South Fortuna Road between the I-8 frontage roads
- South Foothills Boulevard between the I-8 frontage roads
- South Avenue 15E between South Frontage Road and CO 13th Street

In addition to the segment-based capacity analysis performed for the Buildout condition, a detailed analysis of peak-hour intersection operations also was conducted. Daily segment volumes from the Buildout travel demand model were used to calculate AM (morning) and PM (late afternoon-evening) peak-hour entry and exit volumes at each study area intersection using assumptions for peak hour (k) and directional distribution (D) factors. The 'k' and 'D' factors were calculated from existing turning movement counts and segment counts. For cases where segment counts were missing, an average of all the known 'k' factors was calculated to arrive at a six percent k-factor for AM and PM conditions. The resulting volumes and existing turning movement counts at each intersection were used to estimate future turning movements based on methodologies published in the National Cooperative Highway Research Program (NHCPR) Report 255, Highway Traffic Data for Urbanized Area Project Planning and Design, published by the Transportation Research Board (TRB). A consistency check was performed to ensure estimated Buildout turning-movement volumes were equal to or higher than existing turning movement counts. Finally, the Buildout turning-movement volumes were adjusted to minimize volume differences between adjacent intersections.

TABLE 5.7
NETWORK PERFORMANCE: BUILDOUT
E+C ROADWAY NETWORK

Road Name	From	To	Lanes	Class	Lane Capacity	Daily Volume	Capacity	v/c Ratio	LOS
East-West Facilities									
N Frontage Rd	Avenue 10 E	Fortuna Rd	2	Minor Arterial	9,000	16,400	18,000	0.91	E
N Frontage Rd	Fortuna Rd	Foothills Blvd	2	Minor Arterial	9,000	12,700	18,000	0.71	C
N Frontage Rd	Foothills Blvd	Avenue 14E	2	Minor Collector	5,400	8,900	10,800	0.82	D
I-8 Westbound	Avenue 10 E	Fortuna Rd	2	Interstate	21,300	34,500	42,600	0.81	D
I-8 Westbound	Fortuna Rd	Foothills Blvd	2	Interstate	21,300	29,400	42,600	0.69	C
I-8 Westbound	Foothills Blvd	Avenue 15E	2	Interstate	21,300	17,000	42,600	0.40	A
I-8 Eastbound	Avenue 10 E	Fortuna Rd	2	Interstate	21,300	34,500	42,600	0.81	D
I-8 Eastbound	Fortuna Rd	Foothills Blvd	2	Interstate	21,300	29,600	42,600	0.69	C
I-8 Eastbound	Foothills Blvd	Avenue 15E	2	Interstate	21,300	17,000	42,600	0.40	A
S Frontage Rd	Avenue 10 E	Fortuna Rd	2	Minor Arterial	9,000	15,200	18,000	0.84	E
S Frontage Rd	Fortuna Rd	Foothills Blvd	2	Minor Arterial	9,000	15,100	18,000	0.84	E
S Frontage Rd	Foothills Blvd	Avenue 14E	2	Minor Collector	5,400	13,800	10,800	1.28	F
S Frontage Rd	Avenue 14E	Avenue 15E	2	Minor Collector	5,400	8,300	10,800	0.77	D
40th St/Co 12th St	Avenue 10 E	Fortuna Rd	2	Major Collector	7,000	13,000	14,000	0.93	E
40th St/Co 12th St	Fortuna Rd	Foothills Blvd	4	Minor Arterial	9,000	23,800	36,000	0.66	C
40th St/Co 12th St	Foothills Blvd	Avenue 14E	2	Collector	6,700	18,100	13,400	1.35	F
40th St/Co 12th St	Avenue 14E	Avenue 15E	2	Collector	6,700	10,000	13,400	0.75	D
48th St/Co 13th St	Fortuna Rd	Foothills Blvd	2	Minor Arterial	9,000	11,400	18,000	0.63	C
48th St/Co 13th St	Foothills Blvd	Avenue 14E	2	Minor Arterial	9,000	15,300	18,000	0.85	E
48th St/Co 13th St	Avenue 14E	Avenue 15E	2	Minor Arterial	9,000	16,600	18,000	0.92	E
56th St/Co 14th St	Avenue 10 E	Fortuna Rd	2	Minor Arterial	9,000	16,500	18,000	0.92	E
56th St/Co 14th St	Fortuna Rd	Foothills Blvd	2	Minor Arterial	9,000	11,200	18,000	0.62	C
56th St/Co 14th St	Foothills Blvd	Avenue 14E	2	Minor Arterial	9,000	16,200	18,000	0.90	E
56th St/Co 14th St	Avenue 14E	Avenue 15E	2	Minor Arterial	9,000	14,300	18,000	0.79	D
North-South Facilities									
Avenue 10 E	S Frontage Rd	40th St/Co 12th St	2	Major Collector	7,000	5,900	14,000	0.42	A
Fortuna Rd	E County 10th St	N Frontage Rd	4	Minor Arterial	9,000	26,600	36,000	0.74	D
Fortuna Rd	N Frontage Rd	S Frontage Rd	4	Minor Arterial	9,000	36,600	36,000	1.02	F
Fortuna Rd	S Frontage Rd	40th St/Co 12th St	4	Minor Arterial	9,000	28,100	36,000	0.78	D
Fortuna Rd	40th St/Co 12th St	48th St/Co 13th St	4	Minor Arterial	9,000	20,400	36,000	0.57	B
Fortuna Rd	48th St/Co 13th St	56th St/Co 14th St	2	Minor Arterial	9,000	7,800	18,000	0.43	A
Foothills Blvd	N Frontage Rd	S Frontage Rd	4	Minor Arterial	9,000	40,900	36,000	1.14	F
Foothills Blvd	S Frontage Rd	40th St/Co 12th St	4	Minor Arterial	9,000	24,200	36,000	0.67	C
Foothills Blvd	40th St/Co 12th St	48th St/Co 13th St	4	Minor Arterial	9,000	24,600	36,000	0.68	C
Foothills Blvd	48th St/Co 13th St	56th St/Co 14th St	4	Minor Arterial	9,000	13,200	36,000	0.37	A
Avenue 14E	S Frontage Rd	40th St/Co 12th St	2	Collector	6,700	10,400	13,400	0.78	D
Avenue 14E	48th St/Co 13th St	56th St/Co 14th St	2	Collector	6,700	3,400	13,400	0.25	A
Avenue 15E	S Frontage Rd	40th St/Co 12th St	2	Minor Arterial	9,000	15,800	18,000	0.88	E
Avenue 15E	40th St/Co 12th St	48th St/Co 13th St	2	Minor Arterial	9,000	17,700	18,000	0.98	E
Avenue 15E	48th St/Co 13th St	56th St/Co 14th St	2	Minor Arterial	9,000	11,000	18,000	0.61	C

Prepared by Wilson & Company, November 2011.

Indicates segments operating at LOS E
 Indicates segments operating at LOS F

FIGURE 5.9
STUDY AREA TRAFFIC FORECASTS: BUILDOUT E + C ROADWAY NETWORK

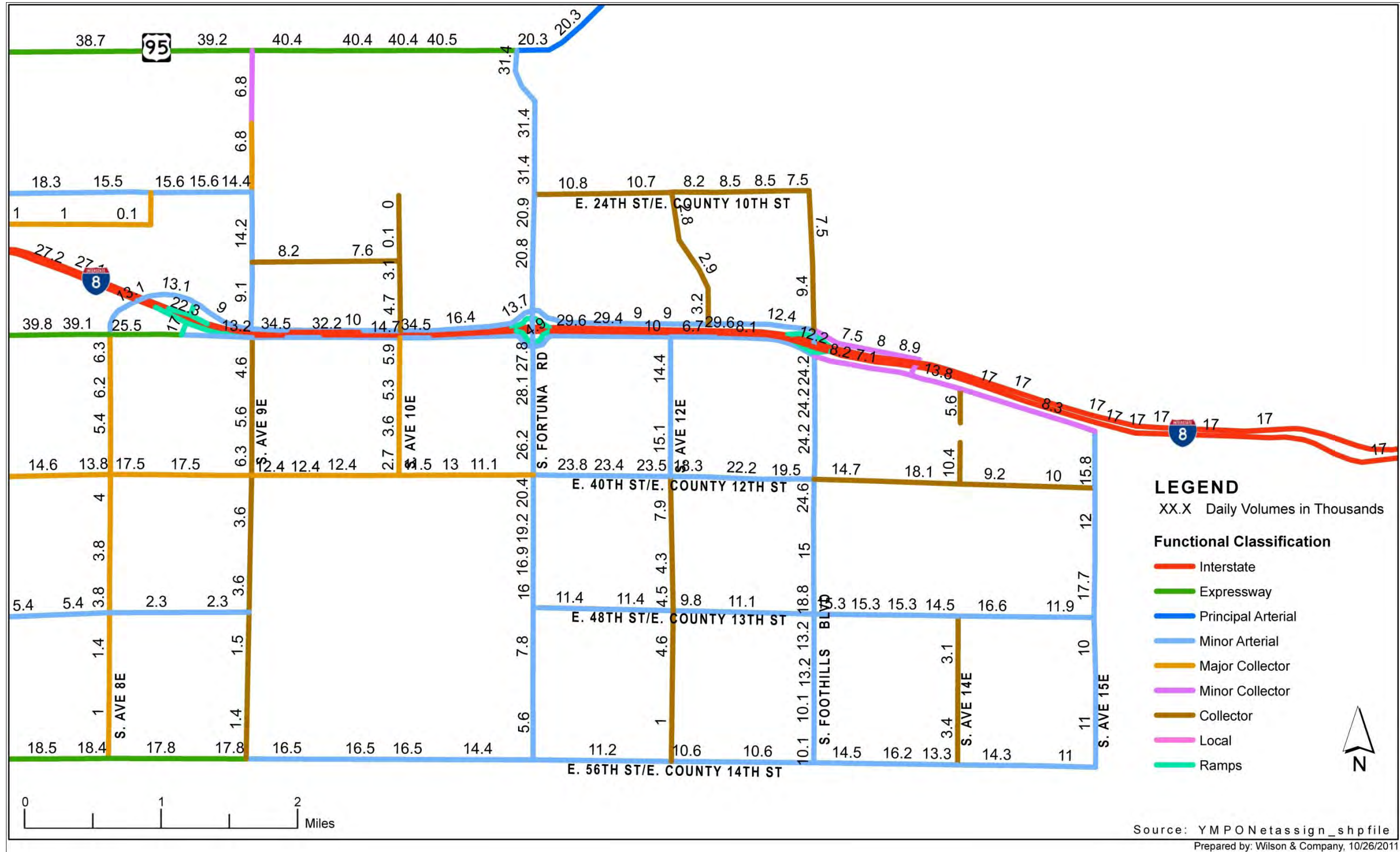
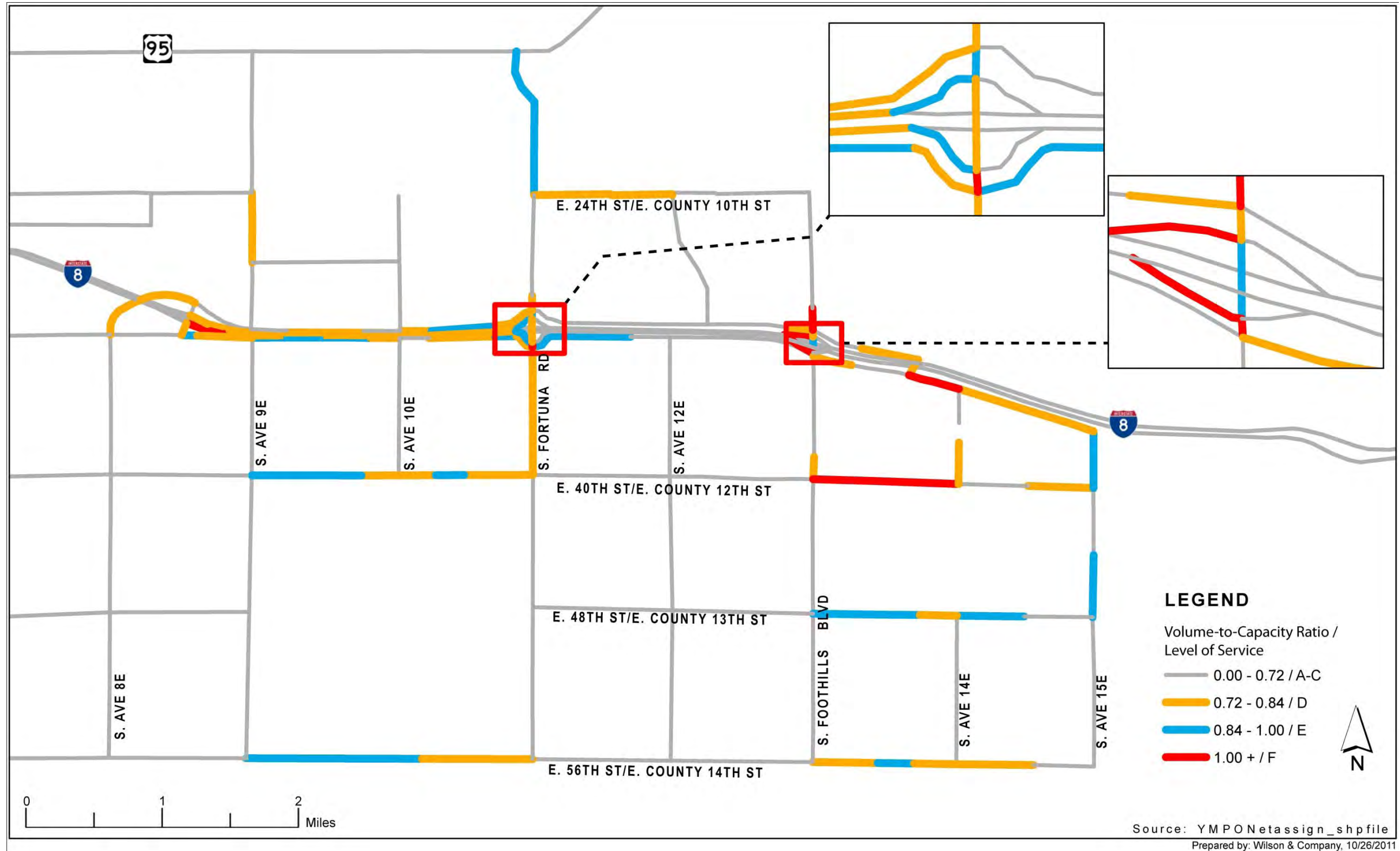


FIGURE 5.10
STUDY AREA NETWORK PERFORMANCE: BUILDOUT E + C ROADWAY NETWORK



The resulting turning-movement volumes are displayed in Figure 5.11. Table 5.8 provides a summary of anticipated level of service (LOS) at signalized intersections in the study area, while unsignalized intersection performance is documented in Table 5.9. As indicated in these tables, the following intersections are anticipated to operate with unacceptable LOS E or F delays:

- East 28th Street at South Fortuna Road (AM peak)
- I-8 North Frontage Road at South Fortuna Road (AM and PM peaks)
- I-8 South Frontage Road at South Fortuna Road (PM peak)
- East 40th Street/East County 12th Street at South Fortuna Road (AM and PM peaks)
- I-8 North Frontage Road at South Foothills Boulevard (AM and PM peaks)
- I-8 Eastbound On/Off Ramps at South Foothills Boulevard (AM and PM peaks)
- I-8 South Frontage Road at South Foothills Boulevard (AM and PM peaks)
- East 28th Street at South Camino Del Sol (AM and PM Peaks).

FIGURE 5.11
PEAK-HOUR INTERSECTION TURN MOVEMENTS: BUILDOUT E + C ROADWAY NETWORK

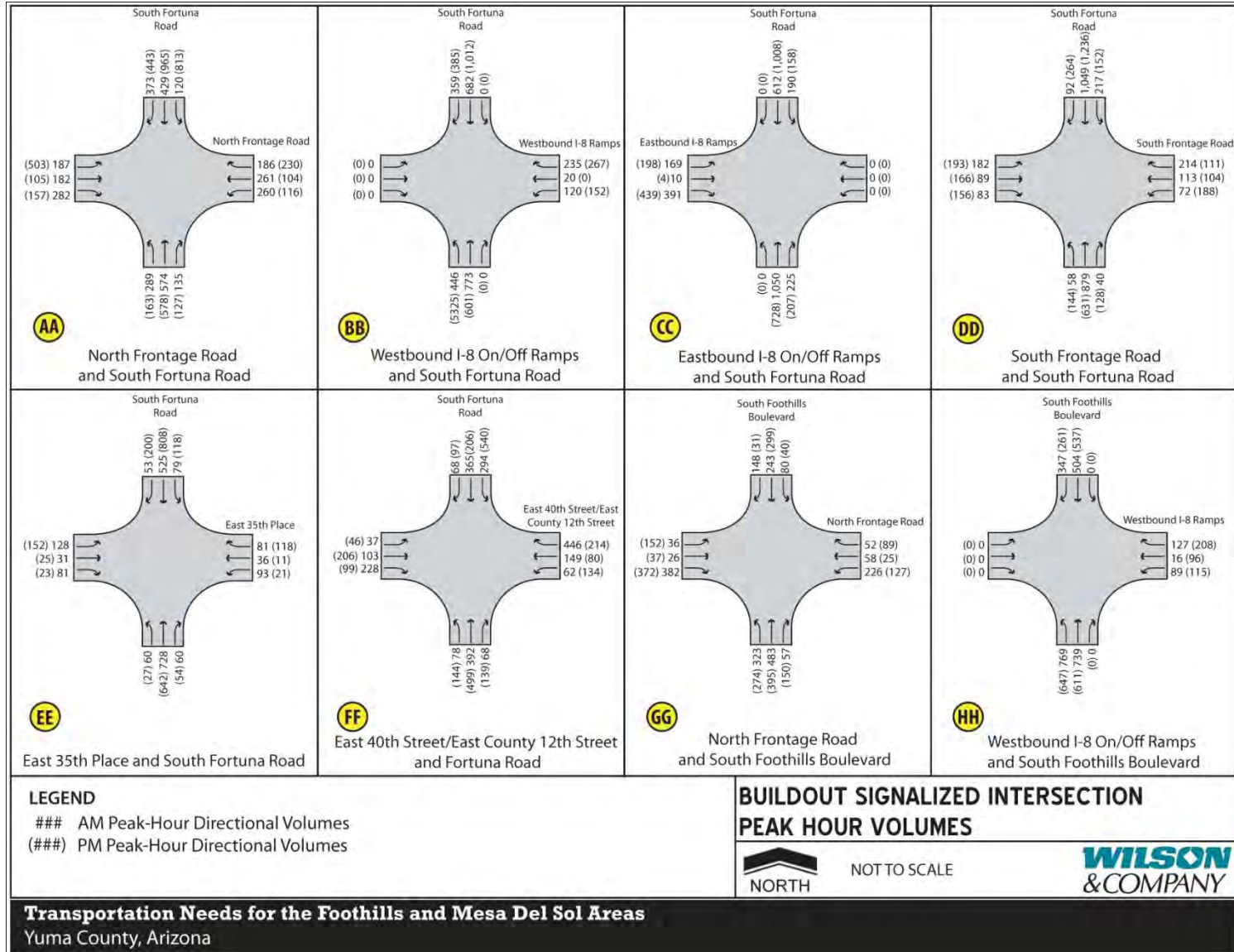


FIGURE 5.11 (CONT.)
PEAK-HOUR INTERSECTION TURN MOVEMENTS: BUILDOUT E + C ROADWAY NETWORK

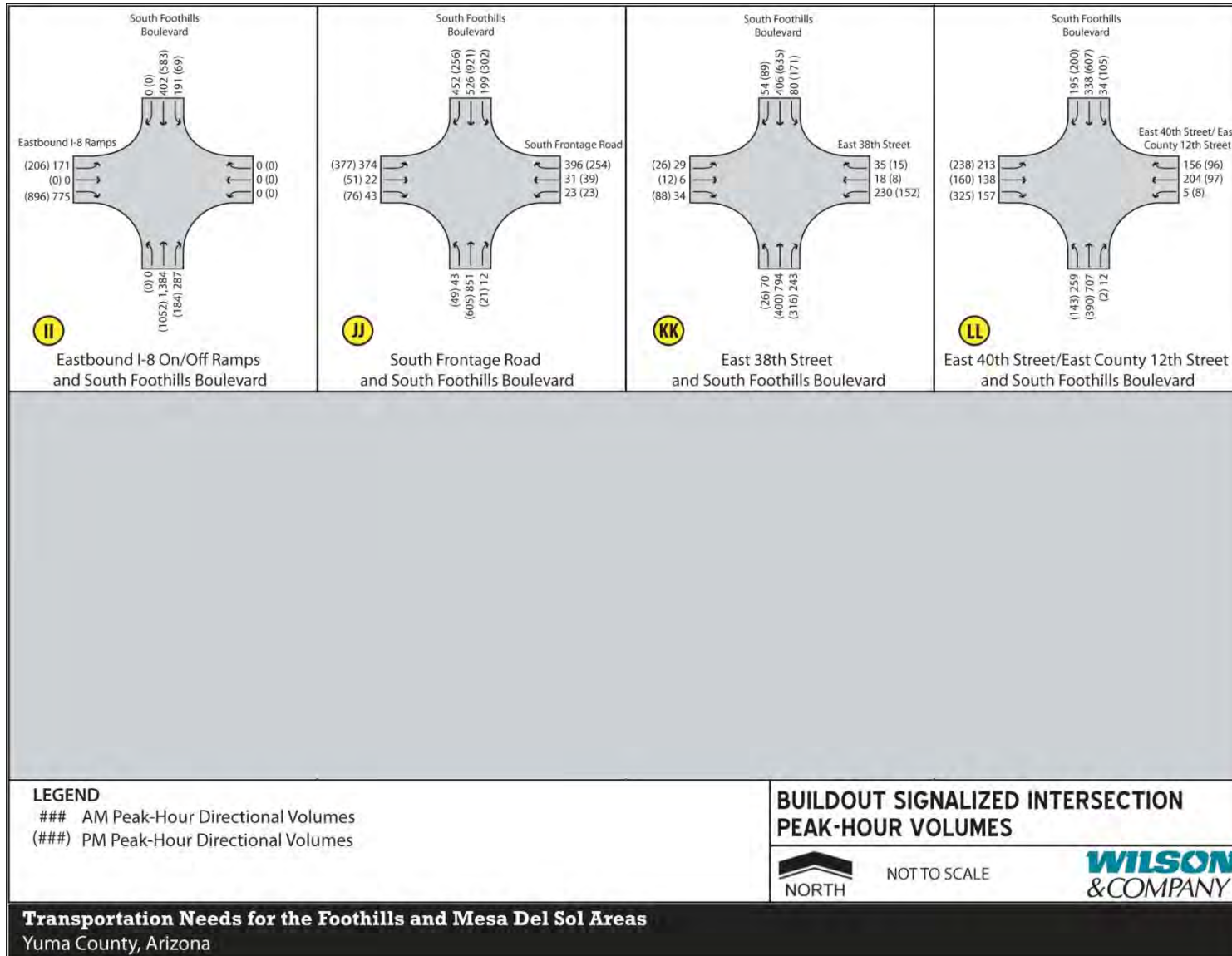


FIGURE 5.11 (CONT.)
PEAK-HOUR INTERSECTION TURN MOVEMENTS: BUILDOUT E + C ROADWAY NETWORK

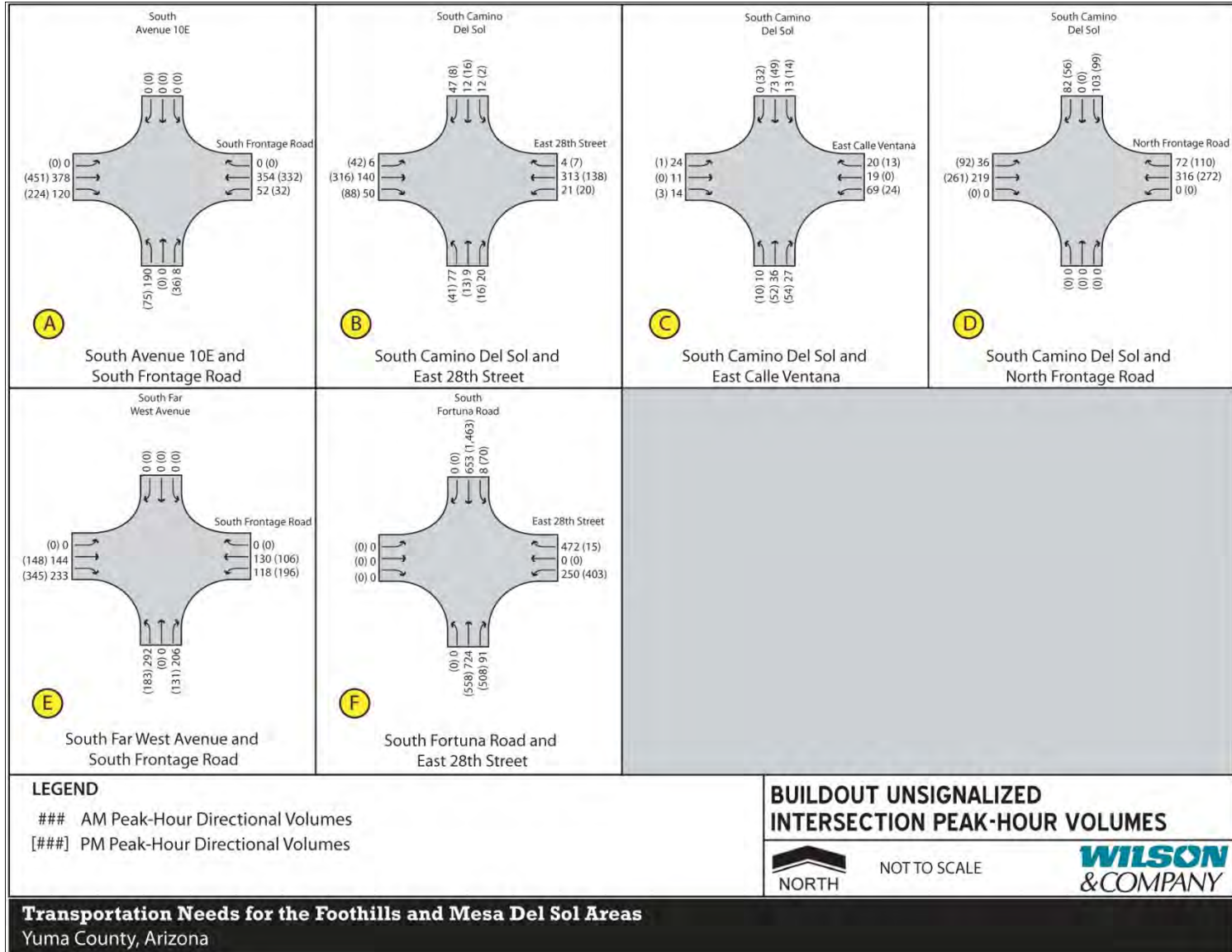


TABLE 5.8
LEVEL OF SERVICE ANALYSIS FOR SIGNALIZED INTERSECTIONS: BUILDOUT
E+C ROADWAY NETWORK

ID	Signalized Intersection Name	Metric	Northbound			Southbound			Eastbound			Westbound		
			Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn
AA	North Frontage Rd & S. Fortuna Rd	Volume-to-Capacity (v/c)	1.069 (0.628)	0.391 (0.517)	0.202 (0.254)	0.23 (1.52)	0.366 (0.992)	0.634 (1.005)	0.877 (1.768)	0 (0)	0.728 (0.312)	0.605 (0.243)	0 (0)	0.982 (0.677)
		Avg. Approach Delay (sec/veh)	71.7 (57)			38.5 (144.1)			69.9 (288.8)			80.7 (54.4)		
		Approach LOS	E (E)			D (F)			E (F)			F (D)		
		Avg. Intersection Delay (sec/veh)	63.5 (142.9)											
		Intersection LOS	E (F)											
BB	I-8 WB On/Off Ramps & S. Fortuna Rd	Volume-to-Capacity (v/c)	1.057 (0.669)	0.416 (0.267)	0 (0)	0 (0)	0.322 (0.452)	0.544 (0.553)	0 (0)	0 (0)	0 (0)	0.206 (0.402)	0.033 (0)	0.451 (0.791)
		Avg. Approach Delay (sec/veh)	45.5 (12.5)			32.7 (40.4)			-			36.4 (56.3)		
		Approach LOS	D (B)			C (D)			-			D (E)		
		Avg. Intersection Delay (sec/veh)	39.2 (33.4)											
		Intersection LOS	D (C)											
CC	I-8 EB On/Off Ramps & S. Fortuna Rd	Volume-to-Capacity (v/c)	0 (0)	0.353 (0.315)	0.243 (0.288)	0.759 (0.578)	0.283 (0.591)	0 (0)	0 (0)	0 (0)	0.982 (0.733)	0 (0)	0 (0)	0 (0)
		Avg. Approach Delay (sec/veh)	34.3 (42.5)			23.1 (31.5)			88.2 (42.8)			-		
		Approach LOS	C (D)			C (C)			F (D)			-		
		Avg. Intersection Delay (sec/veh)	42.5 (37.9)											
		Intersection LOS	D (D)											
DD	South Frontage Rd & S. Fortuna Rd	Volume-to-Capacity (v/c)	0.169 (1.158)	0.416 (0.379)	0.042 (0.172)	0.564 (0.329)	0.332 (0.648)	0.129 (0.354)	0.705 (0.725)	0 (0)	0.216 (0.27)	0.907 (1.078)	0 (0)	0.91 (0.262)
		Avg. Approach Delay (sec/veh)	16.2 (53.6)			31.8 (56.4)			73.2 (55.7)			106.9 (113.6)		
		Approach LOS	B (D)			C (E)			E (E)			F (F)		
		Avg. Intersection Delay (sec/veh)	42.6 (62.6)											
		Intersection LOS	D (E)											
EE	E. 35th Place & S. Fortuna Rd	Volume-to-Capacity (v/c)	0.105 (0.074)	0.329 (0.3)	0.329 (0.3)	0.165 (0.235)	0.258 (0.44)	0.259 (0.44)	0 (0)	0 (0)	0.351 (0.087)	0.413 (0.081)	0 (0)	0.484 (0.481)
		Avg. Approach Delay (sec/veh)	8 (9.1)			7.7 (9.8)			80.7 (99.1)			58 (54.4)		
		Approach LOS	A (A)			A (A)			F (F)			E (D)		
		Avg. Intersection Delay (sec/veh)	22 (20.8)											
		Intersection LOS	C (C)											
FF	E. 40th Street & S. Fortuna Rd	Volume-to-Capacity (v/c)	2.214 (4.076)	0 (0)	0 (0)	1.928 (2.316)	0 (0)	0.094 (0.121)	0 (0)	0 (0)	0.463 (0.354)	0.208 (0.458)	0.257 (0.172)	0.905 (0.54)
		Avg. Approach Delay (sec/veh)	580 (1414.4)			407 (549.7)			17.6 (18.6)			31.9 (20.7)		
		Approach LOS	F (F)			F (F)			B (B)			C (C)		
		Avg. Intersection Delay (sec/veh)	278.6 (658.3)											
		Intersection LOS	F (F)											
GG	North Frontage Rd & S. Foothills Blvd	Volume-to-Capacity (v/c)	0.518 (0.363)	0.402 (0.297)	0.056 (0.132)	0.183 (0.063)	0.202 (0.125)	0.145 (0.127)	0 (0)	0 (0)	1.417 (2.193)	4.534 (2.556)	0 (0)	0.355 (0.599)
		Avg. Approach Delay (sec/veh)	23 (7)			9.1 (4.1)			244.7 (726.6)			1157 (458)		
		Approach LOS	C (A)			A (A)			F (F)			F (F)		
		Avg. Intersection Delay (sec/veh)	246.7 (263.8)											
		Intersection LOS	F (F)											
HH	I-8 WB On/Off Ramps & S. Foothills Blvd	Volume-to-Capacity (v/c)	0.71 (0.778)	0.322 (0.241)	0 (0)	0 (0)	0.49 (0.35)	0.753 (0.381)	0 (0)	0 (0)	0 (0)	0.299 (0.916)	0 (0)	0.408 (1.034)
		Avg. Approach Delay (sec/veh)	24.2 (27.6)			27.8 (16.6)			-			45.1 (109.6)		
		Approach LOS	C (C)			C (B)			-			D (F)		
		Avg. Intersection Delay (sec/veh)	27.3 (37.9)											
		Intersection LOS	C (D)											
II	I-8 EB On/Off Ramps & S. Foothills Blvd	Volume-to-Capacity (v/c)	0 (0)	0.459 (0.411)	0.461 (0.411)	0.822 (0.285)	0.164 (0.28)	0 (0)	0 (0)	0 (0)	3.099 (2.16)	0 (0)	0 (0)	0 (0)
		Avg. Approach Delay (sec/veh)	0.1 (10.5)			15.5 (12.6)			842.3 (481.2)			-		
		Approach LOS	A (B)			B (B)			F (F)			-		
		Avg. Intersection Delay (sec/veh)	255.1 (184.5)											
		Intersection LOS	F (F)											
JJ	South Frontage Rd & S. Foothills Blvd	Volume-to-Capacity (v/c)	0.129 (0.215)	0.336 (0.287)	0.336 (0.288)	0.503 (0.715)	0.408 (0.556)	0.413 (0.56)	0 (0)	0 (0)	0.271 (0.316)	0.849 (0.51)	0 (0)	1.74 (0.761)
		Avg. Approach Delay (sec/veh)	9.5 (16)			12.2 (15.1)			2899.7 (2571.9)			375 (56.7)		
		Approach LOS	A (B)			B (B)			F (F)			F (E)		
		Avg. Intersection Delay (sec/veh)	492.8 (453)											
		Intersection LOS	F (F)											
KK	E. 38th Street & S. Foothills Blvd	Volume-to-Capacity (v/c)	0.108 (0.055)	0.504 (0.337)	0.505 (0.313)	0.187 (0.121)	0.163 (0.294)	0.166 (0.294)	0 (0)	0 (0)	0.109 (0.389)	0.699 (0.616)	0.049 (0.03)	0.112 (0.066)
		Avg. Approach Delay (sec/veh)	19.4 (13.3)			11.9 (9.2)			38.4 (45.6)			48.3 (51.5)		
		Approach LOS	B (B)			B (A)			D (D)			D (D)		
		Avg. Intersection Delay (sec/veh)	22.9 (17.6)											
		Intersection LOS	C (B)											
LL	E. 40th Street & S. Foothills Blvd	Volume-to-Capacity (v/c)	0.751 (0.422)	0.545 (0.287)	0.545 (0.287)	0.113 (0.21)	0.531 (0.63)	0.361 (0.631)	0 (0)	0 (0)	0.564 (1.108)	0.018 (0.074)	0 (0)	0.677 (0.429)
		Avg. Approach Delay (sec/veh)	18 (12.3)			15.6 (16.9)			35.2 (76.2)			20.1 (18.6)		
		Approach LOS	B (B)			B (B)			D (E)			C (B)		
		Avg. Intersection Delay (sec/veh)	21.4 (34.1)											
		Intersection LOS	C (C)											

Source: Synchro 7 Traffic Simulation based on model generated traffic forecasts.

TABLE 5.9
LEVEL OF SERVICE ANALYSIS FOR UNSIGNALIZED INTERSECTIONS: BUILDOUT
E+C ROADWAY NETWORK

ID	Signalized Intersection Name	Metric	Northbound			Southbound			Eastbound			Westbound		
			Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn	Left-Turn	Through	Right-Turn
A	South Frontage Rd & S. Avenue 10E	Volume-to-Capacity (v/c)	0.8 (0.41)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.32 (0.43)	0 (0)	0 (0)	0.06 (0.04)	0 (0)
		Avg. Approach Delay (sec/veh)	55.6 (25.8)			-			-			1.7 (1.2)		
		Approach LOS	F (D)			-			-			-		
		Avg. Intersection Delay (sec/veh)	10.6 (2.9)											
		Intersection LOS	B (A)											
B	E. 28th Street & S. Camino Del Sol	Volume-to-Capacity (v/c)	0 (0)	0.26 (0.34)	0 (0)	0.02 (0.13)	0.21 (0.47)	0 (0)	0 (0)	0 (0)	0 (0)	1.69 (1.94)	0 (0)	0 (0)
		Avg. Approach Delay (sec/veh)	-			0.2 (0.5)			-			339.6 (473.6)		
		Approach LOS	-			-			-			F (F)		
		Avg. Intersection Delay (sec/veh)	111.5 (65.9)											
		Intersection LOS	F (F)											
C	E. Calle Ventana & S. Camino Del Sol	Volume-to-Capacity (v/c)	0 (0)	0.05 (0.03)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.32 (0.64)	0 (0)	0 (0)	0.61 (0.28)	0 (0)
		Avg. Approach Delay (sec/veh)	5.5 (4.4)			0.2 (0.6)			12.9 (17.9)			20 (12.9)		
		Approach LOS	-			-			B (C)			C (B)		
		Avg. Intersection Delay (sec/veh)	14.1 (14.8)											
		Intersection LOS	B (B)											
D	North Frontage Rd & S. Camino Del Sol	Volume-to-Capacity (v/c)	0 (0)	0.01 (0.01)	0 (0)	0 (0)	0.01 (0.01)	0 (0)	0 (0)	0.07 (0.06)	0 (0)	0 (0)	0.16 (0.05)	0 (0)
		Avg. Approach Delay (sec/veh)	1.5 (0.7)			1.2 (1.2)			10.2 (10)			10.7 (9.9)		
		Approach LOS	-			-			B (A)			B (A)		
		Avg. Intersection Delay (sec/veh)	5.8 (3.4)											
		Intersection LOS	A (A)											
E	South Frontage Rd & Far West Ave	Volume-to-Capacity (v/c)	0 (0)	0 (0)	0 (0)	0.31 (0.23)	0 (0)	0.14 (0.09)	0.04 (0.09)	0.14 (0.17)	0 (0)	0 (0)	0.25 (0.24)	0 (0)
		Avg. Approach Delay (sec/veh)	-			16 (15.9)			1.2 (2.2)			-		
		Approach LOS	-			C (C)			-			-		
		Avg. Intersection Delay (sec/veh)	4 (3.2)											
		Intersection LOS	A (A)											
F	E. 28th Street & S. Fortuna Rd	Volume-to-Capacity (v/c)	1.16 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.24 (0.32)	0 (0)	0 (0)	0.11 (0.21)	0 (0)
		Avg. Approach Delay (sec/veh)	119.7 (85.9)			-			-			4.6 (6.8)		
		Approach LOS	F (F)			-			-			-		
		Avg. Intersection Delay (sec/veh)	54.1 (26.2)											
		Intersection LOS	F (D)											

Source: Synchro 7 Traffic Simulation based on model generated traffic forecasts.

Prepared by Wilson & Company, November, 2011.

5.7 FINDINGS AND RECOMMENDATIONS

The information and analysis presented in the previous section reveals that certain roadway segments and intersections in the study area will be overcapacity during the planning horizon. These capacity issues must be addressed by identifying practical alternative improvement scenarios to provide anticipated congestion relief. In addition, there are deficiencies associated with alternative travel modes that should be addressed. Improvement actions will be identified for each modal alternative for purposes of developing a plan of improvements that can be evaluated by applying an objective set of criteria. The results of this evaluation and recommended actions to meet future transportation needs are reported in Chapters 6 and 7.

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EVALUATION OF ALTERNATIVES

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6.0 EVALUATION OF ALTERNATIVES

The Project Team prepared updated travel demand models for Year 2030 and Buildout roadway networks to address deficiencies identified and documented in Working Paper #1 – Existing and Future Conditions. Outside the project study area, network characteristics documented in the YMPO 2033 Regional Transportation Plan were assumed to be in place. Network definition and design within the study area were based on feedback received at Technical Advisory Committee (TAC) meetings on September 14, 2011 and December 14, 2011, as well as subsequent comments and input from the Yuma County Planning and Engineering staff.

6.1 DEFINITION OF ALTERNATIVES

Five study area roadway network alternatives representing Buildout conditions were developed and evaluated:

- Alternative A: Buildout Conditions – Existing + Committed (E+C) Network with Limited Additional Connectivity;
- Alternative B: Buildout Conditions with Proposed County Improvements;
- Buildout Condition: Network Alternative 1 – Introduces a new traffic interchange (TI) on I-8 at South Avenue 15E to support an extension of South Avenue 15E north of I-8, which would connect with East 28th Street/ East County 10½ Street (Masterson Avenue) and, ultimately, East 24th Street/ East County 10th Street;
- Buildout Condition: Network Alternative 2 – Incorporates an extension of South Foothills Boulevard north to US 95; and
- Buildout Condition: Network Alternative 3 – Combines attributes of both Buildout Conditions Alternatives 1 and 2. Similar to Buildout Conditions Alternative 1, it incorporates the new TI on I-8 at South Avenue 15E.

Each network was subjected to analysis using the TransCAD travel demand modeling software. The following model data are provided, reflecting the operational characteristics of each improvement alternative:

- Number of through lanes and roadway functional classification;
- Forecast daily traffic volumes (in thousands); and
- Roadway segment level of service (LOS) A – F, based on forecast daily traffic volumes.

Table 6.1 summarizes proposed capacity and connectivity improvements associated with each Buildout alternative relative to the existing 2011 roadway network. Graphics displaying the physical and operational characteristics of the five alternative Buildout transportation networks, as well as detailed descriptions of each alternative, are presented in the following subsections.

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**TABLE 6.1
COMPARISON OF BUILDOUT IMPROVEMENT ALTERNATIVES TO EXISTING ROADWAY NETWORK**

Roadway Segment	From	To	BUILDOUT ALTERNATIVES									
			Alternative A: Existing + Committed (E+C) Network w/Limited Additional Connectivity		Alternative B: Augmented w/Proposed County Improvements		Alternative 1: I-8/Ave 15E to 24th St		Alternative 2: I-8/Foothills Blvd to US 95		Alternative 3: I-8/Ave 15E to US 95	
			No. of Lanes	Functional Classification	No. of Lanes	Functional Classification	No. of Lanes	Functional Classification	No. of Lanes	Functional Classification	No. of Lanes	Functional Classification
East-West Roadways												
US 95	Avenue 10 E	Fortuna Rd	6	Expressway	6	Expressway	6	Expressway	6	Expressway	6	Expressway
24th/Co 10th	Fortuna Rd	Foothills Blvd	4	Collector	2	Collector	4	Minor Arterial	2	Collector	2	Collector
28th St	E. of Avenue 10E	Avenue 10E	4	Collector	2	Collector	2	Collector	2	Collector	2	Collector
28th St	Foothills Blvd	Avenue 15E					4	Minor Arterial				
Frontage_North	Avenue 10 E	Fortuna Rd	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial
Frontage_North	Fortuna Rd	Foothills Blvd	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial
Frontage_North	Foothills Blvd	Avenue 14E	2	Minor Collector	2	Minor Collector	2	Minor Collector	2	Minor Collector	2	Minor Collector
I-8 WB	Avenue 10 E	Fortuna Rd	2	Interstate	2	Interstate	2	Interstate	2	Interstate	2	Interstate
I-8 WB	Fortuna Rd	Foothills Blvd	2	Interstate	2	Interstate	2	Interstate	2	Interstate	2	Interstate
I-8 WB	Foothills Blvd	Avenue 15E	2	Interstate	2	Interstate	2	Interstate	2	Interstate	2	Interstate
I-8 EB	Avenue 10 E	Fortuna Rd	2	Interstate	2	Interstate	2	Interstate	2	Interstate	2	Interstate
I-8 EB	Fortuna Rd	Foothills Blvd	2	Interstate	2	Interstate	2	Interstate	2	Interstate	2	Interstate
I-8 EB	Foothills Blvd	Avenue 15E	2	Interstate	2	Interstate	2	Interstate	2	Interstate	2	Interstate
Frontage South	Avenue 10 E	Fortuna Rd	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial
Frontage South	Fortuna Rd	Foothills Blvd	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial	2	Minor Arterial
Frontage South	Foothills Blvd	Avenue 14E	2	Minor Collector	2	Minor Collector	2	Minor Collector	2	Minor Collector	2	Minor Collector
Frontage South	Avenue 14E	Avenue 15E	2	Minor Collector	2	Minor Collector	2	Minor Collector	2	Minor Collector	2	Minor Collector
40th/Co 12th	Avenue 10 E	Fortuna Rd	2	Major Collector	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
40th/Co 12th	Fortuna Rd	Foothills Blvd	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
40th/Co 12th	Foothills Blvd	Avenue 14E	2	Collector	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
40th/Co 12th	Avenue 14E	Avenue 15E	2	Collector	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
48thCo 13th	Avenue 10 E	Fortuna Rd			4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
48thCo 13th	Fortuna Rd	Foothills Blvd	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
48thCo 13th	Foothills Blvd	Avenue 14E	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
48thCo 13th	Avenue 14E	Avenue 15E	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
56th/Co 14th	Avenue 10 E	Fortuna Rd	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
56th/Co 14th	Fortuna Rd	Foothills Blvd	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
56th/Co 14th	Foothills Blvd	Avenue 14E	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
56th/Co 14th	Avenue 14E	Avenue 15E	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
North-South Roadways												
Avenue 10 E	24th/Co 10th	Frontage North	4	Collector	2	Collector	2	Collector	2	Collector	2	Collector
Avenue 10 E	Frontage South	40th/Co 12th	2	Major Collector	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Avenue 10 E	40th/Co 12th	56th/Co 14th			4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
US 95	Fortuna Rd	E. of Fortuna Rd	4	Principal Arterial	4	Principal Arterial	4	Principal Arterial	4	Principal Arterial	4	Principal Arterial
Fortuna Rd	US 95	24th/Co 10th	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Fortuna Rd	24th/Co 10th	28th St	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Fortuna Rd	28th St	Frontage North	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Fortuna Rd	Frontage North	Frontage South	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Fortuna Rd	Frontage South	40th/Co 12th	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Fortuna Rd	40th/Co 12th	48th/Co 13th	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Fortuna Rd	48th/Co 13th	56th/Co 14th	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Avenue 12E	Frontage South	40th/Co 12th	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Avenue 12E	40th/Co 12th	56th/Co 14th	2	Collector	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Camino del Sol	24th/Co 10th	Frontage North	4	Collector	2	Collector	2	Collector	2	Collector	2	Collector
Foothills Blvd	US 95	24th/Co 10th							4	Minor Arterial		
Foothills Blvd	24th/Co 10th	Frontage North	4	Collector	2	Collector	4	Collector	4	Collector	2	Collector
Foothills Blvd	24th/Co 10th	28th St/Co 10 1/2					4	Minor Arterial				
Foothills Blvd	28th St/Co 10 1/2	Frontage North					2	Collector				
Foothills Blvd	Frontage North	Frontage South	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Foothills Blvd	Frontage South	40th/Co 12th	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Foothills Blvd	40th/Co 12th	48th/Co 13th	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Foothills Blvd	48th/Co 13th	56th/Co 14th	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Avenue 14E*	Frontage South	40th/Co 12th	2	Collector	2	Collector	2	Collector	2	Collector	2	Collector
Avenue 14E*	40th/Co 12th	48th/Co 13th			2	Collector	2	Collector	2	Collector	2	Collector
Avenue 14E	48th/Co 13th	56th/Co 14th	2	Collector	2	Collector	2	Collector	2	Collector	2	Collector
Avenue 15E	US 95	I-8									4	Minor Arterial
Avenue 15E	24th/Co 10th	Frontage North					4	Minor Arterial				
Avenue 15E	Frontage North	Frontage South					4	Minor Arterial				
Avenue 15E	Frontage South	40th/Co 12th	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Avenue 15E	40th/Co 12th	48th/Co 13th	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial
Avenue 15E	48th/Co 13th	56th/Co 14th	2	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial	4	Minor Arterial

Prepared by Wilson & Company, September 2011.

Notes:

* Roadway Segment assumes discontinuity at Wash C, as identified in Drainage Facility Inventory Memorandum for Foothills Master Drainage Plan Update, Yuma County Project No. 12-89.

	Existing Roadway Segment
	New or Upgraded Roadway Segment
	Roadway Segment, as defined, not included in this Alternative

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6.1.1 ALTERNATIVE A: BUILDOUT CONDITIONS – EXISTING + COMMITTED (E+C) NETWORK WITH LIMITED ADDITIONAL NETWORK CONNECTIVITY

This alternative represents an updated version of the Buildout E+C Network introduced in Working Paper No. 1. The revised network includes additional detail on roadway connectivity required to serve the forecast study area development at Buildout. The following figures are provided for reference:

- Figure 6.1 Buildout Conditions: Existing + Committed Network with Limited Additional Connectivity – Number of Lanes
- Figure 6.2 Buildout Conditions: Existing + Committed Network with Limited Additional Connectivity – Forecast Daily Traffic Volumes
- Figure 6.3 Buildout Conditions: Existing + Committed Network with Limited Additional Connectivity – Roadway Segment LOS Based on Daily Traffic Volumes.

This network has been conceived and analyzed as a means to display deficiencies that would result should only limited investment be made to the study area grid network beyond currently programmed funds. Identification of these deficiencies assists in highlighting areas where additional improvements will be most needed under Buildout conditions. The deficiencies suggest areas where future investments should be prioritized.

It should be noted that the analyses performed for this study focused primarily on the Year 2030 and Buildout Conditions. Projects identified as part of the 2033 Scenario and included in the YMPO RTP, were incorporated in all modeling efforts conducted in conjunction with this study. Thus, RTP projects outside of the study area would be assumed to be in place for future Year 2030 and Buildout Conditions.

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FIGURE 6.1
ALTERNATIVE A. BUILDOUT CONDITIONS: EXISTING + COMMITTED NETWORK WITH LIMITED ADDITIONAL CONNECTIVITY – NUMBER OF LANES

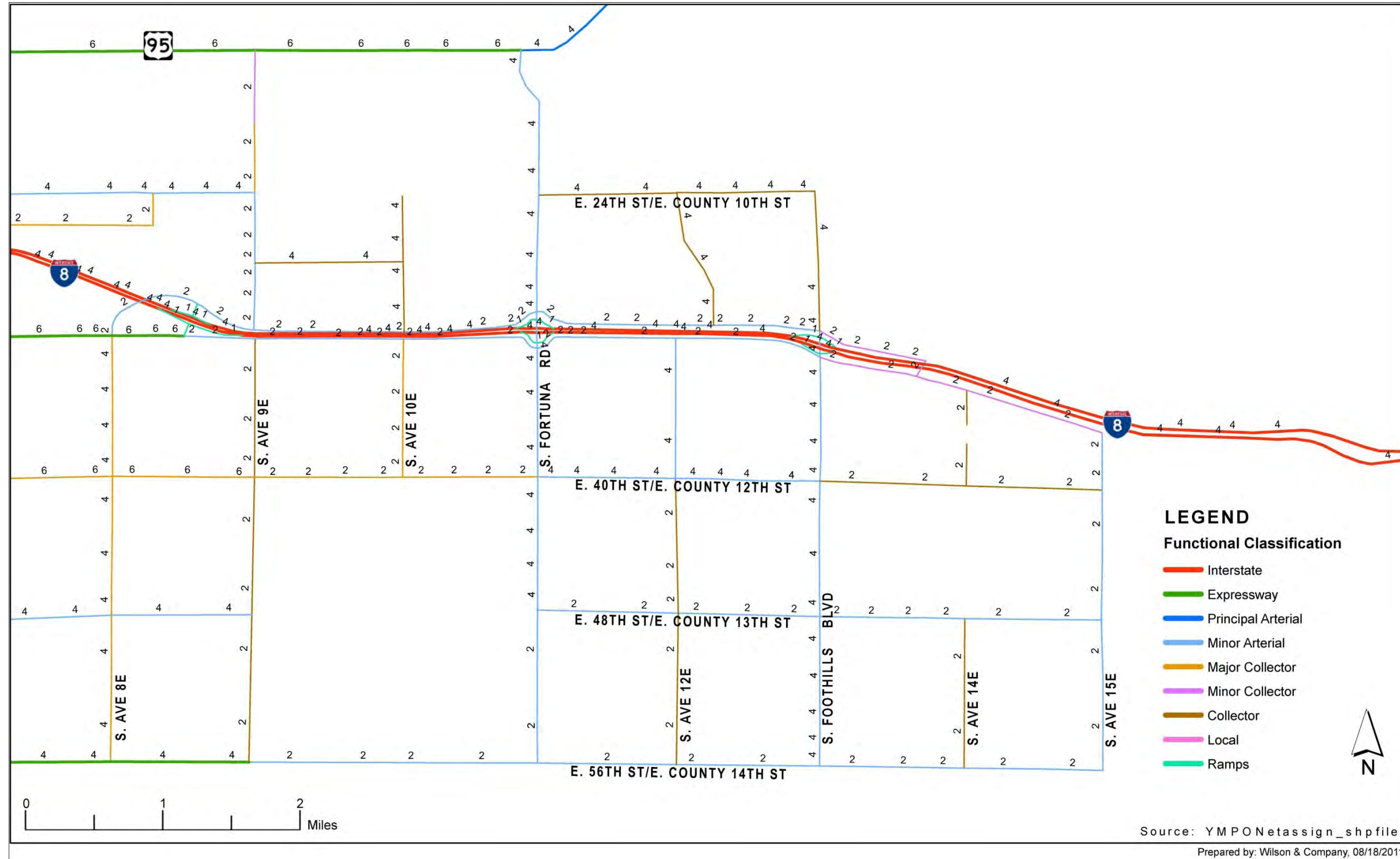


FIGURE 6.2
ALTERNATIVE A. BUILDOUT CONDITIONS: EXISTING + COMMITTED NETWORK WITH LIMITED ADDITIONAL CONNECTIVITY – FORECAST DAILY TRAFFIC VOLUMES

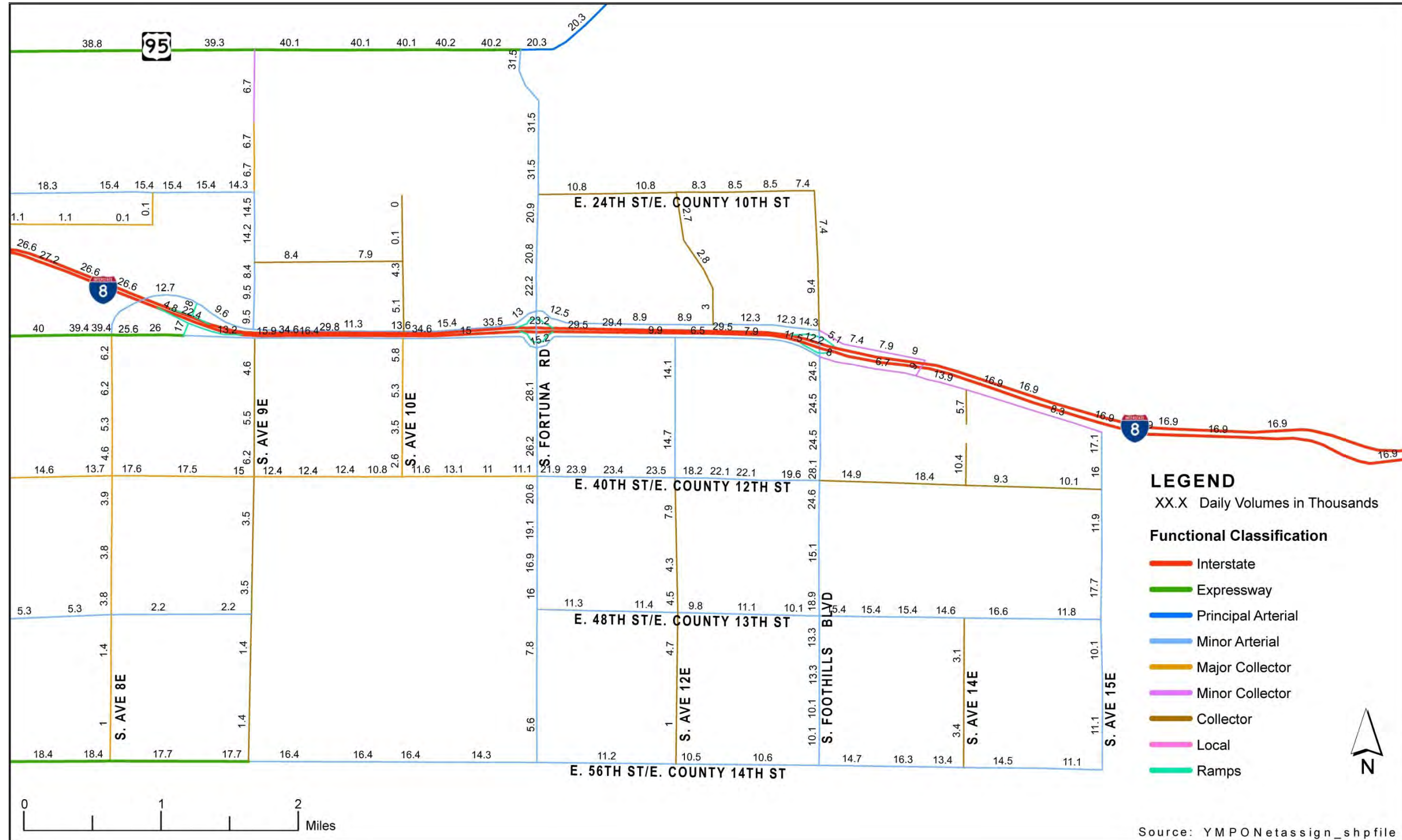
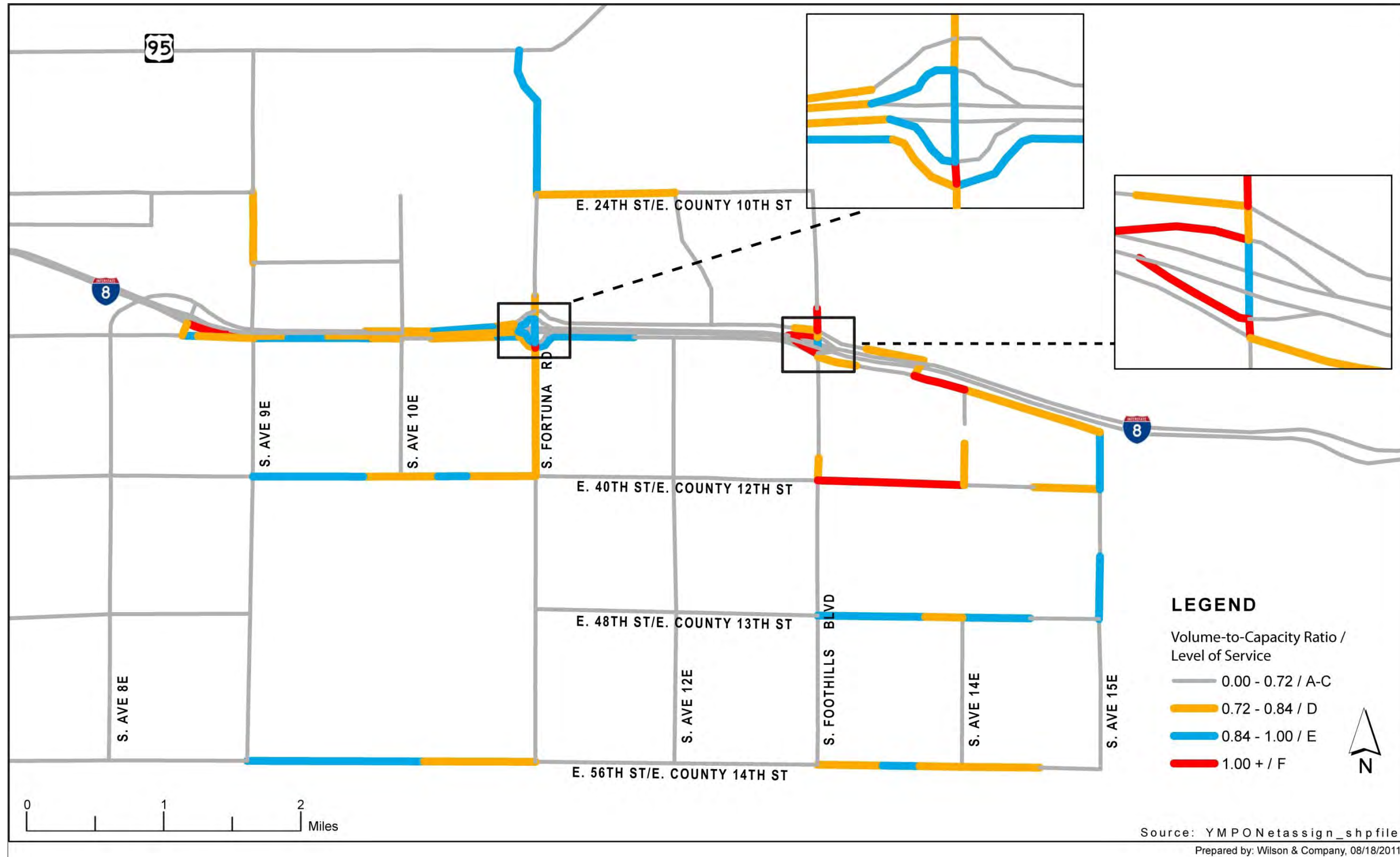


FIGURE 6.3
ALTERNATIVE A. BUILDOUT CONDITIONS: EXISTING + COMMITTED NETWORK WITH LIMITED ADDITIONAL CONNECTIVITY – ROADWAY SEGMENT LEVEL OF SERVICE BASED ON DAILY TRAFFIC VOLUMES



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6.1.2 ALTERNATIVE B: BUILDOUT CONDITIONS AUGMENTED WITH PROPOSED COUNTY IMPROVEMENTS

This alternative network augments the Buildout E+C Network with additional roadway capacity the County anticipates may be constructed to accommodate forecast travel demand under Buildout conditions. The following figures are provided for reference:

Figure 6.4 Buildout Conditions Augmented with Proposed County Improvements – Number of Lanes

Figure 6.5 Buildout Conditions Augmented with Proposed County Improvements – Forecast Daily Traffic Volumes

Figure 6.6 Buildout Conditions Augmented with Proposed County Improvements – Roadway Segment LOS Based on Daily Traffic Volumes.

Funds currently are not dedicated or identified to implement these improvements. This network incorporates feedback received on the Buildout Network from the TAC, as well as additional comments received from the County staff at follow-up meetings.

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FIGURE 6.4
ALTERNATIVE B. BUILDOUT CONDITIONS AUGMENTED WITH PROPOSED COUNTY IMPROVEMENTS – NUMBER OF LANES

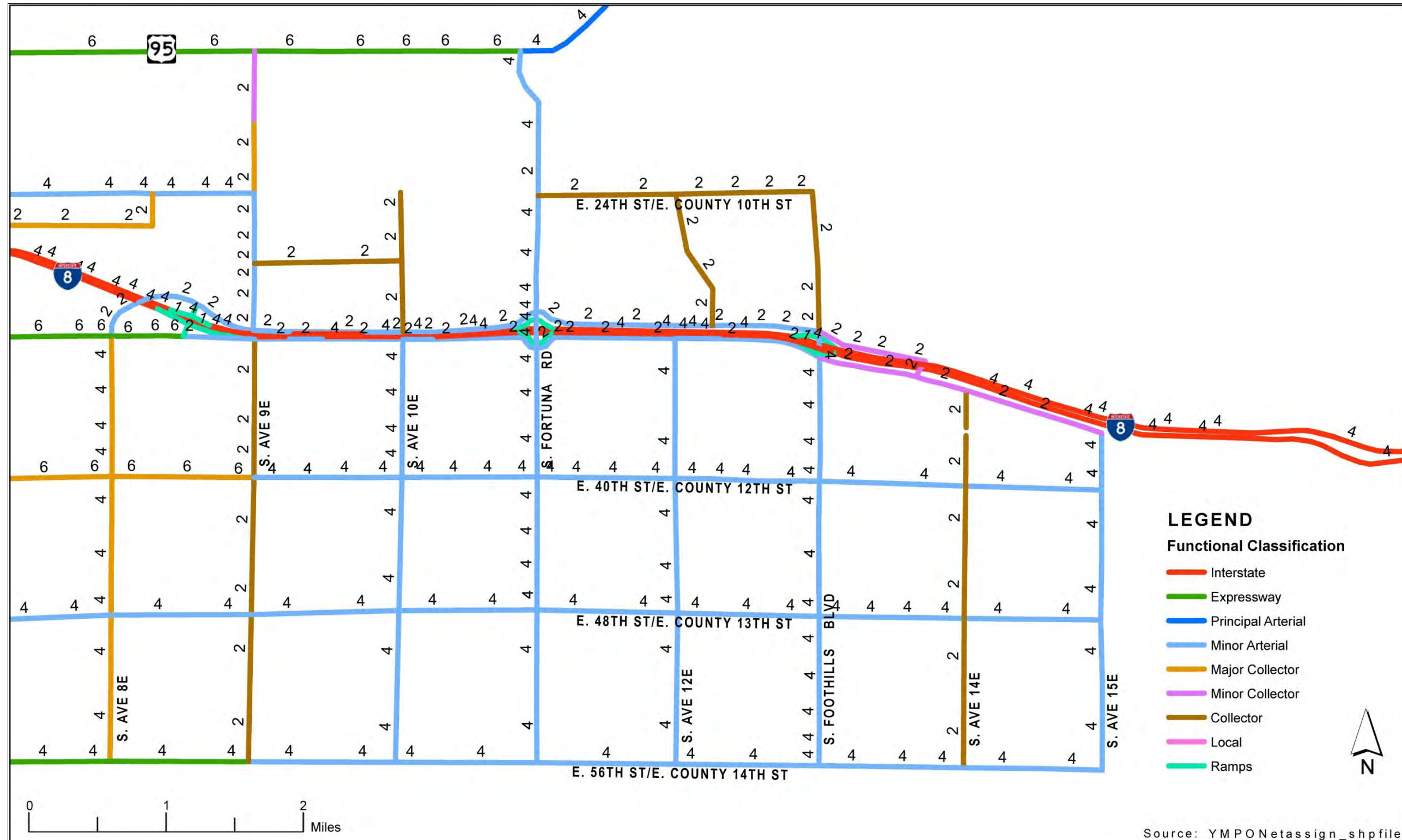


FIGURE 6.5
ALTERNATIVE B. BUILDOUT CONDITIONS AUGMENTED WITH PROPOSED COUNTY IMPROVEMENTS – FORECAST DAILY TRAFFIC VOLUMES

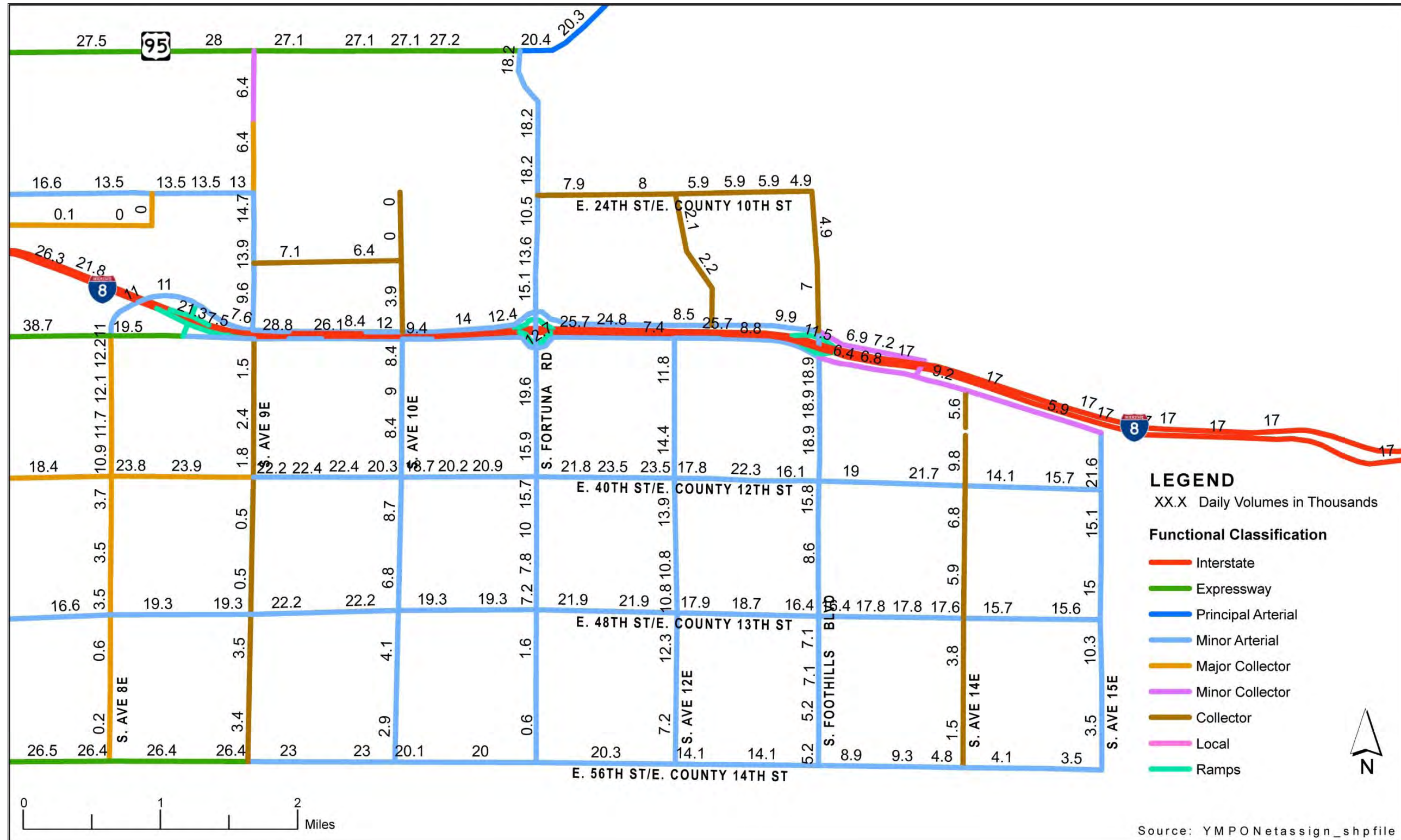
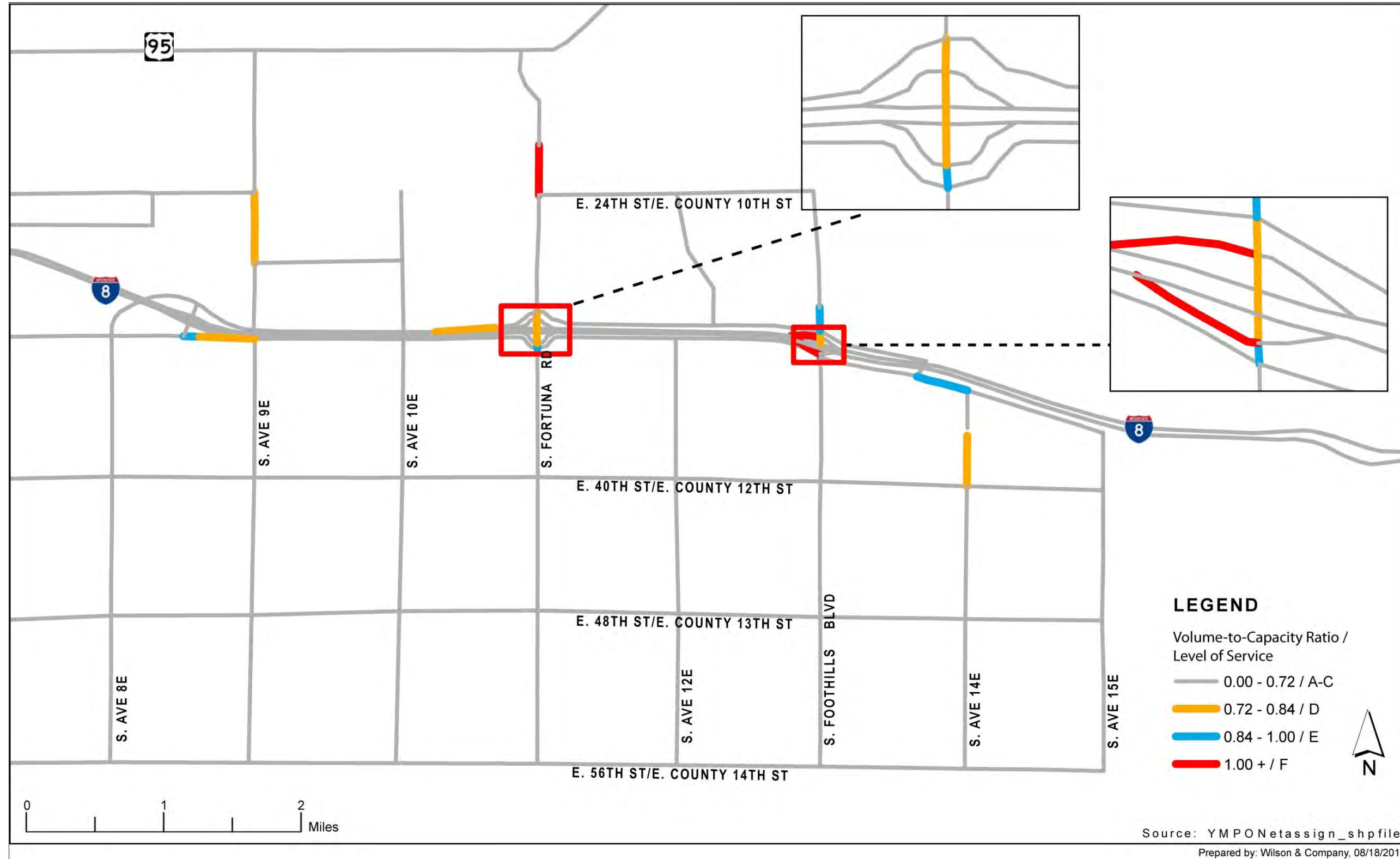


FIGURE 6.6
ALTERNATIVE B. BUILDOUT CONDITIONS AUGMENTED WITH PROPOSED COUNTY IMPROVEMENTS – ROADWAY SEGMENT LEVEL OF SERVICE BASED ON DAILY TRAFFIC VOLUMES



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6.1.3 BUILDOUT CONDITION: NETWORK ALTERNATIVE 1

Buildout Alternative 1 introduces a new traffic interchange (TI) on I-8 at South Avenue 15E. The new TI would serve the extension of South Avenue 15E north of I-8, which would connect with East 28th Street/East County 10½ Street (Masterson Avenue) and, ultimately, East 24th Street/East County 10th Street. Thus, an alternative connection would be achieved between I-8, South Fortuna Road, and ultimately US 95 via East 24th Street/East County 10th Street. This network modification also would provide an alternative route to the I-8 frontage roads, particularly east of South Foothills Boulevard. The following figures are provided for reference:

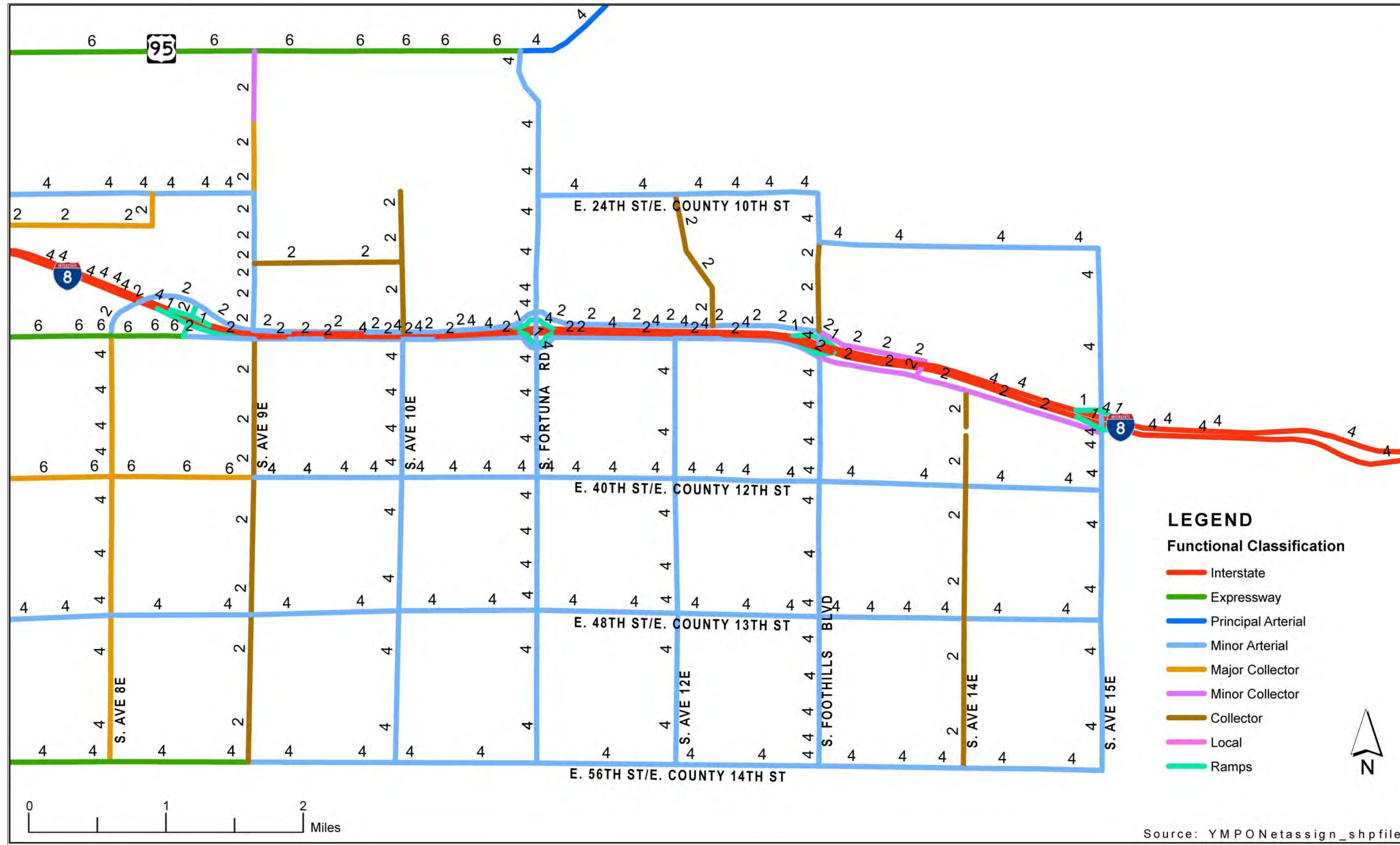
Figure 6.7 Buildout Conditions: Network Alternative 1 – Number of Lanes

Figure 6.8 Buildout Conditions: Network Alternative 1 – Forecast Daily Traffic Volumes

Figure 6.9 Buildout Conditions: Network Alternative 1 – Roadway Segment LOS Based on Daily Traffic Volumes.

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FIGURE 6.7
BUILDOUT CONDITIONS: NETWORK ALTERNATIVE 1 – NUMBER OF LANES



Source: YMPONetassign_shpfile
Prepared by: Wilson & Company, 11/14/2011

FIGURE 6.8
BUILDOUT CONDITIONS: NETWORK ALTERNATIVE 1 – FORECAST DAILY TRAFFIC VOLUMES

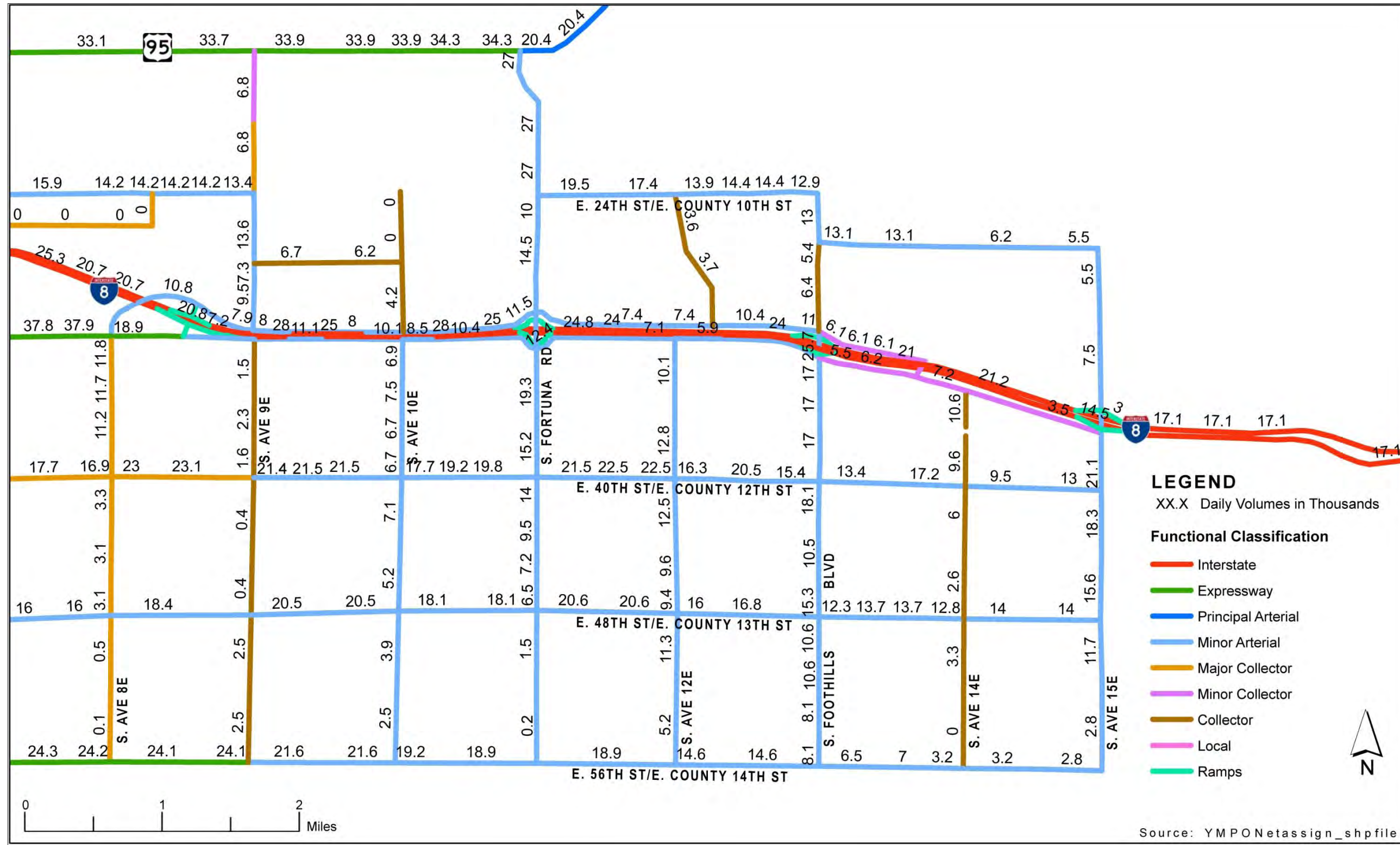
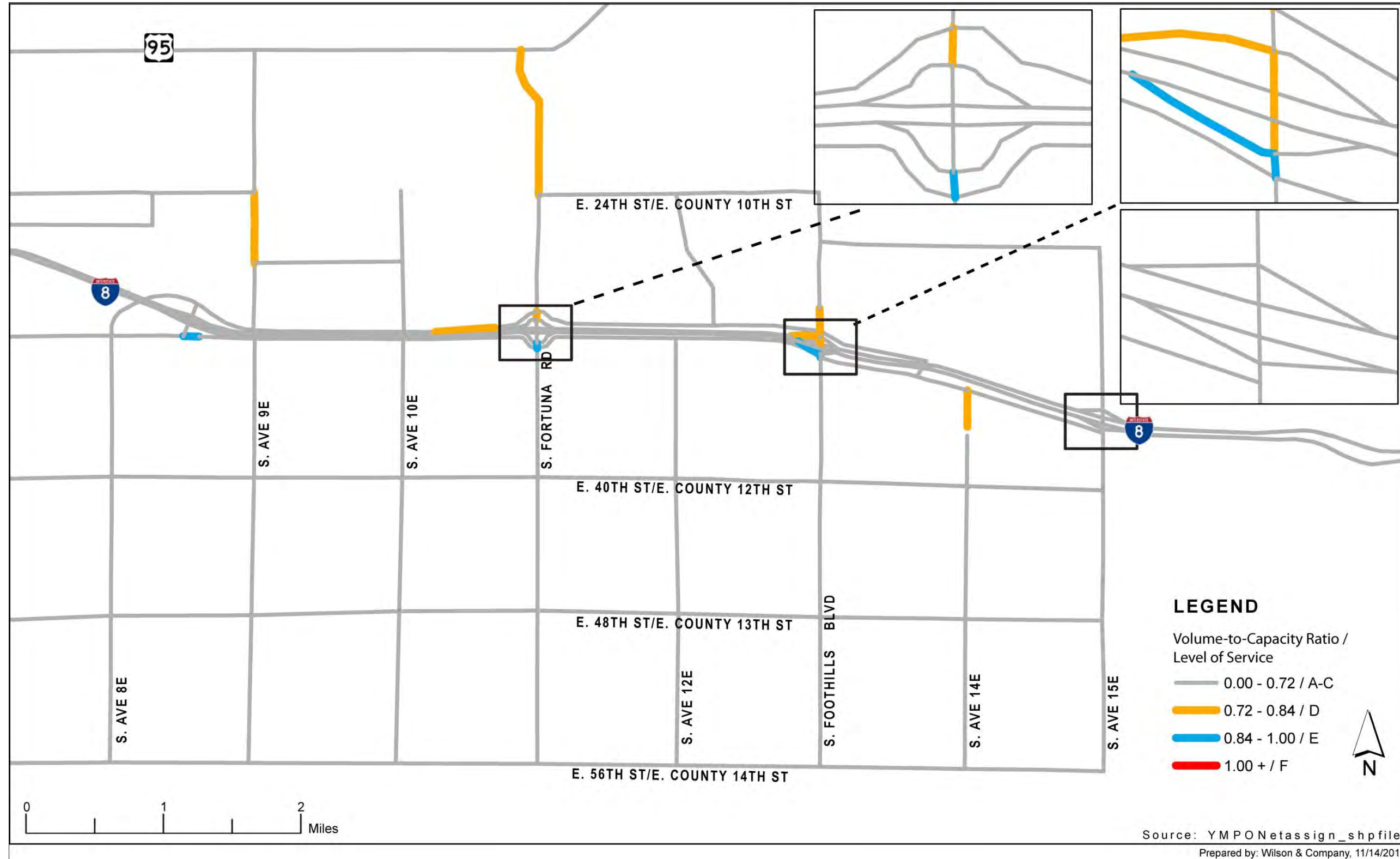


FIGURE 6.9
BUILDOUT CONDITIONS: NETWORK ALTERNATIVE 1 – ROADWAY SEGMENT LEVEL OF SERVICE BASED ON DAILY TRAFFIC VOLUMES



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6.1.4 BUILDOUT CONDITION: NETWORK ALTERNATIVE 2

This network incorporates an extension of South Foothills Boulevard north to US 95. The extension will also provide an alternative route to South Fortuna Road via East 24th Street/East County 10th Street, improving connectivity of the study area with external origins/destinations. Improved east-west connectivity also would be attained between South Fortuna Road and South Foothills Boulevard, providing relief for the I-8 North Frontage Road.

This alternative presents the connection of I-8 to US 95 through extension of South Foothills Boulevard as a concept only. It does not intend to propose a specific route. The route identified for implementation, should this alternative be selected, would be subject to subsequent more detailed studies.

The following figures are provided for reference:

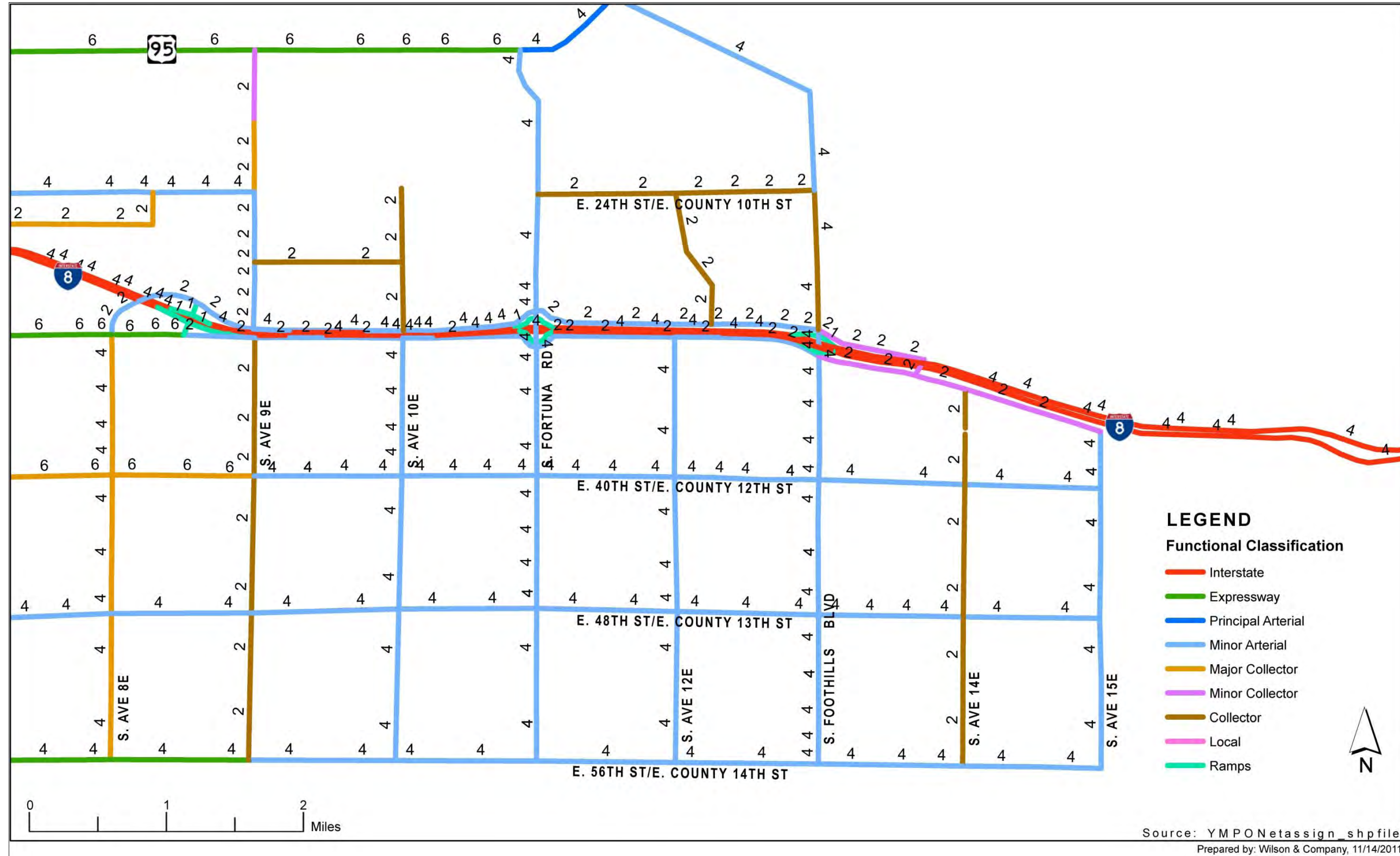
Figure 6.10 Buildout Conditions: Network Alternative 2 – Number of Lanes

Figure 6.11 Buildout Conditions: Network Alternative 2 – Forecast Daily Traffic Volumes

Figure 6.12 Buildout Conditions: Network Alternative 2 – Roadway Segment LOS Based on Daily Traffic Volumes.

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FIGURE 6.10
BUILDOUT CONDITIONS: NETWORK ALTERNATIVE 2 – NUMBER OF LANES



Source: YMPONetassign_shpfile
Prepared by: Wilson & Company, 11/14/2011

FIGURE 6.11
BUILDOUT CONDITIONS: NETWORK ALTERNATIVE 2 – FORECAST DAILY TRAFFIC VOLUMES

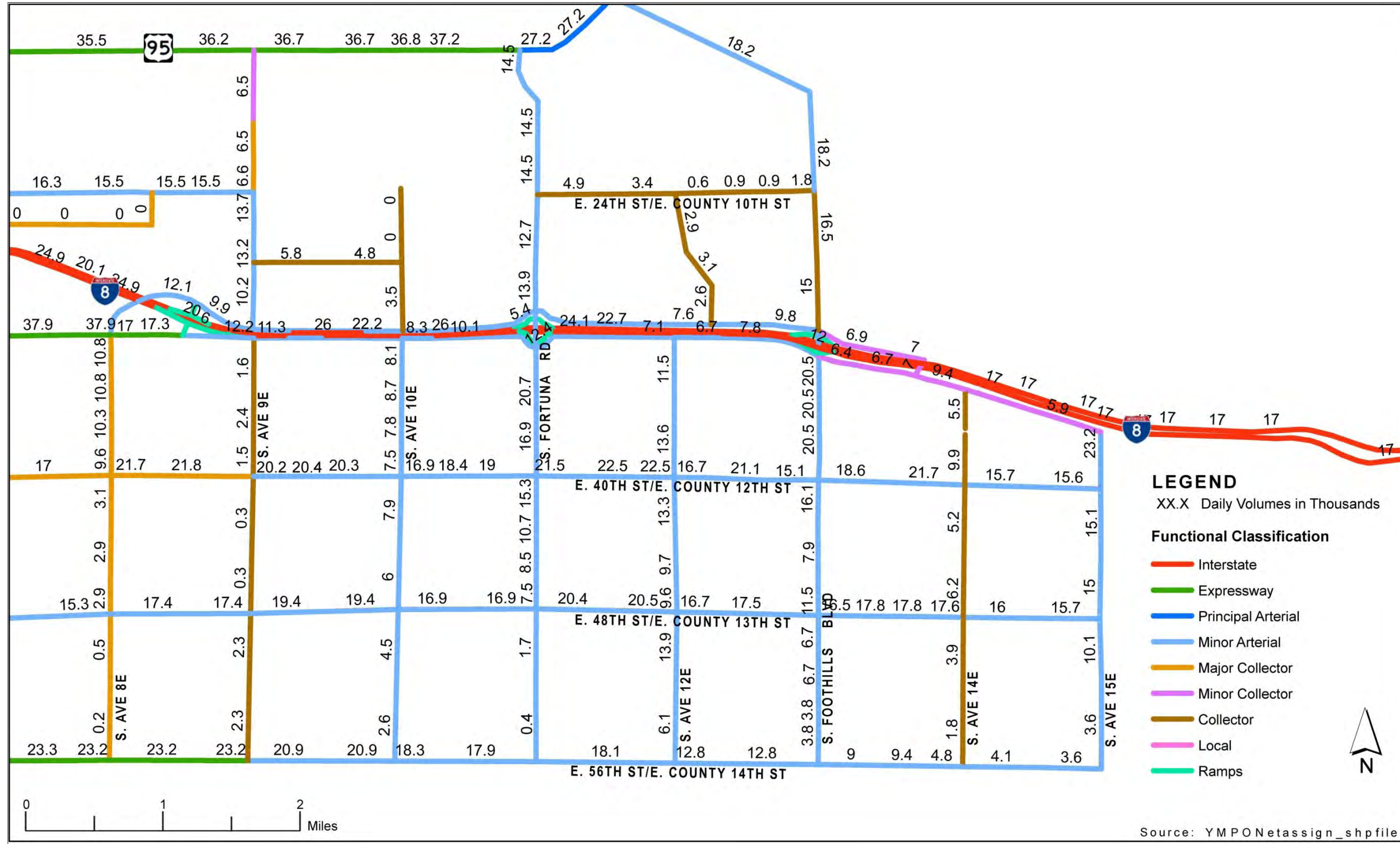
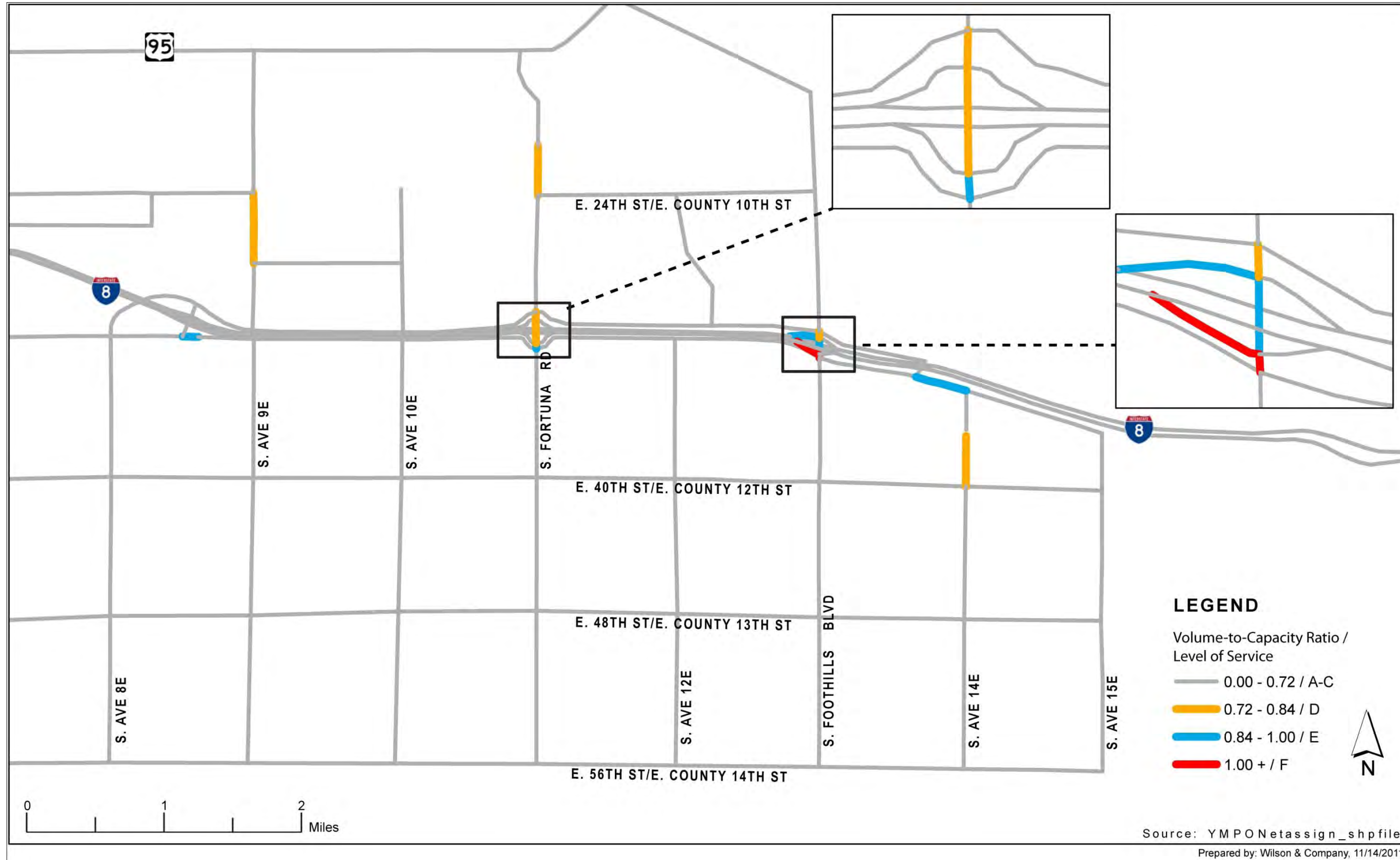


FIGURE 6.12
BUILDOUT CONDITIONS: NETWORK ALTERNATIVE 2 – ROADWAY SEGMENT LEVEL OF SERVICE BASED ON DAILY TRAFFIC VOLUMES



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6.1.5 BUILDOUT CONDITION: NETWORK ALTERNATIVE 3

This network combines attributes of both Buildout Condition Alternatives 1 and 2. Similar to Buildout Condition Alternative 1, it incorporates the new TI on I-8 at South Avenue 15E. The new TI would support extension of South Avenue 15E north of I-8 to US 95.

In contrast to Buildout Conditions Alternative 1, Alternative 3 contemplates South Avenue 15E continuing north with a direct connection to US 95. This connection would provide an alternate route north of the study area in addition to South Fortuna Road. It also represents a direct continuation of the proposed East 56th Street/East County 14th Street Outer Loop. In addition, South Foothills Boulevard would be extended north of I-8 to East 24th Street/East County 10th Street, establishing improved east-west connectivity between South Fortuna Road and South Foothills Boulevard. This improvement would provide relief for the I-8 North Frontage Road.

This alternative presents the connection of I-8 to US 95 through extension of South Avenue 15E as a concept only. It does not intend to propose a specific route. The route identified for implementation, should this alternative be selected, would be subject to subsequent more detailed studies.

The following figures are provided for reference:

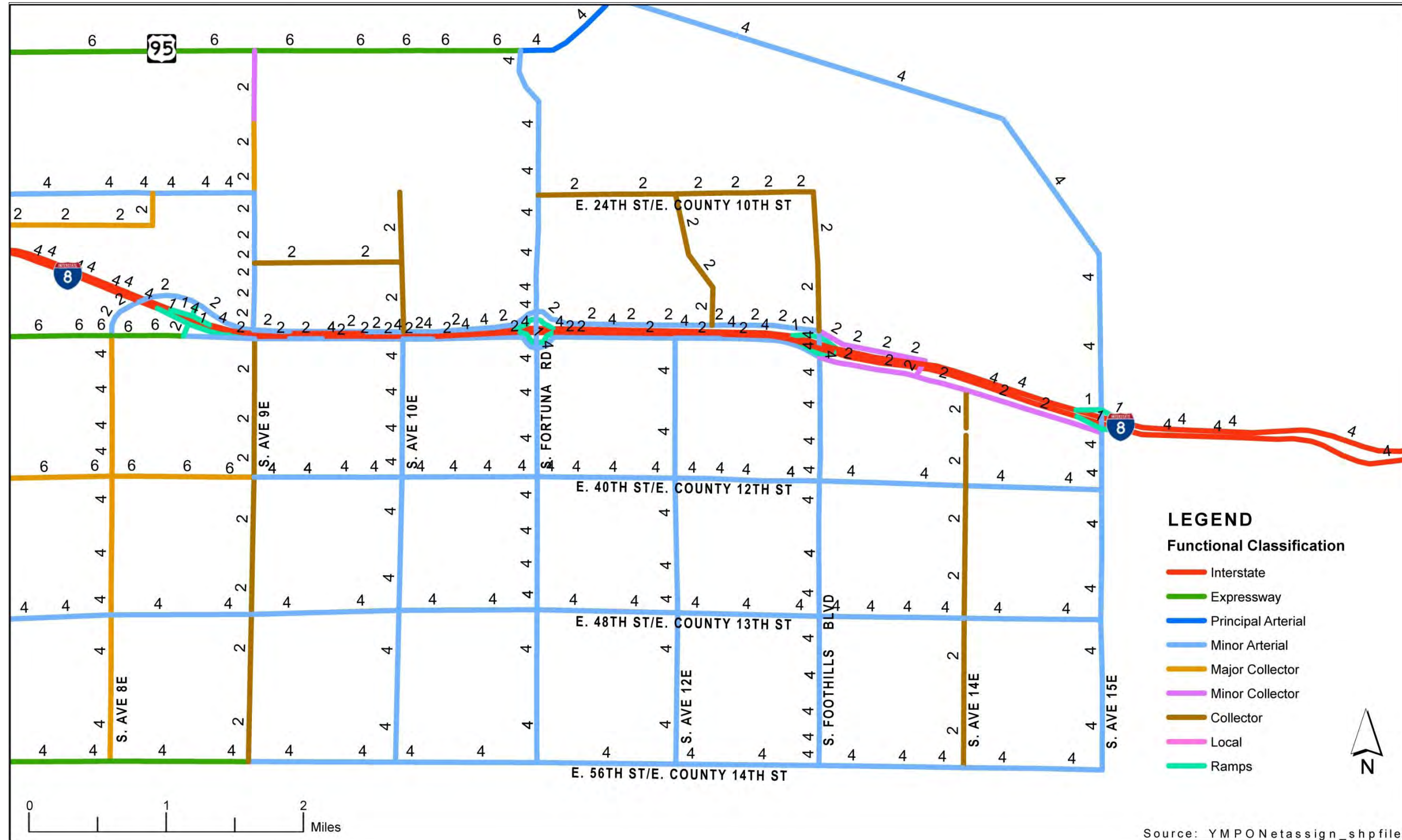
Figure 6.13 Buildout Conditions: Network Alternative 2 – Number of Lanes

Figure 6.14 Buildout Conditions: Network Alternative 2 – Forecast Daily Traffic Volumes

Figure 6.15 Buildout Conditions: Network Alternative 2 – Roadway Segment LOS Based on Daily Traffic Volumes.

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FIGURE 6.13
BUILDOUT CONDITIONS: NETWORK ALTERNATIVE 3 – NUMBER OF LANES



Source: Y M P O Netassign_shp file
Prepared by: Wilson & Company, 11/14/2011

FIGURE 6.14
BUILDOUT CONDITIONS: NETWORK ALTERNATIVE 3 – FORECAST DAILY TRAFFIC VOLUMES

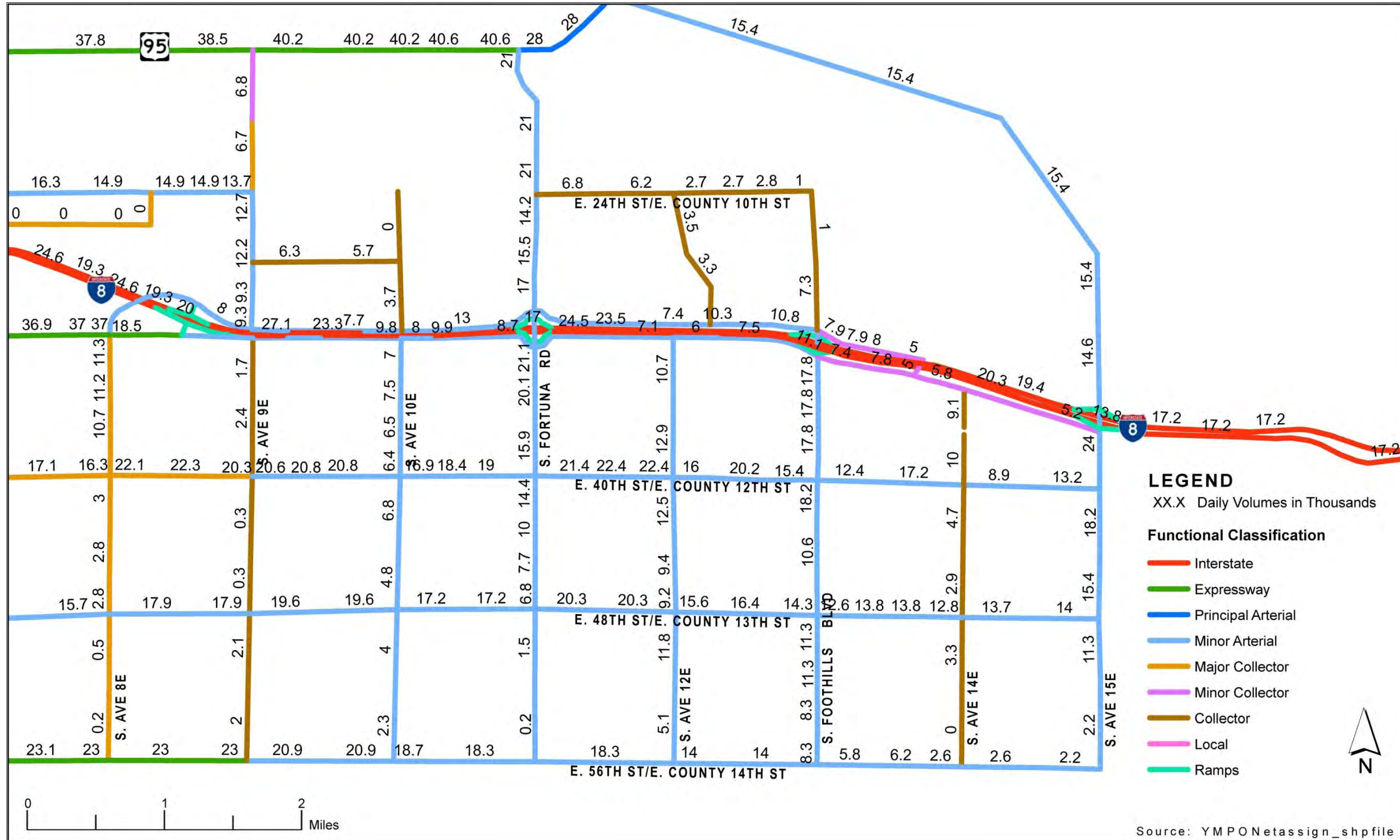
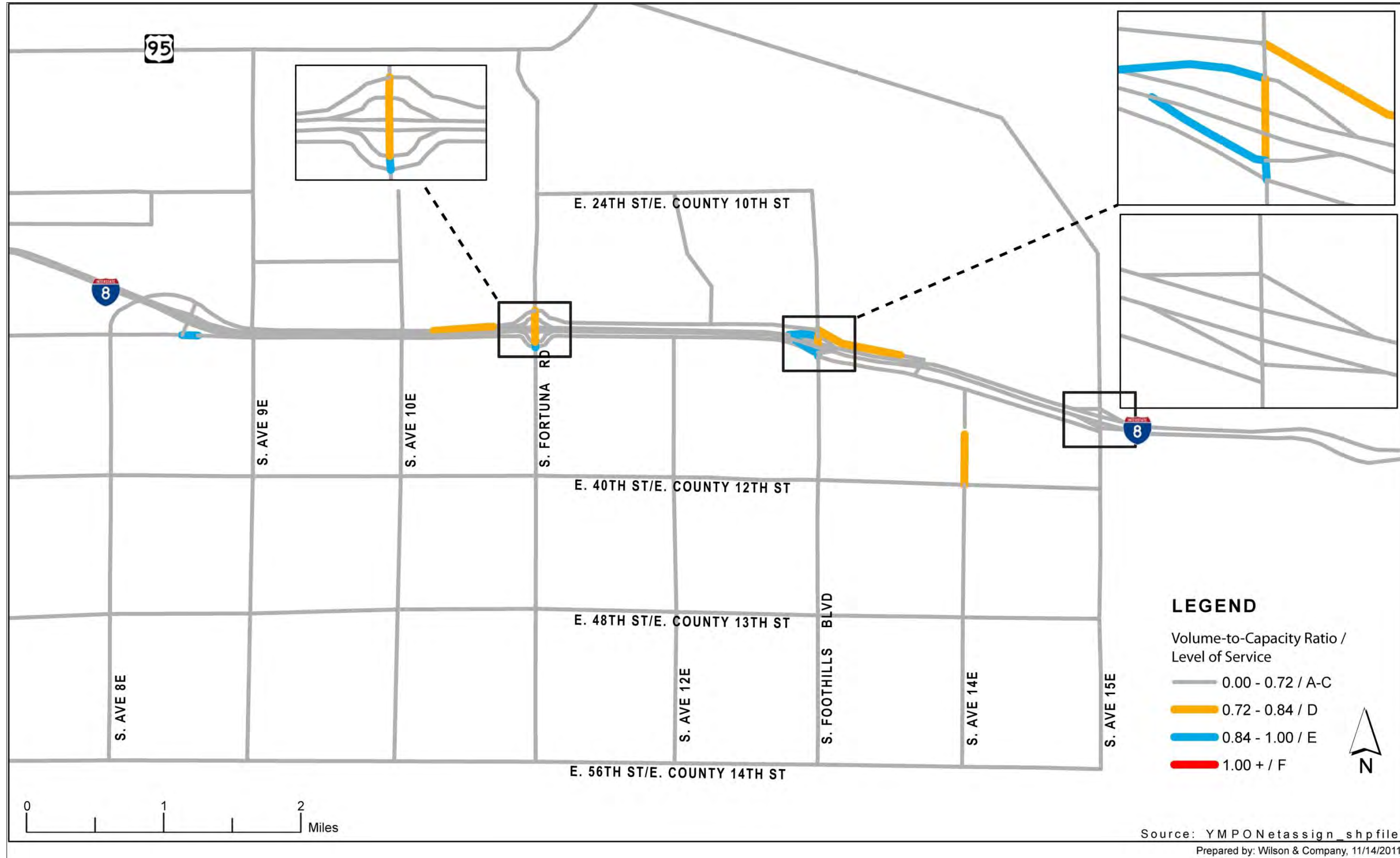


FIGURE 6.15
 BUILDOUT CONDITIONS: NETWORK ALTERNATIVE 3 – ROADWAY SEGMENT LEVEL OF SERVICE BASED ON DAILY TRAFFIC VOLUMES



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6.2 EVALUATION OF ALTERNATIVES

The information and analyses presented herein provides a rational basis for evaluating the advantages and disadvantages of the five alternative Buildout roadway networks. Criteria were identified to facilitate such an evaluation. The criteria give focus to the improvement scenario that will best address capacity needs and provide relief from congestion forecast by the model runs of future Buildout traffic conditions. The criteria also assist in identifying where deficiencies still exist relative to future travel demand and long-term growth and development expected in the study area.

6.2.1 SUMMARY OF OPERATIONAL STATISTICS

Table 6.2 below provides a summary of key operational aspects of the five Buildout alternatives. The table reveals that Total Vehicles Miles Traveled (VMT) ranges from 913,000 to 970,000, while Total Vehicle Hours Traveled (VHT) ranges from 1,850,000 to 4,593,000. Clearly, there are significant differences in operational efficiency associated with the alternatives evaluated. The alternative defined as *Buildout Conditions: E+C w/Limited Additional Network Connectivity* exhibits the highest (by several orders of magnitude) VMT, VHT, as well as Congested VMT, VHT, and Lane Miles. These operational statistics demonstrate that improvement alternatives to create new linkages and add capacity where needed have the potential to significantly upgrade the efficiency of the study area roadway network.

TABLE 6.2
PHYSICAL AND OPERATIONAL CHARACTERISTICS OF BUILDOUT ALTERNATIVES

Network Physical and Operational Characteristics	Alternative A: E+C Network w/Limited Additional Connectivity	Alternative B: Augmented w/Proposed County Improvements	Alternative 1: I-8/Ave 15E to 24 th St	Alternative 2: I-8/Foothills Blvd to US 95	Alternative 3: I-8/Ave 15E to US 95
Total Road Miles	60.16	62.79	66.85	65.04	68.85
Total Lane Miles	152.77	188.53	207.80	201.93	211.22
New Lane Miles	0.0*	35.76	55.03	49.16	58.45
Total Vehicle Miles Traveled (VMT)	969,957	913,431	949,157	934,266	966,638
Total Vehicle Hours Traveled (VHT)	4,592,711	2,019,681	1,868,546	1,805,204	1,823,362
Congested VMT	139,617	19,101	3,925	13,395	6,143
Congested VHT	1,824,929	189,483	18,436	86,639	24,408
Congested Lane Miles	17.31	2.45	0.46	1.85	0.67
Congested VMT/Total VMT	14.4%	2.1%	0.4%	1.4%	0.6%
VHT/Total Lane Miles	30,063	10,713	8,992	8,940	8,633

Prepared by Wilson & Company, December 2011.

* NOTE: The E+C w/Limited Additional Network Connectivity" is the base Buildout condition to which "New Lane Miles" is being referenced for all other alternatives.

6.2.2 EVALUATION FRAMEWORK

The following key objectives were established to guide development and evaluation of the alternatives presented in the previous chapter.

- Address the needs of the Mesa Del Sol and Foothills areas
- Identify roadway and potential multimodal improvements coupled with flood control requirements to meet the growing population and changing land uses to:
 - Improve mobility and safety
 - Encourage sensible and sustainable development that supports current and projected uses
- Assess the feasibility of funding and implementing the needed improvements for five-, ten- and twenty-year periods
- Actively solicit input from stakeholders and the public, and incorporate their priorities into the plan and program for improvements
- Outline a refined plan for improvements for five-, ten-, and twenty-year periods.

6.2.3 ALTERNATIVES EVALUATION MATRIX

The following evaluation matrix (Table 6.3) provides an assessment of the five Buildout alternatives relative to 17 evaluation criteria identified with respect to five Goals/Objectives. The evaluation criteria were presented to and approved by the Technical Advisory Committee (TAC) for use in this study. Each alternative was assessed a measure of effectiveness in the following manner:

- The alternative least compatible with Goals/Objectives was awarded zero (0) points, symbolized by a ○;
- The alternative most or very compatible with Goals/Objectives was awarded two (2) points, symbolized by a ●;
- The alternatives lying between the two extremes, being somewhat or moderately compatible with Goals/Objectives, were awarded one (1) point each, symbolized by a ●.

If two or more alternatives effectively satisfied or did not satisfy a criterion equally relative to meeting Goals/Objectives, then each was awarded the same number of points.

The evaluation matrix shows that Buildout Alternative 1 is the preferred improvement scenario with a total of 22 points. This alternative is anticipated to:

- Most strongly support existing, expanding, or new development
- Minimize the number of lane miles on all facilities operating at LOS E or F
- Minimize impacts to areas containing known or likely habitat for Threatened, Endangered and other sensitive species
- Maximize the likelihood of acceptance by local elected officials, and
- Maximize the likelihood of acceptance by outside agencies, stakeholders and the community.

Buildout Alternative 1 is somewhat or moderately compatible with all other criteria. Although this alternative would not minimize daily VMT, such as its next closest competitor, Buildout Alternative Augmented with Proposed County Improvements, it would perform very well with respect to establishing quality LOS. Buildout Alternative 1 is also not the best performing with respect to Environmental Compatibility nor Cost. However, it is strongly rated with respect to Ease of Implementation. The Buildout Alternative 1:

- Incorporates the new interchange on I-8 at South Avenue 15E that has been included in adopted regional transportation plans;
- Establishes improved regional connectivity that would be useful to the core residents of the study area; and
- Provides an alternative route of travel for the eastern portion of the study area that would ease the traffic burden on I-8 and the I-8 frontage roads.

**TABLE 6.3
EVALUATION OF BUILDOUT ALTERNATIVES**

Goals/Objectives	Buildout Alternatives				
	Alt A: E+C w/Limited Additional Connectivity	Alt B: Augmented w/Proposed County Improvements	Alt 1	Alt 2	Alt 3
Local Plan Consistency					
Support existing, expanding or new development	○	●	●	●	●
Projects are identified in existing corridor study or comprehensive plan	○	●	●	●	●
Subtotal	0	2	3	2	2
Safety & Mobility					
Minimize daily vehicle miles traveled	○ 970,000	● 913,000	● 949,000	● 934,000	● 967,000
Minimize the number of lane miles on all facilities operating at LOS E or F	○ 17.31	● 2.45	● 0.5	● 1.9	● 0.7
Provide additional sub-regional connectivity	○	●	●	●	●
Minimize the percent of congested (LOS E or F) daily vehicle miles traveled (VMT)	○ 14.4%	● 2.1%	● 0.4%	● 1.4%	● 0.6%
Subtotal	0	5	6	5	4
Environmental Compatibility					
Minimize impacts associated with crossing of floodplains or disturbance of drainage features	● 1 new wash crossings	● 2 new wash crossings	○ 8 new wash crossings	● 3 new wash crossings	○ 9 new wash crossings
Minimize impacts to resources protected under Section 4(f) – Parks – and 6(f) – Historic and Archaeological Sites	● Existing travel corridors; no apparent impacts	● Existing travel corridors; no apparent impacts	● Moderate visual impact relative to Gila Mountains Open Space and Recreational Area	○ Bisecting traverse of Yuma County Desert Preserve	○ Potential conflict with Arizona State Land Department (ASLD) holdings and Gila Mountains Open Space and Recreational Area
Minimize impacts to areas containing known or likely habitat for Threatened, Endangered and other sensitive species	● Not likely to be intrusive	● Not likely to be intrusive	● Not likely to be intrusive	● Not likely to be intrusive	● Potentially intrusive

TABLE 6.3 EVALUATION OF BUILDOUT ALTERNATIVES (CONTINUED)

Goals/Objectives	Buildout Alternatives				
	Alt A: E+C w/Limited Additional Connectivity	Alt B: Augmented w/Proposed County Improvements	Alt 1	Alt 2	Alt 3
Minimize impacts to wildlife corridors	● 5 new travel corridors	● 7 new travel corridors	● 9 new travel corridors	● 8 new travel corridors	○ 8 new travel corridors; potential impact on Gila Mountains Habitat Block
Minimize daily VHT	○ 4,593,000	● 2,020,000	● 1,869,000	● 1,805,000	● 1,823,000
Subtotal	8	7	5	6	2
Cost					
Minimize capital cost	● Includes at-grade arterial roadways only	● Includes at-grade arterial roadways only	● Includes new traffic interchange (TI) on I-8 at South Avenue 15E	● Includes crossing of Union Pacific Railroad (UPRR) and major intersection at US 95	○ Includes new TI at South Avenue 15E; crossing of UPRR; and major intersection at US 95
Minimize operating and maintenance cost (Total Lane Miles)	● 152.8	● 188.5	● 207.8	● 201.9	○ 211.2
Minimize right-of-way cost (Total Road Miles)	● 60.2	● 62.8	● 66.9	● 65.0	○ 68.9
Minimize VHT per Lane Mile - Maximize roadway network productivity	○ 30,063	● 10,713	● 8,992	● 8,940	● 8,633
Subtotal	6	5	4	4	2
Ease of Implementation					
Maximize the likelihood of acceptance by local elected officials	○	●	●	●	●
Maximize the likelihood of acceptance by outside agencies, stakeholders and the community	○	●	●	●	●
Subtotal	0	2	4	2	2
GRAND TOTAL	14	21	22	19	12

- Notes:
- Least compatible with Goals/Objectives – zero points
 - Somewhat or Moderately compatible with Goals/Objectives – one (1) point
 - Very compatible with Goals/Objectives – two (2) points



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RECOMMENDED TRANSPORTATION IMPROVEMENTS

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7.0 RECOMMENDED TRANSPORTATION IMPROVEMENTS

7.1 ROADWAY NETWORK IMPROVEMENTS

Two roadway networks have been defined and recommended for implementation: Year 2030 and Buildout. This section provides a description of specific improvements recommended for implementation by Year 2030 and, ultimately, to serve travel needs at Buildout.

7.1.1 YEAR 2030 ROADWAY NETWORK IMPROVEMENTS

The recommended Year 2030 roadway network would establish new connections within the existing network to relieve anticipated congestion. Figure 7.1 shows the changes from existing conditions associated with the recommended Year 2030 roadway network, which are highlighted below:

North of I-8

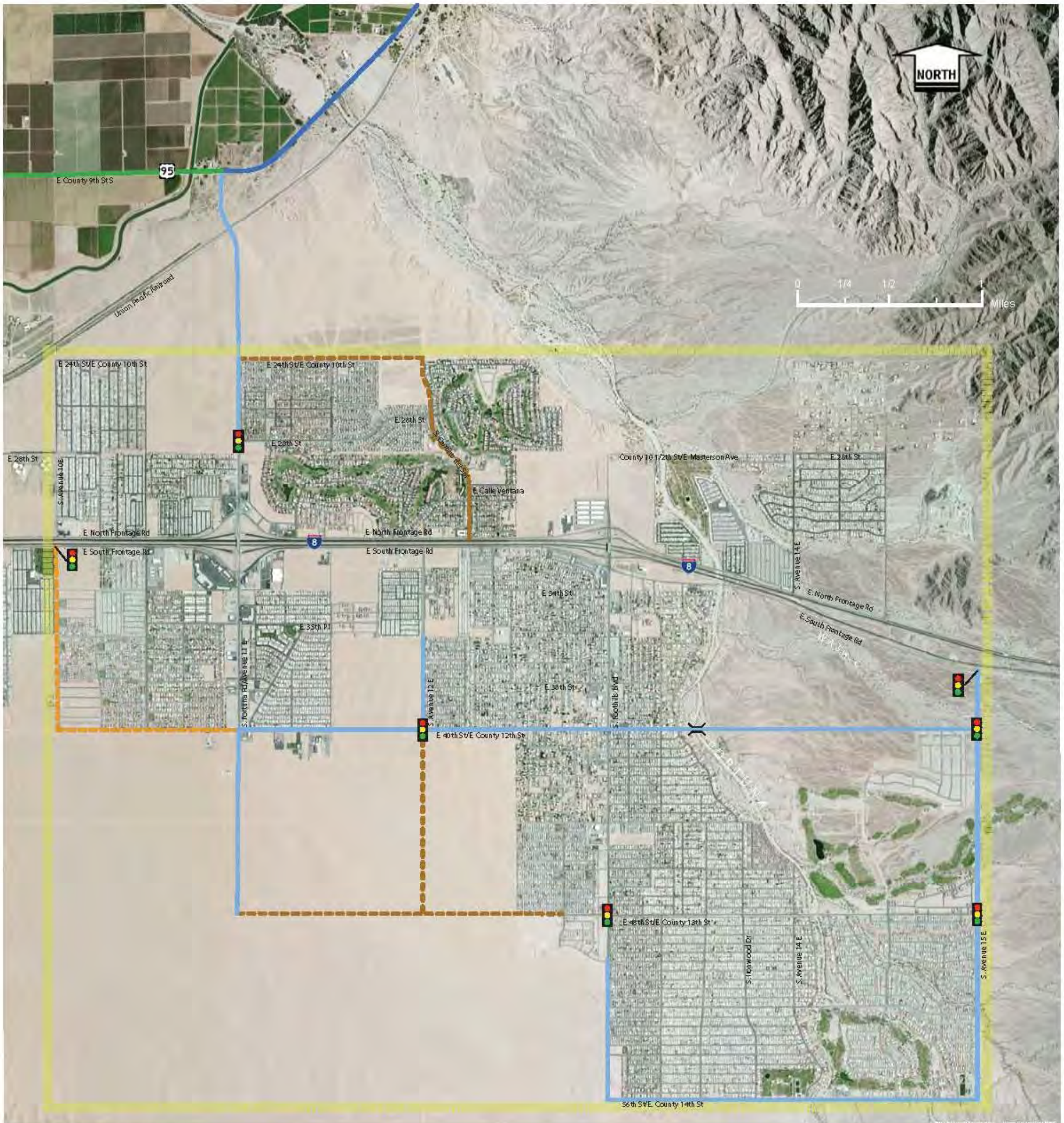
- Reconstruct South Fortuna Road as a four-lane Minor Arterial from East 28th Street/ East County 10½ Street to US 95;
- Fully construct East 24th Street/East County 10th Street between South Fortuna Road and South Camino Del Sol to a two-lane Collector;
- Fully construct South Camino Del Sol north of East 28th Street/ East County 10½ Street to East 24th Street/East County 10th Street as a two-lane Collector.

South of I-8

- Fully construct South Avenue 10E as a two-lane Major Collector between the I-8 South Frontage Road and East 40th Street/East County 12th Street;
- Build out East 40th Street/ East County 12th Street to a four-lane Minor Arterial between South Fortuna Road and South Avenue 15E;
- Extend South Fortuna Road south to East 48th Street/East County 13th Street as a four-lane Minor Arterial;
- Build out South Avenue 12E south of East 36th Street to East 40th Street/ East County 12th Street as four-lane Minor Arterial;
- Extend South Avenue 12E south to East 48th Street/East County 13th Street as a two-lane Collector;
- Extend East 48th Street/East County 13th Street west from South Foothills Boulevard to South Fortuna Road as a two-lane Collector;
- Build out to four-lane Minor Arterials –
 - South Foothills Boulevard south of East 50th Street to 56th Street/East County 14th Street;
 - East 56th Street/East County 14th Street between South Foothills Boulevard and South Avenue 15E; and
 - South Avenue 15E between I-8 South Frontage Road and East 56th Street/East County 14th Street.

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FIGURE 7.1
YEAR 2030 RECOMMENDED IMPROVEMENTS



LEGEND

- Study Area Boundary
- New Wash Crossing
- Future Signalized Intersection*

Roadway Improvements

 2 Lanes	 4 Lanes
 Expressway	 Principal Arterial
 Minor Arterial	 Major Collector
 Minor Collector	 Collector

* While standard intersection configurations and traffic control were assumed for this analysis, ADOT considers roundabouts to be a viable alternative, and their applicability could be the subject of subsequent site-specific studies.

Year 2030 Recommended Improvements



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7.1.2 BUILDOUT NETWORK IMPROVEMENTS

Based on the conclusions presented in the previous section, the recommended Buildout roadway network is Alternative 1. This alternative would add necessary capacity to the principal roadway system in the study area. It also would create a viable linkage connecting South Fortuna Road at East 24th Street/East County 10th Street with a new I-8 TI at South Avenue 15E. This new linkage would create a continuous east-west route north of I-8 providing relief for this Interstate facility. It also would integrate the eastern portion of the study area, i.e., Fortuna Hills, Foothills North, and Foothills Mountain Estates, with the central portion of the study area and establish direct access to US 95. Access to US 95 will provide an alternate route to the City of Yuma to the west, as well as points north, such as the Yuma Proving Grounds, Quartzite, and ultimately recreation opportunities in Parker. Figure 7.2 shows the changes from existing conditions associated with the recommended Buildout roadway network, which are highlighted below:

North of I-8

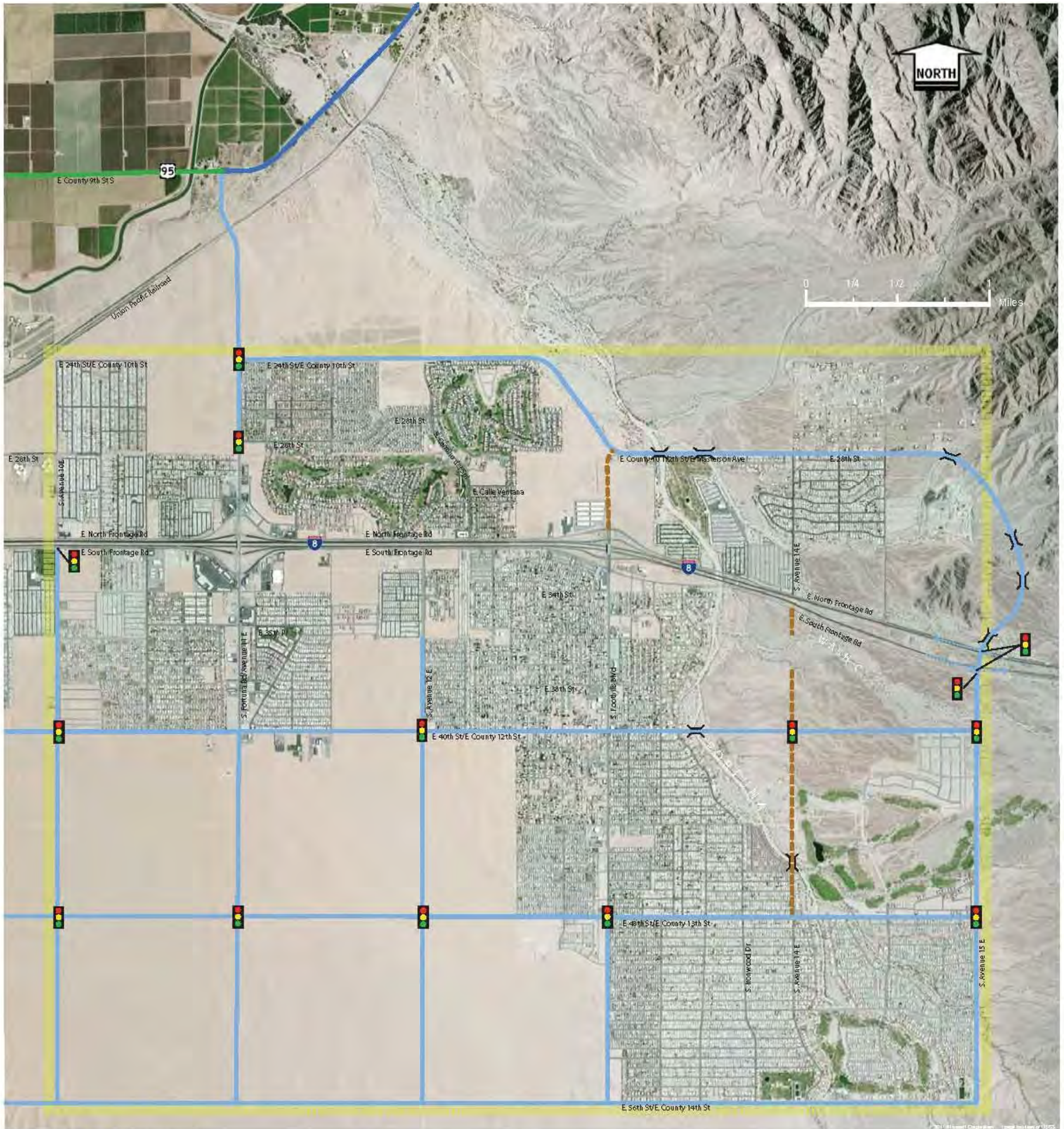
- Construct East 24th Street/East County 10th Street as a four-lane Minor Arterial between South Fortuna Road and South Foothills Boulevard;
- Construct a four-lane Minor Arterial facility (likely along the East 28th Street/East County 10½ Street alignment) between South Foothills Boulevard and South Avenue 15E;
- Extend Foothills Boulevard as a two-lane collector to intersect with the new east-west connector arterial (likely on the East 28th Street alignment);
- Construct South Avenue 15E between I-8 and new east-west connector (likely the East 28th Street/East County 10½ Street alignment) as a four-lane Minor Arterial;
- Construct a new traffic interchange on I-8 at South Avenue 15E.

South of I-8

- Construct four-lane Minor Arterials all north-south and east-west roadways forming the mile-road grid, except South Avenue 14E between East 48th Street/East County 13th Street and East 56th Street/East County 14th Street which will remain a two-lane collector;
- Construct South Avenue 14E as a two-lane collector south from the I-8 South Frontage Road to Wash C;
- Construct South Avenue 14E as a two-lane Collector south of Wash C to East 48th Street/East County 13th Street.

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FIGURE 7.2
RECOMMENDED BUILDOUT IMPROVEMENTS



LEGEND

- Study Area Boundary
- New Wash Crossing
- Future Signalized Intersection*

Roadway Improvements

2 Lanes	4 Lanes	
		Expressway
		Principal Arterial
		Major Collector
		Minor Collector
		Collector

NOTE: This recommendation presents the connection from I-8 to South Fortuna Road via South Avenue 15E, East 28th Street/East County 101/2 Street, and East 24th Street/East County 10th Street as a concept only. The routing shown is not intended to propose or define a specific alignment. The route identified for implementation, should this recommendation be accepted and carried forward, would be subject to subsequent more detailed studies.

Buildout Conditions:
Alternative 1



* While standard intersection configurations and traffic control were assumed for this analysis, ADOT considers roundabouts to be a viable alternative, and their applicability could be the subject of subsequent site-specific studies.

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7.2 PERFORMANCE OF THE YEAR 2030 AND BUILDOUT ROADWAY NETWORKS

Based on modeling results of the Year 2030 and Buildout roadway networks, key intersections were identified and evaluated for system performance. Figure 7.3 shows the location of intersections selected and identifies which were evaluated relative to Year 2030 Recommended Improvements and which were added to the evaluation relative to Buildout Conditions: Alternative 1. The information in this section highlights intersection-related improvements associated with the two roadway networks identified in Section 7.1 above. Recommended changes (compared to 2011) to intersection operations and geometrics for Year 2030 and Buildout are depicted in Figure 7.4.

All improvements noted are identified relative to existing 2011 conditions. Detailed LOS analyses for Year 2030 (modeled and mitigated) and Buildout roadway networks are provided in the Technical Appendices. The analyses in these appendices reveal that each analyzed intersection would operate at LOS D with forecast traffic volumes, provided the proposed improvements are implemented. LOS D or better is an acceptable operating environment for urbanized areas. A tabular summary of changes to the number of lanes at each intersection, as modeled for the two roadway networks, is provided in the Technical Appendices.

7.2.1 YEAR 2030 RECOMMENDED IMPROVEMENTS

Operational and geometric modifications needed relative to existing 2011 conditions have been identified for 18 intersections analyzed for the roadway network defined by Year 2030 Recommended Improvements. Forecast LOS deficiencies have been mitigated by segment improvements and intersection modifications, as specified.

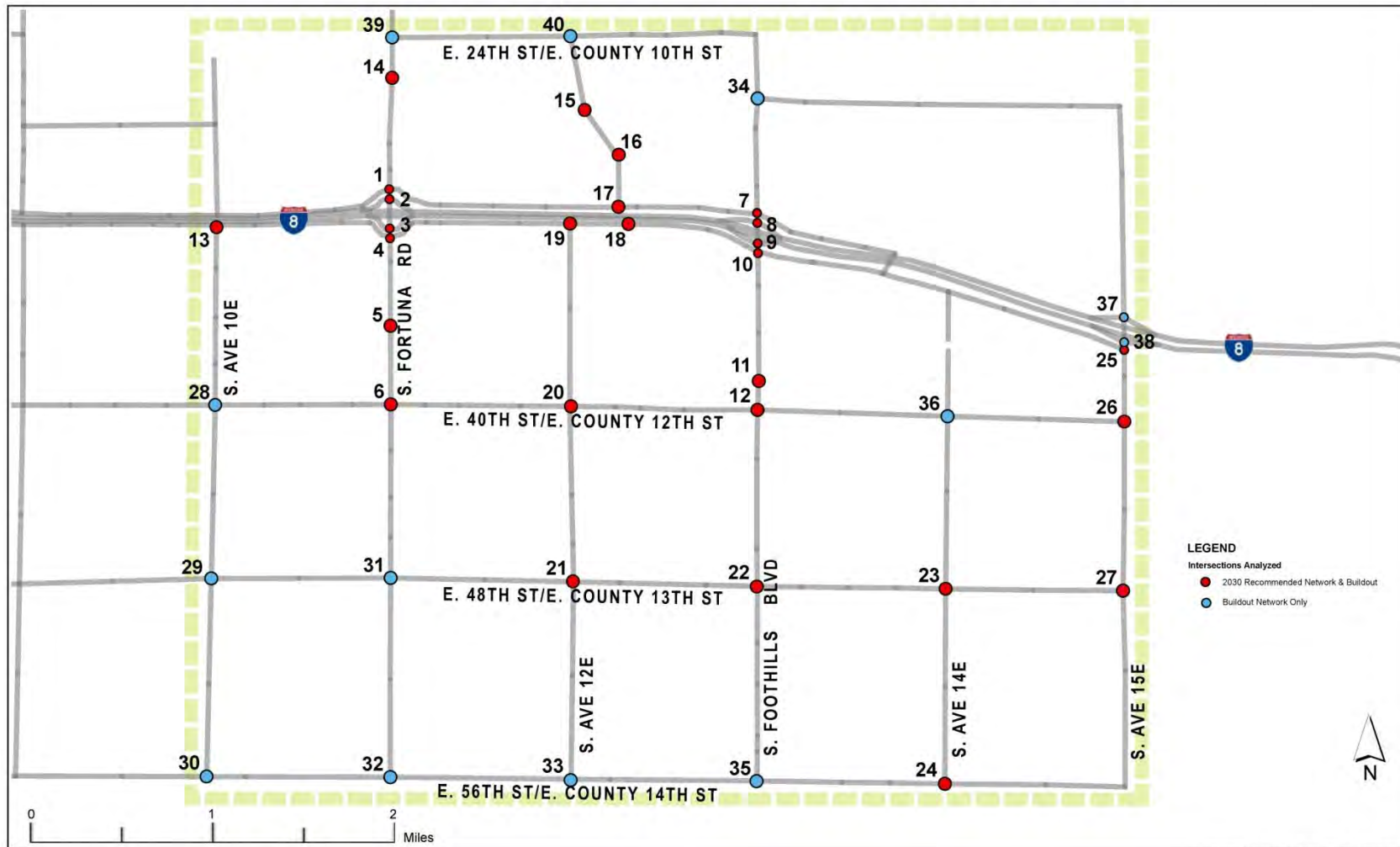
7.2.2 BUILDOUT CONDITIONS: ALTERNATIVE 1 IMPROVEMENTS

Operations and geometry modifications needed beyond those implemented for Year 2030 have been identified for 24 of the 40 intersections analyzed for the Buildout Conditions: Alternative 1 roadway network. No additional mitigation actions were necessary to achieve acceptable levels of service for intersections in the network.

7.2.3 SOUTH FOOTHILLS BOULEVARD TRAFFIC SIGNAL PHASING AT I-8 EASTBOUND OFF-RAMP AND I-8 SOUTH FRONTAGE ROAD

The South Foothills Boulevard/I-8 Eastbound Off-Ramp and South Foothills Boulevard/I-8 South Frontage Road intersections are very closely spaced, and the two traffic signals are operated with a single controller. In order to mitigate Year 2030 congestion conditions at these two intersections, due to forecasted traffic levels being higher than existing conditions, the existing signal phasing had to be modified. The phasing scheme implemented for Year 2030 mitigation strategy is illustrated in Figure 7.5. Deficiencies at the two intersections also could be alleviated using two separate signal controllers that are coordinated. This approach has been applied elsewhere by ADOT.

FIGURE 7.3
LOCATION OF INTERSECTIONS SELECTED FOR PERFORMANCE ANALYSIS: YEAR 2030 AND BUILDOUT ROADWAY NETWORKS



Prepared by: Wilson & Company, 11/14/2011

FIGURE 7.4
RECOMMENDED INTERSECTION OPERATIONAL AND GEOMETRIC MODIFICATIONS: 2030 AND BUILDOUT

	INTERSECTION 1 North Frontage Rd. & Fortuna Rd.	INTERSECTION 2 I-8 WB & Fortuna Rd.	INTERSECTION 3 I-8 EB & Fortuna Rd.	INTERSECTION 4 E. South Frontage Rd & Fortuna Rd.	INTERSECTION 5 35th Pl. & Fortuna Rd.
EXISTING					
2030		NO CHANGE	NO CHANGE	NO CHANGE	NO CHANGE
BUILDOUT				NO CHANGE	NO CHANGE

No Scale
 = Existing
 = 2030 Committed/Planned Improvements
 = Buildout Improvements

Source: Wilson & Company, March 2012.

FIGURE 7.4 (CONTINUED)
RECOMMENDED INTERSECTION OPERATIONAL AND GEOMETRIC MODIFICATIONS: 2030 AND BUILDOUT

	INTERSECTION 6 40th St. & Fortuna Rd.	INTERSECTION 7 E. North Frontage Rd. & Foothills Blvd.	INTERSECTION 8 I-8 WB & Foothills Blvd.	INTERSECTION 9 I-8 EB & Foothills Blvd.	INTERSECTION 10 E. South Frontage Rd. & Foothills Blvd.
EXISTING					
2030			NO CHANGE		
BUILDOUT	NO CHANGE		NO CHANGE		

⊕
No Scale

→ = Existing → = 2030 Committed/Planned Improvements → = Buildout Improvements

Source: Wilson & Company, March 2012.

FIGURE 7.4 (CONTINUED)
RECOMMENDED INTERSECTION OPERATIONAL AND GEOMETRIC MODIFICATIONS: 2030 AND BUILDOUT

	INTERSECTION 11 38th St. & Foothills Blvd.	INTERSECTION 12 40th St. & Foothills Blvd.	INTERSECTION 13 E. South Frontage Rd. & S. Ave. 10E	INTERSECTION 14 E. 28th St. & Fortuna Rd.	INTERSECTION 15 E. 28th St. & S. Camino Del Sol
EXISTING					
2030	NO CHANGE				NO CHANGE
BUILDOUT	NO CHANGE	NO CHANGE		NO CHANGE	NO CHANGE

No Scale
 = Existing
 = 2030 Committed/Planned Improvements
 = Buildout Improvements

Source: Wilson & Company, March 2012.

FIGURE 7.4 (CONTINUED)
RECOMMENDED INTERSECTION OPERATIONAL AND GEOMETRIC MODIFICATIONS: 2030 AND BUILDOUT

	INTERSECTION 16 E. Calle Centana & E. Camino Del Sol	INTERSECTION 17 E. North Frontage Rd. & E. Camino Del Sol	INTERSECTION 18 E. South Frontage Rd. & Far West Ave.	INTERSECTION 19 E. South Frontage Rd. & 12E Ave.	INTERSECTION 20 40th St. & 12E Ave.
EXISTING					
2030	NO CHANGE	NO CHANGE	NO CHANGE		
BUILDOUT	NO CHANGE	NO CHANGE	NO CHANGE	NO CHANGE	

No Scale
 = Existing
 = 2030 Committed/Planned Improvements
 = Buildout Improvements

Source: Wilson & Company, March 2012.

FIGURE 7.4 (CONTINUED)
RECOMMENDED INTERSECTION OPERATIONAL AND GEOMETRIC MODIFICATIONS: 2030 AND BUILDOUT

	INTERSECTION 21 CO 13th & 12E Ave.	INTERSECTION 22 CO 13th & Foothills Blvd.	INTERSECTION 23 CO 13th & Ave. 14E	INTERSECTION 24 56th & Ave. 14E	INTERSECTION 25 S. Frontage Rd. & Ave. 15E
EXISTING					
2030					
BUILDOUT					

No Scale
 = Existing
 = 2030 Committed/Planned Improvements
 = Buildout Improvements

Source: Wilson & Company, March 2012.

FIGURE 7.4 (CONTINUED)
RECOMMENDED INTERSECTION OPERATIONAL AND GEOMETRIC MODIFICATIONS: 2030 AND BUILDOUT

	INTERSECTION 26 40th St. & Ave. 15E	INTERSECTION 27 CO 13th & Ave. 15E	INTERSECTION 28 40th St. & S. Ave. 10E	INTERSECTION 29 CO 13th & S. Ave. 10E	INTERSECTION 30 56th & S. Ave. 10
EXISTING					
2030					
BUILDOUT	NO CHANGE				

No Scale

= Existing

= 2030 Committed/Planned Improvements

= Buildout Improvements

Source: Wilson & Company, March 2012

FIGURE 7.4 (CONTINUED)
RECOMMENDED INTERSECTION OPERATIONAL AND GEOMETRIC MODIFICATIONS: 2030 AND BUILDOUT

	INTERSECTION 31 CO 13th & Fortuna Rd.	INTERSECTION 32 56th & Fortuna Rd.	INTERSECTION 33 56th & 12E. Ave.	INTERSECTION 34 28th & Foothills Blvd.	INTERSECTION 35 56th & Foothills Blvd.
EXISTING					
2030					
BUILDOUT					

No Scale
 = Existing
 = 2030 Committed/Planned Improvements
 = Buildout Improvements

Source: Wilson & Company, March 2012

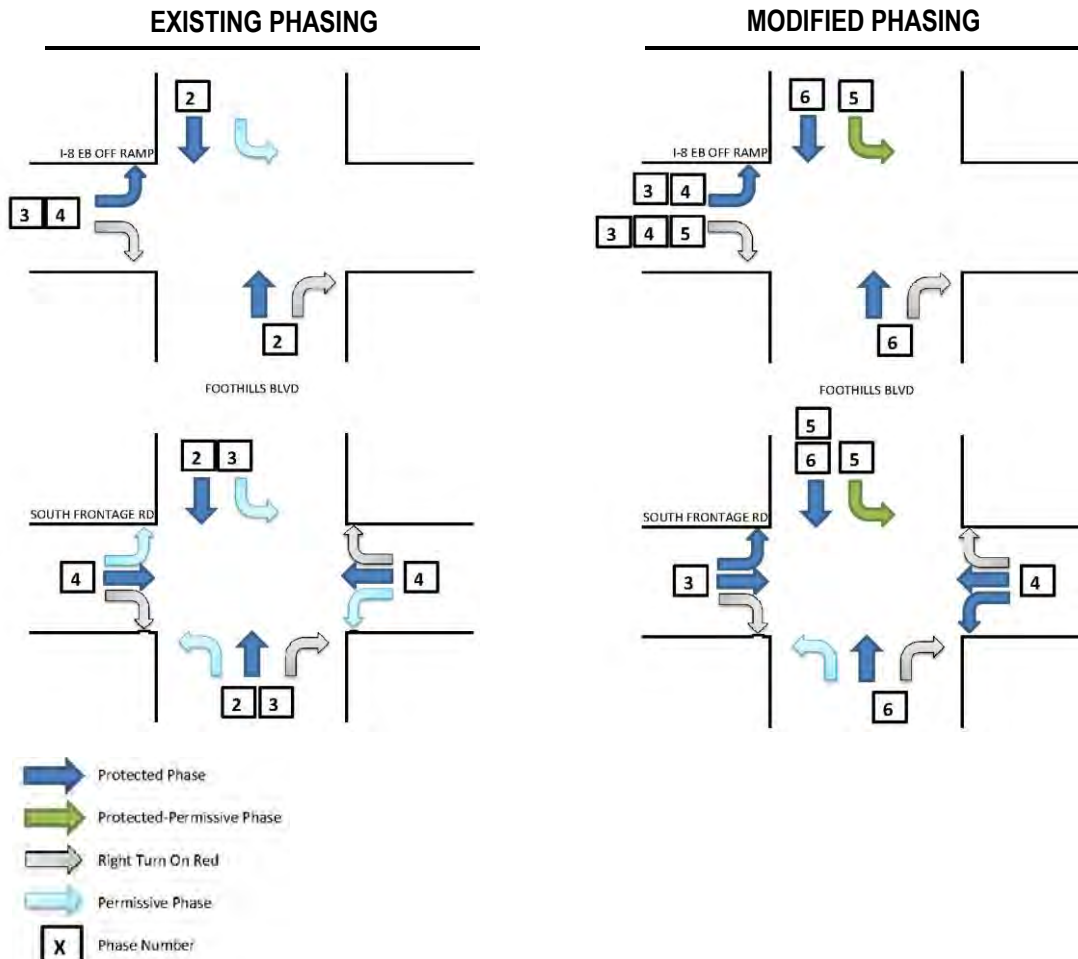
FIGURE 7.4 (CONTINUED)
RECOMMENDED INTERSECTION OPERATIONAL AND GEOMETRIC MODIFICATIONS: 2030 AND BUILDOUT

	INTERSECTION 36 40th St. & Ave. 14E	INTERSECTION 37 I-8 WB Off Ramp & Ave. 15E	INTERSECTION 38 I-8 EB Off Ramp & Ave. 15E	INTERSECTION 39 24th & Fortuna Rd.	INTERSECTION 40 24th & S. Camino Del Sol
EXISTING					
2030					
BUILDOUT					

No Scale
 = Existing
 = 2030 Committed/Planned Improvements
 = Buildout Improvements

Source: Wilson & Company, March 2012.

FIGURE 7.5
RECOMMENDED SIGNAL PHASING OF I-8 EASTBOUND OFF-RAMP AND SOUTH FRONTAGE ROAD AT SOUTH FOOTHILLS BOULEVARD



Prepared by Wilson & Company, January, 2012.

7.3 RECOMMENDED INTERIM IMPROVEMENTS

The analyses of transportation network alternatives focused on Year 2030 and Buildout development conditions and associated travel demand. However, evaluations of interim needs for the near-term and mid-term (five- and ten-year) timeframes also were conducted. These supporting evaluations served to identify the highest priority components of the Year 2030 Recommended Network that should be prioritized for implementation.

7.3.1 NEAR-TERM IMPROVEMENTS (5-YEAR TIMEFRAME)

Recommended near-term (5-year) projects have been identified to align with those projects already programmed in the study area. A summary of projects documented in Capital Improvement Plans (CIPs) and Transportation Improvement Programs (TIPs) through 2016 is provided in Table 7.3.

**TABLE 7.1
ROADWAY CAPITAL IMPROVEMENT PROJECTS**

Source	Project Name	Funding (000's)				
		FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
ADOT STIP	Reconstruct I-8 South Frontage Road, South Avenue 9E - South Avenue 11E	2,072	1,020	--	--	--
	I-8/South Fortuna Road Traffic Interchange Improvements	636	--	--	--	--
Yuma County CIP	I-8 North & South Frontage Road Widening, South Avenue 10E – South Avenue 13E	2,897	--	400	600	400
	East 40 th Street/East County 12 th Street Reconstruction, South Avenue 12E – South Avenue 13E	2,721	500	--	--	150
	Signal at South Foothills Boulevard and East 48 th Street/East County 13 th Street	113	--	--	--	--

Prepared by Wilson & Company, December, 2011.

7.3.2 MID-TERM IMPROVEMENTS (10-YEAR TIMEFRAME)

Previously, an analysis of Year 2020 forecasted volumes on the E+C Improvements network was conducted and documented in Section 5.0 of this document. Based on deficiencies identified in the analysis of Year 2020 conditions, the following improvement components of the Year 2030 Recommended Network are recommended to supplement the programmed CIP projects:

- Upgrade the north and south frontage roads of I-8 between South Avenue 10E and South Avenue 15E to provide three travel lanes – one through lane in each direction and a center turn lane;
- Reconstruct East 40th Street/East County 12th Street as a 4-lane minor arterial between South Fortuna Road and South Avenue 12E; and
- Extend East 40th Street/East County 12th Street as a 4-lane minor arterial between South Foothills Boulevard and South Avenue 15E.

7.4 RECOMMENDED PUBLIC TRANSIT IMPROVEMENTS

The YMPO RTP Update contains short- and long-range plans for improving the regional transit system. A follow-on study, the Yuma Regional Transit Study, continues the regional transit planning process by more closely examining the ability to fund and implement planned short-range transit service improvements. The 2011 Yuma Regional Transportation Coordination Plan completed in 2011 was a separate project addressing the need to coordinate the several services available to persons in the YMPO region with special transportation needs. Recommendations and guidance provided in the RTP, Yuma Regional Transit Study, and 2011 Yuma Regional Transportation Coordination Plan are included by reference as key elements of this Transportation Needs Study for the Foothills and Mesa Del Sol Areas. The general focus of these plans is presented below.

7.4.1 FIXED-ROUTE PUBLIC TRANSIT SERVICE

The Yuma County Area Transit (YCAT) public transit service has experienced strong growth since its inception, demonstrating high potential for regional support of transit services. Although the recent recession has had severe impacts on the ability of the region to maintain service levels, planning continues to focus on enhancing and expanding this system.

7.4.2 YCAT SHORT-RANGE TRANSIT PLAN

The Short-Range Transit Plan (SRTP) of the YCAT system provides guidelines for meeting the near-term needs of transit users in the City of Yuma and southwestern Yuma County. The SRTP covers a period of five years with the principal thrust to build a strong foundation for implementation of the Long-Range Transit Plan (LRTP). The SRTP depicts two circulator routes operating in the Foothills and two routes serving the Mesa Del Sol area, as shown in Figure 7.6 and Figure 7.7. The RTP recognizes these routes are preliminary, to be implemented as funding is available and priorities are established.

7.4.3 LONG-RANGE TRANSIT PLAN

The Long-Range Transit Plan (LRTP) in the YMPO RTP outlines a region-focused course of action to ensure transit will be supported by Yuma County communities and that ridership is encouraged over time. To be successful, transit services must become an integral part of overall planning for the YMPO region. The LRTP establishes the necessary regional perspective for this to happen and highlights means to enhance travel between neighboring cities and expand transportation choices within the regional transportation system.

To this end, the LRTP is goal-oriented, setting out unambiguous transit mode share objectives that will be supportive of the desired land-use, lifestyle, and transportation vision for the region. It is anticipated that transit mode share objectives will become part

of the region's process for approving major transportation and land development projects. Implementation of this transit strategy will be accomplished in conjunction with improvements to the roadway network and will help to achieve the overall goal of an integrated multi-modal system. The Yuma Regional Transit Study (see below) has been undertaken to clarify, enhance, and expand the plans, goals, and objectives set forth in the YMPO RTP.

7.4.4 YUMA REGIONAL TRANSIT STUDY

The principal focus of this regional study, which followed completion of the YMPO RTP, was identification of feasible transit corridors that would permit development of a regional transit system design and implementation plan. The study included evaluation of three funding scenarios. The focus of the study included the jurisdictions of Yuma County, Cocopah Indian Tribe, Fort Yuma Quechan Indian Tribe, the Town of Wellton, and the cities of Yuma, Somerton, and San Luis. The major points of emphasis for this study were:

- Transit system design options;
- Evaluation of a member agency cost apportionment policy;
- Public transportation division organizational structure;
- Public transportation funding opportunities; and
- Operating contract requirements.

Subsequent to substantive public involvement, regional transit alternatives were developed to address service deficiencies and special needs. Three service alternatives for the YCAT system were developed and presented for public review prior to finalizing the study and preparing firm recommendations. Implementation recommendations derived through this study assumed current funding levels, a 1/10 cent county-wide sales tax, and a 1/5 cent county-wide sales tax. A corresponding 5-year financial plan was formulated to support the recommendations. The Yuma County Transit Study did not result in a final recommendation as to route structure or service, but, rather, provided a decision framework within which community leaders could refine and make more viable regional transit services. This has been a dynamic process ongoing in the region for several years.

As stated earlier, service on the Orange Route was suspended east of South Fortuna Road. This suspension of service was effective January 9, 2012. The Orange Route in the past continued east to Wellton along the I-8 Frontage Roads and I-8. It served the core portion of the study area, even operating along South Far West Avenue and East 34th Street between the I-8 South Frontage Road and South Foothills Boulevard. Service east of South Fortuna Road is now provided via a new Gold Route, which is routed along the I-8 South Frontage Road to South Foothills Boulevard, then on to Wellton. The route is designated as offering flexible, deviated fixed-route service – or “Flex Route” – within the study area. Such service permits prospective users to call at least 60 minutes in advance (and up to 7 days) for pick-up/drop-off at a location up to

one and one-half miles from the designated route. Service to the East 34th Street area, therefore, still is possible with advanced reservations.

The Yuma Regional Transit Study Final Report, published January 2012, states:

Service Alternative 1 could potentially be implemented during the fiscal year 2012-2013 as it is based on current funding levels with the addition of partnerships with several institutions.

Service Alternatives 2 and 3 require higher capital and operating funding, and are based on the establishment of a transit-dedicated sales tax. Such a tax is subject to voters' approval and would not be in place before a couple of fiscal years.

Given the route descriptions provided for each service alternative, the transit agency could sequentially implement the routes or combine solutions from the three service alternatives, to provide the service that is appropriate given transit demand and available funding.

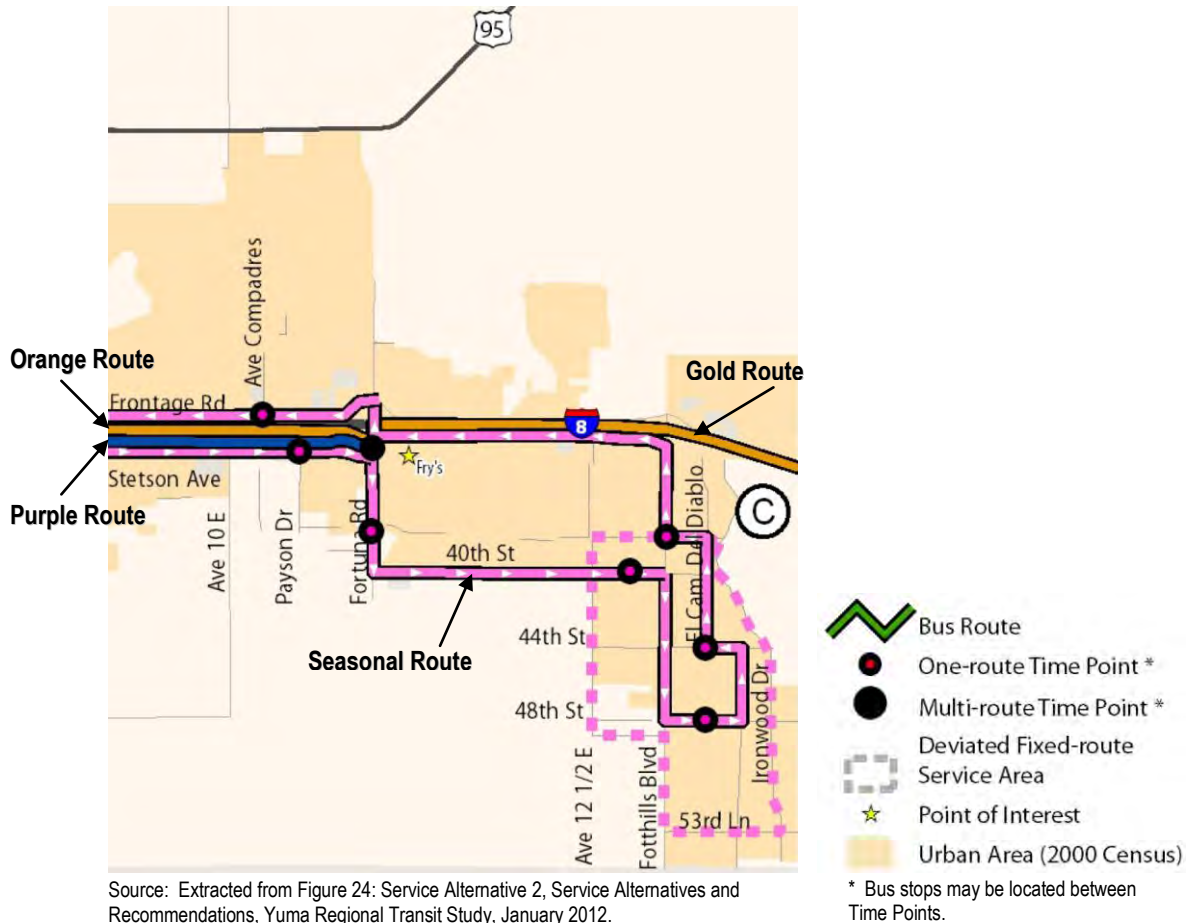
Service Alternative 1 is based on current funding levels and comprised of seven routes, three of which are Flex Routes that can deviate in response to customer request, as described above. Service Alternative 2 assumes a network of eight routes, including Flex Route service in the evening. The coverage area and route network is similar to that provided by Service Alternative 1 with the addition of an exclusive route serving the Fortuna Foothills area, a downtown loop in the City of San Luis, and two-way circulators in downtown Yuma. The coverage and route network of Service Alternative 3 is identical to Service Alternative 2. The principal difference is an increase in the frequency of service in areas with the most population.

Service Alternative 1 is comparable to current YCAT service as outlined at the Web site YCIPTA. In the study area, this means transit service west of South Fortuna Road is provided via the Orange Route, and service east of South Fortuna Road is provided via the Gold Route, as described above. In light of the findings of the Yuma County Transit Study and recent local actions creating the YCIPTA as the administrative and operating entity of YCAT, this route service is concluded to constitute the existing transit service.

7.4.5 RECOMMENDED PUBLIC TRANSIT SERVICE NETWORK

Future transit service in the near-term (0 to 5 years), funding permitting, would include the base service defined as Yuma Regional Transit Study Service Alternative 1 and a seasonal, one-way circulator route serving the southern portion of the study area. Beyond the near-term, implementation of Service Alternatives 2 and 3, as funding permits, is recommended as a mid-term, 10-year development initiative. This action would be consistent with the 5-year Financial Plan adopted as part of the Yuma Regional Transit Study. The deviated, fixed-route service shown in Figure 7.8 would provide linkages for the southeastern portion of the study area to shopping opportunities along South Foothills Boulevard, South Fortuna Road, and the Walmart at

**FIGURE 7.8
FUTURE NEAR- TO MID-TERM TRANSIT SERVICE RECOMMENDATION
(BASED ON AVAILABILITY OF FUNDING)**



South Avenue 8E and the I-8 South Frontage Road. Therefore, it is assumed the transit services shown in Figure 7.8 would be implemented as soon as funding becomes available.

Under Buildout conditions, as defined in Section 7.1.2, the full complement of transit services presented in the YMPO RTP and Yuma Regional Transit Study would constitute the minimum long-term transit component for the Foothills and Mesa Del Sol Areas. The transit service network under Buildout conditions would reflect the routes shown earlier in Figures 7.5 and 7.6. At this time, no plans include consideration of transit service to the southwestern portion of the study area. Therefore, extending transit service to the southwestern portion of the study area will need to be reviewed and its viability assessed, as development moves toward Buildout conditions.

7.4.6 DIAL-A-RIDE/PARATRANSIT SERVICE

The 2011 Yuma Regional Transportation Coordination Plan identifies local and regional transportation and mobility coordination gaps and barriers that exist in the YMPO planning area. YMPO and participating agencies developed a regional coordination process to address local and regional gaps in transportation services, as well as any barriers, that may be prohibiting potential users from accessing regional destinations.

The Plan satisfies the planning requirements for a Coordinated Public Transit-Human Services Transportation Plan, specifically mandated in Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation and subsequent guidance from the Federal Transit Administration (FTA). As such, it is incorporated by reference into this assessment of the Transportation Needs for the Foothills and Mesa Del Sol area and represents the recommended Dial-a-Ride (DAR) and paratransit component of this study.

7.5 RECOMMENDED PEDESTRIAN AND BICYCLE FACILITIES

Recommended improvements for pedestrian and bicycle movements have been adapted from adopted plans developed by the YMPO and Yuma County.

7.5.1 IMPROVEMENTS TO PEDESTRIAN ENVIRONMENT

Because every trip has a walking component of some length, there is a need to provide a safe and effective mobility environment for pedestrian movements. Therefore, the YMPO RTP includes a Pedestrian Element that calls for consideration of the following pedestrian-related design elements during the course of developing the transportation system:

- Continuous sidewalks;
- Comfortable [and safe] access to shopping, schools, and other activity centers; and
- Requirements specified in the Americans with Disability Act (ADA).

The YMPO RTP points out that most new urban street design and construction includes sidewalks for pedestrians. Nevertheless, it should be noted that there are many streets in the study area lacking adequate pedestrian facilities

The Guide for the Planning, Design, and Operation of Pedestrian Facilities, published by the American Association of State Highway and Transportation Officials (AASHTO), recommends a minimum sidewalk width of five feet. However, there are conditions that merit additional area for the accommodation of sidewalks and pedestrian environments to improve safety and enhance the pedestrian experience:

- A sidewalk width of six to eight feet with a buffer (or planting) strip between the sidewalk and the roadway is desirable along arterials not located in a central business district (CBD). The AASHTO Guide recommends the buffer be five to six feet wide along arterial or major roads (two to four feet along collector facilities).

- A sidewalk width of eight to ten feet is preferred where the sidewalk is flush against the roadside curb.

The YMPO RTP includes the goal to increase the availability of pedestrian facilities in the region and improve pedestrian safety. Objectives adopted in conjunction with this goal have been adapted to the situations and conditions in the Foothills and Mesa Del Sol study area:

- Provide safe and systematic connections between residential areas and key community destination points.
- Identify the need for sidewalks or sidewalk upgrades along major and minor arterials in the study area.
- Encourage the creation of transit-accessible designs for pedestrian facilities.
- Coordinate development and enhancement of pedestrian facilities with the Safe Routes to School (SRTS) Program established in August 2005 as part of Section 1404 of SAFETEA-LU.
- Incorporate recommendations of the AASHTO Guide and other relevant national standards, as appropriate into development of pedestrian facilities.

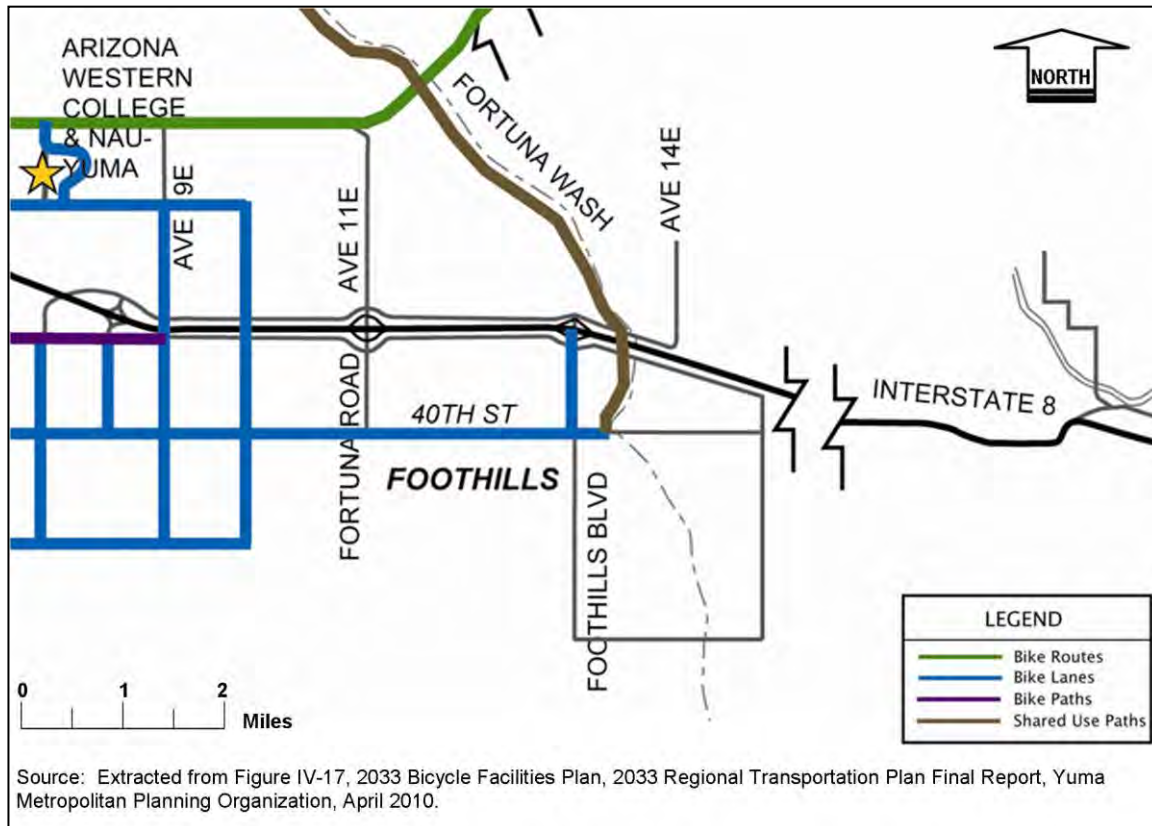
7.5.2 BICYCLE FACILITIES

The Yuma County 2010 Comprehensive Plan states “there is a need to incorporate provisions [for bicycle facilities] into existing infrastructure, roadway and non-motorized plans to accommodate this mode of transportation.” The YMPO RTP responds to this need by incorporating a Bicycle Element to guide development of a safe and convenient system of linear facilities and nodes. The 2033 Bicycle Facilities Plan is shown in Figure 7.9. Of particular note with regard to the Foothills and Mesa Del Sol study area is the shared-use path planned along Fortuna Wash north of East 40th Street/East County 12th Street. This path will link to the Anza historic trail, which is a route followed by members of the Spanish Expedition that generally corresponds to the Gila River approximately three miles north of the study area. Three other roadways in the study area have been designated for development with Bike Lanes:

- South Avenue 10E (two segments) – from East 24th Street/East County 10th Street to the I-8 North Frontage Road and from the I-8 South Frontage Road to East 48th Street/East County 13th Street;
- East 40th Street/East County 12th Street between South Avenue 10E and Fortuna Wash, where it would connect with the planned shared-use path heading north to the Gila River; and
- South Foothills Boulevard between East 40th Street/East County 12th Street and I-8.

Goals and objectives adopted in the YMPO RTP regarding development of bicycle facilities have been adapted to the situations and conditions in the Foothills and Mesa Del Sol study area and are presented below as recommendations for the transportation system of the study area:

FIGURE 7.9
PLANNED STUDY AREA BICYCLE FACILITIES



Provide safe and systematic connections between residential areas and key community and regional destination points, such as the City of Yuma and Yuma Palms Center;

- Encourage the creation of transit-accessible designs for bicycle facilities and routes, including the provision of parking, water, bike lockers, and other amenities, as deemed appropriate;
- Coordinate development of bicycle facilities with the Safe Routes to School (SRTS) Program;
- Establish viable, safe bicycle routes that minimize conflicts with motorized traffic and are appropriately marked and signed; and
- Incorporate recommendations of the AASHTO Guide and other relevant national standards, as appropriate, into development of bicycle facilities.

Consistent with the information and guidance outlined above, Figures 7.10 and 7.11 show recommended bicycle facilities for the Year 2030 and Buildout roadway networks in the study area. The recommended bicycle facilities recognize the desire to establish

a network that provides access throughout the community and connects with key community and regional destinations as well as the transit system.

7.5.3 ACCOMMODATIONS FOR PEDESTRIAN AND BICYCLE TRAVEL

Bike lanes, as recommended in Figures 7.10 and 7.11, currently are not integral to the typical roadway cross-sections required for arterials in Yuma County. Therefore, two alternative arterial cross-sections that accommodate bicycle lanes and pedestrians have been developed for review and possible adoption by the County in the future (Figure 7.12):

- Alternative Arterial Cross-Section 1 – Bike Lane and Sidewalk
- Alternative Arterial Cross-Section 2 – Multi-Use Path.

Both cross-sections anticipate a four-lane roadway with center left-turn lane constructed within a right-of-way of 100 feet. Alternative 1 would provide for separation of bicycle and pedestrian modes of travel by having vehicular traffic share the roadway with bicyclists in a dedicated lane and creating sidewalk for a distinct pedestrian environment. Alternative 2 would involve developing the roadway shoulder to create a 10-foot wide multi-use path separated from traffic to be shared by pedestrians and bicyclists.

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FIGURE 7.10
RECOMMENDED BICYCLE FACILITIES YEAR 2030

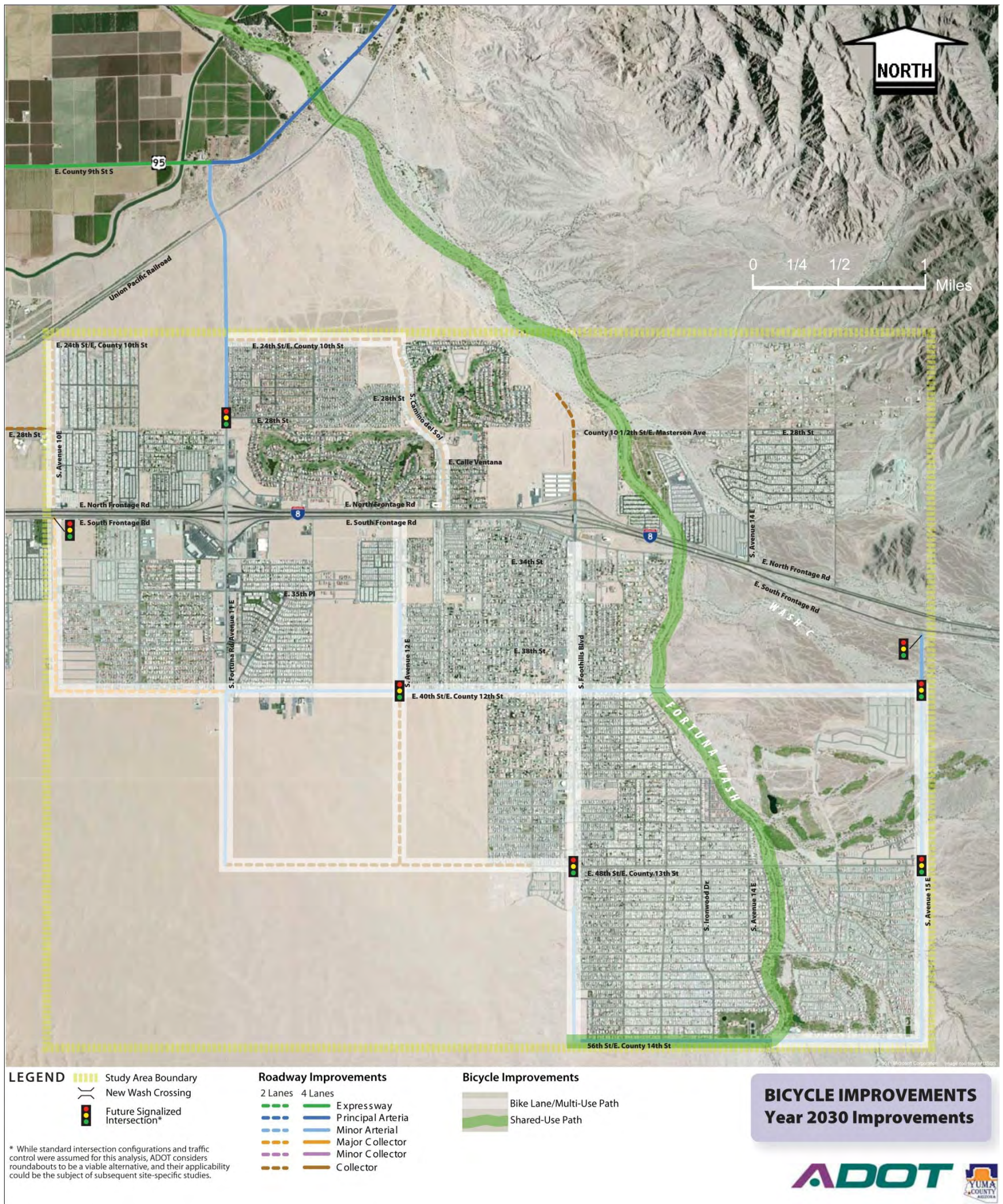


FIGURE 7.11
RECOMMENDED BICYCLE FACILITIES FOR BUILDOUT CONDITIONS – ALTERNATIVE 1

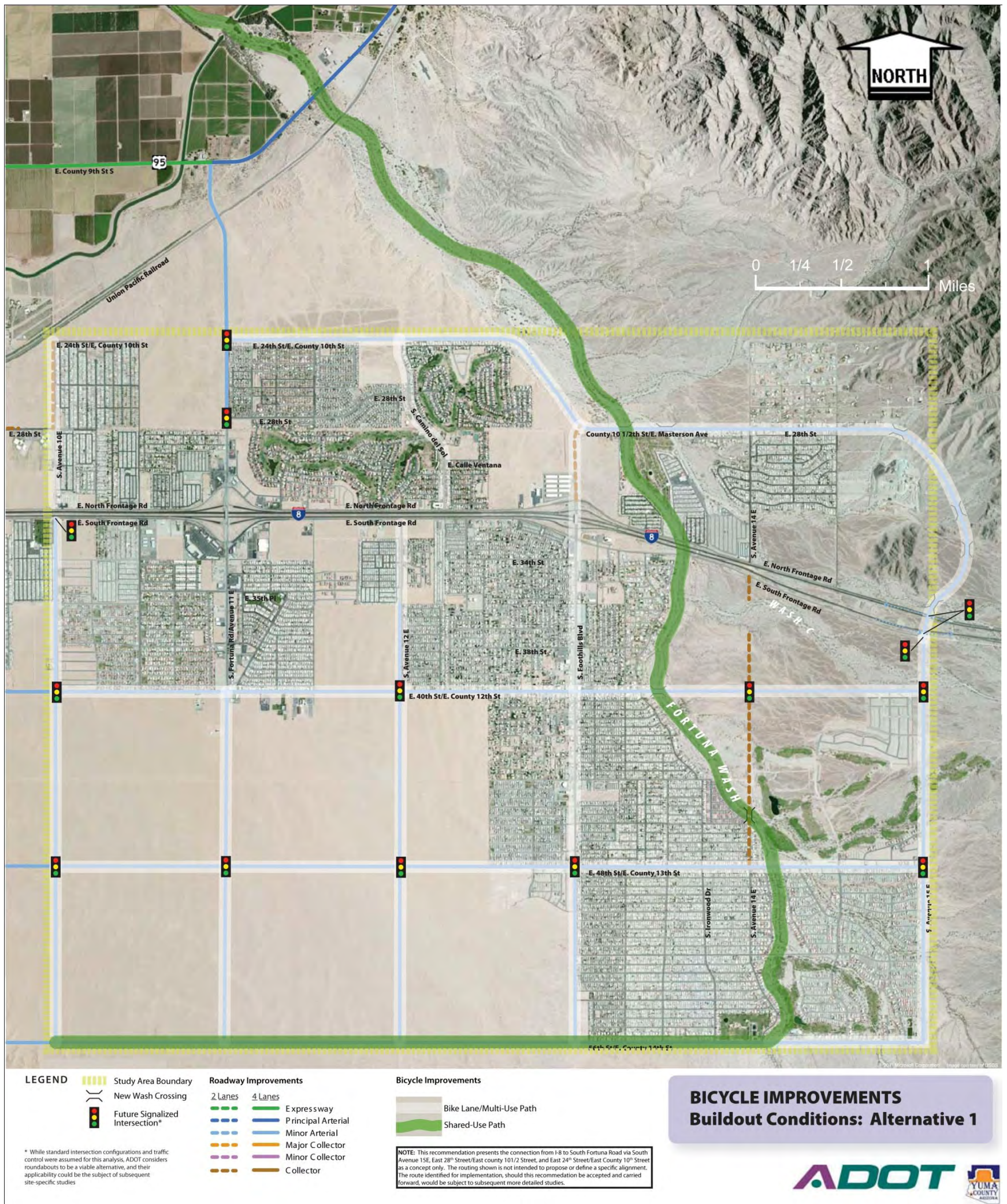


FIGURE 7.12
ALTERNATIVE ARTERIAL CROSS-SECTION 1

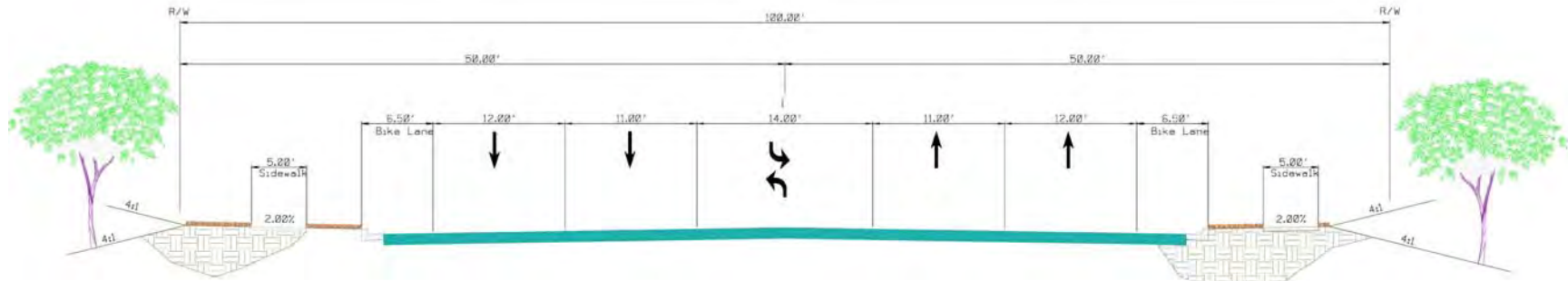
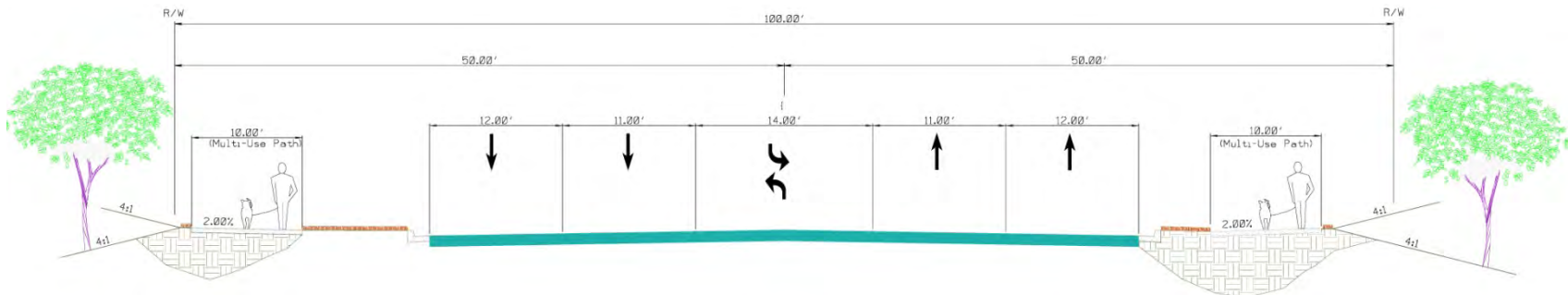


FIGURE 7.13
ALTERNATIVE ARTERIAL CROSS-SECTION 2



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PLANNING-LEVEL COSTS OF RECOMMENDED IMPROVEMENTS

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8.0 PLANNING-LEVEL COSTS OF RECOMMENDED IMPROVEMENTS

8.1 DERIVATION OF PLANNING-LEVEL COST COMPONENTS

Table 8.1 shows how planning-level costs, in constant 2012 dollars, were calculated for the Year 2020, 2030 and Buildout Recommended Improvements. Costs used were derived from review of recent cost estimates prepared in similar studies in Yuma County, including costs published in the YMPO RTP and national averages. Ultimately, estimated costs were presented to and approved by the Technical Advisory Committee (TAC). All unit costs are likely to change substantially during subsequent planning and design concept work. They also will vary by location according to terrain, drainage, soil conditions, and other characteristics.

TABLE 8.1
DERIVATION OF PLANNING-LEVEL COST

Improvement Type	Cost Unit	Estimated Cost per Unit*
New Traffic Signal	Each	\$250,000
Intersection Widening – Additional Turn Lane	Each	\$350,000
New Two-Lane Collector	Mile	\$2,000,000
New Four-Lane Arterial	Mile	\$5,000,000
Roadway Widening – One Additional Lane	Mile	\$3,000,000
Roadway Widening - Two Additional Lanes	Mile	\$4,500,000
Shared-Use Path	Mile	\$700,000
New Wash Crossing (Bridge)	100 Feet	\$1,000,000
New Traffic Interchange	Each	\$25,000,000

* 2012 Dollars

Prepared by Wilson & Company, March, 2012.

8.2 YEAR 2030 AND BUILDOUT PLANNING-LEVEL COSTS

Table 8.2 provides a summary of cost by improvement type for Year 2020, 2030 and Buildout Recommended Improvements. Detailed calculations are provided in the Technical Appendices.

**TABLE 8.2
SUMMARY OF RECOMMENDED IMPROVEMENT COSTS**

Improvement Type	Year 2020*	Year 2030*	Buildout*
New Traffic Signal	n/a	\$1,750,000	\$2,000,000
Intersection Widening – Additional Turn Lane	n/a	\$3,850,000	\$4,900,000
New Two-Lane Collector	n/a	\$6,500,000	\$2,200,000
New Four-Lane Arterial	\$8,000,000	\$5,000,000	\$59,500,000
Roadway Widening – One Additional Lane	\$21,750,000	\$1,200,000	n/a
Roadway Widening - Two Additional Lanes	\$6,300,000	\$24,980,000	\$39,380,000
Shared-Use Path	n/a	\$3,150,000	n/a
New Wash Crossing (Bridge)	\$6,000,000	n/a	\$28,000,000
New Traffic Interchange	n/a	n/a	\$25,000,000
TOTAL ESTIMATED IMPROVEMENT COSTS	\$42,050,000	\$46,430,000	\$160,980,000
New Transit Circulators	\$143, 095 Annually (per Yuma Regional Transit Study)		TBD

* 2012 Dollars
n/a = Not Applicable

Prepared by Wilson & Company, March, 2012.

PUBLIC INVOLVEMENT ACTIVITIES

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9.0 PUBLIC INVOLVEMENT

Public and stakeholder outreach during the Transportation Needs Study for the Foothills and Mesa Del Sol Area emphasized achievement of community input on a vision for the study area that will guide future decision-making. Thus, decisions made during this study were based on a process that reached out not only to those living in the study area but also those outside stakeholders interested in effecting transportation improvements in the area.

The Public Involvement Program adopted for this study was oriented to satisfying the information needs of a diverse audience that was fully engaged and actively involved throughout the study, including: agency staff, residents, area stakeholders, and elected officials. To accomplish this ambitious outreach effort, the Public Involvement Program included the following elements:

- **Committee Structure** – A strong advisory committee is critical to the success of studies addressing broad community interests. A Technical Advisory Committee (TAC), including representatives from the County, ADOT, City of Yuma, YMPO, YCIPTA, Federal Highway Administration (FHWA), Arizona State Land Department (ASLD), and Arizona Game and Fish Department (AzGFD), was formed and met to guide, evaluate, and critique the process and products of the Project Study Team.
- **One-on-One Meetings/Interviews** – Formal meetings with key stakeholders, including representatives from Yuma County Planning and Public Works, Marine Corps Air Station (MCAS), U.S. Army Yuma Proving Ground (YPG), Yuma County Sheriff's Office, and Rural Metro, were conducted to gain an understanding of issues, perspectives, and ideas.
- **Public Outreach**– Two stages of public outreach activities provided the general citizenry an opportunity to: 1) understand and provide feedback on project scope, expectations, vision, and opportunities/constraints, and 2) review and receive feedback on the recommended improvement program. The first stage consisted of introduction of a project fact sheet, accompanied by a public survey on transportation in the study area. The second stage consisted of a public open house which included a presentation of study elements, graphic displays, and an opportunity to engage in dialogue with planners.
- **Commission/City Council Briefings/Public Hearings** – Detailed summaries of study results, findings, and conclusions/recommendations will be presented to the County.

Details regarding the public outreach activities and all stakeholder/public input received during the course of the study is included in the Public Involvement Report in the Technical Appendices.

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TECHNICAL APPENDICES

Appendix A
Arizona Game and Fish Department
Special Status Species List for Yuma County

**Arizona Game and Fish Department
Special Status Species List for Yuma County**

Scientific Name	Common Name	ESA	Critical Habitat	USFS	WSCA	NPL	NESL	Taxonomic Group
Ardea alba	Great Egret			S	WC			Bird
Coccyzus americanus occidentalis	Western Yellow-Billed Cuckoo			S	WC		4	Bird
Egretta thula	Snowy Egret			S	WC			Bird
Empidonax traillii extimus	Southwestern Willow Flycatcher	LE	Y		WC		2	Bird
Glaucidium brasilianum cactorum	Cactus Ferruginous Pygmy-Owl	LE	P	S	WC			Bird
Himantopus mexicanus	Black-Necked Stilt			S				Bird
Laterallus jamaicensis coturniculus	California Black Rail	SC			WC			Bird
Rallus longirostris yumanensis	Yuma Clapper Rail	LE		S	WC			Bird
Anodonta californiensis	California Floater	SC						Invertebrate
Euderma maculatum	Spotted Bat	SC		S	WC			Mammal
Eumops perotis californicus	Great Western Mastiff Bat	SC		S				Mammal
Macrotus californicus	California Leaf-Nosed Bat	SC		S	WC			Mammal
Myotis yumanensis	Yuma Myotis	SC		S				Mammal
Peromyscus eremicuspapensis	see: Peromyscuseremicus eremicus	SC						Mammal
Plecotus townsendii pallescens	Pale Townsend's Big-Eared Bat	SC						Mammal
Sigmodon	Yuma Hispid	SC						Mammal

Scientific Name	Common Name	ESA	Critical Habitat	USFS	WSCA	NPL	NESL	Taxonomic Group
hispidus eremicus	Cotton Rat							
Allium parishii	Parish Onion	SC						Plant
Chamaesyce platysperma	Dune Spurge	SC						Plant
Colubrina californica	California Snakewood			S				Plant
Cryptantha ganderi	Gander's Cryptantha	SC						Plant
Helianthus niveus ssp tephrodes	Dune Sunflower	SC						Plant
Lophocereus schottii	Senita					SR		Plant
Opuntia wigginsii	Wiggin's Cholla					SR		Plant
Pholisma sonorae	Sand Food	SC				HS		Plant
Rhus kearneyi	Kearny Sumac					SR		Plant
Triteleiopsis palmeri	Blue Sand Lily					SR		Plant
Washingtonia filifera	California Fan Palm					SR		Plant
Charina trivirgata gracia	Desert Rosy Boa	SC						Reptile
Gopherus agassizii (sonoran population)	Sonoran Desert Tortoise	SC		S	WC			Reptile
Heloderma suspectum	Gila Monster	SC		S				Reptile
Phrynosoma mcalli	Flat-tailed Horned Lizard	SC		S	WC			Reptile
Thamnophis eques megalops	Mexican Garter Snake	SC		S	WC			Reptile
Uma notata rufopunctata	Cowels Fringe-toed Lizard	SC			WC			Reptile
Xyrauchen	Razorback sucker	LE		Y	WC		2	Fish

Scientific Name	Common Name	ESA	Critical Habitat	USFS	WSCA	NPL	NESL	Taxonomic Group
texanus								
Myotis Yumanensis	Yuma Myotis	SC						Mammal
Antilocapra Americana sonoriensis	Sonoran Pronghorn	SC		S	WC			Mammal

Legend:

ESA - Endangered Species Act; **LE** - Listed Endangered, imminent jeopardy of extinction; **SC** - Species of Concern; **USFS**; **S** - Sensitive, those taxa occurring on National Forests in Arizona which are considered sensitive by the Regional Forester; **WSCA** - Wildlife of Special Concern in Arizona, if a "y" is indicated, critical habitat has been designated or proposed for the species; **NPL** - Native Plant Law; **SR**-Salvage Restricted collection only with permit; **NESL** - Navajo Endangered Species List Group.

Appendix B

Detailed Crash Data for Key Roadway Segments

North Frontage Road, Ave 10E – Ave 11E (Fortuna Road)

ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle		1		1	1		3
Headon							0
Leftturn		1	1	2			4
Other		1					1
Rear End		3	1		1		5
Rear to Side							0
Sideswipe Opposite Direction				1			1
Sideswipe Same Direction		1					1
Single Vehicle	1	1	3		1		6
Total	1	8	5	4	3	0	21
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	0	6	4	3	2	0	15
Incapacitating Injury							0
Non_Incapacitating Injury	1	1			1		3
Possible Injury		1	1	1			3
Total	1	8	5	4	3	0	21
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted							0
Dark_Not Lighted					1		1
Dark_Unknown Lighting		1	2				3
Dawn				1			1
Daylight	1	6	3	3	2		15
Dusk							0
Not Reported		1					1
Total	1	8	5	4	3	0	21
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt							0
Clear	1	6	5	3	3		18
Cloudy		1					1
Rain				1			1
Severe Crosswinds							0
Unkown		1					1
Total	1	8	5	4	3	0	21

North Frontage Road, Ave 11E – Ave 13E (Foothills Blvd)

ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle							0
Headon							0
Leftturn	1	1	1	1			4
Other							0
Rear End	1	4	1	1			7
Rear to Side							0
Sideswipe Opposite Direction			1				1
Sideswipe Same Direction		1				1	2
Single Vehicle		3	2	2			7
Total	2	9	5	4	0	1	21
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	2	6	3	3		1	15
Incapacitating Injury		1	2	1			4
Non_Incapacitating Injury		1					1
Possible Injury		1					1
Total	2	9	5	4	0	1	21
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted						1	1
Dark_Not Lighted							0
Dark_Unknown Lighting		2	2	1			5
Dawn							0
Daylight	2	7	3	3			15
Dusk							0
Not Reported							0
Total	2	9	5	4	0	1	21
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt							0
Clear	2	9	3	4		1	19
Cloudy			2				2
Rain							0
Severe Crosswinds							0
Unkown							0
Total	2	9	5	4	0	1	21

North Frontage Road, Ave 13E – Ave 15E

ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle		1			1	1	3
Headon							0
Leftturn							0
Other			1				1
Rear End							0
Rear to Side							0
Sideswipe Opposite Direction							0
Sideswipe Same Direction							0
Single Vehicle	1		1	2		2	6
Total	1	1	2	2	1	3	10

ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	1	1	1	1	1	2	7
Incapacitating Injury				1		1	2
Non_Incapacitating Injury							0
Possible Injury			1				1
Total	1	1	2	2	1	3	10

ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted							0
Dark_Not Lighted							0
Dark_Unknown Lighting	1			2			3
Dawn			1				1
Daylight		1	1		1	2	5
Dusk						1	1
Not Reported							0
Total	1	1	2	2	1	3	10

ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt							0
Clear	1	1	2	2	1	3	10
Cloudy							0
Rain							0
Severe Crosswinds							0
Unkown							0
Total	1	1	2	2	1	3	10

South Frontage Road, Ave 10E – Ave 11E (Fortuna Road)

ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle		6	5	4	2	1	18
Headon		1				1	2
Leftturn	2	8		2			12
Other			1				1
Rear End	3	6	2	5		1	17
Rear to Side		1					1
Sideswipe Opposite Direction				1			1
Sideswipe Same Direction				2	1	1	4
Single Vehicle		3	4	1	6	1	15
Total	5	25	12	15	9	5	71
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	3	21	7	11	7	3	52
Incapacitating Injury		1	1	1		1	4
Non_Incapacitating Injury	1		2	1	2		6
Possible Injury	1	3	1	2		1	8
Fatal			1				1
Total	5	25	12	15	9	5	71
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted					1	2	3
Dark_Not Lighted					1		1
Dark_Unknown Lighting		3	4	1			8
Dawn							0
Daylight	5	21	8	14	6	3	57
Dusk					1		1
Not Reported		1					1
Total	5	25	12	15	9	5	71
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt							0
Clear	5	23	11	15	8	5	67
Cloudy		1	1		1		3
Rain		1					1
Severe Crosswinds							0
Unkown							0
Total	5	25	12	15	9	5	71

South Frontage Road, Ave 11E – Ave 13E (Foothills Blvd)

ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle	1	4	1	1			7
Headon	1						1
Leftturn		1	1	1			3
Other							0
Rear End	2	1		3	1	1	8
Rear to Side							0
Sideswipe Opposite Direction							0
Sideswipe Same Direction				1		1	2
Single Vehicle	1		2	2		1	6
Total	5	6	4	8	1	3	27
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	4	6	3	7	1	3	24
Incapacitating Injury							0
Non_Incapacitating Injury				1			1
Possible Injury	1		1				2
Fatal							
Total	5	6	4	8	1	3	27
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted							0
Dark_Not Lighted							0
Dark_Unknown Lighting	1		3	2			6
Dawn				1			1
Daylight	4	6	1	5	1	3	20
Dusk							0
Not Reported							0
Total	5	6	4	8	1	3	27
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt		1					1
Clear	2	3	4	8	1	3	21
Cloudy	2	2					4
Rain							0
Severe Crosswinds							0
Unkown	1						1
Total	5	6	4	8	1	3	27

South Frontage Road, Ave 13E – Ave 15E

ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle		1					1
Headon							0
Leftturn	1						1
Other							0
Rear End						1	1
Rear to Side							0
Sideswipe Opposite Direction							0
Sideswipe Same Direction							0
Single Vehicle		1					1
Total	1	2	0	0	0	1	4
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury		1				1	2
Incapacitating Injury							0
Non_Incapacitating Injury	1	1					2
Possible Injury							0
Fatal							
Total	1	2	0	0	0	1	4
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted							0
Dark_Not Lighted							0
Dark_Unknown Lighting		1					1
Dawn							0
Daylight	1	1				1	3
Dusk							0
Not Reported							0
Total	1	2	0	0	0	1	4
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt							0
Clear	1	2				1	4
Cloudy							0
Rain							0
Severe Crosswinds							0
Unkown							0
Total	1	2	0	0	0	1	4

Fortuna Road, south of South Frontage Road							
ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle		2	5	1		1	9
Headon							0
Leftturn		1	1	1		1	4
Other		1					1
Rear End	1	5	3	2		1	12
Rear to Side							0
Sideswipe Opposite Direction							0
Sideswipe Same Direction		2	1		2	1	6
Single Vehicle							0
Total	1	11	10	4	2	4	32
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	1	9	9	3	2	4	28
Incapacitating Injury		1					1
Non_Incapacitating Injury							0
Possible Injury		1	1	1			3
Fatal							0
Total	1	11	10	4	2	4	32
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted							0
Dark_Not Lighted							0
Dark_Unknown Lighting	1	4	1				6
Dawn		1					1
Daylight		6	9	4	2	4	25
Dusk							0
Not Reported							0
Total	1	11	10	4	2	4	32
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt							0
Clear	1	10	9	4	2	4	30
Cloudy		1	1				2
Rain							0
Severe Crosswinds							0
Unkown							0
Total	1	11	10	4	2	4	32

Fortuna Road, between North and South Frontage Roads

ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle	1	4	6	1	4	5	21
Headon					2		2
Leftturn	6	10	4	7	5	1	33
Other		1	1		1		3
Rear End	4	7	4	7	14	7	43
Rear to Side	1	2		2			5
Sideswipe Opposite Direction							0
Sideswipe Same Direction	3	4	4		5	2	18
Single Vehicle	1	1	2		1	1	6
Total	16	29	21	17	32	16	131
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	14	22	16	13	25	11	101
Incapacitating Injury		1					1
Non_Incapacitating Injury	1	4	2	1	6	3	17
Possible Injury	1	2	3	3	1	2	12
Fatal							0
Total	16	29	21	17	32	16	131
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted					5	2	7
Dark_Not Lighted					1		1
Dark_Unknown Lighting	2	7	6	3			18
Dawn		1			1		2
Daylight	14	20	15	14	22	13	98
Dusk					3	1	4
Not Reported		1					1
Total	16	29	21	17	32	16	131
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt					1		1
Clear	16	26	19	16	30	15	122
Cloudy		2	2	1		1	6
Rain							0
Severe Crosswinds					1		1
Unkown		1					1
Total	16	29	21	17	32	16	131

Fortuna Road, north of North Frontage Road

ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle		2	2	2		2	8
Headon							0
Leftturn		1					1
Other							0
Rear End	1		2	2	1	1	7
Rear to Side							0
Sideswipe Opposite Direction							0
Sideswipe Same Direction				1	1		2
Single Vehicle	1	1			1		3
Total	2	4	4	5	3	3	21
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	2	3	4	3	2	1	15
Incapacitating Injury							0
Non_Incapacitating Injury					1	2	3
Possible Injury		1		2			3
Fatal							0
Total	2	4	4	5	3	3	21
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted							0
Dark_Not Lighted							0
Dark_Unknown Lighting	1						1
Dawn							0
Daylight	1	4	4	5	3	3	20
Dusk							0
Not Reported							0
Total	2	4	4	5	3	3	21
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt							0
Clear	2	4	4	5	3	3	21
Cloudy							0
Rain							0
Severe Crosswinds							0
Unkown							0
Total	2	4	4	5	3	3	21

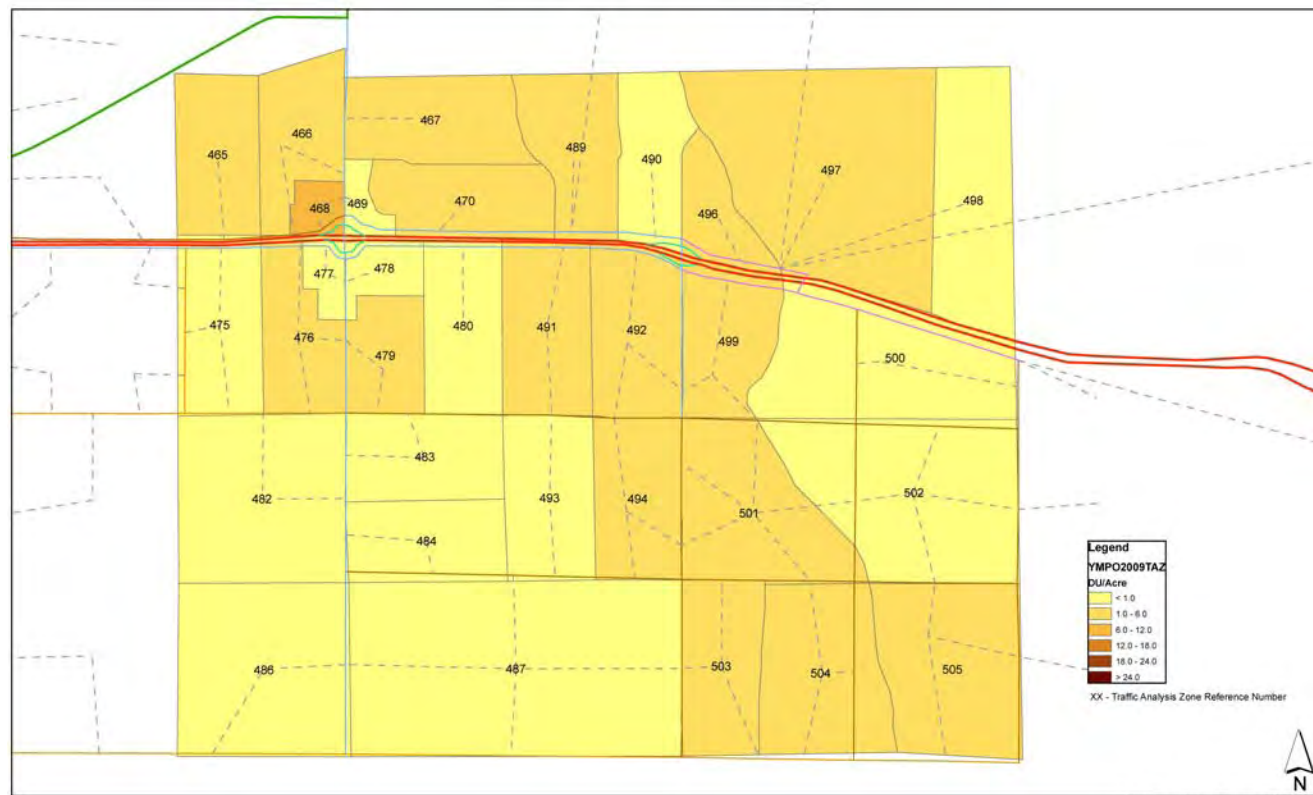
Foothills Blvd, south of South Frontage Road							
ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle		1	2	1			4
Headon				1			1
Leftturn			1	1		1	3
Other					1		1
Rear End						1	1
Rear to Side							0
Sideswipe Opposite Direction							0
Sideswipe Same Direction		1		1		1	3
Single Vehicle	1		1				2
Total	1	2	4	4	1	3	15
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	1	2	4	3	1	2	13
Incapacitating Injury							0
Non_Incapacitating Injury				1		1	2
Possible Injury							0
Fatal							0
Total	1	2	4	4	1	3	15
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted							0
Dark_Not Lighted							0
Dark_Unknown Lighting	1		1				2
Dawn			1		1		2
Daylight		2	2	4		3	11
Dusk							0
Not Reported							0
Total	1	2	4	4	1	3	15
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt				1			1
Clear	1	2	4	3	1	3	14
Cloudy							0
Rain							0
Severe Crosswinds							0
Unkown							0
Total	1	2	4	4	1	3	15

Foothills Blvd, between North and South Frontage Roads							
ACCIDENT MANNER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Angle	1		3	4		2	10
Headon							0
Leftturn		2	1	1			4
Other							0
Rear End	1	3		1	1		6
Rear to Side		1					1
Sideswipe Opposite Direction							0
Sideswipe Same Direction				2	1		3
Single Vehicle							0
Total	2	6	4	8	2	2	24
ACCIDENT SEVERITY	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
No Injury	1	2	2	6	2		13
Incapacitating Injury						1	1
Non_Incapacitating Injury	1	2	1	1			5
Possible Injury		2	1	1		1	5
Fatal							0
Total	2	6	4	8	2	2	24
ACCIDENT LIGHTING	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Dark_Lighted							0
Dark_Not Lighted							0
Dark_Unknown Lighting			2				2
Dawn							0
Daylight	2	6	2	8	2	2	22
Dusk							0
Not Reported							0
Total	2	6	4	8	2	2	24
ACCIDENT WEATHER	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	TOTAL
Blowing Sand Soil Dirt							0
Clear	2	5	4	8	1	2	22
Cloudy		1			1		2
Rain							0
Severe Crosswinds							0
Unkown							0
Total	2	6	4	8	2	2	24

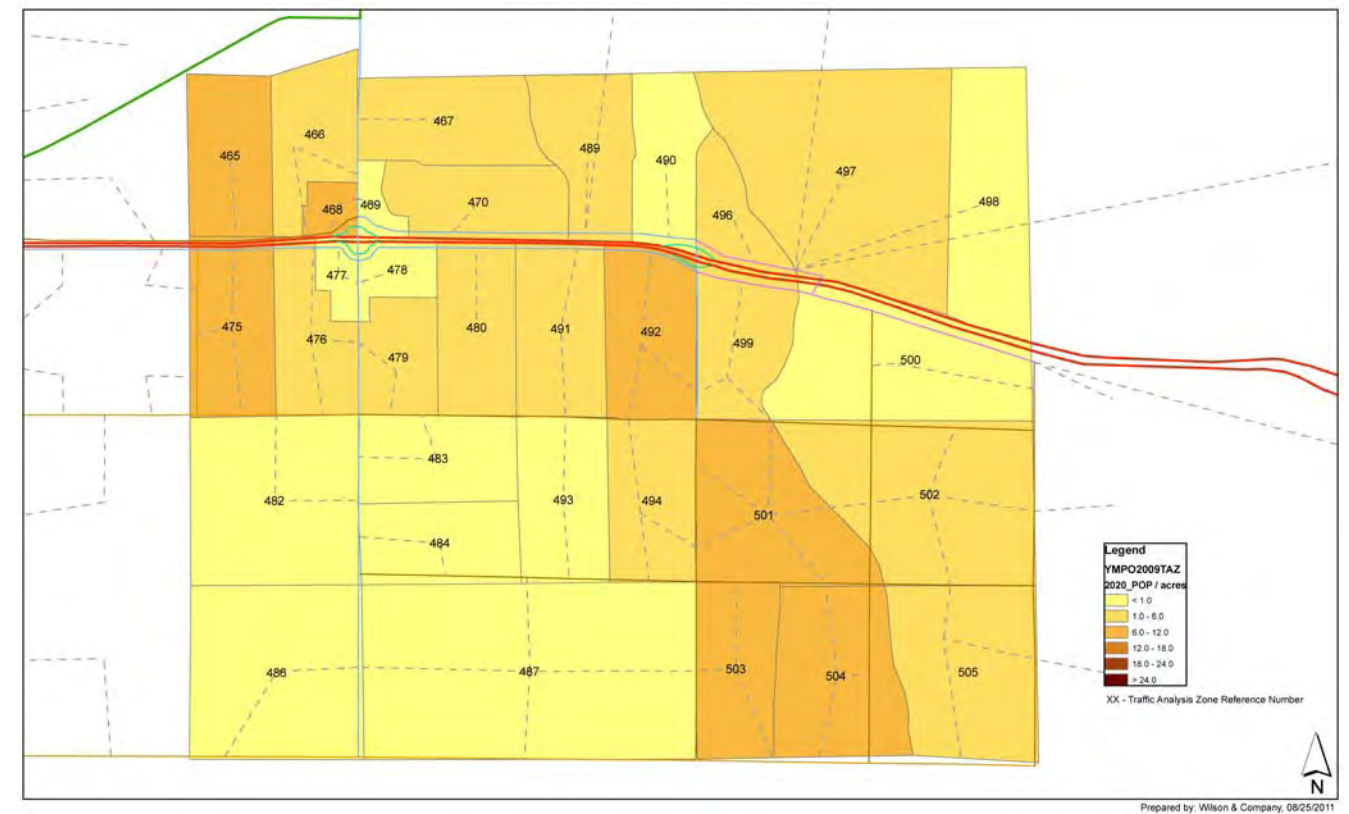
Appendix C

Projected Future Growth Patterns

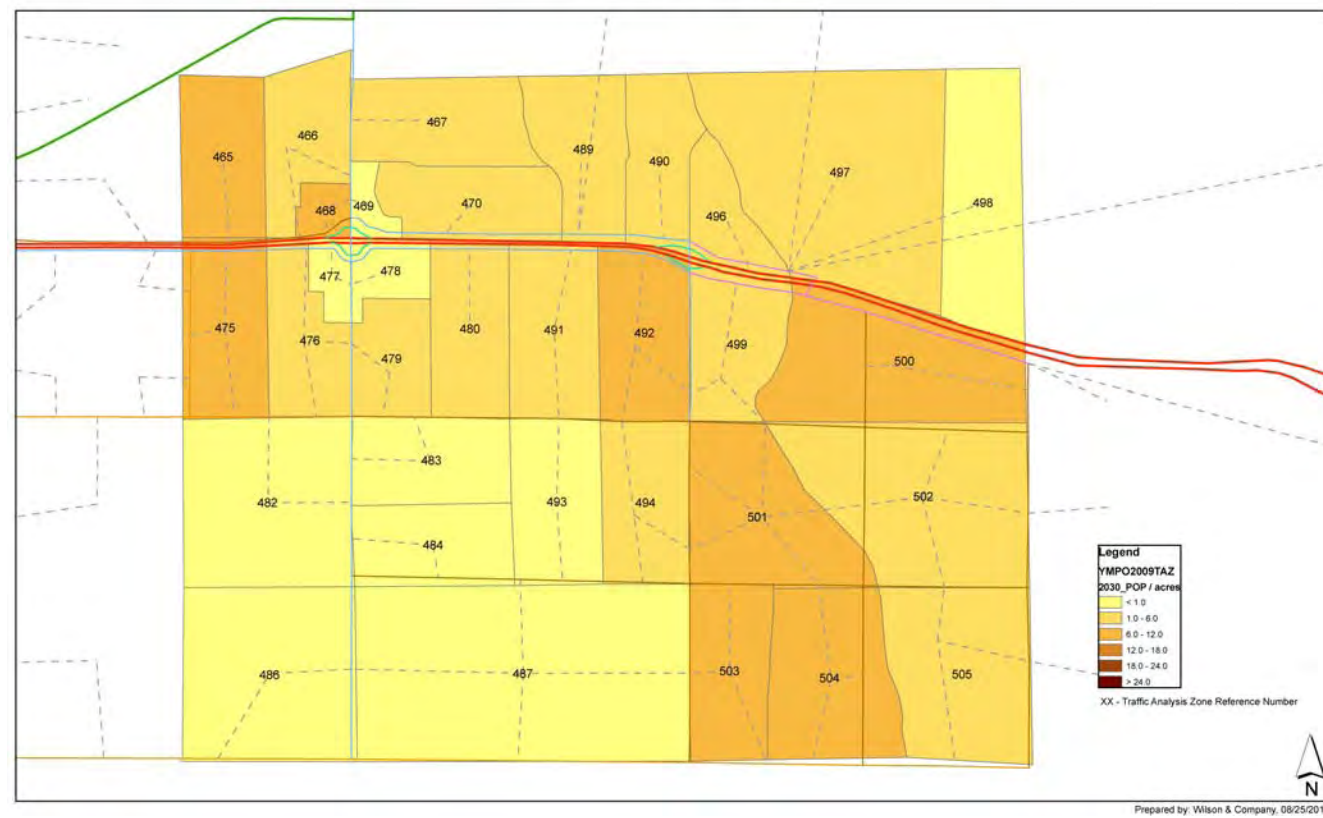
Year 2009 Dwelling Unit Density
Yuma Travel Demand Model



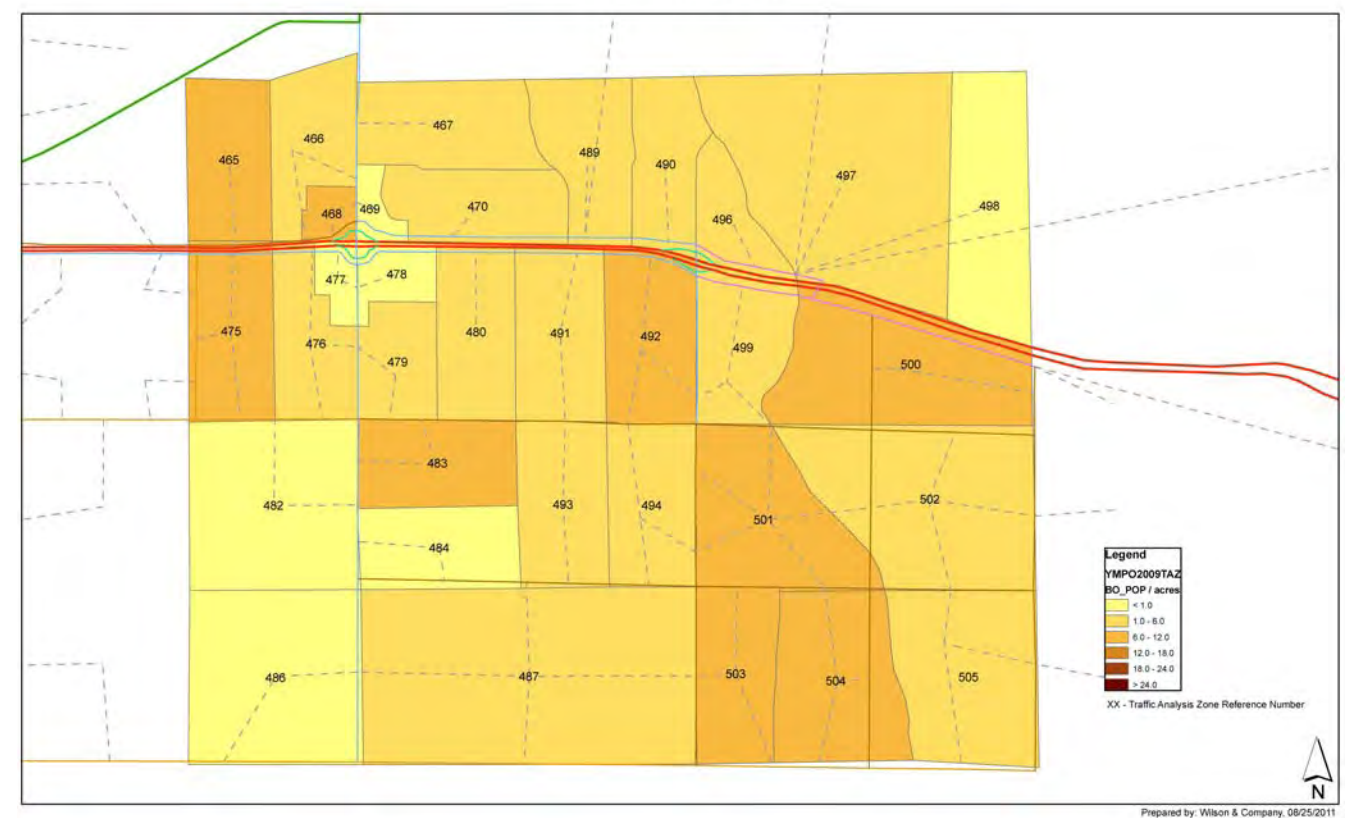
Year 2020 Dwelling Unit Density
Yuma Travel Demand Model



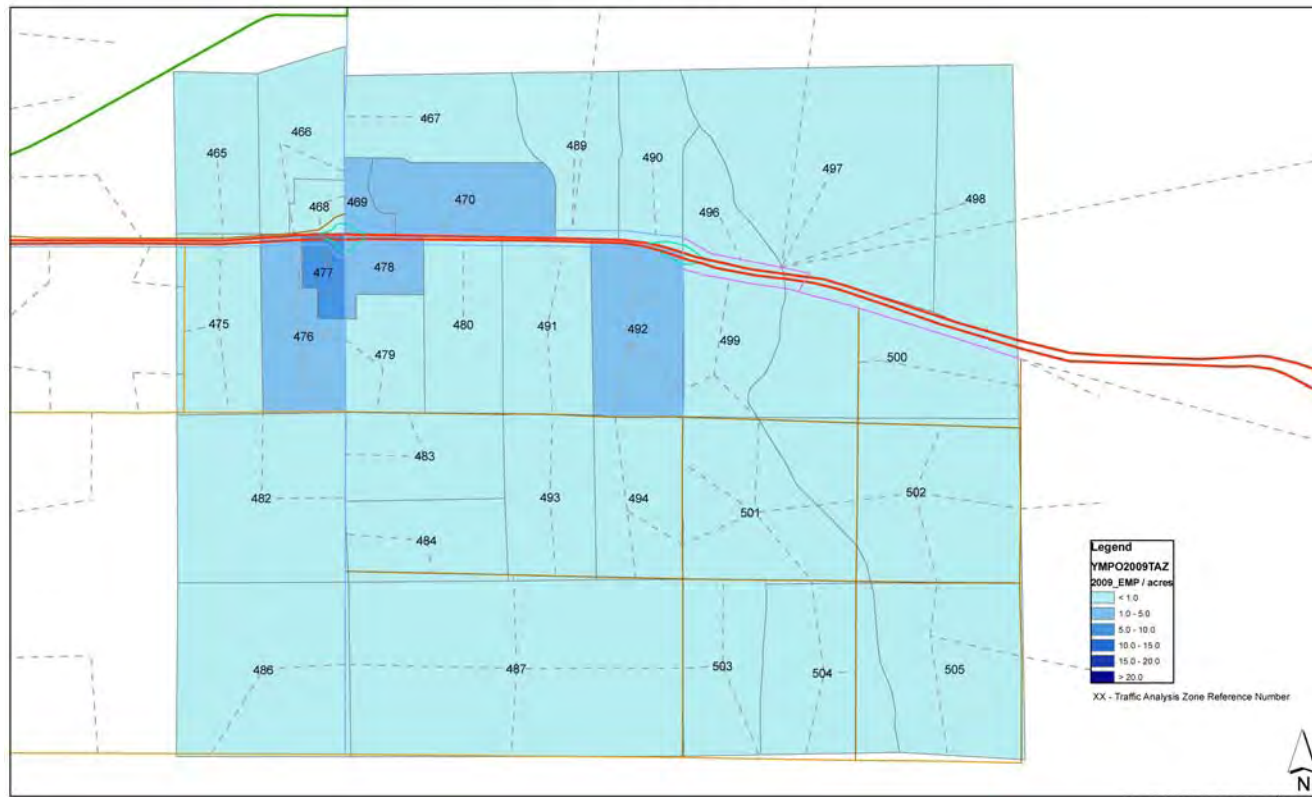
Year 2030 Dwelling Unit Density
Yuma Travel Demand Model



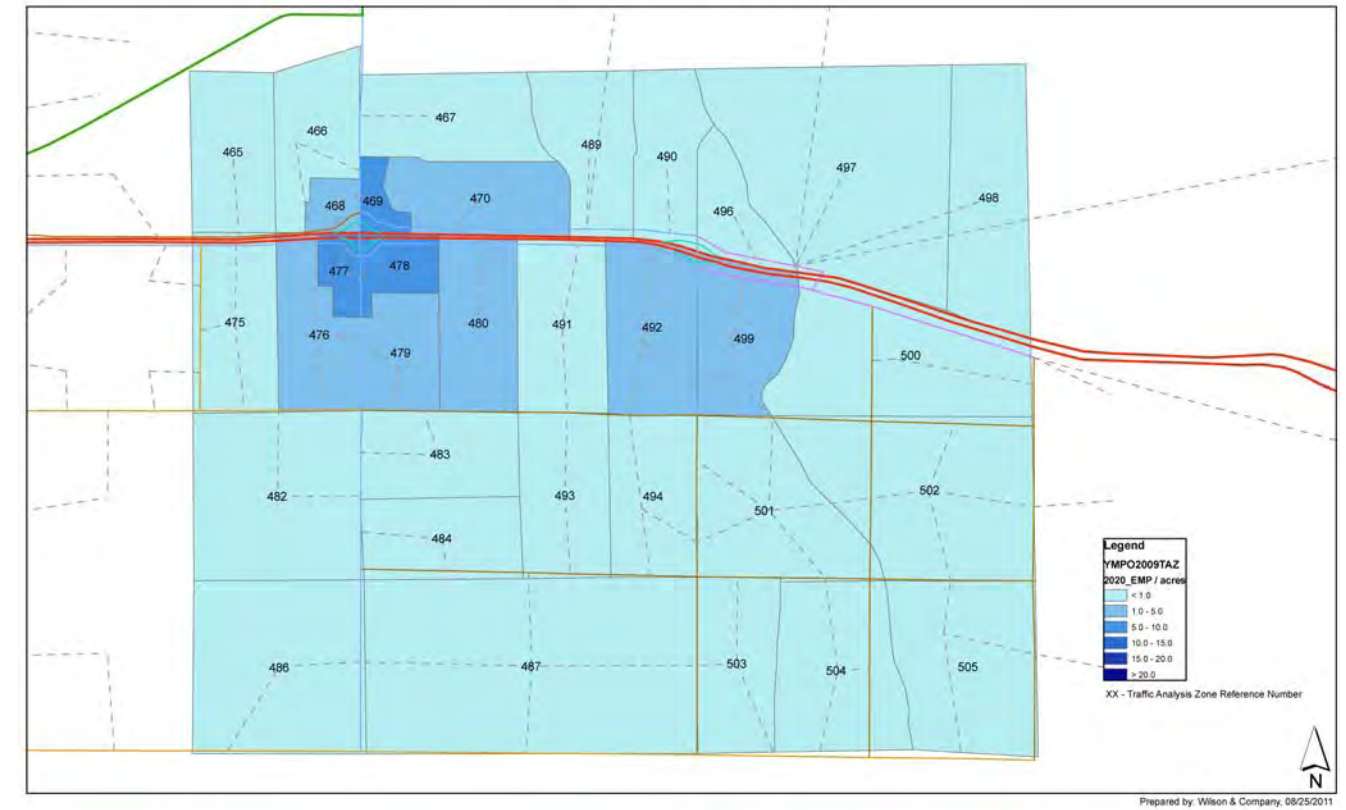
Buildout Dwelling Unit Density
Yuma Travel Demand Model



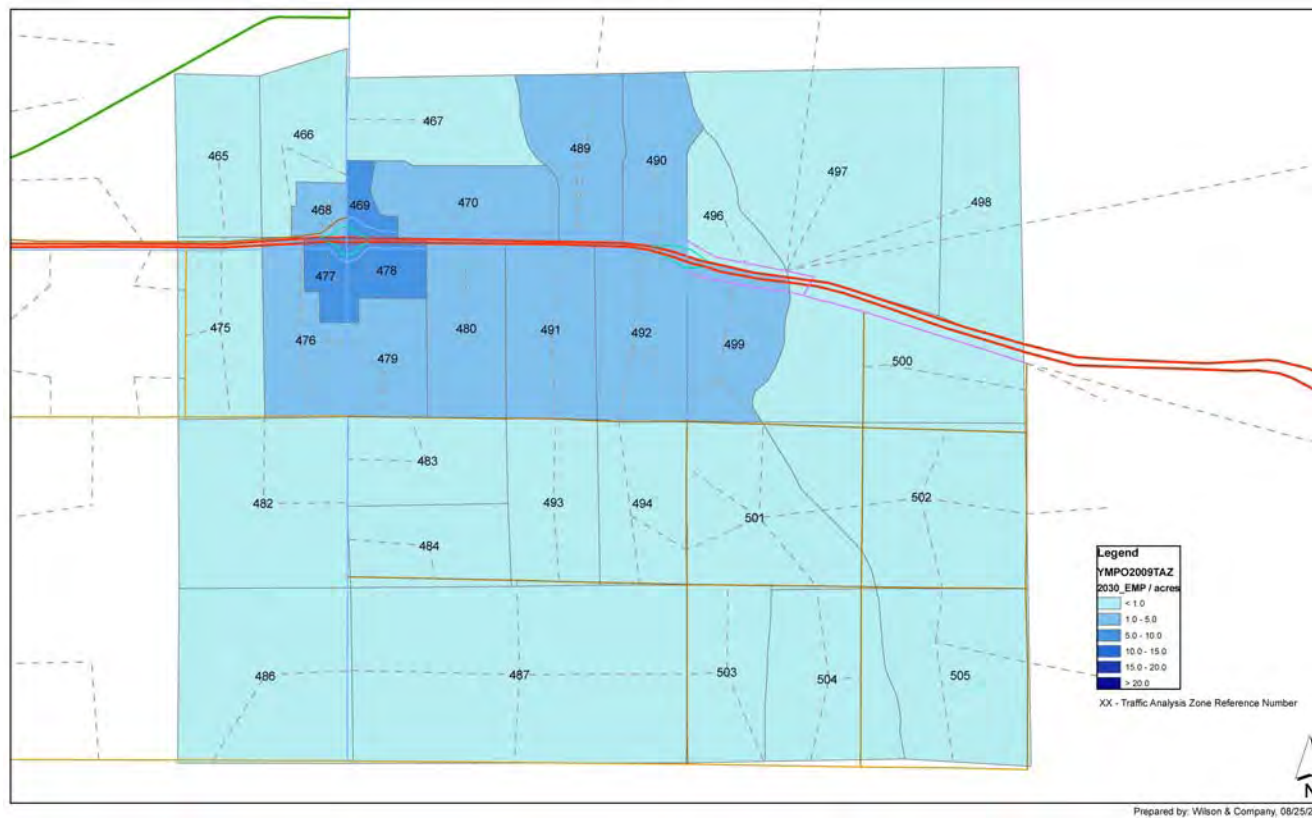
Year 2009 Employment Density
Yuma Travel Demand Model



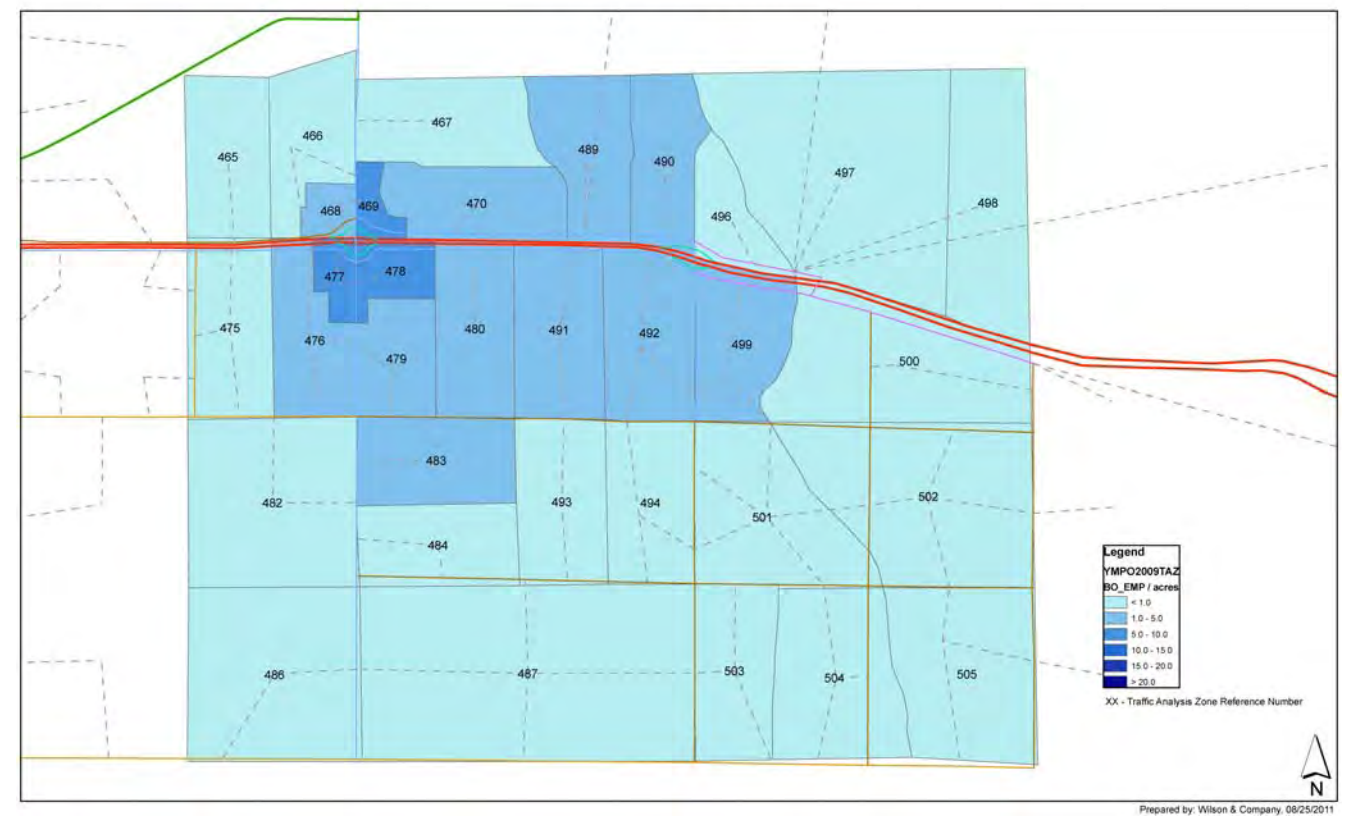
Year 2020 Employment Density
Yuma Travel Demand Model



Year 2030 Employment Density
Yuma Travel Demand Model



Buildout Employment Density
Yuma Travel Demand Model



Appendix D

Year 2030 and Buildout Intersection Level of Service with Recommended Improvements

Peak-Hour Intersection Performance Analysis: Year 2030 Recommended Improvements
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Operations Metric	AM (PM)											
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Fortuna Rd & North Frontage Rd (Signal)	Volume (vph)	297 (163)	589 (669)	83 (127)	54 (538)	528 (1228)	438 (603)	208 (556)	151 (105)	360 (157)	220 (116)	227 (85)	142 (170)
		v/c Ratio	0.933 (0.901)	0.414 (0.96)	0.13 (0.407)	0.157 (1.125)	0.521 (1.002)	0.926 (1.054)	0.756 (1.256)	0 (0)	0.901 (0.291)	0.485 (0.371)	0 (0)	0.826 (0.971)
		Movement Delay (s)	51.3 (78.1)	27.7 (97.2)	24 (64.9)	29.5 (140.9)	39.3 (83.1)	66.8 (108.9)	38.8 (194.4)	41.4 (40.3)	57.7 (42.5)	31.7 (63.1)	0 (0)	53.2 (123)
		Movement LOS	D (E)	C (F)	C (E)	C (F)	D (F)	E (F)	D (F)	D (D)	E (D)	C (E)	-	D (F)
		Approach Delay (s)	34.6 (89.7)			50.6 (102.8)			48.8 (145.5)			45.1 (104.3)		
		Approach LOS	C (F)			D (F)			D (F)			D (F)		
		Intersection Delay (s)	44.5 (107.9)											
		Intersection LOS	D (F)											
2	Fortuna Rd & I-8 Westbound (Signal)	Volume (vph)	395 (357)	816 (603)	0 (0)	0 (0)	667 (874)	323 (299)	0 (0)	0 (0)	0 (0)	134 (192)	25 (0)	277 (313)
		v/c Ratio	0.866 (0.855)	0.515 (0.378)	0 (0)	0 (0)	0.536 (0.699)	0.833 (0.768)	0 (0)	0 (0)	0 (0)	2.531 (2.499)	0.034 (0)	0.446 (0.561)
		Movement Delay (s)	29.2 (24.8)	22.1 (13.8)	0 (0)	0 (0)	39.4 (28.7)	47.1 (30.2)	0 (0)	0 (0)	0 (0)	800.1 (751.8)	20.9 (0)	25.6 (21.6)
		Movement LOS	C (C)	C (B)	-	-	D (C)	D (C)	-	-	-	F (F)	C -	C (C)
		Approach Delay (s)	24.4 (17.9)			41.9 (29.1)			-			263.4 (299.2)		
		Approach LOS	C (B)			D (C)			-			F (F)		
		Intersection Delay (s)	70.5 (76.7)											
		Intersection LOS	E (E)											
3	Fortuna Rd & I-8 Eastbound (Signal)	Volume (vph)	0 (0)	1143 (771)	277 (216)	142 (157)	567 (929)	0 (0)	236 (220)	14 (4)	418 (501)	0 (0)	0 (0)	0 (0)
		v/c Ratio	0 (0)	0.704 (0.555)	0.548 (0.499)	0.445 (0.44)	0.343 (0.625)	0 (0)	0 (0)	0 (0)	0.889 (0.912)	0 (0)	0 (0)	0 (0)
		Movement Delay (s)	0 (0)	18.8 (20)	17.7 (19.8)	13.1 (13.8)	9.7 (14.1)	0 (0)	17.9 (15.2)	15.2 (13.1)	23.4 (23)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	B (C)	B (B)	B (B)	A (B)	-	B (B)	B (B)	C (C)	-	-	-
		Approach Delay (s)	18.6 (20)			10.4 (14)			21.3 (20.6)			-		
		Approach LOS	B (B)			B (B)			C (C)			-		
		Intersection Delay (s)	17.2 (17.8)											
		Intersection LOS	B (B)											
4	Fortuna Rd & E. South Frontage Rd (Signal)	Volume (vph)	58 (95)	896 (692)	21 (105)	196 (139)	713 (1199)	113 (264)	216 (193)	89 (138)	83 (106)	40 (146)	113 (83)	276 (146)
		v/c Ratio	0.202 (0.383)	0.679 (0.381)	0.679 (0.385)	0.605 (0.348)	0.691 (0.825)	0.245 (0.406)	0.446 (0.507)	0 (0)	0.204 (0.467)	0.086 (0.443)	0.292 (0.366)	0.839 (0.758)
		Movement Delay (s)	16.6 (16.6)	23.1 (16)	23.4 (16.1)	16.3 (11.4)	21.6 (21.1)	18.1 (16.1)	14.7 (25.9)	19.6 (33.6)	19.7 (33.3)	18.4 (28.2)	23 (34.1)	28.4 (37.8)
		Movement LOS	B (B)	C (B)	C (B)	B (B)	C (C)	B (B)	B (C)	B (C)	B (C)	B (C)	C (C)	C (D)
		Approach Delay (s)	22.8 (16.1)			20.2 (19.4)			16.9 (30.1)			26.1 (33.2)		
		Approach LOS	C (B)			C (B)			B (C)			C (C)		
		Intersection Delay (s)	21.5 (21.5)											
		Intersection LOS	C (C)											
5	Fortuna Rd & 35th Place (Signal)	Volume (vph)	33 (24)	737 (637)	56 (48)	69 (163)	535 (831)	53 (200)	122 (152)	24 (17)	45 (21)	88 (19)	29 (8)	121 (139)
		v/c Ratio	0.073 (0.082)	0.533 (0.43)	0.533 (0.431)	0.171 (0.359)	0.37 (0.597)	0.372 (0.598)	0 (0)	0 (0)	0.122 (0.055)	0.21 (0.046)	0 (0)	0.395 (0.382)
		Movement Delay (s)	8.2 (10.5)	12.9 (13.7)	12.9 (13.7)	7.9 (8.3)	10.5 (13.2)	10.5 (13.2)	24 (30.8)	17.1 (20.9)	17.4 (21)	18.8 (21.4)	0 (0)	19.3 (23.5)
		Movement LOS	A (B)	B (B)	B (B)	A (A)	B (B)	B (B)	C (C)	B (C)	B (C)	B (C)	-	B (C)
		Approach Delay (s)	12.7 (13.6)			10.2 (12.6)			21.6 (28.8)			19.1 (23.3)		
		Approach LOS	B (B)			B (B)			C (C)			B (C)		
		Intersection Delay (s)	13.5 (15)											
		Intersection LOS	B (B)											
6	Fortuna Rd & 40th Street (Signal)	Volume (vph)	41 (64)	224 (290)	27 (68)	388 (643)	199 (103)	107 (102)	70 (60)	134 (232)	127 (63)	27 (67)	146 (101)	543 (352)
		v/c Ratio	0.901 (1.249)	0 (0)	0 (0)	2.296 (2.819)	0 (0)	0.151 (0.132)	0 (0)	0 (0)	0.246 (0.311)	0.07 (0.21)	0.241 (0.202)	1.053 (0.829)
		Movement Delay (s)	45.9 (153)	0 (0)	0 (0)	617.8 (849.2)	0 (0)	10 (7.5)	18.8 (18.9)	16 (17.4)	16.2 (17.5)	18.2 (20.6)	16.2 (16.9)	75.4 (25.1)
		Movement LOS	D (F)	-	-	F (F)	-	B (A)	B (B)	B (B)	B (B)	B (C)	B (B)	F (C)
		Approach Delay (s)	45.9 (153)			524.1 (748)			16.7 (17.7)			61.2 (22.9)		
		Approach LOS	D (F)			F (F)			B (B)			E (C)		
		Intersection Delay (s)	209.8 (334.3)											
		Intersection LOS	F (F)											
7	Foothills Blvd & E. North Frontage Rd (Signal)	Volume (vph)	227 (242)	295 (357)	51 (138)	105 (59)	206 (168)	190 (41)	58 (200)	26 (37)	348 (320)	200 (114)	58 (32)	88 (116)
		v/c Ratio	0.58 (0.604)	0.426 (0.646)	0.087 (0.451)	0.271 (0.245)	0.297 (0.192)	0.323 (0.199)	0 (0)	0 (0)	0.697 (0.537)	1.733 (1.047)	0 (0)	0.258 (0.219)
		Movement Delay (s)	18.6 (21.2)	12.4 (18.1)	10.6 (15.5)	16.8 (24)	11.7 (14.9)	11.8 (15)	29.9 (437.6)	0 (0)	17.4 (11.1)	389.6 (126.2)	0 (0)	11.6 (8.8)
		Movement LOS	B (C)	B (B)	B (B)	B (C)	B (B)	B (B)	C (F)	-	B (B)	F (F)	-	B (A)
		Approach Delay (s)	14.7 (18.6)			12.8 (16.9)			19 (164.2)			230.1 (59.9)		
		Approach LOS	B (B)			B (B)			B (F)			F (E)		
		Intersection Delay (s)	55.4 (68.8)											
		Intersection LOS	E (E)											
8	Foothills Blvd & I-8 Westbound (Signal)	Volume (vph)	905 (779)	435 (431)	0 (0)	0 (0)	347 (475)	395 (281)	0 (0)	0 (0)	0 (0)	95 (103)	31 (152)	163 (152)
		v/c Ratio	0.937 (0.921)	0.201 (0.235)	0 (0)	0 (0)	0.353 (0.624)	0.898 (0.825)	0 (0)	0 (0)	0 (0)	1.468 (1.471)	0 (0)	0.636 (0.669)
		Movement Delay (s)	40.1 (37)	6.6 (10.4)	0 (0)	0 (0)	28 (32.8)	42.6 (36.2)	0 (0)	0 (0)	0 (0)	323.7 (317.2)	0 (0)	39 (30.8)
		Movement LOS	D (D)	A (B)	-	-	C (C)	D (D)	-	-	-	F (F)	-	D (C)
		Approach Delay (s)	29.2 (27.5)			35.7 (34)			-			132.6 (103.3)		
		Approach LOS	C (C)			D (C)			-			F (F)		
		Intersection Delay (s)	43.9 (42.6)											
		Intersection LOS	D (D)											
9	Foothills Blvd & I-8 Eastbound (Signal)	Volume (vph)	0 (0)	1282 (862)	347 (199)	100 (89)	128 (548)	0 (0)	241 (215)	0 (0)	822 (1006)	0 (0)	0 (0)	0 (0)
		v/c Ratio	0 (0)	0.538 (0.52)	0.54 (0.523)	0.603 (0.48)	0.061 (0.387)	0 (0)	0 (0)	0 (0)	2.153 (1.519)	0 (0)	0 (0)	0 (0)
		Movement Delay (s)	0 (0)	12 (21.1)	12.1 (21.2)	32.2 (34.6)	8.1 (19.6)	0 (0)	1726.8 (1120.4)	0 (0)	573.6 (268.4)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	B (C)	B (C)	C (C)	A (B)	-	F (F)	-	F (F)	-	-	-
		Approach Delay (s)	12.1 (21.1)			18.7 (21.6)			835.1 (418.4)			-		
		Approach LOS	B (C)			B (C)			F (F)			-		
		Intersection Delay (s)	312.2 (187.4)											
		Intersection LOS	F (F)											
10	Foothills Blvd & E. South Frontage Rd / E. South Frontage Rd (Signal)	Volume (vph)	43 (49)	867 (534)	12 (21)	113 (313)	411 (949)	308 (207)	338 (331)	22 (51)	43 (76)	23 (23)	31 (39)	417 (167)
		v/c Ratio	0.159 (0.338)	0.548 (0.297)	0.548 (0.297)	0.485 (0.789)	0.511 (0.632)	0.451 (0.636)	0 (0)	0 (0)	0.117 (0.248)	0.459 (0.442)	0 (0)	0.805 (0.416)
		Movement Delay (s)	22 (35)	16.1 (15.5)	16.1 (15.5)	27.6 (36.1)	15.7 (20.1)	15.1 (20.1)	1539.6 (2511.7)	0 (0)	16 (28.4)	22.6 (65.6)	0 (0)	30 (30.6)
		Movement LOS	C (D)	B (B)	B (B)	C (D)	B (C)	B (C)	F (F)	-	B (C)	C (E)	-	C (C)
		Approach Delay (s)	16.3 (17.1)			17.1 (23.5)			1293.9 (1823.1)			29.3 (34.1)		
		Approach LOS	B (B)			B (C)			F (F)			C (C)		
		Intersection Delay (s)	214.8 (321.6)											
		Intersection LOS	F (F)											
11	Foothills Blvd & 38th Street (Signal)	Volume (vph)	154 (112)	945 (488)	182 (239)	15 (46)	315 (781)	14 (39)	29 (26)	6 (11)	122 (161)	158 (102)	9 (8)	26 (11)
		v/c Ratio	0.297 (0.338)	0.682 (0.473)	0.684 (0.475)	0.062 (0.127)	0.231 (0.554)	0.233 (0.554)	0 (0)	0 (0)	0.486 (0.694)	0.441 (0.296)	0.03 (0.029)	0.104 (0.047)
		Movement Delay (s)	8.6 (9.8)	9.5 (8.2)	9.5 (8.2)	15.5 (12.3)	9 (9.7)	9 (9.7)	16.8 (16.5)	16.3 (16.1)	18.2 (19.3)	18.9 (17.7)	16.3 (16.1)	16.6 (16.1)
		Movement LOS	A (A)	A (A)	A (A)	B (B)	A (A)	A (A)	B (B)	B (B)	B (B)	B (B)	B (B)	B (B)
		Approach Delay (s)	9.4 (8.4)			9.3 (9.8)			17.9 (18.7)			18.5 (17.5)		
		Approach LOS	A (A)			A (A)			B (B)			B (B)		
		Intersection Delay (s)	10.9 (10.6)											
		Intersection LOS	B (B)											

Peak-Hour Intersection Performance Analysis: Year 2030 Recommended Improvements
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Operations Metric	AM (PM)												
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
12	Foothills Blvd & 40th Street (Signal)	Volume (vph)	280 (161)	764 (413)	22 (4)	66 (173)	372 (654)	215 (223)	222 (267)	253 (284)	167 (368)	8 (13)	350 (180)	267 (168)	
		v/c Ratio	0.961 (0.719)	0.747 (0.397)	0.747 (0.397)	0.409 (0.455)	1.131 (0.858)	0.769 (0.858)	0 (0)	0 (0)	0.478 (0.875)	0.021 (0.104)	0 (0)	0.707 (0.461)	
		Movement Delay (s)	83.5 (34.3)	47.5 (33)	47.5 (33)	44.3 (25.3)	143.4 (46.5)	62.9 (47.1)	97.3 (42.6)	0 (0)	19.1 (36.4)	26 (49.3)	0 (0)	25 (21.1)	
		Movement LOS	F (C)	D (C)	D (C)	D (C)	F (D)	E (D)	F (D)	-	B (D)	C (D)	-	C (C)	
		Approach Delay (s)	57 (33.3)			106.9 (43.3)				46.2 (38.2)			25 (22.1)		
		Approach LOS	E (C)			F (D)				D (D)			C (C)		
		Intersection Delay (s)	58.9 (37.1)												
		Intersection LOS	E (D)												
13	S. Ave 10 E & E. South Frontage Rd (Stop)	Volume (vph)	299 (149)	0 (0)	10 (24)	0 (0)	0 (0)	0 (0)	0 (0)	378 (451)	222 (375)	55 (29)	354 (332)	0 (0)	
		v/c Ratio	1.37 (0.8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.38 (0.53)	0 (0)	0 (0)	0.06 (0.04)	0 (0)	
		Movement Delay (s)	230.8 (61.4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1.9 (1.3)	0 (0)	
		Movement LOS	F (F)	-	-	-	-	-	-	-	-	-	A (A)	-	
		Approach Delay (s)	230.8 (61.4)			-				-			1.9 (1.3)		
		Approach LOS	F (F)			-				-			A (A)		
		Intersection Delay (s)	54.7 (8.2)												
		Intersection LOS	F (A)												
14	Fortuna Rd & E. 28th Street (Stop)	Volume (vph)	0 (0)	846 (538)	51 (473)	53 (70)	701 (1554)	0 (0)	0 (0)	0 (0)	0 (0)	250 (167)	0 (0)	407 (15)	
		v/c Ratio	0 (0)	0.28 (0.32)	0 (0)	0.08 (0.12)	0.22 (0.5)	0 (0)	0 (0)	0 (0)	0 (0)	1.76 (0.84)	0 (0)	0 (0)	
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	10.6 (11.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	376.9 (67.5)	0 (0)	0 (0)	
		Movement LOS	-	-	-	B (B)	-	-	-	-	-	F (F)	-	-	
		Approach Delay (s)	-	-	-	0.7 (0.5)			-	-	-	376.9 (67.5)			
		Approach LOS	-	-	-	D (D)			-	-	-	F (F)			
		Intersection Delay (s)	107.5 (4.6)												
		Intersection LOS	F (A)												
15	S. Camino Del Sol & E. 28th Street (Stop)	Volume (vph)	323 (189)	14 (26)	8 (12)	1 (1)	29 (17)	48 (8)	6 (40)	8 (23)	198 (338)	15 (9)	21 (7)	4 (4)	
		v/c Ratio	0 (0)	0.23 (0.13)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.28 (0.51)	0 (0)	0 (0)	0.22 (0.08)	0 (0)	
		Movement Delay (s)	0 (0)	7.7 (6.5)	0 (0)	0 (0)	0.1 (0.3)	0 (0)	0 (0)	11 (13.4)	0 (0)	0 (0)	27.7 (20.3)	0 (0)	
		Movement LOS	-	A (A)	-	-	A (A)	-	-	B (B)	-	-	D (C)	-	
		Approach Delay (s)	-	7.7 (6.5)	-	-	0.1 (0.3)	-	-	11 (13.4)	-	-	27.7 (20.3)	-	
		Approach LOS	-	A (A)	-	-	A (A)	-	-	B (B)	-	-	D (C)	-	
		Intersection Delay (s)	9 (10.8)												
		Intersection LOS	A (B)												
16	E. Camino Del Sol/ E. Camionero Del Sol & E. Calle Ventana (Stop)	Volume (vph)	12 (7)	158 (222)	27 (54)	15 (27)	262 (196)	0 (25)	25 (13)	2 (2)	12 (9)	69 (24)	5 (0)	38 (10)	
		v/c Ratio	0 (0)	0.01 (0.01)	0 (0)	0 (0)	0.01 (0.02)	0 (0)	0 (0)	0.09 (0.05)	0 (0)	0 (0)	0.23 (0.08)	0 (0)	
		Movement Delay (s)	0 (0)	0.6 (0.2)	0 (0)	0 (0)	0.5 (1.1)	0 (0)	0 (0)	13.4 (12.6)	0 (0)	0 (0)	14 (13.2)	0 (0)	
		Movement LOS	-	A (A)	-	-	A (A)	-	-	B (B)	-	-	B (B)	-	
		Approach Delay (s)	-	0.6 (0.2)	-	-	0.5 (1.1)	-	-	13.4 (12.6)	-	-	14 (13.2)	-	
		Approach LOS	-	A (A)	-	-	A (A)	-	-	B (B)	-	-	B (B)	-	
		Intersection Delay (s)	3.8 (1.8)												
		Intersection LOS	A (A)												
17	E. North Frontage Rd & E. Camino Del Sol (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	254 (192)	0 (0)	82 (56)	36 (92)	146 (183)	0 (0)	0 (0)	232 (187)	207 (271)	
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.62 (0.61)	0 (0)	0.13 (0.09)	0.04 (0.09)	0.09 (0.12)	0 (0)	0 (0)	0.28 (0.29)	0 (0)	
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	25.3 (30.4)	0 (0)	11.1 (10.7)	8.4 (8.7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
		Movement LOS	-	-	-	D (D)	-	B (B)	A (A)	-	-	-	-	-	
		Approach Delay (s)	-	-	-	21.8 (26)			1.7 (2.9)			-			
		Approach LOS	-	-	-	D (D)			A (A)			-			
		Intersection Delay (s)	8 (7.4)												
		Intersection LOS	A (A)												
18	Far West Ave & E. South Frontage Rd (Stop)	Volume (vph)	41 (29)	0 (0)	68 (42)	0 (0)	0 (0)	0 (0)	0 (0)	158 (200)	27 (62)	48 (77)	168 (124)	0 (0)	
		v/c Ratio	0.17 (0.13)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.12 (0.17)	0 (0)	0 (0)	0.04 (0.07)	0 (0)	
		Movement Delay (s)	11.3 (11.7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (3.4)	0 (0)	
		Movement LOS	B (B)	-	-	-	-	-	-	-	-	-	A (A)	-	
		Approach Delay (s)	11.3 (11.7)	-	-	-	-	-	-	-	-	-	2 (3.4)	-	
		Approach LOS	B (B)	-	-	-	-	-	-	-	-	-	A (A)	-	
		Intersection Delay (s)	3.2 (2.8)												
		Intersection LOS	A (A)												
19	Ave 12E & E. South Frontage Rd (Stop)	Volume (vph)	213 (231)	0 (0)	145 (203)	0 (0)	0 (0)	0 (0)	0 (0)	214 (216)	242 (199)	117 (47)	118 (52)	0 (0)	
		v/c Ratio	0.69 (0.5)	0 (0)	0.23 (0.32)	0 (0)	0 (0)	0 (0)	0 (0)	0.29 (0.27)	0 (0)	0.12 (0.05)	0.08 (0.03)	0 (0)	
		Movement Delay (s)	36.6 (19)	0 (0)	11.9 (12.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8.8 (8.4)	0 (0)	0 (0)	
		Movement LOS	E (C)	-	B (B)	-	-	-	-	-	-	A (A)	-	-	
		Approach Delay (s)	-	26.6 (15.9)	-	-	-	-	-	-	-	-	4.4 (4)	-	
		Approach LOS	-	D (C)	-	-	-	-	-	-	-	-	A (A)	-	
		Intersection Delay (s)	10.1 (7.7)												
		Intersection LOS	B (A)												
20	Ave 12E & 40th Street (Stop)	Volume (vph)	6 (6)	20 (26)	3 (4)	57 (142)	160 (209)	121 (109)	232 (154)	599 (827)	80 (99)	105 (82)	640 (493)	70 (55)	
		v/c Ratio	0 (0)	0 (0)	0 (0)	0 (0)	14.13 (17.31)	0 (0)	0 (0)	0.3 (0.17)	0 (0)	0 (0)	0.13 (0.13)	0 (0)	
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7.2 (4.7)	0 (0)	0 (0)	3.3 (3.3)	0 (0)	
		Movement LOS	-	F (F)	-	-	F (F)	-	-	A (A)	-	-	A (A)	-	
		Approach Delay (s)	-	0 (0)	-	-	0 (0)	-	-	7.2 (4.7)	-	-	3.3 (3.3)	-	
		Approach LOS	-	F (F)	-	-	F (F)	-	-	A (A)	-	-	A (A)	-	
		Intersection Delay (s)	0 (0)												
		Intersection LOS	A (A)												
21	Ave 12E & CO 13th (48th St) (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	13 (16)	0 (0)	24 (31)	83 (115)	220 (297)	0 (0)	0 (0)	272 (141)	82 (43)	
		v/c Ratio	0 (0)	0 (0)	0 (0)	0 (0)	0.08 (0.1)	0 (0)	0 (0)	0.08 (0.09)	0 (0)	0 (0)	0 (0)	0 (0)	
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	0 (0)	13.2 (12.5)	0 (0)	0 (0)	2.8 (2.8)	0 (0)	0 (0)	0 (0)	0 (0)	
		Movement LOS	-	A (A)	-	-	B (B)	-	-	A (A)	-	-	A (A)	-	
		Approach Delay (s)	-	-	-	-	13.2 (12.5)	-	-	2.8 (2.8)	-	-	-	-	
		Approach LOS	-	A (A)	-	-	B (B)	-	-	A (A)	-	-	A (A)	-	
		Intersection Delay (s)	1.9 (2.7)												
		Intersection LOS	A (A)												
22	Foothills Blvd & CO 13th (48th St) (Stop)	Volume (vph)	162 (90)	594 (343)	77 (44)	54 (91)	300 (531)	52 (63)	116 (149)	219 (325)	76 (146)	33 (23)	174 (98)	22 (13)	
		v/c Ratio	0.15 (0.1)	0.22 (0.12)	0 (0)	0 (0)	0.07 (0.09)	0.03 (0.04)	0 (0)	5.93 (2.43)	0 (0)	0 (0)	2.99 (0)	0 (0)	
		Movement Delay (s)	8.6 (9.3)	0 (0)	0 (0)	0 (0)	2.1 (2.2)	0 (0)	0 (0)	0 (683.4)	0 (0)	0 (0)	1006.2 (0)	0 (0)	
		Movement LOS	A (A)	-	-	-	A (A)	-	-	F (F)	-	-	F (F)	-	
		Approach Delay (s)	-	1.7 (1.8)	-	-	1.8 (2)	-	-	(683.4)	-	-	1006.2	-	
		Approach LOS	-	A (A)	-	-	B (B)	-	-	F (F)	-	-	F (F)	-	
		Intersection Delay (s)	2310.9 (0)												
		Intersection LOS	F (A)												

Peak-Hour Intersection Performance Analysis: Year 2030 Recommended Improvements
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Operations Metric	AM (PM)											
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
23	Ave 14E & CO 13th (48th St) (Stop)	Volume (vph)	48 (24)	57 (24)	8 (3)	3 (5)	15 (25)	8 (19)	27 (41)	137 (206)	29 (75)	32 (20)	202 (123)	21 (13)
		v/c Ratio	0 (0)	0.28 (0.13)	0 (0)	0 (0)	0.06 (0.1)	0 (0)	0 (0)	0.02 (0.03)	0 (0)	0 (0)	0.02 (0.02)	0 (0)
		Movement Delay (s)	0 (0)	16.3 (15)	0 (0)	0 (0)	12.8 (12.8)	0 (0)	0 (0)	1.3 (1.2)	0 (0)	0 (0)	1.2 (1.1)	0 (0)
		Movement LOS	-	C (B)	-	-	B (B)	-	-	A (A)	-	-	A (A)	-
		Approach Delay (s)	-	16.3 (15)	-	-	12.8 (12.8)	-	-	1.3 (1.2)	-	-	1.2 (1.1)	-
		Approach LOS	-	C (B)	-	-	B (B)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
24	CO 14th St (56th St) & Ave 14E (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	37 (48)	0 (0)	44 (55)	60 (75)	108 (145)	0 (0)	0 (0)	157 (88)	70 (37)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.13 (0.16)	0 (0)	0 (0)	0 (0)	0.05 (0.06)	0 (0)	0 (0)	0.15 (0.08)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	11.3 (11.1)	0 (0)	0 (0)	0 (0)	3.1 (2.9)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	-	-	B (B)	-	-	-	A (A)	-	-	-	-
		Approach Delay (s)	-	-	-	-	11.3 (11.1)	-	-	3.1 (2.9)	-	-	-	-
		Approach LOS	-	-	-	-	B (B)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
25	Ave 15E & S. Frontage Rd (Stop)	Volume (vph)	442 (307)	0 (0)	474 (434)	0 (0)	0 (0)	0 (0)	0 (0)	83 (265)	110 (375)	480 (434)	355 (306)	0 (0)
		v/c Ratio	7.06 (8.45)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.12 (0.41)	0 (0)	0 (0)	0.38 (0.52)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7.3 (11.4)	0 (0)
		Movement LOS	F (F)	-	-	-	-	-	-	-	-	-	A (B)	-
		Approach Delay (s)	-	-	-	-	-	-	-	-	-	-	7.3 (11.4)	-
		Approach LOS	-	F (F)	-	-	-	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
26	Ave 15E & 40th Street (Stop)	Volume (vph)	250 (113)	584 (267)	0 (0)	0 (0)	492 (698)	495 (476)	565 (576)	0 (0)	333 (414)	0 (0)	0 (0)	0 (0)
		v/c Ratio	0.42 (0.23)	0.37 (0.17)	0 (0)	0 (0)	0.31 (0.45)	0.32 (0.3)	11.29 (5.62)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement Delay (s)	14.5 (13.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	B (B)	-	-	-	-	-	-	F (F)	-	-	-	-
		Approach Delay (s)	-	4.3 (4)	-	-	-	-	-	-	-	-	-	-
		Approach LOS	-	-	-	-	-	-	-	F (F)	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
27	Ave 15E & CO 13th (48th St) (Stop)	Volume (vph)	145 (74)	442 (229)	0 (0)	0 (0)	260 (402)	183 (169)	196 (217)	0 (0)	108 (130)	0 (0)	0 (0)	0 (0)
		v/c Ratio	0 (0)	0.15 (0.08)	0 (0)	0 (0)	0.28 (0.37)	0 (0)	1.36 (1.14)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement Delay (s)	0 (0)	3.6 (2.9)	0 (0)	0 (0)	0 (0)	0 (0)	225.4 (126.6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	A (A)	-	-	-	-	F (F)	-	-	-	-	-
		Approach Delay (s)	-	3.6 (2.9)	-	-	-	-	-	225.4 (126.6)	-	-	-	-
		Approach LOS	-	-	-	-	-	-	-	F (F)	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-

Peak-Hour Intersection Performance Analysis: Year 2030 Recommended Improvements - Mitigated
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Fields	AM (PM)												
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
1*	Fortuna Rd & North Frontage Rd (Signal)	Volume (vph)	347 (163)	663 (669)	183 (127)	54 (488)	528 (1028)	438 (603)	208 (556)	151 (105)	360 (157)	220 (116)	227 (85)	142 (170)	
		v/c Ratio	-	-	-	-	-	-	-	-	-	-	-	-	
		Movement Delay (s)	22 (26)	11 (20)	4 (6)	39 (53)	27 (43)	9 (26)	40 (46)	34 (30)	10 (10)	29 (22)	32 (38)	8 (10)	
		Movement LOS	C (C)	B (B)	A (A)	D (D)	C (D)	A (C)	D (D)	C (C)	A (A)	C (C)	C (D)	A (A)	
		Approach Delay (s)	-	12 (17)	-	-	19 (35)	-	-	22 (35)	-	-	-	24 (19)	
		Approach LOS	-	B (B)	-	-	B (C)	-	-	C (C)	-	-	-	C (B)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
2*	Fortuna Rd & I-8 Westbound (Signal)	Volume (vph)	463 (357)	916 (634)	0 (0)	0 (0)	685 (966)	423 (335)	0 (0)	0 (0)	0 (0)	134 (242)	25 (0)	277 (325)	
		v/c Ratio	-	-	-	-	-	-	-	-	-	-	-	-	
		Movement Delay (s)	50 (42)	24 (31)	-	-	24 (22)	7 (8)	-	-	-	31 (40)	-	14 (13)	
		Movement LOS	D (D)	C (C)	A (A)	A (A)	C (C)	A (A)	A (A)	A (A)	A (A)	C (D)	D (A)	B (B)	
		Approach Delay (s)	-	28 (33)	-	-	16 (17)	-	-	-	-	-	-	19 (23)	
		Approach LOS	-	C (C)	-	-	B (B)	-	-	A (A)	-	-	-	B (C)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
3*	Fortuna Rd & I-8 Eastbound (Signal)	Volume (vph)	0 (0)	1143 (771)	277 (260)	202 (157)	617 (1051)	0 (0)	236 (220)	14 (4)	418 (551)	0 (0)	0 (0)	0 (0)	
		v/c Ratio	-	-	-	-	-	-	-	-	-	-	-	-	
		Movement Delay (s)	-	5 (4)	16 (13)	35 (29)	19 (21)	-	30 (30)	35 (26)	12 (15)	-	-	-	
		Movement LOS	A (A)	A (A)	B (B)	C (C)	B (C)	A (A)	C (C)	C (C)	B (B)	A (A)	A (A)	A (A)	
		Approach Delay (s)	-	6 (6)	-	-	21 (21)	-	-	17 (19)	-	-	-	-	
		Approach LOS	-	A (A)	-	-	C (C)	-	-	B (B)	-	-	-	A (A)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
4*	Fortuna Rd & E. South Frontage Rd (Signal)	Volume (vph)	58 (95)	928 (692)	21 (105)	196 (139)	713 (1199)	126 (264)	216 (193)	89 (138)	83 (106)	40 (146)	113 (83)	276 (146)	
		v/c Ratio	-	-	-	-	-	-	-	-	-	-	-	-	
		Movement Delay (s)	15 (23)	21 (18)	14 (11)	4 (11)	12 (15)	15 (6)	25 (23)	28 (28)	2 (4)	18 (21)	28 (29)	8 (6)	
		Movement LOS	B (C)	C (B)	B (B)	A (B)	B (B)	B (A)	C (C)	C (C)	A (A)	B (C)	C (C)	A (A)	
		Approach Delay (s)	22 (21)	-	-	-	11 (12)	-	-	17 (16)	-	-	-	12 (18)	
		Approach LOS	-	C (C)	-	-	B (B)	-	-	B (B)	-	-	-	B (B)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
5	Fortuna Rd & 35th Place (Signal)	Volume (vph)	33 (24)	737 (637)	56 (48)	69 (163)	535 (831)	53 (200)	122 (152)	24 (17)	45 (21)	88 (19)	29 (8)	121 (139)	
		v/c Ratio	0.074 (0.087)	0.561 (0.555)	0.561 (0.556)	0.175 (0.365)	0.387 (0.705)	0.388 (0.706)	0 (0)	0 (0)	0.118 (0.053)	0.203 (0.041)	0 (0)	0.382 (0.368)	
		Movement Delay (s)	8.5 (10.9)	13.3 (14.7)	13.3 (14.7)	8.1 (8.2)	10.8 (15)	10.8 (15.2)	22.4 (21.7)	15.9 (14.8)	16.2 (14.9)	17.5 (15.2)	0 (0)	17.9 (16.7)	
		Movement LOS	A (B)	B (B)	B (B)	A (A)	B (B)	B (B)	C (C)	C (C)	B (B)	B (B)	-	B (B)	
		Approach Delay (s)	-	13.1 (14.5)	-	-	10.5 (14.1)	-	-	20.1 (20.4)	-	-	-	17.8 (16.6)	
		Approach LOS	-	B (B)	-	-	B (B)	-	-	C (C)	-	-	-	B (B)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
6	Fortuna Rd & 40th Street (Signal)	Volume (vph)	41 (64)	224 (290)	27 (68)	388 (643)	199 (103)	107 (102)	70 (60)	134 (232)	127 (63)	27 (67)	146 (101)	543 (352)	
		v/c Ratio	0.385 (0.538)	0 (0)	0.428 (0.626)	0.874 (0.903)	0.266 (0.113)	0.168 (0.132)	0 (0)	0 (0)	0.224 (0.313)	0.062 (0.21)	0.219 (0.203)	0.957 (0.834)	
		Movement Delay (s)	20.8 (21)	0 (0)	21.2 (21.7)	43.2 (37.3)	11.6 (7.3)	11.1 (7.4)	15.3 (18.7)	13 (17.3)	13.2 (17.4)	14.8 (20.5)	13.1 (16.7)	44.8 (25.6)	
		Movement LOS	C (C)	-	C (C)	D (D)	B (A)	B (A)	B (B)	B (B)	B (B)	B (C)	B (B)	D (C)	
		Approach Delay (s)	-	21 (21.4)	-	-	29.2 (30.1)	-	-	13.6 (17.6)	-	-	-	37.2 (23.2)	
		Approach LOS	-	C (C)	-	-	C (C)	-	-	B (B)	-	-	-	D (C)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
7*	Foothills Blvd & E. North Frontage Rd (Signal)	Volume (vph)	285 (242)	345 (357)	151 (138)	105 (59)	206 (331)	190 (41)	58 (200)	26 (37)	348 (320)	200 (164)	58 (32)	88 (116)	
		v/c Ratio	-	-	-	-	-	-	-	-	-	-	-	-	
		Movement Delay (s)	10 (9)	5 (4)	2 (1)	34 (33)	32 (31)	17 (17)	39 (42)	32 (35)	8 (7)	38 (33)	36 (34)	17 (14)	
		Movement LOS	A (A)	A (A)	A (A)	C (C)	C (C)	B (B)	D (D)	C (C)	A (A)	D (C)	D (C)	B (B)	
		Approach Delay (s)	-	5 (5)	-	-	24 (28)	-	-	12 (20)	-	-	-	30 (25)	
		Approach LOS	-	A (A)	-	-	C (C)	-	-	B (B)	-	-	-	C (C)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
8*	Foothills Blvd & I-8 Westbound (Signal)	Volume (vph)	905 (779)	618 (585)	0 (0)	0 (0)	347 (534)	407 (281)	0 (0)	0 (0)	0 (0)	95 (103)	31 (152)	163 (152)	
		v/c Ratio	-	-	-	-	-	-	-	-	-	-	-	-	
		Movement Delay (s)	39 (38)	20 (16)	-	-	33 (28)	11 (8)	-	-	-	-	32 (12)	32 (31)	7 (30)
		Movement LOS	D (D)	B (B)	A (A)	A (A)	C (C)	B (A)	A (A)	A (A)	A (A)	A (A)	C (B)	C (C)	A (C)
		Approach Delay (s)	29 (25)	-	-	-	19 (19)	-	-	-	-	-	-	-	17 (22)
		Approach LOS	-	C (C)	-	-	B (B)	-	-	-	-	-	-	-	B (C)
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
9*	Foothills Blvd & I-8 Eastbound (Signal)	Volume (vph)	0 (0)	1282 (1099)	347 (199)	150 (89)	292 (548)	0 (0)	241 (265)	0 (0)	822 (1006)	0 (0)	0 (0)	0 (0)	
		v/c Ratio	-	-	-	-	-	-	-	-	-	-	-	-	
		Movement Delay (s)	-	19 (16)	12 (9)	40 (23)	19 (16)	-	35 (32)	-	12 (19)	-	-	-	
		Movement LOS	A (A)	B (B)	B (A)	D (C)	B (B)	A (A)	C (C)	A (A)	B (B)	A (A)	A (A)	A (A)	
		Approach Delay (s)	-	16 (15)	-	-	23 (17)	-	-	15 (18)	-	-	-	-	
		Approach LOS	-	B (B)	-	-	C (B)	-	-	B (B)	-	-	-	A (A)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
10*	Foothills Blvd & E. South Frontage Rd / E. South Frontage Rd (Signal)	Volume (vph)	43 (49)	874 (700)	12 (21)	213 (313)	543 (984)	358 (257)	338 (331)	22 (51)	43 (76)	23 (23)	31 (39)	417 (267)	
		v/c Ratio	-	-	-	-	-	-	-	-	-	-	-	-	
		Movement Delay (s)	23 (37)	29 (22)	21 (19)	46 (25)	11 (10)	6 (7)	59 (47)	49 (40)	43 (42)	57 (49)	50 (47)	20 (8)	
		Movement LOS	C (D)	C (C)	C (B)	D (C)	B (A)	A (A)	E (D)	D (D)	D (D)	E (D)	D (D)	B (A)	
		Approach Delay (s)	-	26 (21)	-	-	12 (11)	-	-	50 (44)	-	-	-	19 (15)	
		Approach LOS	-	C (C)	-	-	B (B)	-	-	D (D)	-	-	-	B (B)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	
11	Foothills Blvd & 38th Street (Signal)	Volume (vph)	154 (112)	945 (488)	182 (239)	15 (46)	315 (781)	14 (39)	29 (26)	6 (11)	122 (161)	158 (102)	9 (8)	26 (11)	
		v/c Ratio	0.31 (0.353)	0.72 (0.505)	0.723 (0.507)	0.064 (0.133)	0.249 (0.597)	0.25 (0.597)	0 (0)	0 (0)	0.48 (0.686)	0.425 (0.284)	0.03 (0.029)	0.102 (0.047)	
		Movement Delay (s)	8.9 (10.2)	9.8 (8.5)	9.9 (8.6)	16 (12.8)	9.2 (10.1)	9.2 (10.1)	15.6 (15.2)	15.1 (14.8)	16.9 (17.7)	17.5 (16.3)	15.1 (14.8)	15.4 (14.8)	
		Movement LOS	A (B)	A (A)	A (A)	B (B)	A (B)	A (B)	B (B)	B (B)	B (B)	B (B)	B (B)	B (B)	
		Approach Delay (s)	-	9.7 (8.8)	-	-	9.5 (10.2)	-	-	16.6 (17.2)	-	-	-	17.1 (16.1)	
		Approach LOS	-	A (A)	-	-	A (B)	-	-	B (B)	-	-	-	B (B)	
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-	
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-	

Peak-Hour Intersection Performance Analysis: Year 2030 Recommended Improvements - Mitigated
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Fields	AM (PM)											
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
12	Foothills Blvd & 40th Street (Signal)	Volume (vph)	280 (161)	764 (413)	22 (4)	66 (173)	372 (654)	215 (223)	222 (267)	253 (284)	167 (368)	8 (13)	350 (180)	267 (168)
		v/c Ratio	0.821 (0.573)	0.517 (0.263)	0.517 (0.264)	0.275 (0.475)	0.876 (0.904)	0.596 (0.904)	0.727 (0.69)	0 (0)	0.284 (0.703)	0.026 (0.063)	0.825 (0.597)	0.74 (0.655)
		Movement Delay (s)	30.3 (14.9)	14.4 (9.9)	14.4 (9.9)	22.7 (19)	41.5 (38)	25.1 (39.3)	26 (22.6)	14.9 (15)	14.3 (17.1)	20.2 (22.5)	28.1 (23.4)	25.6 (24)
		Movement LOS	C (B)	B (A)	B (A)	C (B)	D (D)	C (D)	C (C)	B (B)	B (B)	C (C)	C (C)	C (C)
		Approach Delay (s)	18.5 (11.3)			34.2 (35.4)			18.6 (18)			26.9 (23.7)		
		Approach LOS	B (B)			C (D)			B (B)			C (C)		
		Intersection Delay (s)	23.7 (23.7)											
		Intersection LOS	C (C)											
13	S. Ave 10 E & E. South Frontage Rd (Signal)	Volume (vph)	299 (149)	0 (0)	10 (24)	0 (0)	0 (0)	0 (0)	0 (0)	378 (451)	222 (375)	55 (29)	354 (332)	0 (0)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.493 (0.641)	0 (0)	0 (0)	0.493 (0.641)	0.3 (0.249)	0 (0)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1.1 (1.3)	0.8 (0.6)	0 (0)	0 (0)
		Movement LOS	-	-	-	-	-	-	-	-	A (A)	A (A)	-	-
		Approach Delay (s)	-			-			1.1 (1.3)			0.8 (0.6)		
		Approach LOS	-			-			A (A)			A (A)		
		Intersection Delay (s)	0.9 (1.1)											
		Intersection LOS	A (A)											
14	Fortuna Rd & E. 28th Street (Signal)	Volume (vph)	0 (0)	846 (638)	51 (473)	53 (70)	701 (1554)	0 (0)	0 (0)	0 (0)	0 (0)	250 (267)	0 (0)	407 (15)
		v/c Ratio	0 (0)	0.336 (0.42)	0.336 (0.366)	0.073 (0.131)	0.274 (0.539)	0 (0)	0 (0)	0.336 (0.42)	0.336 (0.366)	0.073 (0.131)	0.274 (0.539)	0 (0)
		Movement Delay (s)	0 (0)	0.7 (0.5)	0.7 (0.5)	0.9 (0.8)	0.6 (0.6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	A (A)	A (A)	A (A)	A (A)	-	-	-	-	-	-	-
		Approach Delay (s)	0.7 (0.5)			0.6 (0.6)			-			-		
		Approach LOS	A (A)			A (A)			-			-		
		Intersection Delay (s)	0.7 (0.6)											
		Intersection LOS	A (A)											
15	S. Camino Del Sol & E. 28th Street (Stop)	Volume (vph)	323 (189)	14 (26)	8 (12)	1 (1)	29 (17)	48 (8)	6 (40)	8 (23)	198 (338)	15 (9)	21 (7)	4 (4)
		v/c Ratio	0 (0)	0.23 (0.13)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.28 (0.51)	0 (0)	0 (0)	0.22 (0.08)	0 (0)
		Movement Delay (s)	0 (0)	7.7 (6.5)	0 (0)	0 (0)	0.1 (0.3)	0 (0)	0 (0)	11 (13.4)	0 (0)	0 (0)	27.7 (20.3)	0 (0)
		Movement LOS	-	A (A)	-	-	A (A)	-	-	B (B)	-	-	D (C)	-
		Approach Delay (s)	7.7 (6.5)			0.1 (0.3)			11 (13.4)			27.7 (20.3)		
		Approach LOS	-			-			B (B)			D (C)		
		Intersection Delay (s)	9 (10.8)											
		Intersection LOS	A (B)											
16	E. Camino Del Sol/ E. Camionero Del Sol & E. Calle Ventana (Stop)	Volume (vph)	12 (7)	158 (222)	27 (54)	15 (27)	262 (196)	0 (25)	25 (13)	2 (2)	12 (9)	69 (24)	5 (0)	38 (10)
		v/c Ratio	0 (0)	0.01 (0.01)	0 (0)	0 (0)	0.01 (0.02)	0 (0)	0 (0)	0.09 (0.05)	0 (0)	0 (0)	0.23 (0.08)	0 (0)
		Movement Delay (s)	0 (0)	0.6 (0.2)	0 (0)	0 (0)	0.5 (1.1)	0 (0)	0 (0)	13.4 (12.6)	0 (0)	0 (0)	14 (13.2)	0 (0)
		Movement LOS	-	A (A)	-	-	A (A)	-	-	B (B)	-	-	B (B)	-
		Approach Delay (s)	0.6 (0.2)			0.5 (1.1)			13.4 (12.6)			14 (13.2)		
		Approach LOS	-			-			B (B)			B (B)		
		Intersection Delay (s)	3.8 (1.8)											
		Intersection LOS	A (A)											
17	E. North Frontage Rd & E. Camino Del Sol (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	254 (192)	0 (0)	82 (56)	36 (92)	146 (283)	0 (0)	0 (0)	232 (187)	207 (271)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.62 (0.7)	0 (0)	0.13 (0.09)	0.04 (0.09)	0.09 (0.18)	0 (0)	0 (0)	0.28 (0.29)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	25.3 (41.5)	0 (0)	11.1 (10.7)	8.4 (8.7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	-	-	D (E)	-	B (B)	A (A)	-	-	-	-	-
		Approach Delay (s)	-			21.8 (34.6)			1.7 (2.1)			-		
		Approach LOS	-			C (D)			-			-		
		Intersection Delay (s)	8 (8.7)											
		Intersection LOS	A (A)											
18	Far West Ave & E. South Frontage Rd (Stop)	Volume (vph)	41 (29)	0 (0)	68 (42)	0 (0)	0 (0)	0 (0)	0 (0)	158 (200)	27 (62)	48 (77)	168 (124)	0 (0)
		v/c Ratio	0.17 (0.13)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.12 (0.17)	0 (0)	0 (0)	0.04 (0.07)	0 (0)
		Movement Delay (s)	11.3 (11.7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (3.4)	0 (0)
		Movement LOS	B (B)	-	-	-	-	-	-	-	-	-	A (A)	-
		Approach Delay (s)	11.3 (11.7)			-			-			2 (3.4)		
		Approach LOS	B (B)			-			-			-		
		Intersection Delay (s)	3.2 (2.8)											
		Intersection LOS	A (A)											
19	Ave 12E & E. South Frontage Rd (Stop)	Volume (vph)	213 (231)	0 (0)	145 (203)	0 (0)	0 (0)	0 (0)	0 (0)	214 (216)	242 (199)	117 (47)	118 (52)	0 (0)
		v/c Ratio	0.69 (0.5)	0 (0)	0.23 (0.32)	0 (0)	0 (0)	0 (0)	0 (0)	0.29 (0.27)	0 (0)	0.12 (0.05)	0.08 (0.03)	0 (0)
		Movement Delay (s)	36.6 (19)	0 (0)	11.9 (12.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8.8 (8.4)	0 (0)	0 (0)
		Movement LOS	E (C)	-	B (B)	-	-	-	-	-	-	A (A)	-	-
		Approach Delay (s)	26.6 (15.9)			-			-			4.4 (4)		
		Approach LOS	D (C)			-			-			-		
		Intersection Delay (s)	10.1 (7.7)											
		Intersection LOS	B (A)											
20	Ave 12E & 40th Street (Signal)	Volume (vph)	6 (6)	20 (26)	3 (4)	57 (142)	160 (209)	121 (109)	232 (154)	599 (827)	80 (99)	105 (82)	640 (493)	70 (55)
		v/c Ratio	0.092 (0.113)	0 (0)	0 (0)	0.611 (0.903)	0 (0)	0.423 (0.19)	0.577 (0.512)	0.309 (0.586)	0.31 (0.586)	0.611 (0.903)	0 (0)	0.505 (0.754)
		Movement Delay (s)	17.6 (12.9)	0 (0)	0 (0)	21.5 (39.8)	0 (0)	19.6 (11.8)	13.6 (14.1)	4.1 (12.2)	4.2 (12.2)	4.3 (18.4)	0 (0)	5.1 (22.4)
		Movement LOS	B (B)	-	-	C (D)	-	B (B)	B (B)	A (B)	A (B)	A (B)	-	A (C)
		Approach Delay (s)	17.6 (12.9)			20.8 (33.1)			6.6 (12.5)			4.8 (20.8)		
		Approach LOS	B (B)			C (C)			A (B)			A (C)		
		Intersection Delay (s)	8.3 (19.2)											
		Intersection LOS	A (B)											
21	Ave 12E & CO 13th (48th St) (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	13 (16)	0 (0)	24 (31)	83 (115)	220 (297)	0 (0)	0 (0)	272 (141)	82 (43)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0 (0)	0.08 (0.1)	0 (0)	0 (0)	0.08 (0.09)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	0 (0)	13.2 (12.5)	0 (0)	0 (0)	2.8 (2.8)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	A (A)	-	-	B (B)	-	-	A (A)	-	-	-	-
		Approach Delay (s)	-			13.2 (12.5)			2.8 (2.8)			-		
		Approach LOS	A (A)			B (B)			-			-		
		Intersection Delay (s)	1.9 (2.7)											
		Intersection LOS	A (A)											
22	Foothills Blvd & CO 13th (48th St) (Signal)	Volume (vph)	162 (90)	594 (343)	77 (44)	54 (91)	300 (531)	52 (63)	116 (149)	219 (325)	76 (146)	33 (23)	174 (98)	22 (13)
		v/c Ratio	0.337 (0.281)	0.469 (0.289)	0.47 (0.293)	0.159 (0.222)	0.245 (0.445)	0.25 (0.447)	0.701 (0.957)	0 (0)	0 (0)	0.159 (0.222)	0.245 (0.445)	0 (0)
		Movement Delay (s)	11.3 (16.2)	9.4 (10.8)	9.4 (10.8)	12.4 (13.6)	8.2 (11.8)	8.2 (11.8)	13.4 (38.5)	0 (0)	0 (0)	9.6 (8.6)	0 (0)	0 (0)
		Movement LOS	B (B)	A (B)	A (B)	B (B)	A (B)	A (B)	B (D)	-	-	A (A)	-	-
		Approach Delay (s)	9.8 (11.8)			8.7 (12)			13.4 (38.5)			9.6 (8.6)		
		Approach LOS	A (B)			A (B)			B (D)			A (A)		
		Intersection Delay (s)	10.3 (20.3)											
		Intersection LOS	B (C)											

Peak-Hour Intersection Performance Analysis: Year 2030 Recommended Improvements - Mitigated
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Fields	AM (PM)											
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
23	Ave 14E & CO 13th (48th St) (Stop)	Volume (vph)	48 (24)	57 (24)	8 (3)	3 (5)	15 (25)	8 (19)	27 (41)	137 (206)	29 (75)	32 (20)	202 (123)	21 (13)
		v/c Ratio	0 (0)	0.28 (0.13)	0 (0)	0 (0)	0.06 (0.1)	0 (0)	0 (0)	0.02 (0.03)	0 (0)	0 (0)	0.02 (0.02)	0 (0)
		Movement Delay (s)	0 (0)	16.3 (15)	0 (0)	0 (0)	12.8 (12.8)	0 (0)	0 (0)	1.3 (1.2)	0 (0)	0 (0)	1.2 (1.1)	0 (0)
		Movement LOS	-	C (B)	-	-	B (B)	-	-	A (A)	-	-	A (A)	-
		Approach Delay (s)	-	16.3 (15)	-	-	12.8 (12.8)	-	-	1.3 (1.2)	-	-	1.2 (1.1)	-
		Approach LOS	-	C (B)	-	-	B (B)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
24	CO 14th St (56th St) & Ave 14E (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	37 (48)	0 (0)	44 (55)	60 (75)	108 (145)	0 (0)	0 (0)	157 (88)	70 (37)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.13 (0.16)	0 (0)	0 (0)	0 (0)	0.05 (0.06)	0 (0)	0 (0)	0.15 (0.08)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	11.3 (11.1)	0 (0)	0 (0)	0 (0)	3.1 (2.9)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	-	-	B (B)	-	-	-	A (A)	-	-	-	-
		Approach Delay (s)	-	-	-	-	11.3 (11.1)	-	-	3.1 (2.9)	-	-	-	-
		Approach LOS	-	-	-	-	B (B)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
25	Ave 15E & S. Frontage Rd (Signal)	Volume (vph)	442 (307)	0 (0)	474 (434)	0 (0)	0 (0)	0 (0)	0 (0)	83 (265)	110 (375)	480 (434)	355 (306)	0 (0)
		v/c Ratio	0 (0)	0 (0)	0.367 (0.714)	0 (0)	0.258 (0.204)	0 (0)	0 (0)	0 (0)	0.367 (0.714)	0.468 (0.639)	0.258 (0.204)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5.5 (5.8)	2.2 (6.2)	0.6 (0.4)	0 (0)
		Movement LOS	-	-	-	-	-	-	-	-	A (A)	A (A)	A (A)	-
		Approach Delay (s)	-	-	-	-	-	-	-	-	5.5 (5.8)	-	1.5 (3.8)	-
		Approach LOS	-	-	-	-	-	-	-	-	A (A)	-	A (A)	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
26	Ave 15E & 40th Street (Signal)	Volume (vph)	250 (113)	584 (267)	0 (0)	0 (0)	208 (521)	495 (476)	565 (576)	0 (0)	101 (252)	0 (0)	0 (0)	0 (0)
		v/c Ratio	0.224 (0.119)	0.202 (0.108)	0 (0)	0 (0)	0.072 (0.21)	0.382 (0.429)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement Delay (s)	0.8 (0.8)	0.4 (0.5)	0 (0)	0 (0)	0.3 (0.6)	1.1 (0.9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	A (A)	A (A)	-	-	A (A)	A (A)	-	-	-	-	-	-
		Approach Delay (s)	-	0.5 (0.6)	-	-	0.9 (0.8)	-	-	-	-	-	-	-
		Approach LOS	-	A (A)	-	-	A (A)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
27	Ave 15E & CO 13th (48th St) (Signal)	Volume (vph)	145 (74)	442 (229)	0 (0)	0 (0)	260 (402)	183 (169)	196 (217)	0 (0)	108 (130)	0 (0)	0 (0)	0 (0)
		v/c Ratio	0.207 (0.123)	0.355 (0.172)	0 (0)	0 (0)	0.207 (0.254)	0.171 (0.257)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement Delay (s)	0.7 (0.7)	0.9 (0.8)	0 (0)	0 (0)	0.7 (0.9)	0.7 (0.9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	A (A)	A (A)	-	-	A (A)	A (A)	-	-	-	-	-	-
		Approach Delay (s)	-	0.8 (0.8)	-	-	0.7 (0.9)	-	-	-	-	-	-	-
		Approach LOS	-	A (A)	-	-	A (A)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-

Note:
 * Indicates intersection simulated with VISSIM software to accurately measure queues and code complex signal phasing.

Peak-Hour Intersection Performance Analysis: Buildout Improvements - Alternative 1
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Fields	AM (PM)												
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
1*	Fortuna Rd & North Frontage Rd (Signal)	Volume (vph)	241 (163)	557 (536)	148 (127)	54 (464)	418 (966)	295 (379)	131 (372)	145 (122)	272 (157)	246 (116)	213 (112)	128 (151)	
		v/c Ratio	0.534 (0.522)	0.534 (0.662)	0.317 (0.351)	0.259 (0.861)	0.336 (0.641)	0.762 (0.808)	0.408 (0.859)	0 (0)	0.792 (0.435)	0.523 (0.256)	0 (0)	0.833 (0.827)	
		Movement Delay (s)	14 (20.2)	21 (27.5)	19.4 (25.1)	33.5 (41.1)	22.2 (23.8)	27.5 (32.5)	31.8 (48)	24.1 (24.6)	28.4 (25.8)	18.1 (21.4)	0 (0)	28 (32.6)	
		Movement LOS	B (C)	C (C)	B (C)	C (D)	C (C)	C (C)	C (D)	C (C)	C (C)	B (C)	-	C (C)	
		Approach Delay (s)	19 (25.7)			25.1 (30)			28.1 (38.3)			23.8 (29.2)			
		Approach LOS	B (C)			C (C)			C (D)			C (C)			
		Intersection Delay (s)	23.4 (30.4)												
Intersection LOS	C (C)														
2*	Fortuna Rd & I-8 Westbound (Signal)	Volume (vph)	250 (190)	783 (622)	0 (0)	0 (0)	634 (886)	302 (353)	0 (0)	0 (0)	0 (0)	54 (89)	9 (0)	163 (204)	
		v/c Ratio	0.437 (0.396)	0.387 (0.316)	0 (0)	0 (0)	0.337 (0.481)	0.515 (0.615)	0 (0)	0 (0)	0 (0)	0.37 (0.464)	0.034 (0)	0.716 (0.784)	
		Movement Delay (s)	6 (6.9)	4.7 (4.9)	0 (0)	0 (0)	10.3 (11.5)	11.4 (12.6)	0 (0)	0 (0)	0 (0)	21.7 (21.4)	17.7 (0)	21.3 (21.6)	
		Movement LOS	A (A)	A (A)	-	-	B (B)	B (B)	-	-	-	C (C)	B (C)	C (C)	
		Approach Delay (s)	5 (5.4)			10.6 (11.8)			-			21.2 (21.6)			
		Approach LOS	A (A)			B (B)			-			C (C)			
		Intersection Delay (s)	9.1 (10.8)												
Intersection LOS	A (B)														
3*	Fortuna Rd & I-8 Eastbound (Signal)	Volume (vph)	0 (0)	893 (614)	173 (215)	143 (124)	545 (851)	0 (0)	140 (198)	7 (2)	272 (317)	0 (0)	0 (0)	0 (0)	
		v/c Ratio	0 (0)	0.513 (0.366)	0.319 (0.319)	0.33 (0.257)	0.297 (0.484)	0 (0)	0 (0)	0 (0)	0.818 (0.841)	0 (0)	0 (0)	0 (0)	
		Movement Delay (s)	0 (0)	13.2 (13.2)	12.2 (13.6)	8 (8.1)	6.2 (8)	0 (0)	17.7 (17.7)	16.1 (15.3)	21.5 (21.4)	0 (0)	0 (0)	0 (0)	
		Movement LOS	-	B (B)	B (B)	A (A)	A (A)	-	B (B)	B (B)	C (C)	-	-	-	
		Approach Delay (s)	13 (13.3)			6.6 (8)			20.1 (20)			-			
		Approach LOS	B (B)			A (A)			C (B)			-			
		Intersection Delay (s)	12.4 (12.6)												
Intersection LOS	B (B)														
4*	Fortuna Rd & E. South Frontage Rd (Signal)	Volume (vph)	58 (76)	692 (511)	23 (96)	166 (123)	526 (781)	125 (264)	145 (193)	89 (126)	83 (88)	41 (131)	113 (81)	229 (125)	
		v/c Ratio	0.156 (0.23)	0.494 (0.391)	0.495 (0.4)	0.438 (0.282)	0.489 (0.698)	0.26 (0.527)	0.325 (0.461)	0 (0)	0.237 (0.443)	0.093 (0.344)	0.339 (0.371)	0.808 (0.674)	
		Movement Delay (s)	13.9 (12.4)	19.2 (15.9)	19.3 (16.1)	13.2 (10.8)	17.9 (17.6)	16.4 (16.4)	15.1 (19.1)	20.3 (25.3)	20.4 (24.8)	18.6 (19.2)	23.3 (24.8)	27.5 (26.9)	
		Movement LOS	B (B)	B (B)	B (B)	B (B)	B (B)	B (B)	B (B)	C (C)	C (C)	B (B)	C (C)	C (C)	
		Approach Delay (s)	18.8 (15.6)			16.7 (16.6)			18 (22.2)			25.3 (23.4)			
		Approach LOS	B (B)			B (B)			B (C)			C (C)			
		Intersection Delay (s)	19 (18.1)												
Intersection LOS	B (B)														
5	Fortuna Rd & 35th Place (Signal)	Volume (vph)	65 (33)	387 (354)	34 (34)	44 (86)	292 (438)	76 (233)	204 (170)	48 (42)	76 (28)	44 (15)	56 (20)	66 (94)	
		v/c Ratio	0.126 (0.093)	0.322 (0.307)	0.325 (0.31)	0.091 (0.159)	0.3 (0.614)	0.307 (0.384)	0 (0)	0 (0)	0.173 (0.069)	0.094 (0.033)	0 (0)	0.259 (0.274)	
		Movement Delay (s)	8.4 (9.8)	12 (12.2)	12 (12.2)	9.2 (7.3)	12.5 (13.1)	12.6 (11.3)	20 (20)	13.8 (14.4)	14.2 (14.3)	14.7 (14.9)	0 (0)	14.7 (15.5)	
		Movement LOS	A (A)	B (B)	B (B)	A (A)	B (B)	B (B)	B (B)	B (B)	B (B)	B (B)	-	B (B)	
		Approach Delay (s)	11.5 (12)			12.2 (11.9)			17.7 (18.3)			14.7 (15.4)			
		Approach LOS	B (B)			B (B)			B (B)			B (B)			
		Intersection Delay (s)	13.6 (13.2)												
Intersection LOS	B (B)														
6	Fortuna Rd & 40th Street (Signal)	Volume (vph)	133 (189)	182 (231)	52 (112)	196 (316)	135 (71)	88 (91)	47 (53)	223 (427)	282 (136)	41 (99)	307 (177)	284 (164)	
		v/c Ratio	0.432 (0.613)	0 (0)	0.536 (0.709)	0.632 (0.788)	0.169 (0.081)	0.13 (0.122)	0 (0)	0 (0)	0.612 (0.533)	0.165 (0.427)	0.566 (0.32)	0.616 (0.349)	
		Movement Delay (s)	16.8 (23.4)	0 (0)	15.7 (22.4)	24.3 (37.7)	8 (8.5)	7.8 (8.7)	18.9 (20.5)	14 (19.1)	15.4 (19.2)	19.7 (26.8)	15 (17.6)	15.4 (17.8)	
		Movement LOS	B (C)	-	B (C)	C (D)	A (A)	A (A)	B (C)	B (B)	B (B)	B (C)	B (B)	B (B)	
		Approach Delay (s)	16.1 (22.8)			15.6 (27.8)			15.1 (19.3)			15.5 (19.7)			
		Approach LOS	B (C)			B (C)			B (B)			B (B)			
		Intersection Delay (s)	15.5 (22.3)												
Intersection LOS	B (C)														
7*	Foothills Blvd & E. North Frontage Rd (Signal)	Volume (vph)	354 (226)	399 (325)	65 (148)	47 (21)	212 (169)	76 (13)	15 (75)	26 (37)	307 (328)	211 (124)	58 (25)	25 (50)	
		v/c Ratio	0.756 (0.478)	0.558 (0.461)	0.107 (0.247)	0.23 (0.077)	0.647 (0.313)	0.674 (0.318)	0 (0)	0 (0)	0.534 (0.622)	0.639 (0.442)	0.056 (0.037)	0.061 (0.086)	
		Movement Delay (s)	21.4 (15.2)	16.8 (12.7)	13.4 (11.4)	30 (20.7)	31.9 (21.5)	32.3 (21.5)	12.4 (11.9)	0 (0)	15.9 (14.5)	27.2 (22.4)	12.4 (10.8)	12.4 (11)	
		Movement LOS	C (B)	B (B)	B (B)	C (C)	C (C)	C (C)	B (B)	-	B (B)	C (C)	B (B)	B (B)	
		Approach Delay (s)	18.5 (13.2)			31.8 (21.4)			15.5 (13.9)			23 (18.1)			
		Approach LOS	B (B)			C (C)			B (B)			C (B)			
		Intersection Delay (s)	21.2 (15.1)												
Intersection LOS	C (B)														
8*	Foothills Blvd & I-8 Westbound (Signal)	Volume (vph)	525 (418)	679 (526)	0 (0)	0 (0)	475 (501)	255 (120)	0 (0)	0 (0)	0 (0)	89 (142)	13 (68)	139 (173)	
		v/c Ratio	0.792 (0.746)	0.343 (0.29)	0 (0)	0 (0)	0.551 (0.638)	0.661 (0.342)	0 (0)	0 (0)	0 (0)	0.435 (0.681)	0 (0)	0.668 (0.645)	
		Movement Delay (s)	17.6 (17.6)	4.4 (5.1)	0 (0)	0 (0)	14.4 (15)	15.4 (13.8)	0 (0)	0 (0)	0 (0)	18 (17.4)	0 (0)	19.5 (17.2)	
		Movement LOS	B (B)	A (A)	-	-	B (B)	B (B)	-	-	-	B (B)	-	B (B)	
		Approach Delay (s)	10.2 (10.6)			14.7 (14.8)			-			18.9 (17.3)			
		Approach LOS	B (B)			B (B)			-			B (B)			
		Intersection Delay (s)	12.7 (13.3)												
Intersection LOS	B (B)														
9*	Foothills Blvd & I-8 Eastbound (Signal)	Volume (vph)	0 (0)	1007 (755)	260 (180)	223 (152)	341 (491)	0 (0)	197 (189)	0 (0)	429 (551)	0 (0)	0 (0)	0 (0)	
		v/c Ratio	0 (0)	0.801 (0.738)	0.801 (0.744)	0.698 (0.513)	0.204 (0.356)	0 (0)	0 (0)	0 (0)	0.922 (0.941)	0 (0)	0 (0)	0 (0)	
		Movement Delay (s)	0 (0)	20.6 (21.9)	21.1 (22.4)	17 (16.5)	8.9 (12.6)	8.7 (0)	17.8 (13.1)	0 (0)	25.1 (27)	0 (0)	0 (0)	0 (0)	
		Movement LOS	-	C (C)	C (C)	B (B)	A (B)	A (B)	B (B)	-	C (C)	-	-	-	
		Approach Delay (s)	20.8 (22)			12.1 (13.5)			22.8 (23.4)			-			
		Approach LOS	C (C)			B (B)			C (C)			-			
		Intersection Delay (s)	19.3 (20.1)												
Intersection LOS	B (C)														
10*	Foothills Blvd & E. South Frontage Rd / E. South Frontage Rd (Signal)	Volume (vph)	43 (49)	656 (415)	12 (21)	101 (206)	348 (599)	321 (237)	338 (346)	22 (51)	43 (76)	23 (23)	31 (39)	273 (174)	
		v/c Ratio	0.105 (0.145)	0.515 (0.312)	0.515 (0.313)	0.358 (0.5)	0.282 (0.448)	0.581 (0.396)	0.6 (0.687)	0 (0)	0.074 (0.148)	0.057 (0.07)	0.042 (0.073)	0.834 (0.728)	
		Movement Delay (s)	13 (13.4)	12.4 (9.5)	12.4 (9.6)	18.1 (14.7)	11 (10.2)	12.9 (10)	15.9 (19.2)	9.3 (10.3)	9.5 (10.5)	15.7 (17)	15.5 (16.8)	20.9 (20.3)	
		Movement LOS	B (B)	B (A)	B (A)	B (B)	B (B)	B (A)	B (B)	A (B)	A (B)	B (B)	B (B)	C (C)	
		Approach Delay (s)	12.5 (9.9)			12.8 (11)			14.8 (16.9)			20 (19.4)			
		Approach LOS	B (A)			B (B)			B (B)			B (B)			
		Intersection Delay (s)	14.1 (12.9)												
Intersection LOS	B (B)														
11	Foothills Blvd & 38th Street (Signal)	Volume (vph)	69 (46)	505 (238)	218 (264)	36 (109)	148 (400)	14 (39)	29 (26)	35 (49)	70 (114)	179 (133)	66 (31)	82 (31)	
		v/c Ratio	0.152 (0.137)	0.577 (0.371)	0.579 (0.484)	0.118 (0.274)	0.13 (0.326)	0.133 (0.328)	0 (0)	0 (0)	0 (0)	0.22 (0.411)	0.431 (0.358)	0.176 (0.095)	0.258 (0.112)
		Movement Delay (s)	10 (10.2)	10.3 (9.2)	10.3 (9.8)	14.5 (13.7)	8.7 (8.4)	8.7 (8.4)	13.9 (13.9)	12.8 (13.6)	13.3 (14.6)	15.5 (15.8)	13.1 (13.4)	13.4 (13.5)	
		Movement LOS	A (B)	B (A)	B (A)	B (B)	A (A)	A (A)	B (B)	B (B)	B (B)	B (B)	B (B)	B (B)	
		Approach Delay (s)	10.3 (9.6)			9.8 (9.5)			13.3 (14.2)			14.5 (15)			
		Approach LOS	B (A)			A (A)			B (B)			B (B)			
		Intersection Delay (s)	11.4 (10.9)												
Intersection LOS	B (B)														

Peak-Hour Intersection Performance Analysis: Buildout Improvements - Alternative 1
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Fields	AM (PM)											
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
12	Foothills Blvd & 40th Street (Signal)	Volume (vph)	201 (113)	507 (277)	12 (52)	31 (88)	241 (432)	135 (140)	144 (166)	132 (250)	121 (255)	5 (8)	186 (93)	134 (84)
		v/c Ratio	0.448 (0.315)	0.321 (0.212)	0.322 (0.216)	0.092 (0.211)	0.509 (0.574)	0.335 (0.58)	0.422 (0.403)	0 (0)	0.252 (0.542)	0.018 (0.034)	0.677 (0.416)	0.574 (0.442)
		Movement Delay (s)	11.3 (10.5)	9 (8)	9 (8.1)	14.8 (13.4)	16.8 (15)	15.8 (15.1)	16.2 (15)	13.3 (13.5)	13.4 (14.1)	19.2 (19)	22.5 (20.3)	21.8 (20.5)
		Movement LOS	B (B)	A (A)	A (A)	B (B)	B (B)	B (B)	B (B)	B (B)	B (B)	B (B)	C (C)	C (C)
		Approach Delay (s)	9.6 (8.7)			16.3 (14.8)			14.4 (14.1)			22.2 (20.3)		
		Approach LOS	A (A)			B (B)			B (B)			C (C)		
		Intersection Delay (s)	14.3 (13.7)											
		Intersection LOS	B (B)											
13	S. Ave 10 E & E. South Frontage Rd (Signal)	Volume (vph)	202 (72)	0 (0)	28 (64)	0 (0)	0 (0)	0 (0)	0 (0)	378 (451)	102 (214)	102 (86)	354 (332)	0 (0)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.397 (0.527)	0 (0)	0 (0)	0.397 (0.527)	0.359 (0.327)	0 (0)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.1)	0.9 (0.7)	0 (0)	0 (0)
		Movement LOS	-	-	-	-	-	-	-	-	A (A)	A (A)	-	-
		Approach Delay (s)	-			-			1 (1.1)			0.9 (0.7)		
		Approach LOS	-			-			A (A)			A (A)		
		Intersection Delay (s)	0.9 (0.9)											
		Intersection LOS	A (A)											
14	Fortuna Rd & E. 28th Street (Signal)	Volume (vph)	0 (0)	512 (280)	151 (485)	78 (70)	289 (722)	0 (0)	0 (0)	0 (0)	0 (0)	367 (284)	0 (0)	58 (15)
		v/c Ratio	0 (0)	0.278 (0.207)	0.279 (0.423)	0.087 (0.092)	0.123 (0.282)	0 (0)	0 (0)	0.278 (0.207)	0.279 (0.423)	0.087 (0.092)	0.123 (0.282)	0 (0)
		Movement Delay (s)	0 (0)	0.8 (0.6)	0.8 (0.9)	1 (1.1)	0.6 (0.6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	A (A)	A (A)	A (A)	A (A)	-	-	-	-	-	-	-
		Approach Delay (s)	0.8 (0.8)			0.7 (0.6)			-			-		
		Approach LOS	A (A)			A (A)			-			-		
		Intersection Delay (s)	0.8 (0.7)											
		Intersection LOS	A (A)											
15	S. Camino Del Sol & E. 28th Street (Stop)	Volume (vph)	23 (17)	50 (57)	35 (35)	8 (8)	78 (75)	49 (12)	8 (38)	10 (25)	15 (133)	30 (25)	20 (7)	22 (23)
		v/c Ratio	0 (0)	0.02 (0.01)	0 (0)	0 (0)	0.01 (0.01)	0 (0)	0 (0)	0.05 (0.25)	0 (0)	0 (0)	0.11 (0.1)	0 (0)
		Movement Delay (s)	0 (0)	1.7 (1.2)	0 (0)	0 (0)	0.5 (0.7)	0 (0)	0 (0)	10.2 (10.7)	0 (0)	0 (0)	10.7 (11.3)	0 (0)
		Movement LOS	-	A (A)	-	-	A (A)	-	-	B (B)	-	-	B (B)	-
		Approach Delay (s)	1.7 (1.2)			0.5 (0.7)			10.2 (10.7)			10.7 (11.3)		
		Approach LOS	-			-			B (B)			B (B)		
		Intersection Delay (s)	3.9 (6.4)											
		Intersection LOS	A (A)											
16	E. Camino Del Sol/ E. Camionero Del Sol & E. Calle Ventana (Stop)	Volume (vph)	5 (2)	52 (75)	27 (54)	13 (25)	104 (73)	0 (14)	10 (6)	5 (3)	5 (5)	69 (24)	6 (0)	29 (16)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0 (0)	0.01 (0.02)	0 (0)	0 (0)	0.03 (0.02)	0 (0)	0 (0)	0.15 (0.06)	0 (0)
		Movement Delay (s)	0 (0)	0.5 (0.1)	0 (0)	0 (0)	0.9 (1.8)	0 (0)	0 (0)	10.2 (10)	0 (0)	0 (0)	10.5 (10)	0 (0)
		Movement LOS	-	A (A)	-	-	A (A)	-	-	B (B)	-	-	B (B)	-
		Approach Delay (s)	0.5 (0.1)			0.9 (1.8)			10.2 (10)			10.5 (10)		
		Approach LOS	-			-			B (B)			B (B)		
		Intersection Delay (s)	4.4 (2.6)											
		Intersection LOS	A (A)											
17	E. North Frontage Rd & E. Camino Del Sol (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	108 (71)	0 (0)	82 (56)	36 (92)	178 (317)	0 (0)	0 (0)	264 (223)	77 (116)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.26 (0.25)	0 (0)	0.13 (0.08)	0.03 (0.08)	0.11 (0.2)	0 (0)	0 (0)	0.22 (0.22)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	15.9 (20.9)	0 (0)	10.8 (10.3)	8.1 (8.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	-	-	C (C)	-	B (B)	A (A)	-	-	-	-	-
		Approach Delay (s)	-			13.7 (16.2)			1.4 (1.9)			-		
		Approach LOS	-			B (C)			A (A)			-		
		Intersection Delay (s)	3.9 (3.2)											
		Intersection LOS	A (A)											
18	Far West Ave & E. South Frontage Rd (Stop)	Volume (vph)	41 (29)	0 (0)	51 (29)	0 (0)	0 (0)	0 (0)	0 (0)	172 (212)	27 (62)	35 (59)	179 (137)	0 (0)
		v/c Ratio	0.15 (0.11)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.13 (0.18)	0 (0)	0 (0)	0.03 (0.05)	0 (0)
		Movement Delay (s)	11.3 (11.8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1.5 (2.7)	0 (0)
		Movement LOS	B (B)	-	-	-	-	-	-	-	-	-	A (A)	-
		Approach Delay (s)	11.3 (11.8)			-			-			1.5 (2.7)		
		Approach LOS	B (B)			-			-			A (A)		
		Intersection Delay (s)	2.7 (2.3)											
		Intersection LOS	A (A)											
19	Ave 12E & E. South Frontage Rd (Stop)	Volume (vph)	167 (181)	0 (0)	98 (199)	0 (0)	0 (0)	0 (0)	0 (0)	79 (79)	193 (152)	139 (65)	63 (32)	0 (0)
		v/c Ratio	0.42 (0.32)	0 (0)	0.13 (0.25)	0 (0)	0 (0)	0 (0)	0 (0)	0.17 (0.15)	0 (0)	0.12 (0.05)	0.04 (0.02)	0 (0)
		Movement Delay (s)	19.3 (13.5)	0 (0)	9.8 (10.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8.2 (7.9)	0 (0)	0 (0)
		Movement LOS	C (B)	-	A (B)	-	-	-	-	-	-	A (A)	-	-
		Approach Delay (s)	15.8 (11.9)			-			-			5.7 (5.3)		
		Approach LOS	C (B)			-			-			A (A)		
		Intersection Delay (s)	7.2 (7.1)											
		Intersection LOS	A (A)											
20	Ave 12E & 40th Street (Signal)	Volume (vph)	119 (166)	200 (255)	16 (36)	28 (60)	250 (220)	87 (103)	201 (118)	355 (607)	143 (61)	38 (25)	424 (279)	24 (15)
		v/c Ratio	0.334 (0.362)	0.197 (0.203)	0.2 (0.207)	0.325 (0.291)	0 (0)	0.38 (0.334)	0.427 (0.26)	0.305 (0.531)	0.31 (0.532)	0.325 (0.291)	0 (0)	0.326 (0.279)
		Movement Delay (s)	15.7 (11.4)	11 (7.2)	11 (7.3)	11.7 (7.5)	0 (0)	12 (7.9)	11.2 (11.2)	6.8 (10.2)	6.8 (10.2)	6.7 (8.7)	0 (0)	6.9 (8.8)
		Movement LOS	B (B)	B (A)	B (A)	B (A)	-	B (A)	B (B)	A (B)	A (B)	A (A)	-	A (A)
		Approach Delay (s)	12.6 (8.7)			11.8 (7.7)			8.1 (10.4)			6.8 (8.7)		
		Approach LOS	B (A)			B (A)			A (B)			A (A)		
		Intersection Delay (s)	9.3 (9.2)											
		Intersection LOS	A (A)											
21	Ave 12E & CO 13th (48th St) (Stop)	Volume (vph)	254 (150)	183 (86)	22 (11)	15 (23)	97 (174)	88 (106)	188 (206)	210 (288)	120 (267)	30 (17)	359 (203)	19 (11)
		v/c Ratio	0.496 (0.329)	0.16 (0.082)	0.164 (0.084)	0.156 (0.243)	0 (0)	0.187 (0.297)	0.411 (0.357)	0.286 (0.401)	0.192 (0.437)	0.156 (0.243)	0 (0)	0.307 (0.176)
		Movement Delay (s)	12.8 (11.2)	8.6 (7.6)	8.6 (7.6)	8.6 (8.2)	0 (0)	8.8 (8.5)	11.9 (8.8)	7.8 (7.3)	7.4 (7.6)	7.8 (6.3)	0 (0)	8 (6.4)
		Movement LOS	B (B)	A (A)	A (A)	A (A)	-	A (A)	B (A)	A (A)	A (A)	A (A)	-	A (A)
		Approach Delay (s)	10.9 (9.8)			8.7 (8.3)			9.2 (7.8)			7.9 (6.4)		
		Approach LOS	B (A)			A (A)			A (A)			A (A)		
		Intersection Delay (s)	9.3 (8)											
		Intersection LOS	A (A)											
22	Foothills Blvd & CO 13th (48th St) (Signal)	Volume (vph)	87 (49)	341 (162)	22 (11)	26 (39)	170 (329)	127 (137)	222 (258)	145 (204)	30 (72)	24 (13)	266 (139)	29 (13)
		v/c Ratio	0.189 (0.118)	0.312 (0.142)	0.315 (0.144)	0.06 (0.069)	0.291 (0.396)	0.255 (0.405)	0.417 (0.429)	0.123 (0.212)	0.128 (0.221)	0.06 (0.069)	0.291 (0.396)	0.246 (0.135)
		Movement Delay (s)	9.9 (9.6)	8.3 (6.9)	8.4 (7)	9.4 (7.5)	8.3 (8)	8.1 (8)	9.6 (9)	6 (6.6)	6 (6.6)	6.4 (6.3)	0 (0)	6.5 (6.3)
		Movement LOS	A (A)	A (A)	A (A)	A (A)	A (A)	A (A)	A (A)	A (A)	A (A)	A (A)	-	A (A)
		Approach Delay (s)	8.7 (7.5)			8.3 (8)			8 (7.7)			6.4 (6.3)		
		Approach LOS	A (A)			A (A)			A (A)			A (A)		
		Intersection Delay (s)	7.9 (7.6)											
		Intersection LOS	A (A)											

Peak-Hour Intersection Performance Analysis: Buildout Improvements - Alternative 1
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Fields	AM (PM)											
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
23	Ave 14E & CO 13th (48th St) (Stop)	Volume (vph)	96 (44)	49 (20)	7 (53)	4 (5)	19 (25)	29 (54)	74 (87)	195 (248)	48 (134)	26 (15)	313 (187)	16 (10)
		v/c Ratio	0 (0)	0.55 (0.34)	0 (0)	0 (0)	0.13 (0.18)	0 (0)	0 (0)	0.08 (0.12)	0 (0)	0 (0)	0.06 (0.04)	0 (0)
		Movement Delay (s)	0 (0)	31.1 (19.3)	0 (0)	0 (0)	14.5 (13.7)	0 (0)	0 (0)	1.95 (1.8)	0 (0)	0 (0)	0.65 (0.6)	0 (0)
		Movement LOS	-	D (C)	-	-	B (B)	-	-	-	-	-	-	-
		Approach Delay (s)	-	31.1 (19.3)	-	-	14.5 (13.7)	-	-	-	-	-	-	-
		Approach LOS	-	D (C)	-	-	B (B)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
24	CO 14th St (56th St) & Ave 14E (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	25 (25)	0 (0)	25 (25)	12 (17)	80 (97)	0 (0)	0 (0)	74 (39)	8 (4)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.06 (0.06)	0 (0)	0 (0)	0 (0)	0.02 (0.02)	0 (0)	0 (0)	0.02 (0.02)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	9.2 (9.1)	0 (0)	0 (0)	0 (0)	1.15 (1.3)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	-	-	A (A)	-	-	-	-	-	-	-	-
		Approach Delay (s)	-	-	-	-	9.2 (9.1)	-	-	-	-	-	-	-
		Approach LOS	-	-	-	-	A (A)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
25	Ave 15E & S. Frontage Rd (Signal)	Volume (vph)	69 (43)	682 (433)	173 (99)	160 (199)	289 (576)	21 (39)	6 (15)	56 (120)	3 (9)	244 (229)	234 (164)	234 (159)
		v/c Ratio	0.166 (0.427)	0 (0)	0.892 (0.617)	0.594 (0.507)	0.181 (0.369)	0.218 (0.37)	0.166 (0.427)	0 (0)	0 (0)	0.542 (0.6)	0 (0)	0.849 (0.605)
		Movement Delay (s)	22.3 (13.7)	0 (0)	32.3 (14.7)	15.8 (10.5)	7.5 (7.7)	7.5 (7.7)	18.2 (18.6)	0 (0)	0 (0)	18 (17.7)	0 (0)	24 (13.9)
		Movement LOS	C (B)	-	C (B)	B (B)	A (A)	A (A)	B (B)	-	-	B (B)	-	C (B)
		Approach Delay (s)	-	27.4 (14.2)	-	-	10.3 (8.4)	-	-	18.2 (18.6)	-	-	-	21.9 (15.5)
		Approach LOS	-	C (B)	-	-	B (A)	-	-	B (B)	-	-	-	C (B)
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
26	Ave 15E & 40th Street (Signal)	Volume (vph)	207 (94)	544 (301)	0 (0)	0 (0)	237 (486)	215 (206)	256 (274)	0 (0)	106 (202)	0 (0)	0 (0)	0 (0)
		v/c Ratio	0.186 (0.103)	0.199 (0.11)	0 (0)	0 (0)	0.087 (0.178)	0.176 (0.168)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement Delay (s)	0.8 (0.7)	0.5 (0.4)	0 (0)	0 (0)	0.4 (0.5)	0.7 (0.6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	A (A)	A (A)	-	-	A (A)	A (A)	-	-	-	-	-	-
		Approach Delay (s)	-	0.6 (0.5)	-	-	0.5 (0.5)	-	-	-	-	-	-	-
		Approach LOS	-	A (A)	-	-	A (A)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
27	Ave 15E & CO 13th (48th St) (Signal)	Volume (vph)	201 (89)	297 (145)	0 (0)	0 (0)	121 (255)	236 (240)	296 (305)	0 (0)	94 (199)	0 (0)	0 (0)	0 (0)
		v/c Ratio	0.247 (0.107)	0.256 (0.135)	0 (0)	0 (0)	0.095 (0.216)	0.218 (0.239)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement Delay (s)	1.3 (1.1)	0.7 (0.7)	0 (0)	0 (0)	0.6 (0.8)	0.7 (0.9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	A (A)	A (A)	-	-	A (A)	A (A)	-	-	-	-	-	-
		Approach Delay (s)	-	1 (0.9)	-	-	0.7 (0.8)	-	-	-	-	-	-	-
		Approach LOS	-	A (A)	-	-	A (A)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
28	S. Ave 10E & 40th Street (Signal)	Volume (vph)	66 (83)	103 (137)	11 (44)	16 (53)	123 (109)	39 (40)	105 (56)	403 (616)	86 (35)	41 (30)	448 (329)	25 (19)
		v/c Ratio	0.598 (0.752)	0 (0)	0.223 (0.346)	0.21 (0.48)	0 (0)	0.305 (0.286)	0.951 (0.507)	0 (0)	0.606 (0.816)	0 (0)	0 (0)	0.574 (0.436)
		Movement Delay (s)	37.9 (53)	0 (0)	14.6 (14.8)	17.2 (33)	0 (0)	15.2 (14.4)	96.8 (33.5)	0 (0)	10.9 (18.2)	31.9 (31.2)	0 (0)	10.3 (9.4)
		Movement LOS	D (D)	-	B (B)	B (C)	-	B (B)	F (C)	-	B (B)	C (C)	-	B (A)
		Approach Delay (s)	-	23.1 (26.8)	-	-	15.5 (19.2)	-	-	26 (19.4)	-	-	-	12 (11.1)
		Approach LOS	-	C (C)	-	-	B (B)	-	-	C (B)	-	-	-	B (B)
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
29	S. Ave 10E & CO 13th (48th St) (Signal)	Volume (vph)	48 (52)	42 (73)	5 (19)	13 (51)	62 (60)	57 (48)	130 (66)	426 (662)	63 (38)	41 (31)	482 (361)	26 (19)
		v/c Ratio	0.355 (0.362)	0 (0)	0.079 (0.134)	0.137 (0.355)	0 (0)	0.201 (0.164)	0.342 (0.174)	0.323 (0.554)	0.326 (0.555)	0 (0)	0 (0)	0.406 (0.365)
		Movement Delay (s)	26 (24.5)	0 (0)	9.5 (7.4)	12.9 (24.4)	0 (0)	10.1 (7.5)	13.9 (13.4)	8.9 (12.2)	9 (12.2)	9.1 (10.6)	0 (0)	9.4 (10.9)
		Movement LOS	C (C)	-	A (A)	B (C)	-	B (A)	B (B)	A (B)	A (B)	A (B)	-	A (B)
		Approach Delay (s)	-	17.8 (13.6)	-	-	10.6 (12.9)	-	-	10 (12.3)	-	-	-	9.3 (10.8)
		Approach LOS	-	B (B)	-	-	B (B)	-	-	A (B)	-	-	-	A (B)
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
30	CO 14th St (56th St) & S. Ave 10E (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	5 (23)	0 (0)	46 (55)	111 (121)	530 (722)	0 (0)	0 (0)	528 (416)	53 (43)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.03 (0.15)	0 (0)	0.07 (0.08)	0 (0)	0.18 (0.22)	0 (0)	0 (0)	0.19 (0.15)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	26.6 (29.8)	0 (0)	10.7 (10.2)	0 (0)	2.2 (1.9)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	-	-	D (D)	-	B (B)	-	-	-	-	-	-
		Approach Delay (s)	-	-	-	-	12.3 (16)	-	-	-	-	-	-	-
		Approach LOS	-	-	-	-	B (C)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
31	Fortuna Rd & CO 13th (48th St) (Signal)	Volume (vph)	4 (6)	23 (38)	3 (12)	72 (156)	62 (84)	49 (39)	121 (67)	415 (605)	27 (34)	46 (37)	488 (386)	81 (66)
		v/c Ratio	0.042 (0.057)	0 (0)	0.061 (0.077)	0.174 (0.309)	0.231 (0.151)	0.215 (0.163)	0.22 (0.126)	0.228 (0.387)	0.23 (0.388)	0 (0)	0.231 (0.151)	0.36 (0.337)
		Movement Delay (s)	10.5 (8.6)	0 (0)	10.6 (8.7)	11.4 (10.4)	11.2 (8.9)	11.2 (9)	5.4 (6.2)	3.2 (5.1)	3.2 (5.1)	3.5 (4.7)	0 (0)	3.6 (4.9)
		Movement LOS	B (A)	-	B (A)	B (B)	B (A)	B (A)	A (A)	A (A)	A (A)	A (A)	-	A (A)
		Approach Delay (s)	-	10.6 (8.7)	-	-	11.3 (9.7)	-	-	3.7 (5.2)	-	-	-	3.6 (4.8)
		Approach LOS	-	B (A)	-	-	B (A)	-	-	A (A)	-	-	-	A (A)
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
32	CO 14th St (56th St) & Fortuna Rd (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	2 (4)	0 (0)	3 (4)	83 (107)	523 (708)	0 (0)	0 (0)	514 (429)	52 (43)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.01 (0.02)	0 (0)	0 (0.01)	0 (0)	0.16 (0.2)	0 (0)	0 (0)	0.18 (0.15)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	23.1 (25.3)	0 (0)	10.3 (9.9)	0 (0)	1.8 (1.8)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	-	-	C (D)	-	B (A)	-	-	-	-	-	-
		Approach Delay (s)	-	-	-	-	15.4 (17.6)	-	-	-	-	-	-	-
		Approach LOS	-	-	-	-	C (C)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-
33	CO 14th St (56th St) & 12E Ave (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	13 (39)	0 (0)	122 (224)	193 (138)	373 (555)	0 (0)	0 (0)	402 (298)	41 (31)
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.08 (0.19)	0 (0)	0.17 (0.29)	0 (0)	0.18 (0.18)	0 (0)	0 (0)	0.14 (0.11)	0 (0)
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	27.9 (24.3)	0 (0)	10.7 (11.1)	0 (0)	3.15 (2.15)	0 (0)	0 (0)	0 (0)	0 (0)
		Movement LOS	-	-	-	D (C)	-	B (B)	-	-	-	-	-	-
		Approach Delay (s)	-	-	-	-	12.4 (13.1)	-	-	-	-	-	-	-
		Approach LOS	-	-	-	-	B (B)	-	-	-	-	-	-	-
		Intersection Delay (s)	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection LOS	-	-	-	-	-	-	-	-	-	-	-	-

Peak-Hour Intersection Performance Analysis: Buildout Improvements - Alternative 1
 Transportation Needs for the Foothills and Mesa Del Sol Areas, Yuma County, AZ

ID	Intersection Name	Fields	AM (PM)												
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
34	Foothills Blvd & 28th (Stop)	Volume (vph)	0 (0)	58 (149)	38 (115)	258 (242)	131 (95)	0 (0)	0 (0)	0 (0)	0 (0)	113 (41)	0 (0)	364 (378)	
		v/c Ratio	0 (0)	0.06 (0.17)	0 (0)	0.19 (0.21)	0.08 (0.06)	0 (0)	0 (0)	0 (0)	0 (0)	0.42 (0.17)	0 (0)	0.41 (0.5)	
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	8 (8.6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	25.9 (21.6)	0 (0)	11.2 (13.8)	
		Movement LOS	-	-	-	A (A)	-	-	-	-	-	D (C)	-	B (B)	
		Approach Delay (s)	-	-	-	5.3 (6.1)			-	-	-	14.7 (14.6)			
		Approach LOS	-	-	-	-			-	-	-	B (B)			
		Intersection Delay (s)	9.4 (8)												
		Intersection LOS	A (A)												
35	CO 14th St (56th St) & Foothills Blvd (Stop)	Volume (vph)	0 (0)	0 (0)	0 (0)	20 (22)	0 (0)	199 (222)	351 (323)	142 (188)	0 (0)	0 (0)	192 (48)	29 (7)	
		v/c Ratio	0 (0)	0 (0)	0 (0)	0.14 (0.1)	0 (0)	0.24 (0.23)	0 (0)	0.18 (0.16)	0 (0)	0 (0)	0.07 (0.02)	0 (0)	
		Movement Delay (s)	0 (0)	0 (0)	0 (0)	32 (22.6)	0 (0)	10.2 (9.5)	0 (0)	4.05 (3.5)	0 (0)	0 (0)	0 (0)	0 (0)	
		Movement LOS	-	-	-	D (C)	-	B (A)	-	-	-	-	-	-	
		Approach Delay (s)	-	-	-	12.2 (10.7)			-	-	-	-			
		Approach LOS	-	-	-	B (B)			-	-	-	-			
		Intersection Delay (s)	6.3 (6.6)												
		Intersection LOS	A (A)												
36	Ave 14E & 40th Street (Signal)	Volume (vph)	165 (79)	97 (39)	13 (5)	17 (23)	80 (110)	165 (200)	283 (272)	171 (238)	57 (165)	19 (9)	236 (108)	12 (6)	
		v/c Ratio	0.566 (0.277)	0 (0)	0 (0)	0.424 (0.241)	0 (0)	0 (0.509)	0.508 (0.378)	0.154 (0.319)	0.162 (0.26)	0 (0)	0 (0)	0.193 (0.089)	
		Movement Delay (s)	11.2 (8.3)	0 (0)	0 (0)	10.2 (8)	0 (0)	0 (9.3)	10.8 (6.4)	6.6 (5.2)	6.7 (5.1)	6.7 (4.5)	0 (0)	6.8 (4.5)	
		Movement LOS	B (A)	-	-	B (A)	-	(A)	B (A)	A (A)	A (A)	A (A)	-	A (A)	
		Approach Delay (s)	11.2 (8.3)			10.2 (8.8)			8.9 (5.7)			6.7 (4.5)			
		Approach LOS	B (A)			B (A)			A (A)			A (A)			
		Intersection Delay (s)	9.2 (6.7)												
		Intersection LOS	A (A)												
37	Ave 15E & I-8 Westbound Off-Ramp (Signal)	Volume (vph)	481 (378)	303 (209)	0 (0)	0 (0)	149 (245)	52 (50)	0 (0)	0 (0)	0 (0)	100 (151)	0 (0)	20 (24)	
		v/c Ratio	0.63 (0.485)	0.226 (0.166)	0 (0)	0 (0)	0.07 (0.108)	0.073 (0.111)	0 (0)	0 (0)	0 (0)	0 (0)	0.07 (0.108)	0 (0)	
		Movement Delay (s)	2.3 (1.7)	0.4 (0.5)	0 (0)	0 (0)	0.3 (0.4)	0.3 (0.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
		Movement LOS	A (A)	A (A)	-	-	A (A)	A (A)	-	-	-	-	-	-	
		Approach Delay (s)	1.6 (1.3)			0.3 (0.5)			-			-			
		Approach LOS	A (A)			A (A)			-			-			
		Intersection Delay (s)	1.3 (1)												
		Intersection LOS	A (A)												
38	Ave 15E & I-8 Eastbound Off-Ramp (Signal)	Volume (vph)	0 (0)	713 (501)	209 (106)	66 (37)	183 (359)	0 (0)	71 (86)	0 (0)	287 (455)	0 (0)	0 (0)	0 (0)	
		v/c Ratio	0 (0)	0.357 (0.255)	0.357 (0.256)	0.108 (0.148)	0.15 (0.18)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.15 (0.18)	0 (0)	
		Movement Delay (s)	0 (0)	0.7 (0.8)	0.8 (0.8)	1.1 (0.7)	0.5 (0.7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
		Movement LOS	-	A (A)	A (A)	A (A)	A (A)	-	-	-	-	-	-	-	
		Approach Delay (s)	-	0.8 (0.8)			0.7 (0.7)			-			-		
		Approach LOS	-	A (A)			A (A)			-			-		
		Intersection Delay (s)	0.7 (0.8)												
		Intersection LOS	A (A)												
39	Fortuna Rd & 24th St (Signal)	Volume (vph)	0 (0)	272 (212)	145 (188)	180 (625)	307 (601)	0 (0)	0 (0)	0 (0)	0 (0)	135 (161)	0 (0)	838 (191)	
		v/c Ratio	0 (0)	0.188 (0.131)	0.118 (0.137)	0.188 (0.686)	0.111 (0.196)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.111 (0.196)	0 (0)	
		Movement Delay (s)	0 (0)	0.6 (0.3)	0.5 (0.3)	1 (4.4)	0.4 (0.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
		Movement LOS	-	A (A)	A (A)	A (A)	A (A)	-	-	-	-	-	-	-	
		Approach Delay (s)	-	0.6 (0.3)			0.6 (2.4)			-			-		
		Approach LOS	-	A (A)			A (A)			-			-		
		Intersection Delay (s)	0.6 (1.9)												
		Intersection LOS	A (A)												
40	S. Camino Del Sol & 24th St (Stop)	Volume (vph)	128 (54)	0 (0)	14 (9)	0 (0)	0 (0)	0 (0)	0 (0)	256 (569)	74 (146)	87 (41)	571 (259)	0 (0)	
		v/c Ratio	0.5 (0.25)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.11 (0.22)	0 (0)	0 (0)	0.16 (0.08)	0 (0)	
		Movement Delay (s)	27.7 (22.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1.55 (1.7)	0 (0)	
		Movement LOS	D (C)	-	-	-	-	-	-	-	-	-	-	-	
		Approach Delay (s)	27.7 (22.3)												
		Approach LOS	D (C)												
		Intersection Delay (s)	4.2 (1.7)												
		Intersection LOS	A (A)												

Note:
 * Indicates intersection simulated with VISSIM software to accurately measure queues and code complex signal phasing.

Appendix E
Summary of Intersection Improvements

TABLE E.1

RECOMMENDED INTERSECTION IMPROVEMENTS FOR YEAR 2030

Intersection	Improvements
#1 – South Fortuna Road and I-8 North Frontage Road	<ul style="list-style-type: none"> • Model forecasts indicate a new turn lane should be added to the following movements: southbound left, southbound right, and eastbound left
#6 – South Fortuna Road and East 40th Street/East County 12 th Street	<ul style="list-style-type: none"> • Northbound through movement should be modified to add an additional lane based on planned segment improvements • Restriping of existing pavement with a through-left shared lane and a right-turn lane to achieve two southbound through lanes with shared right turn and two new southbound left-turn lanes • Southbound left movement should be given a protected phase
#7 – South Foothills Boulevard and I-8 North Frontage Road	<ul style="list-style-type: none"> • Restriping of existing pavement that consists of two through lanes with shared left and right turns to achieve one through lane with shared left-turn and a dedicated right-turn lane in the eastbound direction • Restriping of existing pavement that consists of two through lanes with shared left and right turns to achieve dedicated left-turn lane and a through lane with shared right turn in the westbound direction • Northbound left movement should be given a protected phase
#9 – South Foothills Boulevard and I-8 Eastbound Off-Ramp	<ul style="list-style-type: none"> • Restriping of existing pavement that consists of a dedicated left-turn lane and a through lane with shared left and right turns and a dedicated right-turn lane to achieve a through lane with shared left-turn lane and two dedicated right-turn lanes in on the eastbound off-ramp • Southbound left movement should be given a protected phase • Note: While standard intersection configurations and traffic control were assumed for this analysis, ADOT considers roundabouts to be a viable alternative, and their applicability could be the subject of subsequent site-specific studies. • (Please refer to discussion of South Foothills Boulevard Traffic Signal Phasing at I-8 Eastbound Off-Ramp and I-8 South Frontage Road in Section 4.2.2 for additional details)
#10 – South Foothills Boulevard and I-8 South Frontage Road	<ul style="list-style-type: none"> • Restriping of existing pavement that consists of two through lanes with shared left- and right-turn movements to achieve a through lane with shared left turn and a dedicated right-turn lane in the westbound direction • Eastbound approach would need a new dedicated left-turn lane along with restriping of the existing pavement to achieve a dedicated left-turn lane and a through lane with shared right-turn movement • Southbound left movement should be given a protected phase • (Please refer to discussion of South Foothills Boulevard Traffic Signal Phasing at I-8 Eastbound Off-Ramp and I-8 South Frontage Road in Section 4.2.2 for additional details)
#12 – South Foothills Boulevard and East 40 th Street/East County 12 th Street	<ul style="list-style-type: none"> • Eastbound through movement should be modified to add an additional lane based on planned segment improvements • A turn lane should be added to the westbound right movement • Eastbound left movement should be given a protected phase

TABLE E.1

RECOMMENDED INTERSECTION IMPROVEMENTS FOR YEAR 2030

Intersection	Improvements
#13 – South Avenue 10E and I-8 South Frontage Road	<ul style="list-style-type: none"> • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#14 – South Fortuna Road and East 28 th Street/East County 10½ Street	<ul style="list-style-type: none"> • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#20 – South Avenue 12E and East 40 th Street/East County 12 th Street	<ul style="list-style-type: none"> • East 40th Street/East County 12th Street should be upgraded to four-lane road from a two-lane road based on planned segment improvements with two through lanes in eastbound and westbound approaches at the intersection • South Avenue 12E should be extended to the south of the intersection with one through lane in each direction • A though lane with shared left- and right-turn movements should be considered for the northbound approach • Southbound approach of South Avenue 12E should be restriped to achieve one through lane with shared left-turn movement and a dedicated southbound right-turn lane • A new turn lane should be added to the eastbound left movement • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#21 – South Avenue 12E and East 48 th Street/East County 13 th Street	<ul style="list-style-type: none"> • South Avenue 12E should be extended to East 48th Street/East County 13th Street with one through lane in each direction • East 48th Street/East County 13th Street should be extended as a two-lane road to South Fortuna Road, providing one through lane in each direction east and west of South Avenue 12E • All three approaches should have the same lane configuration consisting of one through lane with shared left- and right-turn movements
#22 – South Foothills Boulevard and East 48 th Street/East County 13 th Street	<ul style="list-style-type: none"> • Additional through lane should be added to the northbound and southbound approaches based on the planned segment improvements • Southbound approach should be restriped to achieve two through lanes with shared right-turn movement • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#24 – South Avenue 14E and East 56 th Street/East County 14 th Street	<ul style="list-style-type: none"> • Additional through lane should be added to eastbound and westbound approaches based on the planned segment improvements
#25 – South Avenue 15E and I-8 South Frontage Road	<ul style="list-style-type: none"> • South Avenue 15E should be upgraded to a four-lane road, based on planned segment improvements • A new dedicated turn lane should be added to the northbound right movement • The existing pavement on eastbound approach should be restriped to achieve one through lane with shared right-turn movement • I-8 South Frontage Road should be extended to the east side of the intersection with one through lane in each direction • A dedicated left-turn lane should be added to the Westbound approach • Westbound left should be given a protected phase • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase

TABLE E.1

RECOMMENDED INTERSECTION IMPROVEMENTS FOR YEAR 2030

Intersection	Improvements
#26 – South Avenue 15E and East 40 th Street/East County 12 th Street	<ul style="list-style-type: none">• South Avenue 15E should be upgraded to a four-lane road from a two-lane road based on planned segment improvements• A turn lane should be added to the eastbound left-turn movement• Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#27 – South Avenue 15E and East 48 th Street/East County 13 th Street	<ul style="list-style-type: none">• South Avenue 15E should be upgraded to a four-lane road from a two-lane road based on planned segment improvements• Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase

Prepared by Wilson & Company, December, 2011.

TABLE E.2

RECOMMENDED INTERSECTION IMPROVEMENTS FOR BUILDOUT CONDITIONS – ALTERNATIVE 1

Intersection	Improvements
#13 – South Avenue 10E and South Frontage Road	<ul style="list-style-type: none"> • South Avenue 10E should be upgraded to a four-lane road from a two-lane road based on planned segment improvements • Pavement should be restriped in the northbound direction to achieve a dedicated left-turn lane and a new dedicated right-turn lane
#20 – South Avenue 12E and East 40 th Street/East County 12 th Street	<ul style="list-style-type: none"> • South Avenue 12E should be upgraded to a four-lane road north and south of East 40th Street/East County 12th Street based on planned segment improvements • Additional through lane should be added to the northbound and southbound approaches along with a new dedicated lane for the northbound left movement
#21 – South Avenue 12E and East 48 th Street/East County 13 th Street	<ul style="list-style-type: none"> • South Avenue 12E north and south of its intersection with East 48th Street/East County 13th Street should be upgraded to a four-lane road based on planned segment improvements • A new left-turn lane should be added to the northbound approach along with an additional through lane • Additional through lane should be added to the southbound approach • East 48th Street/East County 13th Street should be upgraded to a four-lane road from a two-lane road east and west of South Avenue 12E based on planned segment improvements • A dedicated left-turn lane should be added to the eastbound left movement along with an additional through lane • Additional through lane should be added to the westbound approach • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#22 – South Foothills Boulevard and East 48 th Street/East County 13 th Street	<ul style="list-style-type: none"> • East 48th Street/East County 13th Street should be upgraded to a four-lane road from a two-lane road east and west of South Foothills Boulevard based on planned segment improvements • Additional through lane would be added to the eastbound and westbound approaches • Eastbound approach would need a dedicated left-turn lane.
#23 – South Avenue 14E and East 48 th Street/East County 13 th Street	<ul style="list-style-type: none"> • East 48th Street/East County 13th Street should be upgraded to a four-lane road from a two-lane road east and west of South Avenue 14E based on planned segment improvements • A through lane should be added to the eastbound and westbound approaches
#25 – South Avenue 15E and I-8 South Frontage Road	<ul style="list-style-type: none"> • South Avenue 15 E should be extended north of I-8 • Northbound approach at the I-8 South Frontage Rd should be restriped to achieve two through lanes with shared left- and right-turn movements • Southbound approach at the I-8 South Frontage Rd would need a new dedicated left-turn lane and two new through lanes with shared right-turn movement • Southbound and westbound left-turn movements should be given a protected phase
#27 – South Avenue 15E and East 48 th Street/East County 13 th Street	<ul style="list-style-type: none"> • A left-turn lane should be added to the eastbound approach

TABLE E.2

RECOMMENDED INTERSECTION IMPROVEMENTS FOR BUILDOUT CONDITIONS – ALTERNATIVE 1

Intersection	Improvements
#28 – South Avenue 10E and East 40 th Street/East County 12 th Street	<ul style="list-style-type: none"> • South Avenue 10E should be extended south of East 40th Street/East County 12th Street as a four-lane road based on planned segment improvements • Northbound approach should consist of two new through lanes with shared left- and right-turn movements • A through lane should be added to the southbound approach • East 40th Street/East County 12th Street should be upgraded to a four-lane road from a two-lane road east and west of South Avenue 10E • Eastbound approach should consist of two new through lanes with shared left- and right-turn movements • A through lane should be added to the westbound approach • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#29 – South Avenue 10E and East 48 th Street/East County 13 th Street	<ul style="list-style-type: none"> • South Avenue 10E should be extended south of East 48th Street/East County 13th Street as a four-lane road based on planned segment improvements • Northbound and southbound approaches should consist of two through lanes with shared left- and right-turn movements • East 48th Street/East County 13th Street should be upgraded to a four-lane road from a two-lane road east and west of Ave 10E • Eastbound approach should consist of two through lanes with shared right-turn movement and a new dedicated left-turn lane • Westbound approach should consist of two through lanes with shared left- and right-turn movements • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#30 – South Avenue 10E and East 56 th Street/East County 14 th Street	<ul style="list-style-type: none"> • South Avenue 10E should be extended south of East 48th Street/East County 13th Street to East 56th Street/East County 14th Street as a four-lane road based on planned segment improvements • Southbound approach should include new dedicated left- and right-turn lanes • East 56th Street/East County 14th Street should be constructed as a four-lane road east and west of South Avenue 10E • Eastbound approach should consist of two through lanes with shared left-turn movements • Westbound approach should consist of two through lanes with shared right-turn movements

TABLE E.2

RECOMMENDED INTERSECTION IMPROVEMENTS FOR BUILDOUT CONDITIONS – ALTERNATIVE 1

Intersection	Improvements
#31 – South Fortuna Road and East 48 th Street/East County 13 th Street	<ul style="list-style-type: none"> • South Fortuna Road should be extended south of East 48th Street/East County 13th Street as a four-lane road • Northbound approach should consist of two new through lanes with shared right- and left-turn movements • Southbound approach should consist of a new dedicated left-turn lane and two new through lanes with shared right-turn movement • East 48th Street/East County 13th Street east of South Fortuna Road should be upgraded from a two-lane road to a four-lane road • East 48th Street/East County 13th Street should be extended to the west of South Fortuna Road as a four-lane road • Eastbound approach should consist of a new dedicated left-turn lane and two new through lanes with shared right-turn movements • Westbound approach should consist of two new through lanes with shared right- and left-turn movements • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#32 – South Fortuna Road and East 56 th Street/East County 14 th Street	<ul style="list-style-type: none"> • South Fortuna Road should be constructed as a four-lane road north of its intersection with East 56th Street/East County 14th Street • Southbound approach should consist of a new dedicated left- and right-turn lanes • East 56th Street/East County 14th Street should be constructed as a four-lane road east and west of South Fortuna Road • Eastbound approach should consist of two new through lanes with shared left-turn movements • Westbound approach should consist of two new through lanes with shared right-turn movements
#33 – South Avenue 12E and East 56 th Street/East County 14 th Street	<ul style="list-style-type: none"> • South Avenue 12E should be extended as a four-lane road south of East 48th Street/East County 13th Street to East 56th Street/East County 14th Street • Southbound approach should consist of new dedicated left- and right-turn lanes • East 56th Street/East County 14th Street should be constructed as a four-lane road east and west of South Avenue 12E • Eastbound approach should consist of two new through lanes with shared left-turn movements • Westbound approach should consist of two new through lanes with shared right-turn movements
#34 – South Foothills Boulevard and East 28 th Street/East County 10½ Street	<ul style="list-style-type: none"> • South Foothills Boulevard should be constructed as a two-lane road south of East 28th Street/East County 10½ Street and a four-lane road north of East 28th Street/East County 10½ Street • Northbound approach should consist of a new through lane with shared right-turn movement • Southbound approach should consist of a new dedicated left-turn lane and a through lane • East 28th Street/East County 10½ Street should be constructed as a four-lane road east of South Foothills Boulevard • Westbound approach should consist of a new dedicated left- and right-turn lanes

TABLE E.2

RECOMMENDED INTERSECTION IMPROVEMENTS FOR BUILDOUT CONDITIONS – ALTERNATIVE 1

Intersection	Improvements
<p>#35 – South Foothills Boulevard and East 56th Street/East County 14th Street</p>	<ul style="list-style-type: none"> • South Foothills Boulevard should be extended as a four-lane road from East 48th Street/East County 13th Street to East 56th Street/East County 14th Street • Southbound approach should consist of a new dedicated left- and right-turn lanes • East 56th Street/East County 14th Street should be upgraded to a four-lane road from a two-lane road east of South Foothills Boulevard • East 56th Street/East County 14th Street should be constructed as a four-lane road west of South Foothills Boulevard • Eastbound approach should consist of two new through lanes with shared left-turn movements • Westbound approach should consist of two new through lanes with shared right-turn movements
<p>#36 – South Avenue 14E and East 40th Street/East County 12th Street</p>	<ul style="list-style-type: none"> • South Avenue 14 E should be constructed north and south of East 40th Street/East County 12th Street as a four-lane road • Northbound and southbound approaches should consist of a new through lanes with shared left- and right-turn movements • Eastbound approach of East 40th Street/East County 12th Street should consist of a new dedicated left-turn lane and two through lanes with shared right-turn movements • Westbound approach should consist of two through lanes with shared left- and right-turn movements • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
<p>#37 – South Avenue 15E and I-8 Westbound Off-Ramp</p>	<ul style="list-style-type: none"> • South Avenue 15E should be extended as a four-lane road north of I-8 • Northbound approach at the I-8 Westbound Off-Ramp should consist of two new through lanes with shared left-turn movements • Southbound approach should consist of two new through lanes with shared right-turn movements • Westbound approach should consist of a new dedicated left- and right-turn lanes • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase • • Note: While standard intersection configurations and traffic control were assumed for this analysis, ADOT considers roundabouts to be a viable alternative, and their applicability could be the subject of subsequent site-specific studies.
<p>#38 – South Avenue 15E and I-8 Eastbound Off-Ramp</p>	<ul style="list-style-type: none"> • South Avenue 15E should be extended as a four-lane road north of I-8 • Northbound approach at the I-8 Eastbound Off-Ramp should consist of two new through lanes with shared right-turn movements • Southbound approach should consist of two new through lanes with shared left-turn movements • Eastbound approach should consist of new dedicated left- and right-turn lanes • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase • • Note: While standard intersection configurations and traffic control were assumed for this analysis, ADOT considers roundabouts to be a viable alternative, and their applicability could be the subject of subsequent site-specific studies.

TABLE E.2

RECOMMENDED INTERSECTION IMPROVEMENTS FOR BUILDOUT CONDITIONS – ALTERNATIVE 1

Intersection	Improvements
#39 – South Fortuna Road and East 24 th Street/East County 10 th Street	<ul style="list-style-type: none"> • Northbound approach should be restriped to achieve two through lanes with shared right-turn movements • A through lane should be added to the southbound approach • East 24th Street/East County 10th Street should be constructed as a four-lane road east of South Fortuna Road to South Camino Del Sol • Eastbound approach should be striped to provide a left-turn-only lane and two new right-turn-only lanes • Model forecasts indicate this intersection will need a traffic signal; ADOT should consider conducting a warrant analysis when traffic levels increase
#40 - East 24 th Street/East County 10 th Street and South Camino Del Sol	<ul style="list-style-type: none"> • South Camino Del Sol should be extended as a two-lane road north from 28th Street to East 24th Street/East County 10th Street • Northbound approach at this 'T' intersection should consist of a new left-right shared lane • East 24th Street/East County 10th Street should be constructed as a four-lane road east and west of South Camino Del Sol • Eastbound approach should consist of two new through lanes with shared right-turn movements • Westbound approach should consist of two new through lanes with shared left-turn movements

Prepared by Wilson & Company, December, 2011.

Appendix F

Detailed Planning Level Cost Calculations

**Planning Level Cost Estimates
Recommended Mid-Term (10-Year) Improvements**

Improvement	Name	Intersection # or Location	Quantity	Unit Cost (Millions)	Total Cost (Millions)
Widening 2-4 Lanes (Quantity in Miles of Length)					
	40th Street	Fortuna Road to Avenue 12E	1	\$4.50	\$4.50
	40th Street	Avenue 13E to Fortuna Wash	0.4	\$4.50	\$1.80
Sub-Total Cost			1.4	\$4.50	\$6.30
Widening 2-3 Lanes (Quantity in Miles of Length)					
	North and South Frontage Roads	Avenue 10E to Avenue 15E	7.25	\$3.00	\$21.75
Sub-Total Cost			7.25	\$3.00	\$21.75
New 4 lane arterial (Quantity in Miles of Length)					
	40th Street	Fortuna Wash to Avenue 15	1.6	\$5.00	\$8.00
Sub-Total Cost			1.6	\$5.00	\$8.00
New Bridge over Wash (Quantity in 100 Feet of Length)					
	40th Street *	Over Fortuna Wash	6	\$1.00	\$6.00
Sub-Total Cost			6	\$1.00	\$6.00
Total Cost					\$42.05

* Length of the bridge is assumed to be 600 Feet.

**Planning Level Cost Estimates
Recommended Year 2030 Improvements**

Improvement	Name	Intersection # or Location	Quantity	Unit Cost (Millions)	Total Cost (Millions)
New Signals (Quantity in Number of Signals)					
	South Frontage Road and Avenue 10E	13	1	\$0.25	\$0.25
	28th Street and Fortuna Road	14	1	\$0.25	\$0.25
	40th Street and Avenue 12E	20	1	\$0.25	\$0.25
	Co 13th Street and Foothills Boulevard	22	1	\$0.25	\$0.25
	S Frontage Road and Avenue 15 E	25	1	\$0.25	\$0.25
	40th Street and Avenue 15 E	26	1	\$0.25	\$0.25
	Co 13th Street and Avenue 15 E	27	1	\$0.25	\$0.25
Sub-Total Cost			7	\$0.25	\$1.75
Turn lanes (Quantity in Number of Turn Lanes)					
	North Frontage Road and Fortuna Road	1	3	\$0.35	\$1.05
	40th Street and Fortuna Road	6	1	\$0.35	\$0.35
	40th Street and Foothills Boulevard	12	1	\$0.35	\$0.35
	South Frontage Rd and Avenue 12 E	19	1	\$0.35	\$0.35
	40th Street and Avenue 12 E	20	1	\$0.35	\$0.35
	Co 13th Street and Foothills Boulevard	22	1	\$0.35	\$0.35
	S Frontage Road and Avenue 15 E	25	1	\$0.35	\$0.35
	40th Street and Avenue 15 E	26	2	\$0.35	\$0.70
Sub-Total Cost			11	\$0.35	\$3.85
Widening 2-4 Lanes (Quantity in Miles of Length)					
	Avenue 12 E	North of 40th Street	0.5	\$4.50	\$2.25
	Foothills Boulevard	50th Street to 56th Street	0.75	\$4.50	\$3.38
	Avenue 15 E	South Frontage Road to to 56th Street	2.3	\$4.50	\$10.35
	56th Street	Foothills Boulevard to Avenue 15 E	2	\$4.50	\$9.00
Sub-Total Cost			5.55	\$4.50	\$24.98
Widening 3-4 Lanes (Quantity in Miles of Length)					
	Fortuna Road	28th Street to 24th Street	0.4	\$3.00	\$1.20
Sub-Total Cost			0.4	\$3.00	\$1.20
New 2 lane Collector (Quantity in Miles of Length)					
	Avenue 10 E	South of South Frontage Rd	0.25	\$2.00	\$0.50
	Avenue 12 E	South of 40th Street	1	\$2.00	\$2.00
	Foothills Boulevard	North of 28th Street	0.25	\$2.00	\$0.50
	24th Street	West of Camino Del Sol	0.25	\$2.00	\$0.50
	48th Street	Fortuna Road to Foothills Boulevard	1.5	\$2.00	\$3.00
Sub-Total Cost			3.25	\$2.00	\$6.50
New 4 lane arterial (Quantity in Miles of Length)					
	Fortuna Road	40th Street to 48th Street	1	\$5.00	\$5.00
Sub-Total Cost			1	\$5.00	\$5.00
New Shared use path (Quantity in Miles of Length)					
		Along Fortuna Wash	4.5	\$0.70	\$3.15
Sub-Total Cost			4.5	\$0.70	\$3.15
Total Cost					\$46.43

* Length of the bridge is assumed to be 400 Feet.

**Planning Level Cost Estimates
Recommended Buildout Improvements**

Improvement	Name	Intersection # or Location	Quantity	Unit Cost (Millions)	Total Cost (Millions)
New Signals (Quantity in Number of Signals)					
	Co 13th Street and Avenue 12 E	21	1	\$0.25	\$0.25
	40th Street and Avenue 15 E	28	1	\$0.25	\$0.25
	Co 13th Street and S Avenue 10 E	29	1	\$0.25	\$0.25
	Co 13th Street and Fortuna Road	31	1	\$0.25	\$0.25
	40th Street and Avenue 14 E	36	1	\$0.25	\$0.25
	I-8 WB off ramp and Avenue 15 E	37	1	\$0.25	\$0.25
	I-8 EB off ramp and Avenue 15 E	38	1	\$0.25	\$0.25
	34th Street and Fortuna Road	39	1	\$0.25	\$0.25
Sub-Total Cost			8	\$0.25	\$2.00
Turn lanes (Quantity in Number of Turn Lanes)					
	North Frontage Road and Foothills Boulevard	7	1	\$0.35	\$0.35
	South Frontage Road and Foothills Boulevard	10	3	\$0.35	\$1.05
	40th Street and 12E Avenue	20	1	\$0.35	\$0.35
	Co 13th Street and 12E Avenue	21	2	\$0.35	\$0.70
	Co 13th Street and Foothills Boulevard	22	1	\$0.35	\$0.35
	South Frontage Road and Avenue 15E	25	1	\$0.35	\$0.35
	Co 13th Street and Avenue 10E	29	1	\$0.35	\$0.35
	Co 13th Street and Fortuna Road	31	2	\$0.35	\$0.70
	40th Street and Avenue 14E	36	1	\$0.35	\$0.35
	24th Street and Fortuna Road	39	1	\$0.35	\$0.35
Sub-Total Cost			14	\$0.35	\$4.90
Widening 2-4 Lanes (Quantity in Miles of Length)					
	Avenue 10 E	Frontage Road to 40th Street	1	\$4.50	\$4.50
	Avenue 12 E	40th Street to 48th Street	1	\$4.50	\$4.50
	Foothills Boulevard	South of 48th Street	0.25	\$4.50	\$1.13
	24th Street	Fortuna Road to Camino Del Sol	1	\$4.50	\$4.50
	28th Street	Foothills Boulevard to Avenue 15 E	0.75	\$4.50	\$3.38
	40th Street	Avenue 10 E to Fortuna Road	1	\$4.50	\$4.50
	48th Street	Fortuna Road to Avenue 15 E	3.75	\$4.50	\$16.88
Sub-Total Cost			8.75	\$4.50	\$39.38
New 2 lane Collector (Quantity in Miles of Length)					
	Avenue 14 E	40th Street to Fortuna Wash	1.1	\$2.00	\$2.20
Sub-Total Cost			1.1	\$2.00	\$2.20
New 4 lane arterial (Quantity in Miles of Length)					
	Avenue 10 E	40th Street to 56th Street	2	\$5.00	\$10.00
	Fortuna Road	48th Street to 56th Street	1	\$5.00	\$5.00
	Avenue 12 E	48th Street to 56th Street	1	\$5.00	\$5.00
	Avenue 15 E	North of I-8	1.4	\$5.00	\$7.00
	24th Street	Camino Del Sol to 28th Street	1.25	\$5.00	\$6.25
	28th Street	Foothills Boulevard to Avenue 15E	1.25	\$5.00	\$6.25
	48th Street	Avenue 10 E to Fortuna Road	1	\$5.00	\$5.00
	56th Street	Avenue 10 E to Foothills Boulevard	3	\$5.00	\$15.00
Sub-Total Cost			11.9	\$5.00	\$59.50
New Bridge over Wash (Quantity in 100 Feet of Length)					
	Avenue 14E (1 Bridge Location) *	Over Fortuna Wash	4	\$1.00	\$4.00
	28 Street (3 Bridge Locations) *	West of Avenue 15E	12	\$1.00	\$12.00
	Avenue 15E (3 Bridge Locations) *	North of I-8	12	\$1.00	\$12.00
Sub-Total Cost			28	\$1.00	\$28.00
New Interchange					
	I-8 and Avenue 15 E		1	\$25.00	\$25.00
Sub-Total Cost			1	\$25.00	\$25.00
Total Cost					\$160.98

* Length of the bridge is assumed to be 400 Feet.

Appendix G
Public Involvement Summary Report

Transportation Needs for the Yuma Foothills and Mesa Del Sol Areas PARA Study

Public Involvement Summary Report

Prepared for:



Yuma County &
Arizona Department of Transportation,
Multimodal Planning Division

Prepared by:

Godec, Randall & Associates, Inc.

March 2012

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Executive Summary

This report summarizes public involvement efforts and community response during the *Yuma Foothills and Mesa Del Sol Areas Transportation Needs Study*, a Planning Assistance for Rural Areas (PARA) project conducted by the Arizona Department of Transportation (ADOT) and Yuma County, Arizona from April 2011 to March 2012.

The Foothills and Mesa Del Sol Areas Transportation Needs Study was conducted through a cooperative planning process involving agency staff, elected officials, local businesses, and the public. Public involvement was a key component in the development of the study, to assist the project team in evaluating existing area transportation conditions and the future improvement scenarios developed as part of this project. Throughout the study, information was presented to and solicited from stakeholders through individual interviews, advisory committee meetings, project web site, community survey, media outreach, and a public forum.

The public involvement program for this study elicited suggestions and observations about the Foothills/Mesa Del Sol area transportation systems that included strong messages for improving local streets, the Interstate 8 freeway interchange approaches and frontage roads, and bicycle and pedestrian accommodations. Major themes included public safety, traffic congestion, traffic controls, and multimodal access. The study recommendations include excellent alignment with the public's comments and desires, and most people urged implementation of these measures as soon as possible.

1.0 Planning & Research

1.1 Public Involvement Plan

ADOT selected Godec, Randall & Associates, Inc. (GRA) to conduct the public involvement program for the Foothills and Mesa Del Sol Areas Transportation Needs Study. An initial public involvement plan was prepared for the project on April 11, and was refined through discussions with the study team and the planning consultant, Wilson & Company. A modified public involvement program was developed at a meeting on June 10, and the plan continued to be updated as the study progressed. The key elements of the plan, along with implementation dates, are shown on page 1 of the Appendix to this report.

1.2 Project Web Site

The Arizona Department of Transportation maintains a comprehensive Web site at <http://www.azdot.gov> on which it posts information about most current projects. A

Web page on this site was developed for the Foothills and Mesa Del Sol study, <http://www.azdot.gov/foothills>, where all study-related materials were posted. The Web page was also used to announce public participation opportunities and to link to the community survey and public open house comment form. For this project, the study team felt that Web-based communication was important because many seasonal area residents live outside the study area for a portion of the year. The Web page address was advertised in all public communication materials so that remote stakeholders could access study information and submit ideas and comments.

1.3 Stakeholder Research & Database Development

ADOT Communications and Community Partnerships Division in Yuma maintains electronic databases of people interested in transportation issues throughout the region. To supplement these, the study team researched key stakeholders, businesses, and homeowner associations for the Foothills and Mesa Del Sol areas, and Yuma County provided a list of mobile home and recreational vehicle parks. These lists were used to distribute study-related notices and publicity, and were updated as information became available.

At the beginning of the Foothills and Mesa Del Sol study, the planning consultants conducted interviews with several key stakeholders to learn more about the area, obtain data, discuss existing transportation issues, and define objectives for the study. Those interviewed included elected officials, agency staff, emergency responders, and major regional employers.

2.0 Outreach & Community Survey

2.1 Survey Design and Distribution

As input to the Existing and Future Conditions analysis, public opinions were sought about the current transportation problems in the area and priorities for improvements. A survey questionnaire was prepared and administered from September 1 to October 14, 2011. Representatives from the project team drafted questions for the survey questionnaire. The multimodal questionnaire was open-ended, asking respondents to discuss area transportation problems and to prioritize their perceptive needs for the area from a list of potential transportation improvements.

The one-page survey was accompanied by a fact sheet (see Appendix page 2 and page 3). In addition to being posted on the project Web site, boxes containing the surveys were delivered to strategic locations in the study area. Respondents were asked to complete the questionnaire and return it to the box provided. Based on suggestions from the study team and local staff, eight kiosk locations were chosen as optimal.

Survey kits were placed at the following retail shops, community gathering places, and RV parks:

Mesa del Sol Clubhouse
Sundance RV Park
Foothills Walmart
St. John Neumann Church
Westwind RV Park
Hank's Market
Foothills Library
Fry's Marketplace

Response for the online survey was collected from September 1 through Oct. 14, 2011. Survey boxes were placed at the study area locations during the same period, and were collected on October 14.

2.2 Public Notification

ADOT issued a media release to the local media contacts and e-mail notification via the .GOV email delivery system on August 29, 2011 (see Appendix page 4). Gabriella Kemp, ADOT Yuma Senior Community Relations Officer, sent a personalized reminder email solicitation on Sept. 15 (see Appendix page 5). Ms. Kemp conducted television interviews for Yuma City Outlook (Ch. 77) on Sept. 19, both in English and in Spanish, which aired almost continuously on their channel from Sept. 26 through Sept. 30. The study's Technical Advisory Committee sent the announcement internally to their organizations and externally to stakeholder lists, where appropriate. In addition, the project team sent a "last chance" email reminder on October 12 to a list of local contacts, stakeholders, RV parks, businesses, hospitals, schools, and special interest groups (Appendix page 6).

2.3 Results

A total of 77 individuals provided their opinions and feedback regarding transportation issues in the study area. Of these, 30 responses were collected at the survey kiosks and the remainder was provided through the Web site.

Survey respondents identified the following as the main transportation problems in the area. They are listed in order based on the number of times the problem was mentioned.

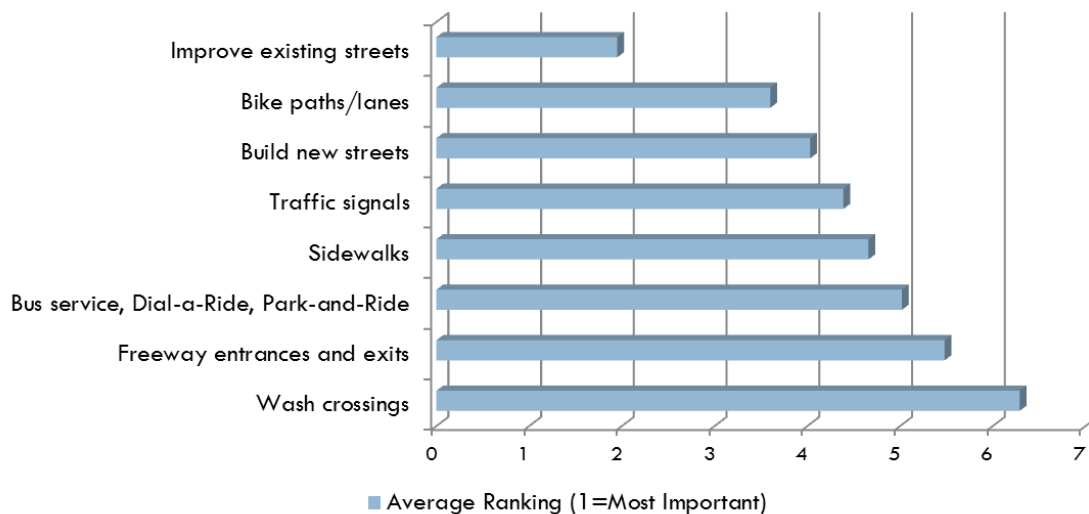
1. Dangerous, poor road conditions
2. Congestion on I-8 frontage roads
3. Lack of bicycle and pedestrian facilities

4. Not enough arterial streets
5. Lack of and poor timing of traffic signals
6. Lack of public transportation
7. Poor road design
8. Traffic congestion, especially during winter visitor season
9. Lack of traffic enforcement

Specific locations of highest concern were the north and south I-8 frontage roads as well as the Foothills Boulevard and Fortuna Road interchanges, due to poor signage and traffic control, congestion, high volume of heavy trucks, structural deterioration like potholes, and lack of left-turn lanes. The need to extend 40th Street to the west to connect into Yuma was mentioned many times. There was a surprisingly high level of concern about the lack of safe pedestrian and bicycle facilities.

When asked about suggested transportation improvements, respondents clearly felt that improving existing streets should be a priority and, based on previous comments, it can be assumed improvements to the frontage roads are the most important to the residents. Other important improvements are adding bicycle lanes and building new arterial streets to provide better east-west access. Additional public transit services were also suggested by some. The table below shows a ranking of suggestions, with #1 representing the highest priority.

Important Transportation Improvements



A comprehensive assessment of survey results was submitted by Godec, Randall & Associates, Inc. on December 6, 2011, and is available as a separate report.

3.0 Public Open House

3.1 Design & Logistics

A number of options were discussed for disseminating the study recommendations and results to area stakeholders and residents. The decision of the TAC was to host a community open house, with advance publicity announcing it.

ADOT and Yuma County invited the public to review the recommendations for the Foothills and Mesa Del Sol Areas Transportation Needs Study at a public open house from 5:00 until 6:30 p.m. on Wednesday, February 8, 2012 at the Yuma Foothills Branch Library, 13226 South Frontage Road, Yuma, AZ 85367. The study team made a presentation at 5:30, followed by questions and answers about the study. Twenty-one people attended, of whom 14 were local residents and seven were project staff. The sign-in sheets from the open house are included as pages 7-12 of the Appendix to this report. People indicated that they had learned about the open house through their homeowner associations, flyers sent to residential parks, direct mailings, and email notices.

A comment form was handed out to capture ideas and suggestions of attendees (Appendix page 13). The comment form was also subsequently posted to the project Web site, along with open house presentation materials, to allow people who were not able to attend to review and comment on the study recommendations. The online comment form was made available until February 17.

3.2 Public Notification

In order to advertise the open house to the public and area stakeholders, the project team reached out to the community via the following methods:

- Meeting invitation letters sent to 51 regional stakeholders on January 25, 2012 (Appendix page 14), including a flyer for posting in public locations (Appendix page 15)
- ADOT electronic notice to .GOV delivery on January 25 (Appendix page 16)
- Newspaper advertisement in *Yuma Sun* on Sunday, February 5 (Appendix page 17)
- ADOT Web page advertisement on February 6
- ADOT Web page posting of the study recommendations presented at the open house, along with an electronic comment form, on February 9

3.3 Results

Public comments and suggestions offered at the open house were very consistent with the results of the community survey conducted earlier. The recommendations developed by the Foothills and Mesa Del Sol Transportation Needs Study team had considered the survey results, and addressed most of the public's concerns at some stage in the long-range plan. Everyone at the meeting suggested that they would like to see the recommended improvements implemented much earlier than the practical funding situation might allow.

Specific comments offered are summarized below.

- Factors that should be considered in thinking about transportation improvements:
 - The average age of people in the study area is between 50 and 60 years.
 - They tend to have large vehicles (e.g. RVs)
 - The population in the winter increases greatly
 - There are many semi-trucks in the area, particularly around the Interstate 8/Fortuna Boulevard interchange, and on the frontage roads.
- The study should acknowledge that the traffic and congestion caused by semi-trucks around the I-8/Fortuna exit (near Barney's truck stop) is especially bad – not like other places. Trucks don't stop safely before coming out onto the road.
 - The County and ADOT said they would consult with law enforcement to keep an eye on this situation in the short term, and evaluate design options that would address this in the study.
- Also regarding Fortuna, the design of the area around the interchange is confusing. People who going northbound in the left lane are routed into the freeway entrance, and a similar situation occurs going southbound. There are directional signs painted on the roadway, but people can't see them when there is traffic.
 - ADOT and Yuma County made a note to look into improved signage at this location.
- What do developers contribute to road improvements? They should do so, rather than taxpayers having to pay for improvements needed by increased population and traffic. It was suggested that there should be impact fees. One person referred to the Foothills area as a "habitat", outside of the major taxation and capital improvement jurisdiction of Yuma – who's responsible for taking care of us?

- The county explained the development process. Yuma County does not typically charge impact fees, but there could be better opportunities for this as larger parcels develop over time.
- It was suggested that highway agencies should conserve funds by building “no frills” projects. People’s property taxes are going up, and many people are on fixed incomes, so everyone needs to save money.
- Several people suggested improving bicycle access and safety by designing roads to accommodate bikes. One specific suggestion was to construct a bike /pedestrian path along the north frontage road near Mesa Del Sol (off the road between the frontage road and the freeway fence).
- Improvements to the south frontage road should be a priority. Specific suggestions included:
 - Needs resurfacing between Fortuna and Foothills Boulevard.
 - Sidewalks should be installed, and they should be coordinated with access to bus stops.
 - Several people felt that a dedicated left-turn lane and more traffic signals should be installed between Payson and the Westwind RV Park.
 - More curbs were also suggested for traffic and pedestrian safety. Yuma County noted that these are already programmed in the County’s 2-year improvement plan.
- Comments about public transit service included:
 - Bus service should be provided beyond the frontage roads.
 - Dial-a-Ride for seniors should be provided.
 - A better implementation plan is needed for transit

No additional comments were received from the comment form posted on the project Website during the comment period.

Appendix

Godec, Randall & Associates, Inc.

Public Involvement Plan Summary

Updated September 21, 2011

Foothills and Mesa del Sol Transportation Needs Study – ADOT Project MPD 14-11 (D)

Phase I – Existing Conditions		Phase II – Alternatives & Recommendations	
<i>Task</i>	<i>Schedule</i>	<i>Task</i>	<i>Schedule</i>
TAC & Stakeholder Activities		Public Open House Activities	
Prepare Public Involvement Work Plan	Apr 11	Arrange logistics	Dec 15 - 30
Attend first TAC meeting to discuss outreach plan	Apr 27	Publish meeting announcement on project web site	Jan 20
Participate in TAC meeting #3 via phone, prepare materials	Sep 14	Mail open house invitations & flyers to key stakeholders	Jan 25
Participate in TAC meeting #4 via phone, prepare materials	Dec 14	Distribute public workshop invitations to e-mail database	Jan 25
Compile local stakeholder list & augment ADOT stakeholder list	ongoing	Distribute media release	Jan 26
Outreach & Community Survey Activities		Publish meeting notice advertisement in Yuma Sun	Feb 5
Support set-up of project web page on ADOT website	May	Prepare meeting materials	Jan 1 - 27
Design Community Survey & review Fact Sheet	Jul 10 – Aug 24	Facilitate & document meeting	Feb 8
Post Survey link to web site	Aug 29	Prepare meeting summary	Feb 10
Design & prepare survey boxes/kits	Aug 20-28	Post online comment form to web site	Feb 6
Deliver hard-copy surveys to study area locations	Sep 1	Collect & integrate online comments	Feb 17
Support ADOT media release	Sep 12	Publish public comment summary to project web site	Mar 15
Support ADOT publicity distribution to e-mail database	Sep 12	Reporting	
Contact individual RV/mobile home parks for contact info / send survey link & fact sheet	Aug 22 – Sep 16	Prepare Public Involvement Program Summary Report	Mar 9
Refill survey boxes as needed	Sep 12-30		
Send reminder e-mail to distribution lists (“1 Week to Go...”)	Oct 7		
Collect hard-copy surveys	Oct 14		
End online survey – remove from web site	Oct 14		
Aggregate survey results	Oct 17 – Dec 4		
Submit survey report	Dec 12		

YOUR INPUT IS IMPORTANT!

Arizona Department of Transportation (ADOT) and Yuma County are conducting a *Transportation Needs Study for the Foothills and Mesa Del Sol Areas* that will look at ways to improve travel in the study area. The study area includes the neighborhoods, businesses, and undeveloped land located between County 10th Street and County 14th Street and between Avenue 10E and Avenue 15E. Your ideas and suggestions are very valuable to the project.

Please complete this questionnaire and return it to the drop box where you picked it up.

-- Thank You --

Do you think there are transportation problems in the Foothills/Mesa Del Sol area? ____yes ____no ____not sure
If so, what do you think are the biggest problems?

1.
2.
3.

What do you think is the most important vehicle-related traffic problem that needs to be fixed?

Do you think public transit is important in your community? ____yes ____no ____not sure
If so, what destinations would you like to see served by buses?

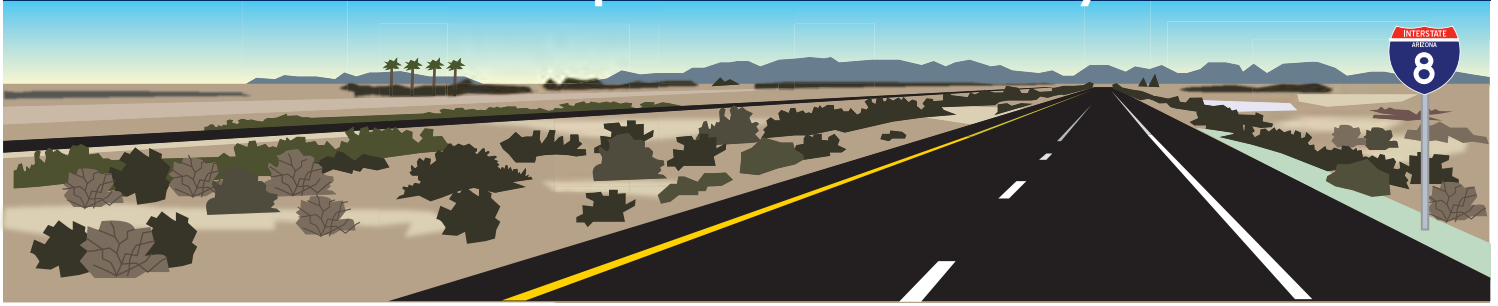
What overall improvements should be made to the Foothills/Mesa Del Sol area transportation network?

Roadway network (streets, intersections, traffic signals, stop signs, freeway interchanges, etc.)
Bicycle/pedestrian facilities (pathways, trails, sidewalks, etc.)
Public transportation (local & regional bus service, Dial-a-Ride, park-and-ride lots, etc.)
Other

Please prioritize the following list of transportation improvements starting with "1" = your highest priority.

Priority		Priority	
	Sidewalks		Bike paths/lanes
	Freeway Interchanges		Traffic signals
	Public transit		Improve existing roadways
	Wash crossings		Build new roadways
	Other:		

Foothills/Mesa Del Sol Transportation Needs Study

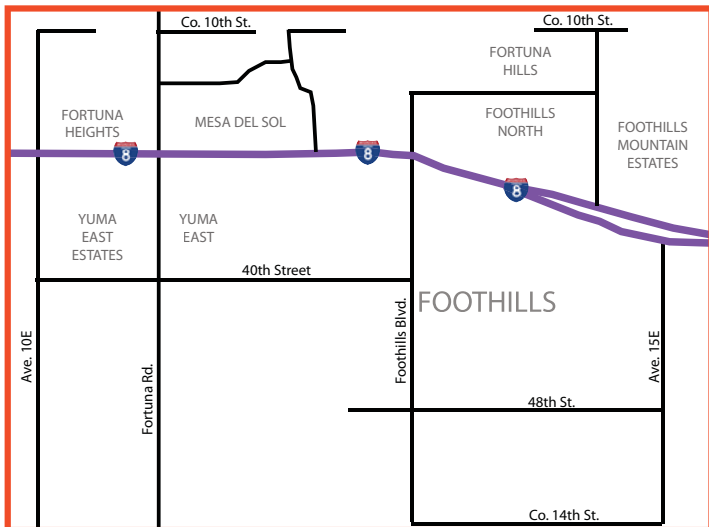


Study Overview

The primary goal of this study is to analyze the current transportation system and recommend needed improvements. Once the study is completed, a Multimodal Transportation Improvement Plan will be created to address the needs in the area. The multimodal plan will consider pedestrian, bicycle, automobile, and public transit needs for 5, 10 and 20 year planning periods. This plan will serve as a guide for future community development, project funding and project implementation.

Study Area

The study covers the area between Avenue 10E and Avenue 15E and between County 10th Street and County 14th Street.



Study Timeline

- ▶ Summer/Fall 2011: Conduct public surveys
- ▶ Late 2011: Assess results
- ▶ Early 2012: Present study results to public and allow public to comment
- ▶ Spring 2012: Conclude study and finalize report

Public Outreach

Input from residents of the Foothills/Mesa Del Sol area is crucial to the success of this study. Questionnaires will be available at local shopping centers and other frequented locations. Please fill out the questionnaires and place them in the provided receptacles to help shape the transportation future of your community. You can also visit the study website for more information or to take the questionnaire online. Once we assess the results, a public meeting will be held to present our findings and allow the public to comment.

For More Information

Please Contact
Mark Hoffman
Arizona Department of
Transportation
602.712.7454
MHoffman@azdot.gov



For Immediate Release: **August 29, 2011**
Contact: ADOT Public Information Office
news@azdot.gov -or- 1.800.949.8057

ADOT and Yuma County to conduct transportation needs study for Foothills/ Mesa Del Sol areas

Area residents urged to give input on current and future transportation needs

YUMA – The Arizona Department of Transportation and Yuma County will conduct a study for the Foothills and Mesa Del Sol areas to analyze the current transportation system and identify the most critical transportation needs. The study covers the area between Avenue 10E and 15E and between County 10th and 14th streets.

Residents living in the Foothills and Mesa Del Sol areas are encouraged to participate in the study by taking a questionnaire. Questionnaires will be available at local shopping centers and other frequented area locations. Local residents can also visit the ADOT project web site at www.azdot.gov/foothills to take the survey online or to learn more about the study.

Once the study is completed, a multimodal transportation plan will be created to address the needs in the area. The multimodal plan will consider pedestrian, automobile and public transit needs for 5, 10 and 20-year planning periods. This plan will serve as a guide for future community development, project funding and improvement implementation. A public meeting will be held in early 2012 to present the findings and allow residents to comment on the study.

For more information about the survey, please contact Project Manager Mark Hoffman at 602.712.7454 or mhoffman@azdot.gov or Yuma District Senior Community Relations Officer Gabriella Kemp at 928.317.2165 or gkemp@azdot.gov. Local media should contact the ADOT Public Information Office at news@azdot.gov or 1.800.949.8057. Visit www.facebook.com/azdot or www.azdot.gov for more information about ADOT. For more information about ADOT projects and programs across Arizona see the agency's latest blog posts at <http://adotblog.blogspot.com>.

#

From: Gabriella Kemp
Sent: Thursday, September 15, 2011 10:08 AM
Subject: Foothills / Mesa Del Sol Transportation Needs Study & Questionnaire

Hi there,

I'd really appreciate your help with this...

The Arizona Department of Transportation (ADOT) and Yuma County have initiated a **transportation needs study** to serve the residents of the **Foothills/ Mesa Del Sol** areas.

We are trying to analyze the current transportation system and recommend needed improvements. The study covers between Avenues 10E and 15E and between County 10th and County 14th Streets.

We've put together a short questionnaire to help us better understand the transportation issues facing this developing area. We hope you can take a few minutes to complete the questionnaire and help us spread the word to others who might be interested in the transportation needs of the Foothills/ Mesa Del Sol areas.

You can take the survey by clicking on the link below:

<http://gci.az.com/selectsurvey/TakeSurvey.aspx?SurveyID=88KMn18>

Please feel free to pass this note along to anyone your friends, co-workers and family members. The results will be carefully evaluated by the study team and used to develop several transportation system alternatives that the public can review and evaluate early next year.

As always, feel free to call me if you have any questions or concerns.

Thank you,

Gaby
Gabriella Kemp
Senior Community Relations Officer
Communication and Community Partnerships
Arizona Department of Transportation
2243 E Gila Ridge Road
Yuma, AZ 85365
Phone: (928) 317.2165
Blackberry: (928) 699.8983
Media Line: 1.800.949.8057

If you'd like more information about the study, please visit the ADOT project web site at:

<http://www.azdot.gov/foothills>.

You can also call contact:

Mark Hoffman, ADOT Project Manager
602-712-7454
Roger Patterson, Yuma County Engineer
928-817-5110

Confidentiality and Nondisclosure Notice: This email transmission and any attachments are intended for use by the person(s)/entity(ies) named above and may contain confidential/privileged information. Any unauthorized use, disclosure or distribution is strictly prohibited. If you are not the intended recipient, please contact the sender by email, and delete or destroy all copies plus attachments.

October 12, 2011

Last Chance to Let Us Know About Transportation in Yuma Foothills and Mesa Del Sol!

There is only one day left to provide community feedback about what you think are the transportation issues and potential improvements you would like to see made in the Yuma Foothills and Mesa Del Sol areas of Yuma County. The online survey (*link below*) will close on **October 14**.

WHAT DO YOU THINK ABOUT TRANSPORTATION IN THE YUMA FOOTHILLS & MESA DEL SOL AREAS? TELL US BY CLICKING THIS LINK: <http://tiny.cc/jx1wh>

If you'd like more information about this study, please visit the ADOT project web site at www.azdot.gov/foothills or contact Mark Hoffman, ADOT Project Manager at [602-712-7454](tel:602-712-7454). Thank you for your participation and we appreciate your feedback!

Gabriella Kemp
Senior Community Relations Officer
Communication and Community Partnerships
Arizona Department of Transportation
2243 E Gila Ridge Road
Yuma, AZ 85365
Phone: [\(928\) 317.2165](tel:928-317-2165)
Blackberry: [\(928\) 699.8983](tel:928-699-8983)
Media Line: [1.800.949.8057](tel:1-800-949-8057)



Foothills & Mesa Del Sol Areas
Transportation Needs Study
Public Open House - February 8, 2012



Please Sign In

Note: information provided is voluntary and is available to the public.

PLEASE PRINT	
Name	Saty Cummings
Address	12288 Del Norte
City/Zip	Yuma 85367
Telephone	(541) 272-7818
E-mail	mailing address P.O.Box 25754
How did you hear about this Open House?	
Name	JAVIER G. BARBARA
Address	YUMA, AZ 85364
City/Zip	
Telephone	2251 W. 26TH ST.
E-Mail	JAVIER.BARBARA@YUMACOUNTY.AZ.GOV
How did you hear about this Open House?	
Name	MAE & JEWEL McNAMEE
Address	YUMA - 85365
City/Zip	
Telephone	10670 E. 35 th PL.
E-mail	gavenjewel@gmail.com
How did you hear about this Open House?	



**Foothills & Mesa Del Sol Areas
Transportation Needs Study
Public Open House – February 8, 2012**



Please Sign In

Note: information provided is voluntary and is available to the public.

PLEASE PRINT	
Name	Joyathan Fell
Address	7722 E 27th St.
Telephone	246-4250
E-mail	fell23@hotmail.com
City/Zip	Yuma
How did you hear about this Open House?	
work @ Yuma County	
Name	DAKE & MARIE CARP
Address	11417 E, 35th PL
Telephone	928-347-9771
E-Mail	
How did you hear about this Open House?	
Name	DB Sew Wilson
Address	
City/Zip	Yuma 85767
Telephone	
E-mail	
FLYER / MESA DEL SOL HOMEOWNERS ASSN.	
How did you hear about this Open House?	



**Foothills & Mesa Del Sol Areas
Transportation Needs Study
Public Open House – February 8, 2012**



Please Sign In

Note: information provided is voluntary and is available to the public.

PLEASE PRINT	
Name	John Andch
Address	2715 East 14th Street
City/Zip	Yuma 85365
Telephone	928-539-7076, ext 237
E-mail	jandch@ycipta.org
How did you hear about this Open House?	email
Name	
Address	
City/Zip	
Telephone	
E-Mail	
How did you hear about this Open House?	
Name	
Address	
City/Zip	
Telephone	
E-mail	
How did you hear about this Open House?	



**Foothills & Mesa Del Sol Areas
Transportation Needs Study
Public Open House – February 8, 2012**



Please Sign In

Note: information provided is voluntary and is available to the public.

PLEASE PRINT	
Name	Nonna Rawn
Address	11342 E 35th PL
Telephone	970-685-7674
City/Zip	85367
How did you hear about this Open House?	
THRU YUMA EAST HOA	
Name	WARREN CRISP
Address	11430 E 35TH PL
Telephone	509 981 5977
City/Zip	85367
How did you hear about this Open House?	
E-Mail	
E-Mail	
Name	
Address	
City/Zip	
Telephone	
E-mail	
How did you hear about this Open House?	



**Foothills & Mesa Del Sol Areas
Transportation Needs Study
Public Open House - February 8, 2012**



Please Sign In

Note: information provided is voluntary and is available to the public.

PLEASE PRINT	
Name	Bruce Fenske
Address	ADOT, 2243 EGINA RIDGE RD, YUMA, AZ 85365
Telephone	928/317-2138
E-mail	BFENSK@AZDOT.GOV
How did you hear about this Open House?	
Name	LEWIS (DAN) SANDERS
Address	12118 E. 28TH PLACE
Telephone	256-468-5300
E-Mail	dan.sanders@yumaz.gov
How did you hear about this Open House?	
Name	Kevin Brown
Address	11391 37th pl.
Telephone	
E-mail	Yuma
How did you hear about this Open House?	

*



**Foothills & Mesa Del Sol Areas
Transportation Needs Study
Public Open House – February 8, 2012**



Please Sign In

Note: information provided is voluntary and is available to the public.

PLEASE PRINT	
Name	RICHARD FROST
Address	11592 VIA SALVOA
Telephone	928-342-5522
City/Zip	YUMA
E-mail	
How did you hear about this Open House?	MDSPOA MEETING
Name	Project Staff:
Address	Mark Hoffman - ADOT
Telephone	
E-Mail	
How did you hear about this Open House?	Amy Moran & Dan Marum - Wilson & Co.
Name	ROGER PATTERSON - Yuma County
Address	John Godek & Debra Duff - GRA
Telephone	
E-mail	
How did you hear about this Open House?	

*

OPEN HOUSE COMMENT FORM

Foothills/Mesa Del Sol Transportation Needs Study

1. What are the top issues/concerns in the study area that you feel need to be addressed?

2. Do you feel the proposed improvement plan addresses the transportation needs of the study area?
If not, what changes do you think should be made to the plan?

3. Please feel free to share any additional comments with us.

Optional

Name: _____ Address: _____

City: _____ Zip: _____ Email Address: _____

Completed comment forms can be submitted to the project team at the completion of the public meeting or to the project team after the meeting by **February 17, 2012**.

Mail: John Godec
c/o Godec, Randall & Associates
3944 N. 14th Street
Phoenix, AZ 85014

fax: 602-222-9575
email: jdg@godecrandall.com

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



FOR MORE INFORMATION:
azdot.gov/foothills



March 9, 2012

[To 51 area stakeholders]

Re: Foothills/Mesa Del Sol Transportation Needs Study
Community Open House – Wednesday, February 8

Dear XX,

The Arizona Department of Transportation and Yuma County invite you to learn more about the recommendations of the Foothills/ Mesa Del Sol Transportation Needs Study at a community Open House. The community Open House will give area residents an opportunity to ask questions and comment on the recommendations for future transportation improvements in the area.

Please join us:

Date: Wednesday, February 8
Time: 5:00 to 6:30 p.m. (presentation at 5:30 p.m.)
Location: Foothills Branch Library
13226 South Frontage Road, Yuma, AZ 85367

The study covers a 20-mile area between avenues 10E and 15E and between County 10th and 14th streets in Yuma. The study purpose is to evaluate the area's existing transportation system, forecast future conditions and identify improvements as part of a long range multimodal transportation plan that includes recommendations to improve roadways, pedestrian and bicycle facilities and public transit for 5, 10 and 20-year time periods.

Please share this information with those who may have an interest in the future of transportation in the Foothills/ Mesa Del Sol areas. We're including a flyer that you can post on a public bulletin board or other location to inform your residents and visitors about the meeting. For those unable to attend, study information, materials, and a comment form will be available on the project website: www.azdot.gov/foothills beginning February 6th.

We look forward to seeing you at the Open House. If you'd like more information, please contact ADOT Senior Community Relations Officer Gabriella Kemp at (928) 317-2165 or gkemp@azdot.gov.

Thank you,

Debra Duerr, Public Involvement Coordinator
Godec, Randall & Associates

Enclosures: Flyer

OPEN HOUSE

FIND OUT MORE ABOUT THE FUTURE OF TRANSPORTATION IN YOUR NEIGHBORHOOD!

Foothills/Mesa Del Sol Transportation Needs Study

Date: Wednesday, February 8th

Time: 5:00 to 6:30 p.m.
(presentation at 5:30 p.m.)

Place: Foothills Branch Library
13226 South Frontage Road
Yuma, AZ 85367



Please join us at an upcoming community open house to give us your input on the recommendations for future improvements to transportation in the Foothills and Mesa Del Sol area. If you cannot attend the open house, you can see the study recommendations online at the project web site azdot.gov/foothills after February 6.

E-mail Blast for Open House 1/25/12

TO: ADOT email distribution list
FROM: Gabriella Kemp
SUBJECT: Community Open House for Transportation Improvements in Foothills/
Mesa Del Sol Area

The Arizona Department of Transportation (ADOT) and Yuma County are conducting a Transportation Needs Study for the Foothills/ Mesa Del Sol areas. The study area includes 20-square miles between avenues 10E and 15E and between County 10th and 14th streets in Yuma.

The study purpose is to evaluate the area's existing transportation system, forecast future conditions and identify improvements as part of a long range transportation plan. The multimodal plan includes recommendations to improve roadway, bicycle and pedestrian facilities and public transit for 5, 10 and 20-year time periods.

The results of the Foothills/ Mesa Del Sol Transportation Improvement plan will be presented at a community Open House to be held:

Date: Wednesday February 8
Time: 5:00 to 6:30 pm (presentation at 5:30 p.m.)
Location: Foothills Branch Library
13226 South Frontage Road, Yuma, AZ 85367

Please come and tell us what you think about the proposed plan and recommendations.

Study information, materials and a comment form will be available on the study website: www.azdot.gov/foothills beginning February 6th.

For more information, please contact ADOT Senior Community Relations Officer Gabriella Kemp at (928) 317-2165 or gkemp@azdot.gov.



ASSOCIATED PRESS

HOMELAND SECURITY SECRETARY Janet Napolitano (center) tours the U.S.-Mexico border with U.S. Border Patrol agents in the Coronado National Forest near Nogales on Oct. 30, 2011.

AP Analysis: Border Patrol OT up as arrests drop

ASSOCIATED PRESS

WASHINGTON — Border Patrol agents have racked up daily overtime at a cost of about \$1.4 billion in the past six years while the number of arrests of illegal border crossers has fallen to the lowest level in nearly 40 years, an Associated Press analysis of agency records finds.

Since the 2006 budget year, the agency charged with stopping would-be illegal border crossers and smugglers from making it into the U.S. over land and sea borders has spent more than \$1.4 billion on what is described as “administrative uncontrollable overtime,” according to the data provided by the Border Patrol. In practical terms, agents average two hours a day in overtime.

That means agents can earn anywhere from 10 percent to 25 percent extra pay an hour for the first two hours of overtime, with the extra cash being steadily re-

duced every hour after that because of complicated overtime rules. Over the course of a year, an agent can earn about \$15,000 more than the base salary, which for a more experienced agent is typically over \$60,000 a year. Agents are limited to \$35,000 in overtime annually.

The cost of overtime rose from about \$155.8 million in 2006 to more than \$331 million in 2011. That increase coincides with the addition of about 9,000 agents in the past six years and the drop of apprehensions to a nearly 40-year low, from more than 1 million arrests in 2006 to about 340,000 in 2011.

Border Patrol Deputy Chief Ronald D. Vitiello said patrolling the border can be an unpredictable job that requires longer hours from agents.

“The uncontrollable nature of the work is inherent in the primary duty of a Border Patrol agent and must be performed in order to get the job done,” Vitiello said, adding that anything from mak-

ing an arrest to talking to witnesses can keep an agent on duty beyond a scheduled shift. Often it stems from charging the Border Patrol for the time spent driving from a remote location to an agent’s home base or staying late to finish the paperwork from an arrest or seizure of illicit cargo.

Still, with the government facing record deficits and the Department of Homeland Security likely to see more cuts, a system that builds in overtime the same way on the busy U.S.-Mexico border as it does on the relatively sleepy U.S.-Canadian border raises questions.

Most illegal border crossers are apprehended along the 2,000-mile long Mexican border in California, Arizona, New Mexico, and Texas. In the budget year that ended in September, 18,506 agents made a combined 327,577 apprehensions — an average of nearly 18 apprehensions per agent. The agency spent about \$283 million on over-

What is site selection?

Generally speaking, to find the most appropriate site for a business from an economic and operational perspective. Varying approaches range from holistic analysis that considers the best region for a firm to locate based from a long-term strategic perspective in which the actual building or site is an afterthought; to the actual physical facility determining the location.

Internet usage and the increase in international sales have created an evolution in the site selection process. There is a significant increase in the number of companies providing site selection services, with multiple specialized consultants working a single project or simply a real estate broker making the case for the company based upon available buildings. Recent large announcements have garnered a great deal of press due to the enormous cash incentives used to “win” projects. Volkswagen chose to locate in Tennessee and was awarded \$250 million by the state. This has created an environment that demands an increase in the use of incentives. Gov. Brewer responded to this pressure last year by creating the Competitiveness Fund.

Site selection used to involve much more face-to-face interaction, more personal involvement in the decision making process. Decisions have been reduced to a few short months as opposed to a year or 18 months. Site visits have been condensed into one or two days, where before the client would want to spend three to five days interviewing the local college, workforce, utilities and peer companies to ensure the community was a good fit. Today the tour consists of seeing a building or land site, lunch with a peer company or workforce team, maybe a meeting with the college if time permits and then they are off to another location to repeat the same agenda with a different community.

An evolving trend is the use of multiple consultants; real estate broker, an incentives/tax specialist and a workforce analyst will all work the same project. The client wants to buy specialization, sometimes this is done by contracting each specialty or by hiring a large firm that has all three specialties within their scope of service. The



GYEDC
Julie Engel

first approach creates a lengthier process toward the decision making. When utilizing one company, the work is usually conducted in tandem.

It is imperative the Economic Development Organization (EDO) know what types of projects will be successful in their communities and need to be able to respond to all the requests for information regarding the three specialties mentioned above as well as demonstrate a company’s return on their investment if they locate in their community. Ultimately the site selector’s goal is to eliminate the communities with the greatest disadvantages and the fewest advantages for their client. They aim to ensure their client will succeed in a location, not just today but for the future as well. Site selectors do not make the final decision, they make recommendations to their clients and they prepare detailed analysis for their clients in order for them to make the decision as to where to locate. In some cases this is when the president, owner or plant manager will actually tour the top three communities recommended by the consultant; they may also add a community the consultant didn’t recommend but they personally wanted to see on their list based upon their own perceptions.

Key factors considered in the initial search:

- **Business Strategy** — This involves a comprehensive look at the business’s development strategy and all its nuances. Untapped markets, accessing a new workforce (talent), improving accessibility to clients or suppliers, reducing their overall costs or a competitive advantage within their industry.
- **Mergers and acquisitions** also play a role.
- **Operating Costs** — Tax structure, transportation, labor, occupancy, utilities and the regulatory environment all fall into this category.
- **Risk Factors** — Risk minimization within the three prior factors is a driving force in every project. Operational interruptions from natural disasters, labor unions, supply chain, etc. Utilities

reliability or uncertainty. Rolling brownouts or recurring blackouts are intolerable. Meeting a company’s construction deadline if a build-to-suit or extensive building improvements are required for an existing site. Predictability in state and local government is considered a risk factor as well as the ability to demonstrate a stable tax environment. Each of these concerns must be mitigated and clearly demonstrated to the site selection consultant and the company; they can, with confidence, eliminate or mitigate these risk factors.

The process begins for the site selection consultant by defining the project requirements, broad screening and cuts, identifying the shortlist and conducting site tours, negotiations (land/building, utilities, and incentives) then finalizing the deal. The role of the EDO is to be prepared in advance to supply the information necessary for the site selector to conduct their analysis, be able to mitigate and hopefully eliminate all risk factors, have broker controlled sites that are ready for occupancy with little modification needed and be able to showcase the community as a viable location for their project. This can only be done through partnerships with the state and local governments, local educational institutions, work force, brokers and our existing businesses who have clearly found success by choosing this location for their expansion or relocation projects.

The number of jobs we are competing for continues to decline while competition continues to increase exponentially. To compete at the level required, there must be a commitment from all the partners listed. Cuts to economic development will diminish our chances to deliver all the necessary components in the site selection process. Funding economic development is investing in our communities and our future. We have been doing more with less year after year and we have reached the point where we have to do less with less. We need the support of the public sector and the private sector in order to increase our capabilities and perform at the level necessary to succeed.

Julie Engel is president/CEO of the Greater Yuma Economic Development Corp.

Join us to shape the future of transportation where you live & work

The Arizona Department of Transportation and Yuma County invite you to review the recommendations of the Foothills/ Mesa Del Sol Transportation Needs Study at a community Open House.

The Open House will give area residents an opportunity to review study results, ask questions and comment on the Foothills/ Mesa Del Sol Transportation Study.

February 8, 2012
Foothills Branch Library
13226 S. Frontage Rd.
Yuma, AZ 85367
5:00 to 6:30 p.m.
(Presentation at 5:30 p.m.)

For special accommodations or more information please contact Gabriella Kemp at (928) 317- 2165/gkemp@azdot.gov or visit www.azdot.gov/foothills.



COMINGS

FROM PAGE B1

Elizabeth Requarth has joined the A.T. Pan-crazi Insurance staff as the agency’s personal lines producer. She can be reached at 783-0000.

A 2005 graduate of Yuma Catholic High School, she studied communications at Northern Arizona University. Requarth obtained her property and casualty producer’s license and personal lines coverage

specialist designation from The Hartford University.



ELIZABETH REQUARTH

Arizona Department of Transportation has made some progress on a roadway improvement project on the east side of Gila Bend. But I can say from personal experience, it still is a challenge to get through the construction zone.

The project includes con-

struction of a new, elevated intersection at State Route 85 and Business Route 8, a wider bridge over the Union Pacific Railroad and realignment of both State Route 85 and Maricopa Road.

The \$13.5 million project is expected to be completed later this year.

Report Comings and Goings to jlobeck@yumasun.com or call Joyce Lobeck at 539-6853.

Yuma Friends of Arizona Health Sciences Center



Gordon A. Ewy, MD

Professor of Medicine, Director of Sarver Heart Center and the Gordon A. Ewy, MD Distinguished Endowed Chair of Cardiovascular Medicine at the University of Arizona College of Medicine



Sarver Heart Center

Join us for a lecture!

Know Your Heart Disease Risks

Wednesday, February 8, 2012
6 p.m.

University of Arizona Yuma Cooperative Extension Offices
2200 W. 28th St. (Next to Yuma Catholic High School)
Yuma, Arizona

Free and Open to the Public
Please RSVP to melindagraham@roadrunner.com
or call 928-210-7202

LOANS

FROM PAGE B1

“Why should a person have to ruin their credit before a bank is willing to even speak with them? Why aren’t they helping beforehand?” Engler said. “The fact that banks won’t talk to you until you’re three months behind is a crime. Banks seem to have lost their business sense ... and can’t see the blinding (light) of the obvious.”

Compounding the problem, Engler said, is that once you do fall behind and negotiations finally begin, banks can foreclose on your house whenever they desire.

“I have helped countless homeowners come to agreements with banks, sometimes even to the point of having a contract in place, and the banks still end up foreclosing and auctioning off their properties.

“It’s a case of the right hand not knowing what the other one is doing. There’s no communication between a bank’s short sale department and its foreclosure department. So even if you think you are saving your house, they can just take it right out from under you. How can things turn around when these are your business practices?”