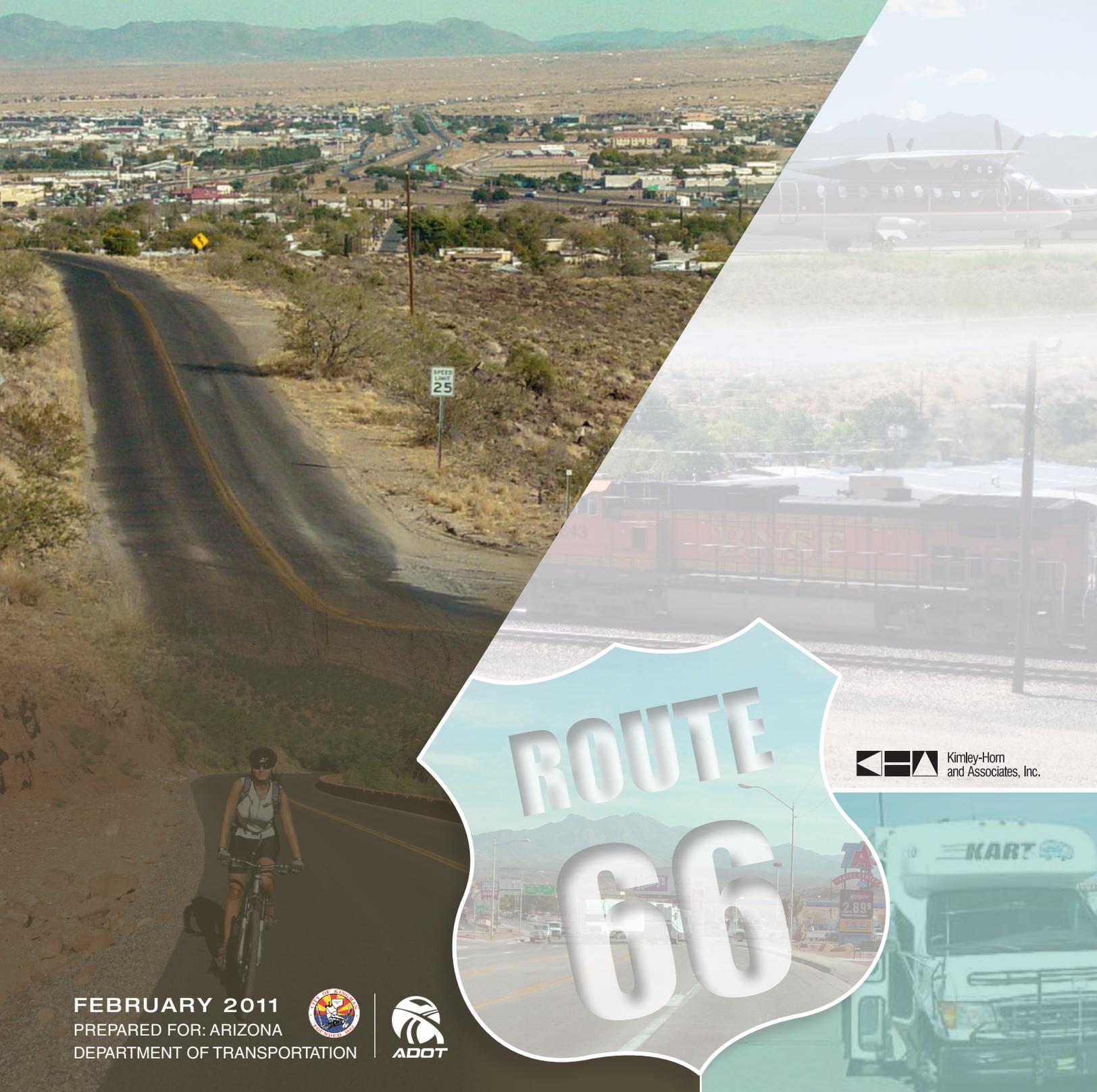


FINAL REPORT

Kingman Area

TRANSPORTATION STUDY UPDATE

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Kimley-Horn
and Associates, Inc.

FEBRUARY 2011
PREPARED FOR: ARIZONA
DEPARTMENT OF TRANSPORTATION





Kingman Area Transportation Study Update

ADOT MPD Task Assignment 14-10
PGTD 0448
Contract # T08-49-U0001

FINAL REPORT

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CITY OF KINGMAN
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1 INTRODUCTION

The Arizona Department of Transportation (ADOT) awarded funding for the Kingman Area Transportation Study Update through the Planning Assistance for Rural Areas (PARA) program. The purpose of the PARA program is to assist counties, cities, towns, and tribal communities in addressing a broad range of multimodal transportation planning issues including roadway and non-motorized modes of travel.

1.1 Study Purpose

ADOT, in cooperation with the City of Kingman and Mohave County, initiated the Kingman Area Transportation Study Update to update the 2005 Kingman Area Transportation Study (KATS). The study provides a plan of improvements for 5-year (short-range), 10-year (mid-range), and 20-year (long-range) transportation planning horizons. The recommendations are multimodal, considering roadways, non-motorized transportation modes (bicycles and pedestrians), and transit components.

1.2 Study Objectives

Objectives of the Kingman Area Transportation Study Update are:

- Update the inventory of existing conditions to account for recent improvements, development plans, and changes in socioeconomic data.
- Collect and analyze new volume data, accident information, and geometric conditions in order to document existing deficiencies.
- Update the transportation model using the latest population and employment information and the current street system.
- Refine and expand the modeling network and zone system as appropriate to incorporate the new study area.
- Use the TransCAD travel-forecasting model to project future travel demand for the years 2015, 2020, and 2030.
- Evaluate the performance of the system for each of the horizon years and document the future deficiencies.
- Develop a set of alternative actions to address the existing and future deficiencies as well as any special topics identified by the project stakeholders.
- Provide implementation recommendations.
- Explore creative financing opportunities to fund recommended improvements.
- Document the results of the study process and the recommendations in a ‘reader-friendly’ report and Executive Summary.

1.3 Study Process

During the course of the project, interim documents were prepared to detail the results of specific work tasks. These interim documents were subject to review and comment and form the basis of the *Kingman Area Transportation Study Update Final Report*. More detailed information can be found in the following interim documents:

- *Working Paper No. 1 – Current and Future Conditions*
- *Working Paper No. 2 – Evaluation Criteria and Plan for Improvements*
- *Public Meeting No. 1 Summary*
- *Public Meeting No. 2 Summary*

1.4 Document Purpose

This document, the *Kingman Area Transportation Study Update Final Report*, defines goals and objectives, summarizes current and future conditions, identifies transportation needs and issues, and describes potential improvement options. This document also presents criteria by which the improvement options were evaluated, recommends specific improvement projects, and assigns implementation timeframes and estimated costs to the recommended improvement projects.

1.5 Study Area

The study area for the Kingman Area Transportation Study Update encompasses all of the City of Kingman (City) plus portions of unincorporated Mohave County (County), as shown in **Figure 1**. This study area is significantly larger than what was included in the 2005 KATS, having been expanded from 59 square miles to 165 square miles.

1.6 Summary of Relevant Plans and Studies

The following plans and studies were reviewed in the preparation of this study so that relevant findings and recommendations could be considered and incorporated in this study.

- *Kingman General Plan 2020 (November 2003)*
- *Kingman Airport Master Plan (February 2006)*
- *Kingman Pedestrian and Bikeway Plan 2000 (2000)*
- *Kingman Capital Improvements Plan – Fiscal Years 2010-2014 (May 2009)*
- *Kingman Traffic Signal Warrant Studies (various dates)*
- *Mohave County General Plan (December 2005)*
- *Grace Neal Parkway Design Concept Report Final Draft (May 2007)*
- *I-40, Kingman Crossing Traffic Interchange Initial Design Concept Report (September 2007)*
- *I-40, Rattlesnake Wash Traffic Interchange Final Design Concept Report (October 2007)*
- *I-40 / US 93 West Kingman Traffic Interchange, Final Feasibility Report (October 2009)*
- *Arizona Subcounty Population Projections (December 2006)*
- *Western Arizona Regional Transportation Coordination Plan (May 2008)*
- *2010 Statewide Transportation Planning Framework Program (January 2010)*
- *Kingman Area Transportation Study Final Report (January 2005)*

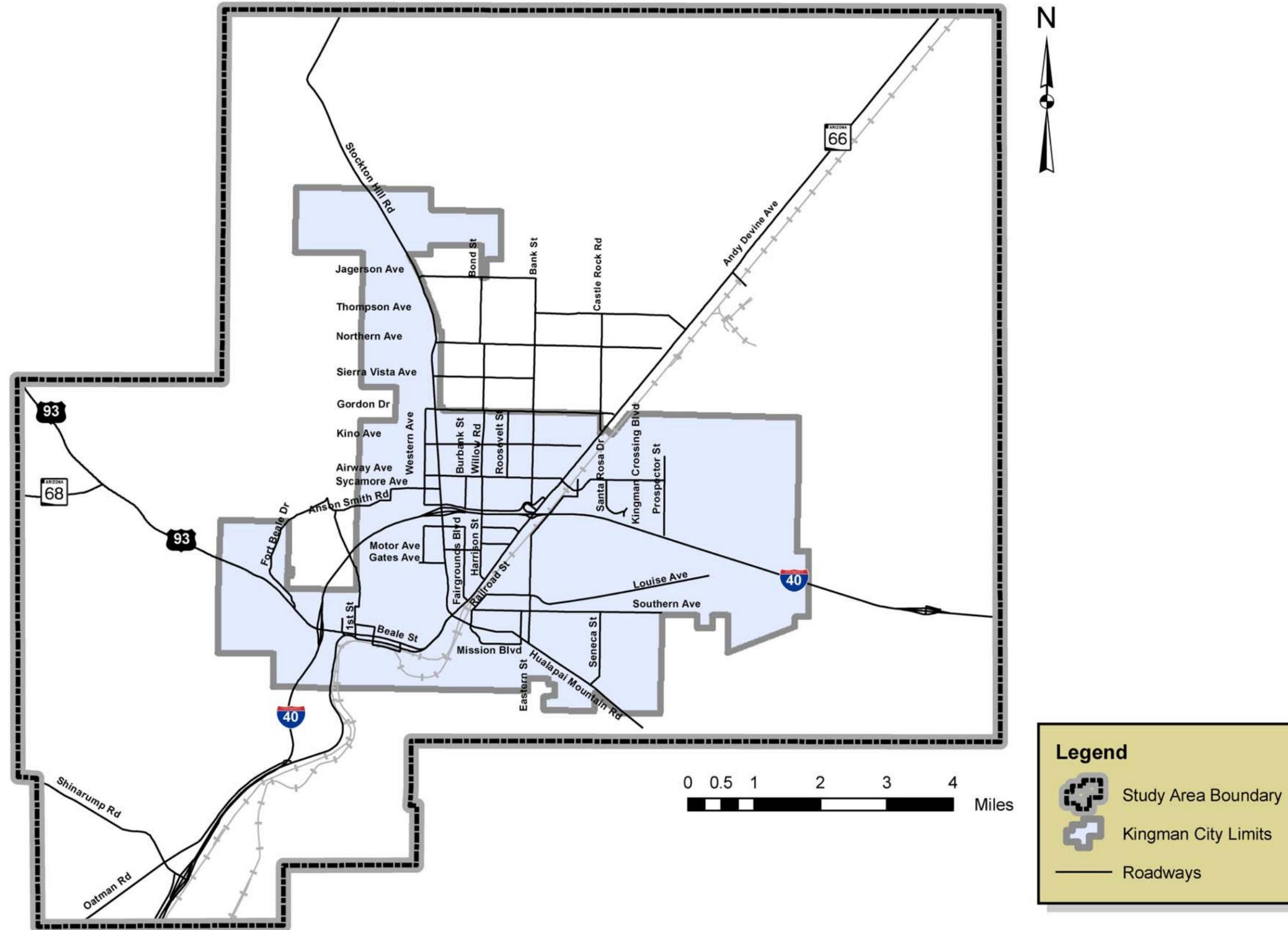


Figure 1: Study Area Map

1.7 Technical Advisory Committee

A Technical Advisory Committee (TAC) provided input throughout the course of the study and reviewed study documents. The TAC consisted of staff from the following agencies:

- ADOT Multimodal Planning Division
- ADOT Communication and Community Partnerships
- ADOT Kingman District
- City of Kingman City Manager
- City of Kingman Public Works
- City of Kingman Engineering
- City of Kingman Development Services
- City of Kingman Fire Department
- City of Kingman Police Department
- Mohave County Public Works
- Mohave County Development Services
- Mohave County Economic Development
- Mohave County Sheriff's Office
- Northern Arizona Fire
- Kingman Airport Authority
- Arizona Game and Fish Department (AZGFD)
- U.S. Bureau of Land Management (BLM)
- Western Arizona Council of Governments (WACOG)

1.8 Public Involvement

Public participation is an integral part of a successful transportation plan. As part of the Kingman Area Transportation Study Update, input was obtained from the general public, business leaders, and elected officials at two public meetings.

The first meeting was held on July 12, 2010 from 4:00 p.m. to 6:00 p.m. in the City Council Chambers. Information on existing and future conditions and needs was presented. The second meeting was held on November 8, 2010 from 5:30 to 7:30 pm at the City Council Chambers. Information on potential improvement projects and preliminary recommendations was presented. Each meeting included a brief presentation followed by a question-and-answer session.

The meetings were staffed by City, ADOT and consultant personnel who were available to provide information, answer questions, and receive comments. Exhibits related to the study were provided. Comment forms were made available for use in submitting written comments.

2 GOALS AND OBJECTIVES

Goals and objectives were developed for the study to outline the framework for developing and implementing the transportation plan in a manner that reflects the overall transportation vision for the region.

Goals are statements describing desirable long-term achievements. They are general in nature and outline the ideal future situation. Objectives are intermediate milestones that are essential to achieve the goals. The goals and objectives developed for the Kingman area are as follows.

GOAL 1: Provide a balanced, multimodal transportation system that supports the safe and efficient movement of people and goods by all modes.

- Objective 1.1 Provide viable options for the movement of people and goods.
- Objective 1.2 Provide a roadway system for the future that learns from and builds on the past. Plan for level of service C.
- Objective 1.3 Improve availability, efficiency, and accessibility of public transportation for all users. Plan for 30-minute frequency on all routes during peak periods.
- Objective 1.4 Create a comprehensive system of bicycle facilities, programs, and services. Provide adequate level of service to make bicycle travel a viable mode.
- Objective 1.5 Create a user-friendly environment for pedestrians. Provide adequate level of service to make pedestrian travel a viable mode.
- Objective 1.6 Create a transportation system that is accessible to all users including the disabled population.
- Objective 1.7 Provide adequate emergency access across I-40 and railroad.
- Objective 1.8 Incorporate utility corridors in roadway widening and right-of-way acquisition.
- Objective 1.9 Incorporate principles of complete streets in the planning and design of the transportation system.

GOAL 2: Develop a sustainable plan that builds on the character of the region, is compatible with land use and sensitive to the environment, and enhances the quality of life today and in the future.

- Objective 2.1 Provide a transportation system that minimizes air, water, and noise pollution while maintaining and enhancing the environment.
- Objective 2.2 Establish guidelines and standards to enhance the land use/transportation connection.
- Objective 2.3 Maintain and enhance neighborhood integrity and identity when planning, designing, and constructing transportation improvements.
- Objective 2.4 Develop transportation facilities that are compatible with the natural landscape and open space.

GOAL 3: Provide an open, objective, and credible process for planning and developing a transportation system that complies with state and federal regulations and is responsive to the community.

- Objective 3.1 Involve citizens in planning the transportation system, ensuring that plans address public values and have the flexibility to respond to changing needs.
- Objective 3.2 Educate and involve the public and policy makers in developing the transportation system.

- Objective 3.3 Coordinate the planning for the existing and future transportation system with adjacent jurisdictions and regional agencies.
- Objective 3.4 Utilize the Kingman Area Transportation Study Update as the foundation for decision-making on transportation-related issues.
- Objective 3.5 Identify and conform to all applicable state and federal regulations.

GOAL 4: Develop a flexible plan that can be funded and that reflects responsible use of public funds.

- Objective 4.1 Develop innovative and sound funding policies to implement the Plan.
- Objective 4.2 Establish funding priorities to guide the timing and sequencing of transportation improvements.
- Objective 4.3 Ensure that new growth and development projects pay for their fair share of transportation infrastructure costs.
- Objective 4.4 Identify, pursue, and be responsive to the requirements of grant applications.
- Objective 4.5 Allocate funds for operations and maintenance.

GOAL 5: Provide a transportation system to support planned economic development and vitality.

- Objective 5.1 Support desired economic development and tourism.
- Objective 5.2 Provide for goods movement.
- Objective 5.3 Provide access to I-40 within the planning area in accordance with ADOT policies.
- Objective 5.4 Provide a high quality transportation system to preserve and enhance the value of Kingman Airport to the region.
- Objective 5.5 Support passenger rail and high-speed rail service.

3 CURRENT CONDITIONS

This chapter summarizes data obtained on current conditions to help identify current needs and deficiencies of the existing transportation network.

3.1 Land Uses

An understanding of current land uses is important for modeling travel characteristics. Land use information is converted to population and employment data at the traffic analysis zone (TAZ) level for use in the travel demand model. Typically, population produces trips while employment attracts trips in the travel demand model.

The study area is currently comprised of various land uses, including commercial, industrial, residential, and public land uses. In general, commercial areas are along Stockton Hill Road, Route 66 (Andy Devine Avenue), Bank Street, Armour Avenue, Airway Avenue, Northern Avenue, and in the downtown area along Beale Street. Current industrial land uses are located primarily along Bank Street and Armour Avenue and at the Kingman Airport and Industrial Park. Residential developments are spread throughout the study area at varying degrees of density. Residential areas closer to the downtown and commercial areas tend to have higher densities while those on the perimeter of the City tend to have lower densities.

Major traffic generators in the study area include the Kingman Airport and Industrial Park, Kingman Regional Medical Center, Hualapai Mountain Medical Center, government services and commercial businesses in the downtown area, and the shopping areas along Stockton Hill Road north of Detroit Avenue.

Public lands are also present within the study area. Public land uses/ownership within the study area include: City, County, State, and Federal government facilities, the Cerbat Foothills Recreation Area (owned by BLM and the City), State Trust land (owned by the Arizona State Land Department (ASLD)), parks, open space, and schools. The locations of BLM and State Trust land in the study area are shown in **Figure 2**.

3.2 Socioeconomic Data

3.2.1 Existing 2010 Population and Employment

The 2010 population for the study area is estimated to be 52,049. This population estimate is comprised of three components:

- The population within the City limits
- The population within the adjacent unincorporated land, which is known as the New Kingman-Butler Census Designated Place (CDP)
- The population within the study area that is not within the City limits or the New-Kingman-Butler CDP (hereinafter referred to as the expanded portion of the study area because it represents the area not included in the 2005 KATS)

The 2010 population estimates for the City of Kingman and the New Kingman-Butler CDP were obtained from the Arizona Department of Commerce website (www.azcommerce.com/econinfo/demographics). The population within the expanded portion of the study area was developed by estimating the number of housing units based on a manual count of rooftops obtained from 2007 aerial photographs. In the 2000 U.S. Census, the average household size was 2.47 for the City of Kingman. This factor was used to convert housing units to population in the expanded portion of the study area. The 2010 population estimates and corresponding 2000 Census population totals for the study area are provided in **Table 1**.

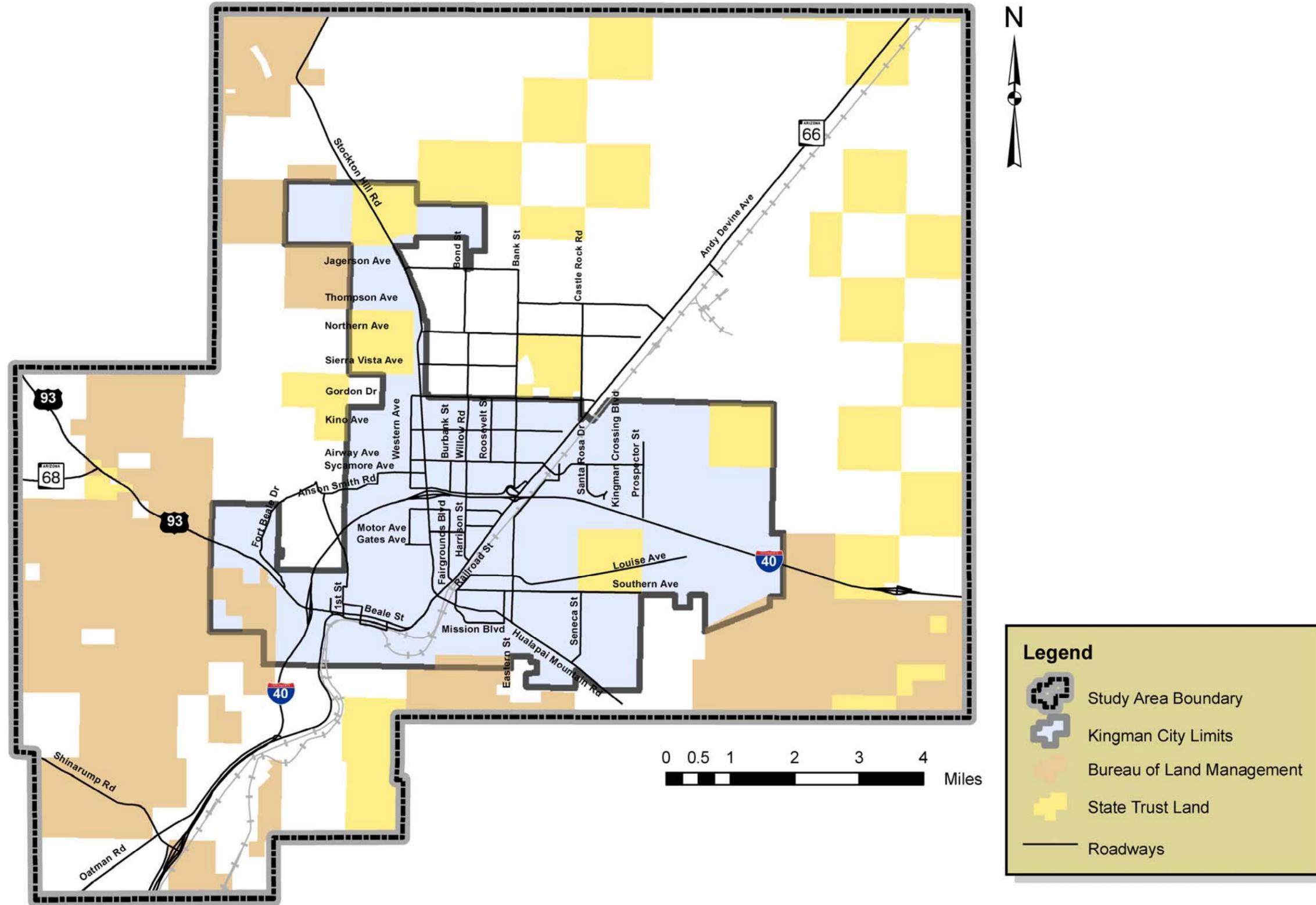


Figure 2: BLM and State Trust Land

Table 1. 2000 and 2010 Study Area Population

Portion of Study Area	2000 Population	2010 Population	2000-2010 Annual Growth Rate
Population within the City limits	20,069	31,722	4.68%
Population within the adjacent unincorporated land	14,810	17,875	1.90%
Population within the expanded portion of the study area	N/A	2,452	N/A
Total	34,879	52,049	

Sources: 2000 Census, Arizona Department of Commerce

The major employers in the Kingman area, according to the Mohave County Economic Development Division and the City of Kingman, are Mohave County, Kingman Regional Medical Center, and Kingman Unified School District. The Kingman Airport Industrial Park, adjacent to the airport, encompasses nearly 1,000 acres and is home to more than 75 businesses employing more than 2,000 persons.

Employment data for 2010 was estimated using a ratio of employment to population. In the 2005 KATS, an employment-to-population ratio of 0.38 was used in the analysis. This same ratio was used to develop employment estimates for this study and the results are shown in **Table 2**.

Table 2. 2010 Employment

Portion of Study Area	2010 Employment
Employment within the City limits	12,054
Employment within the adjacent unincorporated land	6,793
Employment within the expanded portion of the study area	932
Total	19,779

3.2.2 Distribution of Existing 2010 Population and Employment

The study area was divided into TAZs for use in the development of a travel demand forecasting model for the study area. Similar land uses, physical barriers, or major transportation corridors typically define TAZ areas and boundaries. The 94 TAZs developed for the 2005 KATS (numbered 1-94) were retained for this study, augmented by 15 additional TAZs (numbered 501-515) created to cover the expanded portion of the study area. The study area TAZs are shown in **Figure 3**.

The population and employment totals shown in **Table 1** and **Table 2** were distributed among the 109 study area TAZs based on the 2005 KATS TAZ distribution, existing land uses within each TAZ, aerial photography, and input from the City and County. The employment totals were further divided into the categories of retail, general, office, and shopping center employment. The travel demand model contains different trip generation equations for each of the employment categories. The 2010 population and employment estimates for each individual TAZ can be found in **Appendix 9-1**.

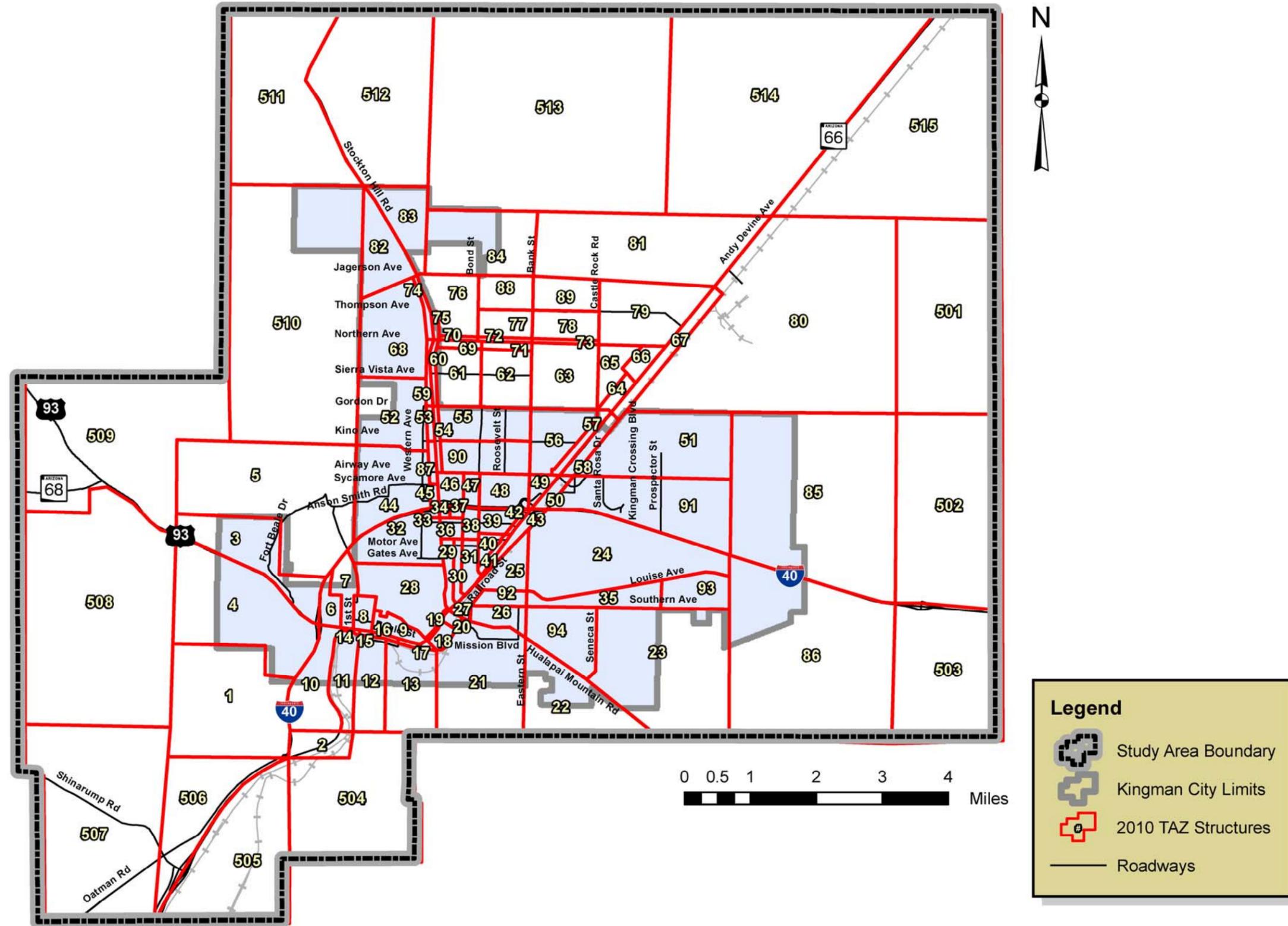


Figure 3: Traffic Analysis Zones

3.2.3 Title VI Populations

Title VI of the Civil Rights Act of 1964 and related statutes assure that individuals are not subjected to discrimination on the basis of race, color, national origin, age, sex, or disability. In February 1994, President Clinton signed Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.” The purpose of the order was to focus attention on the “environmental and human health conditions in minority communities and low income communities with the goal of achieving environmental justice.” The Order does not supersede existing laws or regulations; rather, it requires consideration and inclusion of these targeted populations as mandated in previous legislation including:

- Title VI of the Civil Rights Act of 1964
- National Environmental Policy Act of 1969 (NEPA)
- Section 309 of the Clean Air Act
- Freedom of Information Act

The U.S. Department of Transportation issued its final order to implement the provisions of Executive Order 12898 on April 15, 1997. This final order requires that information be obtained concerning the race, color or national origin, and income level of populations served or affected by proposed programs, policies, and activities. It further requires that steps be taken to avoid disproportionately high and adverse impacts on these populations. One of the first steps in assuring environmental justice is the identification of those populations specifically targeted by the Order – minority and low-income populations.

According to the 2000 U.S. Census, the racial composition of the City of Kingman was predominantly white with about 15 percent minorities as shown in **Table 3**.

Table 3. 2000 Racial Demographic Percentages in the City of Kingman

White Not Hispanic	African American	Native American	Asian	Other	Hispanic or Latino
85.6%	0.5%	1.5%	1.1%	2.0%	9.3%

Source: 2000 Census

The Executive Order also requires the consideration of persons older than 60 years of age. According to the 2000 U.S. Census, approximately 23 percent of the population in Kingman is 60 years or older. In addition, the Order mandates that impacts on low-income people must also be considered. There are nearly 4,400 people in the Kingman area living below the poverty level. Socioeconomic data for the year 2000 for the City of Kingman and Mohave County are listed in **Table 4**.

Table 4. 2000 Low-Income and Disabled Population Percentages

Population Category	City of Kingman	Mohave County
Females	50.6%	50.3%
Males	49.4%	49.7%
Persons with disability	22%	24%
Persons over age 60	23%	27%
Persons living below the poverty level	11%	14%

Source: 2000 Census

3.3 Roadways

The existing roadway network in the study area is composed of an interstate highway, a U.S. highway, two state highways, an arterial street system, and collector and local streets. This study focuses on all of these categories with the exception of local streets.

The highways and busiest arterial roadways typically have four through lanes (two in each direction). Most of the other study area roadways are paved two-lane streets, although there are a few unpaved two-lane streets. **Figure 4** shows the number of through lanes on the major roadways in the study area.

3.3.1 Traffic Control

There are 34 intersections currently controlled by traffic signals in the study area: 24 signalized intersections are owned by the City of Kingman; 1 is owned by Mohave County; and 9 are owned by ADOT. Traffic signal locations are shown in **Figure 5**. All other intersections in the study area are unsignalized.

3.3.2 Federal Functional Classifications

Functional classification is the process by which roadways are grouped according to the character of traffic service they are intended to provide. These classifications are used in transportation system planning, roadway design, and determining eligibility for federal roadway improvement funds.

The primary federal functional classifications are freeways, highways, arterials, collectors, and local roadways. These classifications are listed from highest to lowest as it relates to the degree of mobility provided and the degree to which access to adjacent land is restricted. The Federal Highway Administration (FHWA) determines the federal classification of roadways and seeks to maintain the distribution of the various classifications within a set range of percentages for urban and rural areas (where urban and rural areas are as defined by the U.S. Census Bureau).

The general characteristics associated with the different functional classifications in an urban system, along with the FHWA recommended percentage allocation of each classification, are summarized in **Appendix 9-2**.

In order to utilize federal funding on roadway improvements, the roadway to be improved must have a federal functional classification. The study area roadways with federal functional classifications above local roadways (local roadways are typically residential streets) are shown graphically in **Figure 6**.

3.3.3 Traffic Volumes

Traffic volume information serves to indicate how close to capacity roadway segments or intersections may be. Actual daily traffic volume counts are also used to help calibrate the travel demand model as one of its principal outputs is estimates of daily traffic volumes.

Available traffic count data was reviewed to ascertain the volume of traffic on study area roadways. Daily traffic volume data from 2008, 2009, and 2010 on selected roadway segments was provided by the City, County, and ADOT. The daily traffic volumes are shown in **Figure 7**. Additional information on daily traffic count data is provided in **Appendix 9-3**. Peak period intersection movement volumes were counted in May 2010 at 17 intersections agreed upon by the TAC (see **Figure 8**). The mid-day (MD) and afternoon (PM) peak periods were counted as these are typically the periods with the highest volumes in Kingman. The MD and PM peak hour volumes for the 17 counted intersections are shown in **Figure 9**.

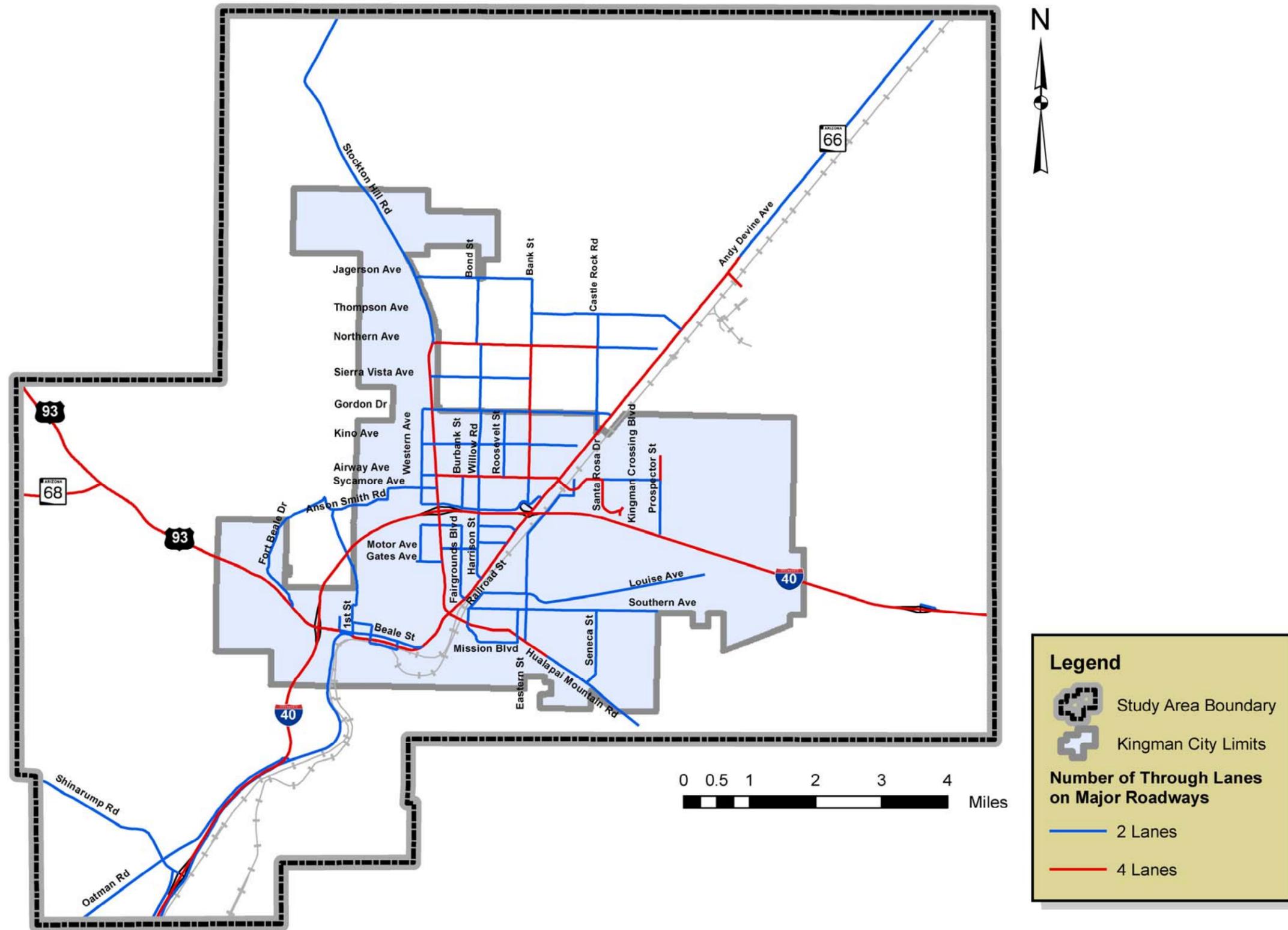


Figure 4: Current Number of Roadway Through Lanes

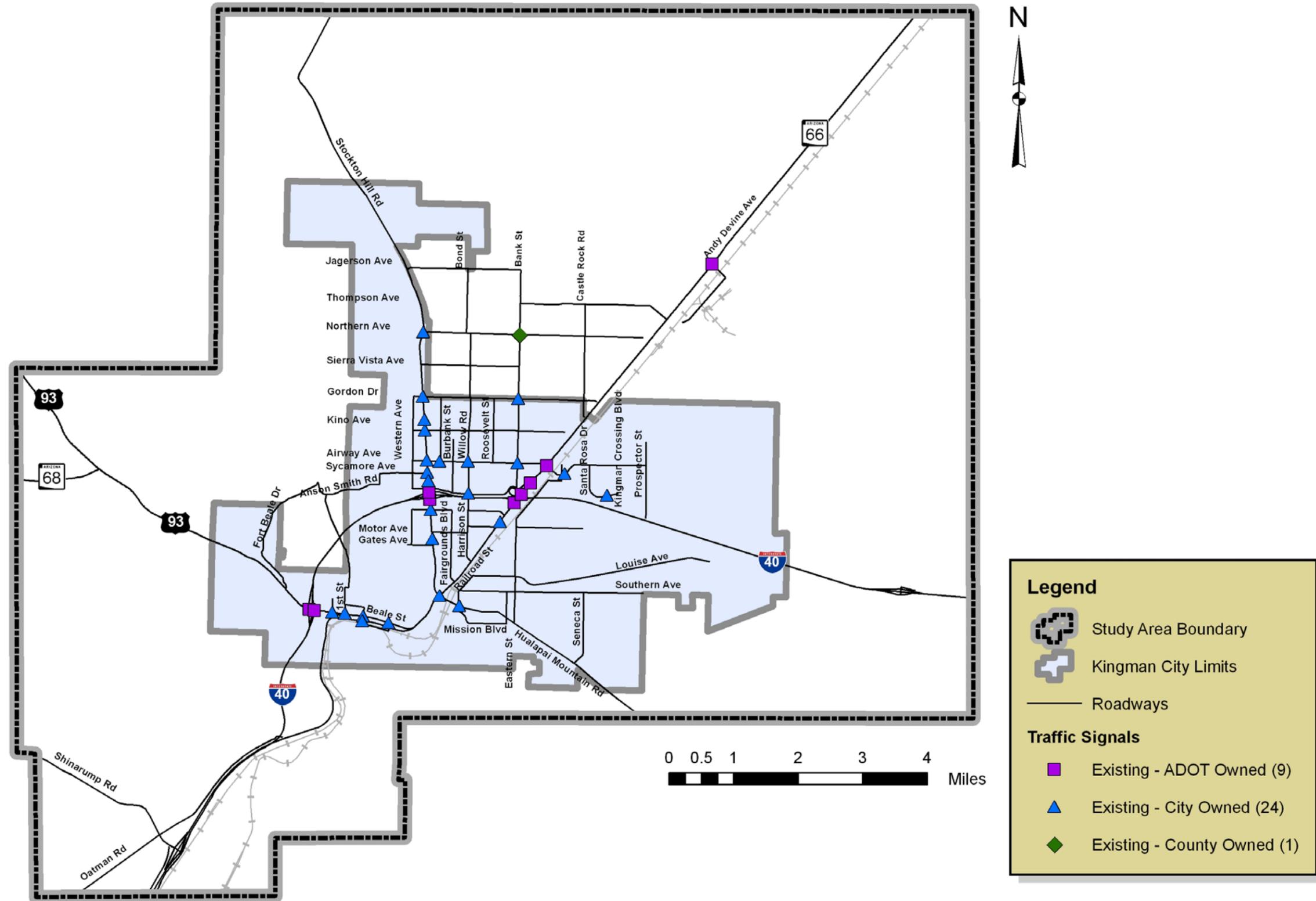


Figure 5: Current Traffic Signal Locations

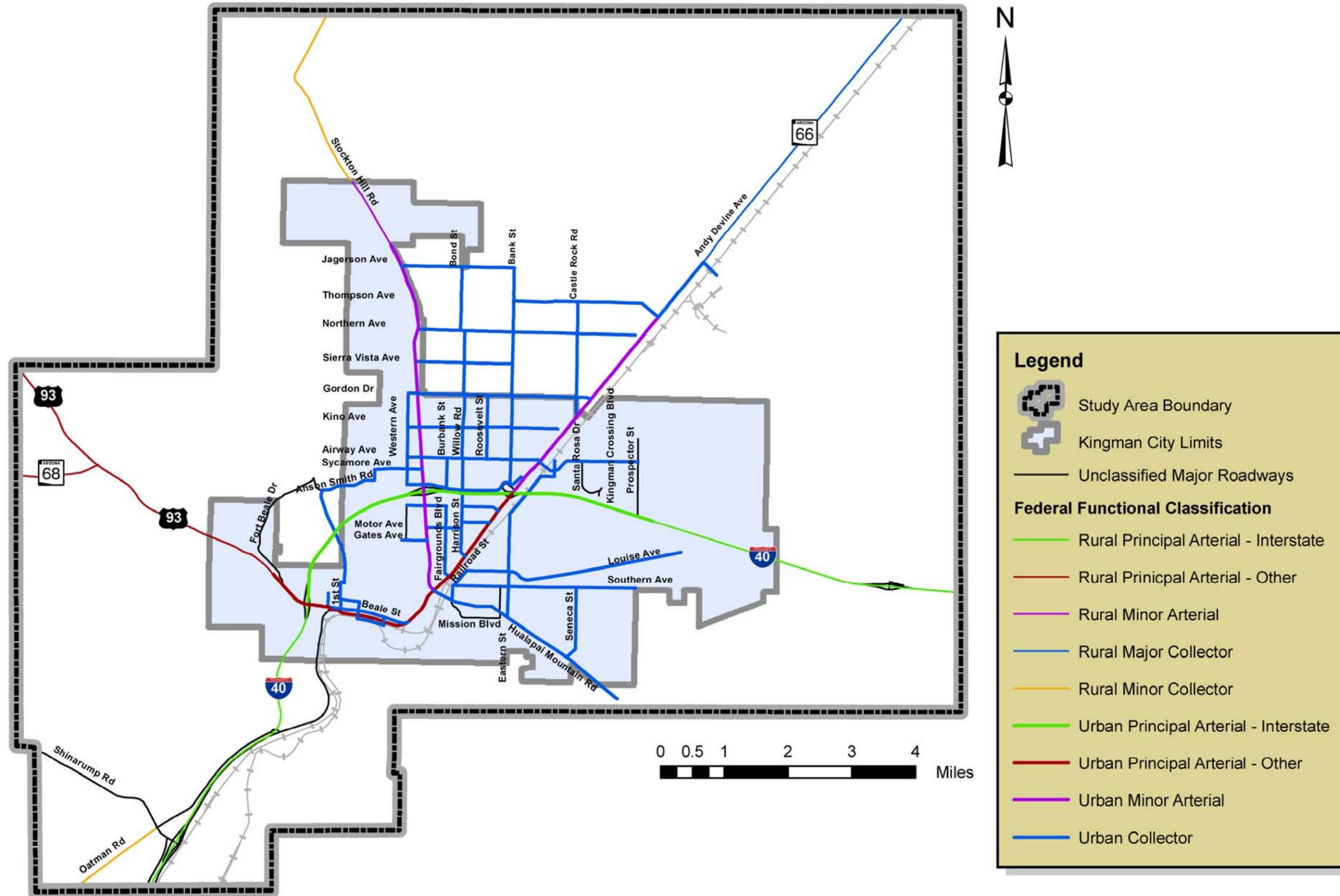


Figure 6: Roadways with Current Federal Functional Classifications.

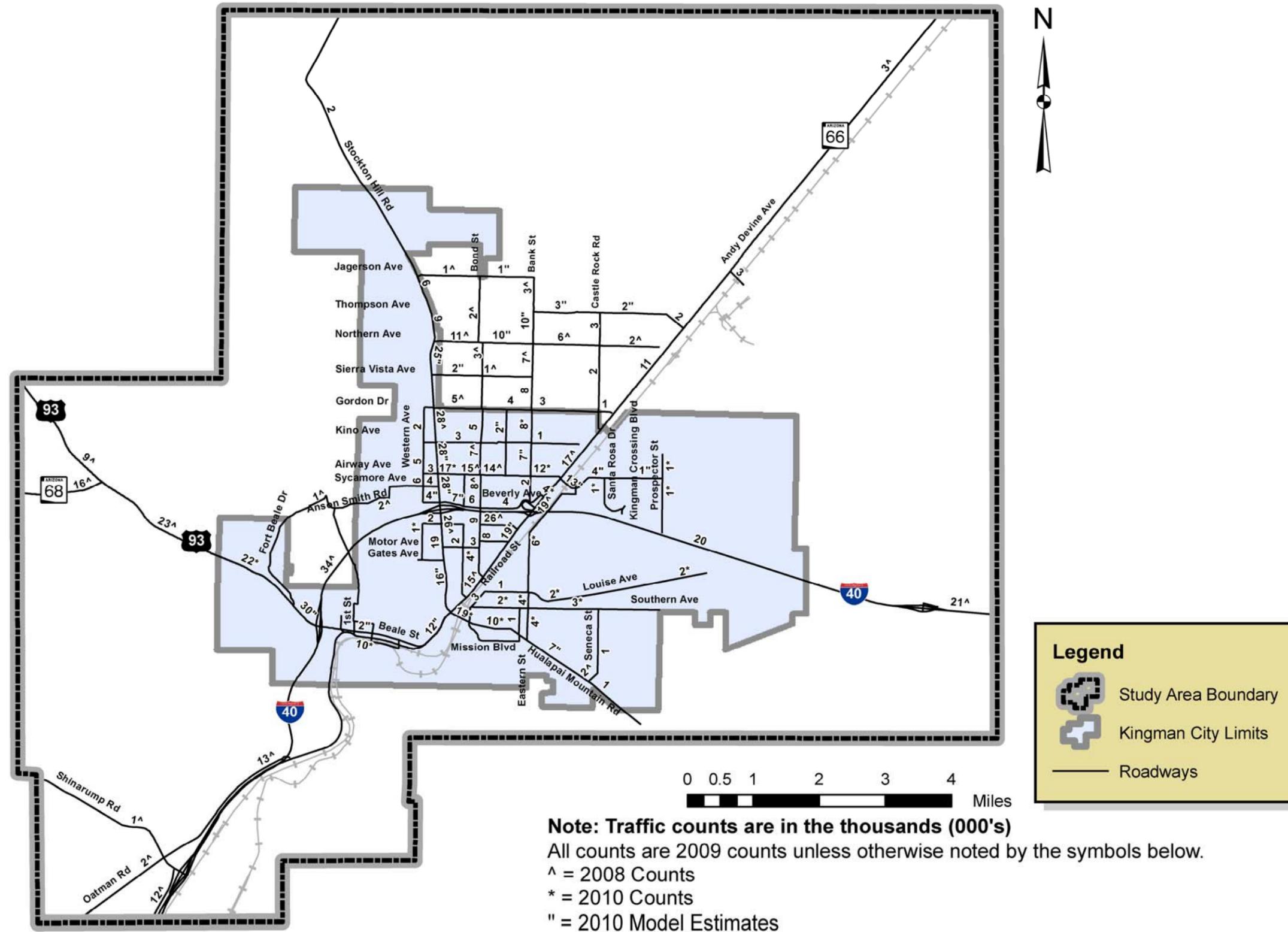


Figure 7: Current Daily Traffic Volumes

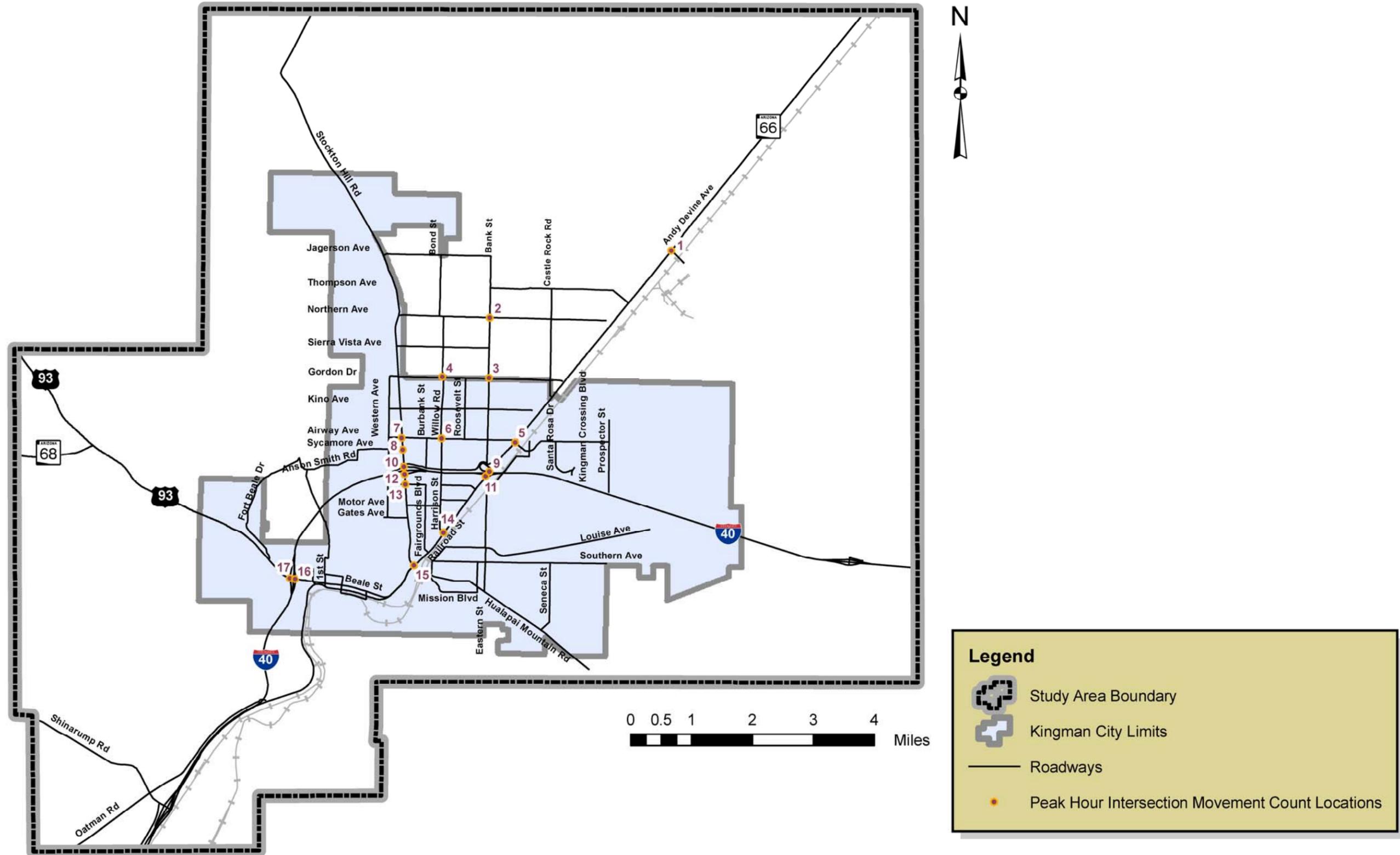


Figure 8: Peak Period Intersection Movement Volume Count Locations

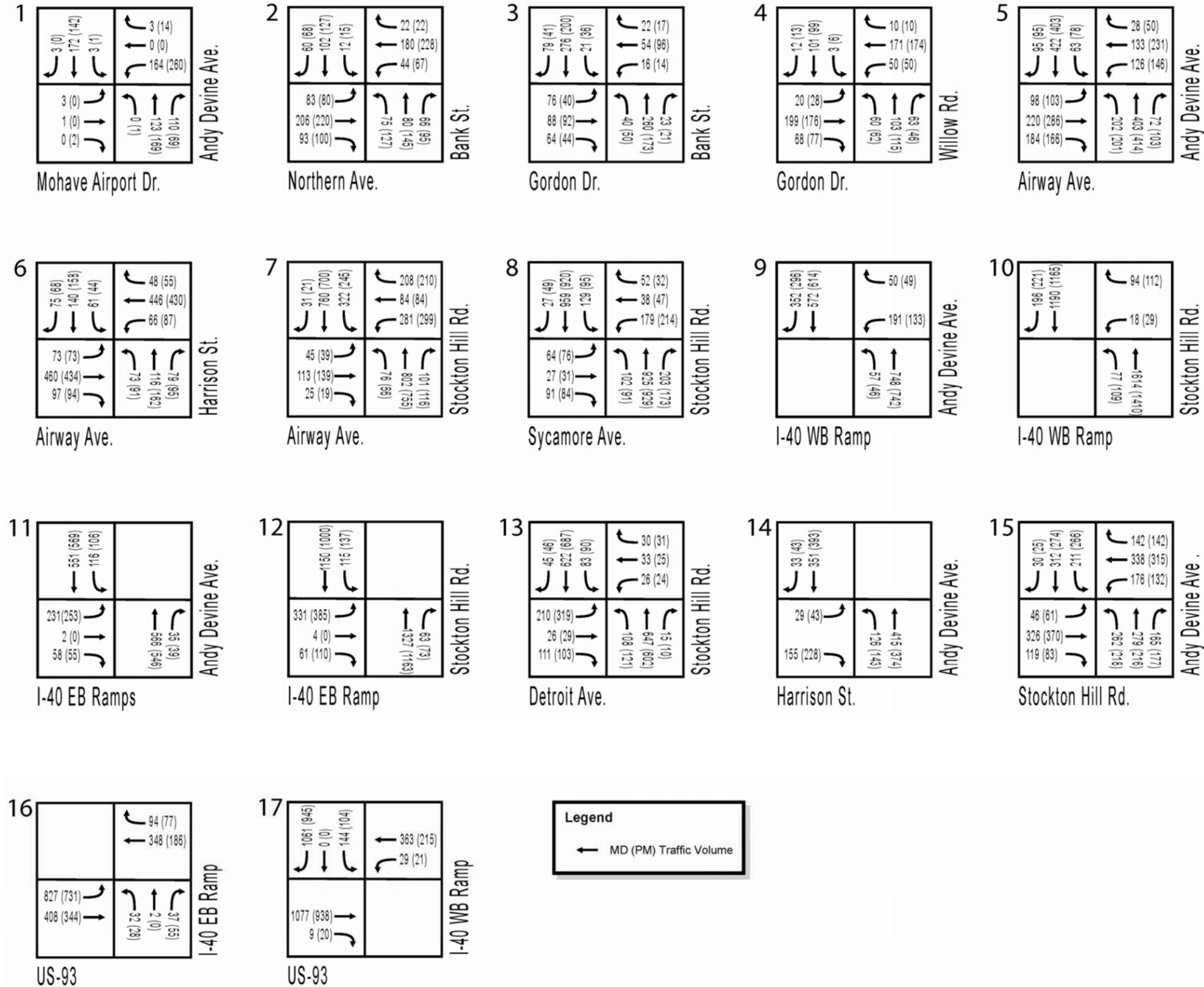


Figure 9: Current Peak Hour Intersection Movement Volumes

3.3.4 Roadway Levels of Service

Roadway traffic operations are defined and categorized by the amount of delay experienced by an average driver. The operations are categorized by a grading system called level of service (LOS), which has a letter designation ranging from A (no delay) to F (severe congestion). These levels are visually depicted in the photographs below.

LOS A



LOS D



LOS B



LOS E



LOS C



LOS F



LOS is generally defined as follows:

- LOS A represents free flow.
- LOS B represents reasonably free flow, but the presence of other users in the traffic stream begins to be noticeable.
- LOS C represents stable flow. The operation of individual users is somewhat affected by interactions with others in the traffic stream.
- LOS D represents high-density but stable flow. The operation of individual users is significantly affected by interactions with others in the traffic stream.
- LOS E represents unstable flow, meaning operating conditions are at or near the capacity level. The operation of individual users is heavily affected by interactions with others in the traffic stream.
- LOS F represents forced or breakdown flow, meaning operating conditions have exceeded the capacity level. The operation of individual users is severely affected by interactions with others in the traffic stream.

Source: Florida DOT Quality/Level of Service Handbook, 2002

For the Kingman area, roadways and intersections operating at LOS A, LOS B, and LOS C are considered to be acceptable and do not require capacity improvements.

Daily traffic volumes on study area roadways were compared to maximum daily volume thresholds for LOS C and LOS D to identify roadways that are approaching their maximum capacity. The daily volume thresholds for LOS C and LOS D shown in **Table 5** are derived from Table 4-1 in the Florida Department of Transportation's 2002 *Quality/Level of Service Handbook*.

Table 5. Daily Volume Thresholds for LOS C and LOS D

Type of Roadway	Number of Through Lanes	Maximum Daily Volume for LOS C	Maximum Daily Volume for LOS D
Collector/Arterial with no left-turn lanes	2	9,000	12,300
Collector/Arterial with left-turn lanes	2	11,200	15,400
Collector/Arterial with no left-turn lanes	4	19,500	24,500
Collector/Arterial with left-turn lanes	4	24,700	31,100
Collector/Arterial with raised medians and left-turn lanes	4	26,000	32,700
Arterial with left-turn lanes	6	38,300	46,700
Arterial with raised medians and left-turn lanes	6	40,300	49,200
Uninterrupted flow highway	2	13,800	19,600
Uninterrupted flow highway	4	47,800	61,800
Freeway	4	52,000	67,200
Freeway	6	81,700	105,800

Source: FDOT 2002 Quality/Level of Service Handbook, analysis by Kimley-Horn and Associates, Inc.

Roadway segments with existing daily volumes below the maximum volume threshold for LOS C likely do not need additional through capacity, while roadway segments with existing daily volumes above the maximum volume threshold for LOS D will probably need additional through capacity. For roadway segments with existing daily volumes between the maximum volume thresholds for LOS C and LOS D, more detailed analysis should be conducted to evaluate intersection geometry, signal timing, and number and spacing of driveways to determine if additional through capacity is needed.

Based on the maximum daily volume LOS thresholds in **Table 5** and the current daily volumes from **Figure 7**, no study area roadway segments currently exceed the maximum daily volume threshold for LOS D. The only roadway segments that currently exceed the maximum daily volume threshold for LOS C are Stockton Hill Road between Northern Avenue and Motor Avenue and US 93 between Fort Beale Drive and I-40.

3.3.5 Intersection Levels of Service

For the intersections where peak hour intersection movement volumes were counted (see **Figure 8** and **Figure 9**), a planning-level capacity analysis was conducted on the MD peak hour volumes (generally the highest peak hour volumes of the day) using the *HCS+* software package. This analysis identified the critical hourly volumes passing through the intersection and compared those volumes to the capacity of the intersection. This critical volume-to-capacity (v/c) ratio can be translated into corresponding LOS values, as shown in **Table 6**. Similar to the roadway segment LOS analysis, intersections with a v/c ratio that corresponds to LOS C or better likely do not need additional capacity, while intersections with a v/c ratio that corresponds to LOS E or worse probably need additional capacity. For intersections with a v/c ratio that corresponds to LOS D, more detailed analysis should be conducted to evaluate intersection geometry, signal timing, and proximity of adjacent driveways to determine if additional capacity is needed.

Table 6. Intersection V/C Ratios and Corresponding LOS Values

V/C Ratio	LOS Value
0.00 to 0.50	A
0.51 to 0.60	B
0.61 to 0.72	C
0.73 to 0.84	D
0.85 to 1.00	E
Greater than 1.00	F

Source: Highway Capacity Manual

Table 7 shows the study area intersections that currently have a critical v/c ratio corresponding to LOS D or worse according to the results of the peak hour capacity analysis. Four intersections along Stockton Hill Road, plus both the I-40 eastbound (EB) and I-40 westbound (WB) ramp intersections at the I-40/US 93 interchange, have a v/c ratio corresponding to LOS E during the MD peak hour. Additional capacity is likely needed at these intersections. The Stockton Hill Road and I-40 WB Ramps intersection has a v/c ratio that corresponds to LOS D during the MD peak hour. More detailed analysis should be conducted at this location to determine if additional capacity is needed. All other analyzed intersections have a MD peak hour v/c ratio corresponding to LOS C or better and likely do not currently need additional capacity.

Table 7. Intersections with Current Need for Improvements

Intersection	V/C Ratio	LOS Value
Stockton Hill Road and Airway Avenue	0.96	E
I-40 EB Ramps and US 93	0.92	E
I-40 WB Ramps and US 93	0.90	E
Stockton Hill Road and I-40 EB Ramps	0.90	E
Stockton Hill Road and Sycamore Avenue	0.89	E
Stockton Hill Road and Andy Devine Avenue	0.86	E
Stockton Hill Road and I-40 WB Ramps	0.83	D

3.3.6 Crash Analysis

Crash data was obtained from ADOT's Safety Data Mart for a five-year analysis period from 2004 to 2008. There were a total of 4,218 crashes in the study area during the analysis period.

Crash rates were computed for roadway segments with high numbers of crashes. Crash rates for roadway segments are expressed as "crashes per million vehicle miles traveled" (MVMT). Roadway segment average annual daily traffic (AADT) volume data was obtained from ADOT's Highway Performance Monitoring System (HPMS) for the year 2007. To calculate the crash rate using five years of crash data, the 2007 AADT volume on a particular roadway segment was assumed to represent the AADT for the five-year period for that roadway segment.

Crash rates were also computed for intersections with high numbers of crashes. Crash rates for intersections are expressed as "crashes per million entering vehicles" (MEV). Entering AADT volume data was obtained from ADOT's HPMS for the year 2007. At the I-40 ramp intersections where no HPMS volumes were available, ramp volumes were estimated based on count data provided by ADOT

and the peak hour counts taken in May 2010 as part of this study. To calculate the crash rate using five years of crash data, the 2007 entering AADT volume or estimated ramp volumes at a particular intersection were assumed to represent the entering AADT for the five-year period for that intersection.

The ten study area roadway segments with the highest crash rates are listed in **Table 8**. The ten study area intersections with the highest crash rates are listed in **Table 9**. The locations of these highest crash rate roadway segments and intersections are shown in **Figure 10**.

Table 8. Roadway Segments with Highest Crash Rates

Roadway Segment	From	To	Length (ft)	Number of Crashes 2004-2008	2007 AADT	Crash Rate (per MVMT)
Townsend St	Bank St	Armour Ave	1,200	22	2,800	18.94
Beale St	2 nd St	7 th St	2,750	26	3,700	7.39
Bank St	600 ft south of Northern Ave	John L Ave	1,850	20	5,200	6.01
Northern Ave	400 ft west of Bond St	600 ft East of Bond St	1,000	21	12,600	4.82
Stockton Hill Rd	400 ft south of Sierra Vista Ave	1,100 ft north of Sierra Vista Ave	1,500	27	16,700	3.12
Andy Devine Ave	Fairgrounds Blvd	500 ft north of Harrison St	2,600	49	17,900	3.05
Stockton Hill Rd	Pasadena Ave	700 ft north of Kino Ave	11,080	275	23,600	3.04
Andy Devine Ave	Michael St	1,100 ft north of Airway Ave	6,030	91	15,100	2.89
Harrison St	450 ft north of Detroit Ave	900 ft north of Beverly Ave	1,830	19	10,500	2.86
I-40	2,600 ft south of Beale St	4,800 ft south of Beale St	2,200	34	18,000	2.48

Source: ADOT, analysis by Kimley-Horn and Associates, Inc.

Table 9. Intersections with Highest Crash Rates

Intersection	Number of Crashes within 200 ft 2004-2008	Entering AADT for Street 1	Entering AADT for Street 2	Crash Rate (per MEV)
Andy Devine Ave and Armour Ave	61	11,100	2,300	2.49
Stockton Hill Rd and Airway Ave	130	24,900	7,000	2.23
Stockton Hill Rd and Sycamore Ave	88	26,300	1,400	1.74
Stockton Hill Rd and Detroit Ave	58	18,700	3,100	1.46
Stockton Hill Rd and I-40 EB Ramps	60	18,700	4,000	1.45
Stockton Hill Rd and Andy Devine Ave	65	15,700	15,300	1.15
Stockton Hill Rd and Beverly Ave	53	22,200	3,800	1.12
Andy Devine Ave and I-40 WB Ramps	26	11,100	2,400	1.06
Stockton Hill Rd and Gordon Dr	44	19,800	3,500	1.03
Andy Devine Ave and 4 th St	24	11,700	1,200	1.02

Source: ADOT Safety Datamart, analysis by Kimley-Horn and Associates, Inc.

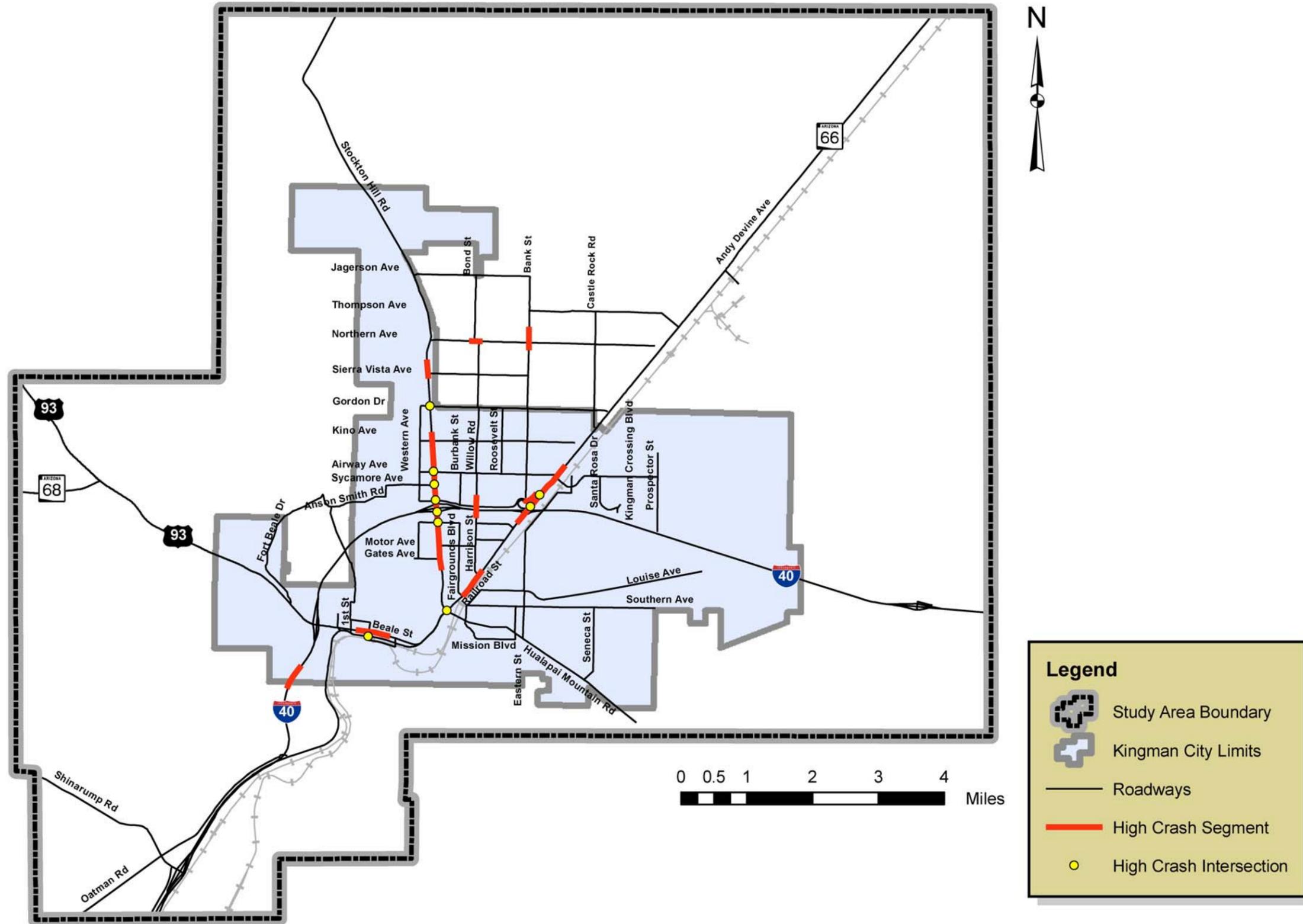


Figure 10: Roadway Segments and Intersections with Highest Crash Rates

3.4 *Alternate Modes of Transportation*

3.4.1 Public Transit

Public transit services are currently provided in the Kingman area through the Kingman Area Regional Transit (KART). The service area for KART is the city limits of Kingman and the Greater Kingman-Butler area.

KART operates four fixed routes in Kingman on an hourly basis. These routes are shown in **Figure 11**. The Yellow Route and Green Route operate from 6 a.m. to 8 p.m., Monday-Friday, and from 9 a.m. to 4 p.m. on Saturday. The Blue Route and Red Route operate from 6 a.m. to 6 p.m., Monday-Friday, and from 9 a.m. to 4 p.m. on Saturday.

Curb-to-curb service is also provided to the general public, seniors, and disabled persons within $\frac{3}{4}$ -mile of the fixed routes. This service requires advance reservations.

KART currently has 106 bus stops. The Red Route was recently extended to serve the new Hualapai Mountain Medical Center.

KART fares can be summarized as follows:

- \$1.00 for general boarding
- \$2.00 for curb-to-curb service for the elderly and disabled
- \$3.00 for curb-to-curb service for the general public

The transit rider must apply for and be approved in advance for curb-to-curb service. KART offers a discount coupon book of 30 coupons for the cost of \$24.00, which provides for a 20% discount or a cost of only \$0.80 per boarding. Children under ten and personal care assistants (PCA) ride free when accompanied with an adult or registered curb-to-curb client. Social service agencies may purchase bulk one-way curb-to-curb trips at 100 passes for \$1.75 each.

KART has an hourly stop at the senior center for the lunch and social programs offered. Mohave County and KART have an intergovernmental agreement (IGA) for Mohave County to purchase \$10,000 of one-way transportation coupons for their senior lunch program.

The total ridership on the KART system in FY 2009 (October 2008-September 2009) was 120,006 persons.

KART currently has two primary funding sources: the Federal Transit Administration's Rural and Small Urban Areas Program (known as 5311) for public transportation in areas with a population less than 50,000; and the City's General Fund. Previously, Local Transportation Assistance Funds (LTAF) from the Arizona state lottery revenues had also been a funding source for KART, but LTAF funding for KART terminated in July 2010 because the State legislature has reallocated the LTAF funds to other uses.

Because of incurred and anticipated reductions in revenue, KART reduced annual service hours from 21,050 to 18,616 starting on August 31, 2009. KART is anticipating a 10% reduction in ridership due to the decrease in service hours. Should revenues continue to decline, KART has tentative plans to further reduce planned annual service hours.

Greyhound Bus provides intercity bus services to and from Kingman. The station is located at KP Transportation, 3264 E. Andy Devine Avenue, in Kingman. Direct service to and from Las Vegas and Flagstaff is available from Kingman, with continuing or connecting services to many other destinations.

Public transit facilities such as bus bays and commuter park-and-ride lots are not currently available in the study area.

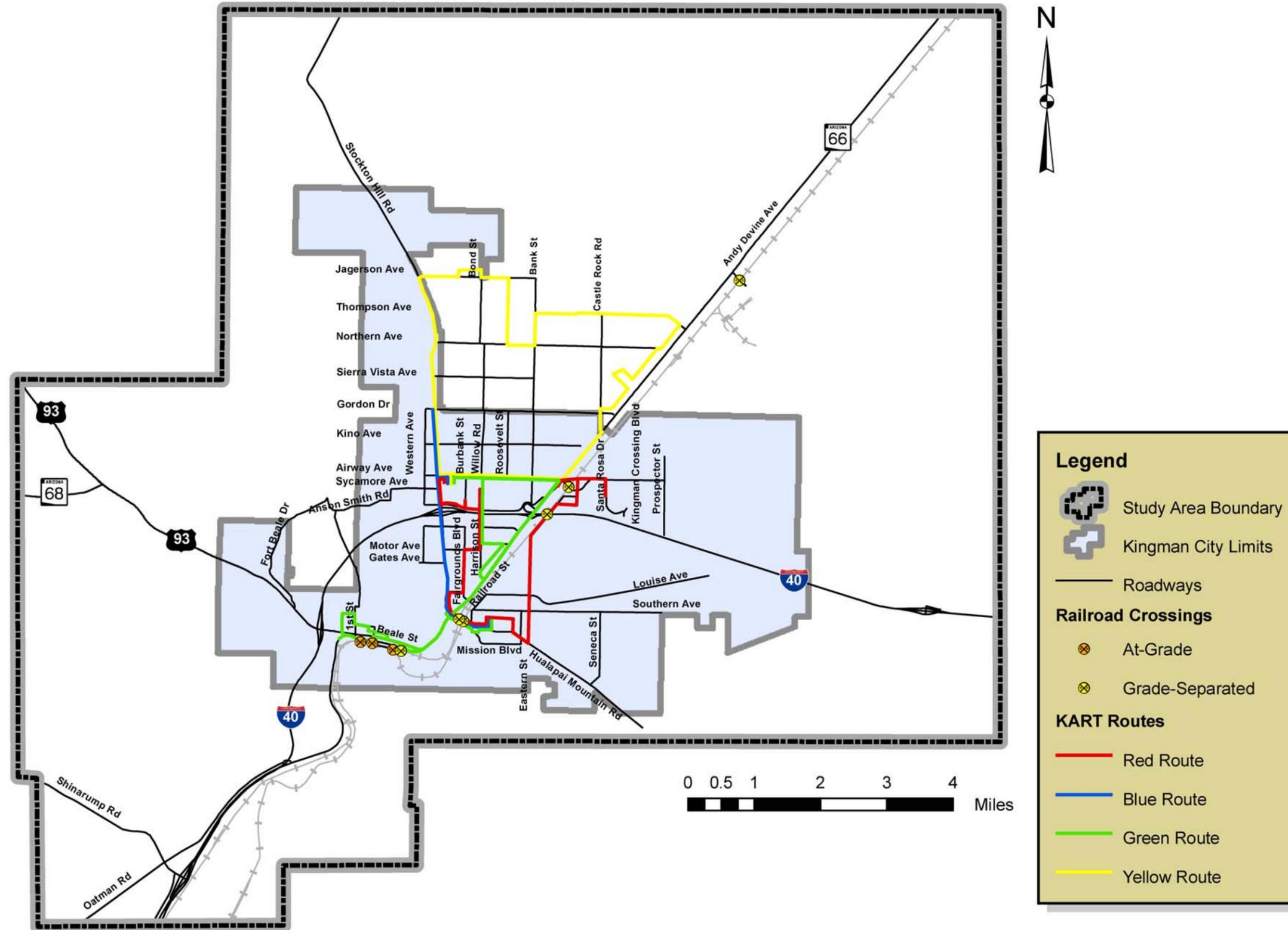


Figure 11: Current Transit and Rail Information

3.4.2 Specialty Transit

A variety of specialized providers operate in the study area to serve specific passenger groups. These include the Mohave Mental Health Center, which provides transportation services to support client needs, and WestCare, which contracts with child protective services to provide services to and from appointments, visits, school, and work within Mohave County seven days a week from 7 a.m. to 7 p.m.

3.4.3 Rail

The railroad tracks that run through the City of Kingman provide for both freight and passenger services. According to the Federal Railroad Administration (FRA) Office of Safety Analysis, up to 81 trains pass through Kingman each day. The Burlington Northern Santa Fe Railway Company (BNSF) provides freight services and Amtrak provides passenger services in Kingman. Both service providers use the BNSF tracks, which run from Los Angeles to Chicago as part of the BNSF Transcon transcontinental main line.

The old train depot in downtown Kingman was recently refurbished and now operates as the Kingman train station for passengers riding on Amtrak's "Southwest Chief" route, which has one train in each direction daily. In fiscal year 2010, the annual ridership at the Kingman Amtrak station was 10,160 persons according to Amtrak.

There are six grade-separated roadway crossings and three at-grade roadway crossings of the main railroad tracks in the study area. **Figure 11** shows the locations of these crossings.

3.4.4 Bicycles and Pedestrians

Bicycle and pedestrian facilities are an important part of a multimodal transportation network in that they provide various options for travel (which is especially critical for travelers who cannot drive). Elements that make up the bicycle network include designated bike routes, striped bike lanes, paved shoulders along roadways, wide curb lanes, multi-use paths, and sidewalks. Pedestrian networks are comprised of sidewalks, trails, and multi-use paths. **Figure 12** shows the existing bicycle and pedestrian facilities on major roadways in Kingman, along with the off-road multi-use paths.

The City's *Pedestrian and Bikeway Plan 2000* identifies the following design criteria for bicycle and pedestrian facilities:

- **Sidewalks:** Typically used by pedestrians, but can be used by inexperienced bicyclists, such as children; minimum 5 feet wide on major and minor arterials; minimum 4 feet wide on collectors, local, and rural streets
- **Trails:** Can be multi-use, which can accommodate bicyclists, pedestrians, equestrians, and other non-motorized transportation; dimensions vary.
- **Bike Lanes:** striped, one-way travel lane on the street; minimum 4 feet from the edge of pavement; minimum 5 feet from face of a curb
- **Bike Routes:** Not striped, but have identification signs at the beginning and end of the route, as well as at intersections; typically located on secondary roads; on streets without curbs, there should be a 4-foot wide minimum shoulder.
- **Wide Curb Lanes:** Wider lane on a street that provides more room for bicycle travel, but is not designated bicycle area and can be used by vehicles; 14 feet is the typical width for the outside lane with an optional lane stripe.
- **Multi-use Paths:** Provides a space for non-motorized transit users separate from vehicles. Can be located alongside streets and completely separated; a width of 10 feet is recommended.
- **Paved Shoulders:** Provided on rural stretches of highway; 4-6-feet is the minimum width.

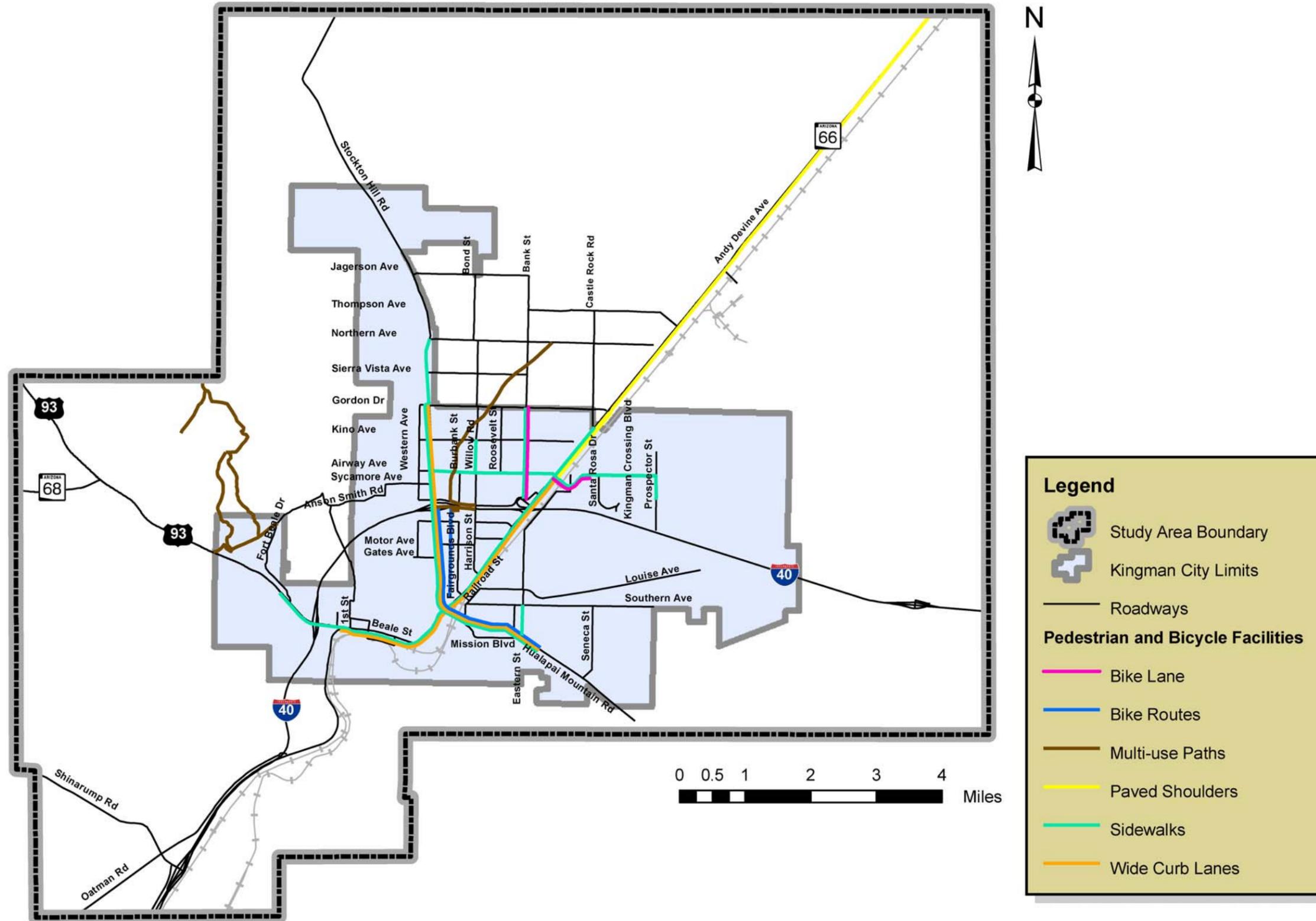


Figure 12: Current Bicycle and Pedestrian Facilities

3.4.5 Kingman Airport

The Kingman Airport is located five miles north of I-40 along State Route (SR) 66 adjacent to the main BNSF railroad tracks. The Kingman Airport encompasses nearly 3,000 acres. Airport facilities include two intersecting runways (6,831 and 6,725 feet long), two helipads, several parallel, connecting, and entrance/exit taxiways, a 2,640 square foot passenger terminal, 21 hangar facilities, and several parking aprons.

According to the 2006 *Kingman Airport Master Plan*, the total number of aircraft based at the Kingman Airport is approximately 305. Commercial air service is provided by Great Lakes Airlines, with service to Las Vegas, Nevada and Farmington, New Mexico.

The Kingman Airport currently has approximately 55,000 annual aircraft operations. Aircraft operations consist of:

- 60% local general aviation
- 37% transient general aviation
- 2% commercial
- 1% air taxi
- < 1% military

4 FUTURE CONDITIONS

This chapter summarizes the anticipated future conditions for the Kingman area transportation network to help identify future needs and deficiencies. The horizon year for this study is 2030.

4.1 Land Uses

Future commercial land uses are expected to be located in the same areas as existing commercial land uses, namely along Stockton Hill Road, Andy Devine Avenue, Bank Street, Armour Avenue, Airway Avenue, Northern Avenue, and in the downtown area along Beale Street. The area east of Andy Devine Avenue is expected to see significant increases in commercial land use near the proposed Kingman Crossing Boulevard and Rancho Santa Fe Parkway traffic interchanges (TIs) on I-40 when the interchanges are built.

Similarly, future industrial land uses are anticipated to be located in the same areas as existing industrial land uses, namely along Bank Street and Armour Avenue and at the Kingman Airport and Industrial Park.

Residential developments are anticipated to replace vacant land primarily on the northern and eastern edges of the City limits. Residential areas closer to the downtown area are anticipated to see increased densities over time as infill development and redevelopment occurs.

Most of the public land uses/ownership within the study area are anticipated to remain unchanged in the future. The major exceptions are the State Trust lands within and near the City limits, which could be sold by ASLD to developers.

4.2 Socioeconomic Data

4.2.1 Future 2030 Population and Employment

The 2030 population for the study area is estimated to be 77,363. This represents a compound annual growth rate of 2.0% compared to the 2010 population. As was the case with the 2010 population estimate, the 2030 population estimate is comprised of three components:

- The population within the City limits
- The population within the adjacent unincorporated land (the New Kingman-Butler CDP)
- The population within the expanded portion of the study area

The 2030 population estimates for the City of Kingman and the New Kingman-Butler CDP were obtained from the Arizona Department of Commerce. The population estimate within the expanded portion of the study area was extrapolated proportionally from the Arizona Department of Commerce 2030 population estimate for the remainder of northern Mohave County (known as the Remainder of Kingman North Census County Division). **Table 10** compares the 2010 and 2030 population estimates for the three components of the study area population.

The Arizona Department of Commerce population estimates show a reduced growth rate in each successive decade between 2000 and 2030 in the study area. The City of Kingman goes from a 4.68% annual growth rate in 2000-2010 to a 2.92% annual growth rate in 2010-2020 to a 1.86% annual growth rate in 2020-2030. The New Kingman-Butler CDP annual growth rate similarly goes from 1.90% to 1.46% to 1.04%.

Table 10. 2010 and 2030 Study Area Population

Portion of Study Area	2010 Population	2030 Population	2010-2030 Annual Growth Rate
Population within the City limits	31,722	50,872	2.39%
Population within the adjacent unincorporated land	17,875	22,911	1.25%
Population within the expanded portion of the study area	2,452	3,580	1.91%
Total	34,879	77,363	2.00%

Sources: 2000 Census, Arizona Department of Commerce

Employment data for 2030, which is shown in **Table 11**, was estimated using the same 0.38 ratio of employment to population that was used for 2010 employment, resulting in an estimated 2030 study area employment total of 29,397.

Table 11. 2030 Employment

Portion of Study Area	2030 Employment
Employment within the City limits	19,331
Employment within the adjacent unincorporated land	8,706
Employment within the expanded portion of the study area	1,360
Total	29,397

The population and employment totals shown in **Table 10** and **Table 11** were distributed among the 109 study area TAZs based on the 2005 KATS TAZ distribution for the year 2023, anticipated future land uses within each TAZ, aerial photography, and input from the City and County. The 2030 population and employment estimates for each individual TAZ are included in **Appendix 9-4**.

4.2.2 Title VI Populations

The 2010 Census will provide updated information on Title VI populations in the Kingman area. Comparing the 2010 Census Title VI information to the 2000 Census Title VI information may provide insights into how the percentages and locations of Title VI populations may change by 2030.

4.3 Roadways

4.3.1 Committed Roadway Improvement Projects

The 2030 baseline roadway network includes the existing roadways plus future “committed” improvement projects for which funding has been secured. This 2030 baseline roadway network constitutes the future “no-build” condition. Per information provided by the City and the County, **Table 12** contains the known future committed roadway improvement projects in the study area.

Table 12. Future Committed Roadway Improvement Projects

Committed Roadway Improvement Project Description	Year	Jurisdiction
Widen Bank Street from 2 to 3 lanes between Northern Avenue and Jagerson Avenue	2011	Mohave County
Add auxiliary lanes at select intersection approaches on Jagerson Avenue between Stockton Hill Road and Bond Street	2011	Mohave County
Widen Gordon Drive from 2 to 5 lanes between Stockton Hill Road and Bank Street	2014	City of Kingman

4.3.2 Other Planned Major Roadways

Planning and preliminary design activities have been conducted for several other proposed major roadways. While these planned roadways are not “committed” projects because funding has not been secured, these planned roadways should be considered when developing potential improvement concepts in the study area.

Much of the future growth in the Kingman area is expected to occur on the east side of the BNSF railroad tracks. This area is bisected by I-40 and there are not currently any TIs or overpasses east of the railroad tracks within the City limits. Design concept reports have been completed on two new TIs along I-40 east of the railroad tracks. These TIs are known as the Rancho Santa Fe Parkway TI and the Kingman Crossing Boulevard TI. The Rancho Santa Fe Parkway TI (formerly known as the Rattlesnake Wash TI) is planned to be located along I-40 at milepost 56.6 near Rattlesnake Wash. Tying into the Rancho Santa Fe Parkway TI would be approximately 3.7 miles of new roadway along the proposed Rancho Santa Fe Parkway alignment, which will connect Hualapai Mountain Road, Louise Avenue, Airway Avenue, and the Airport Industrial Park. The Kingman Crossing Boulevard TI is planned to be located along I-40 just south of the existing Santa Rosa Drive/Kingman Crossing Boulevard intersection. Kingman Crossing Boulevard is ultimately planned to extend south from this TI down to Southern Avenue.

A significant amount of future growth is also expected to occur north of the City. To accommodate this growth, a new five-lane arterial roadway known as the Grace Neal Parkway has been planned between Stockton Hill Road and Andy Devine Avenue ½ mile north of Jagerson Avenue.

Another roadway that could impact future traffic conditions in the Kingman area is a proposed freeway known as I-11. I-11 is a planned freeway connecting the cities of Phoenix and Las Vegas. In the Kingman area, I-11 coming from the east would match the existing I-40 alignment until it intersects US 93/Beale Street, where I-11 would turn northwest and match the existing US 93 alignment. This proposed freeway is currently in the early planning phases and has not yet officially been designated as I-11. **Figure 13** is an excerpt from ADOT’s recently completed 2010 Statewide Transportation Planning Framework Program that shows the general alignment of the proposed I-11 freeway (labeled interstate freeway “X” in the figure).

4.3.3 Traffic Control

The City of Kingman recently signalized the Hualapai Mountain Road and Railroad Street intersection and the Airway Avenue and Yavapai Street intersection. Additional locations in the City have been identified as potential locations for signalization based on completed signal warrant studies, but there is no schedule for construction.

4.3.4 Federal Functional Classifications

Several new roads in the study area have not yet been given a federal functional classification, including Kingman Crossing Boulevard and Santa Rosa Boulevard. These new roads could potentially be federally functionally classified in the future.

4.3.5 Traffic Volume Forecasts

A travel demand model was developed for the Kingman area to provide a tool for estimating future traffic volumes. The model utilizes TAZ population and employment data, typical vehicle trip generation characteristics, and roadway network information such as number of through lanes and speed limits to estimate traffic volumes on the roadway network. The model estimates traffic volumes by determining the number of vehicle trips produced and attracted in each TAZ and then assigning those trips to the adjacent roadway network. The model was developed utilizing the TransCAD software platform.

A 2010 baseline year model was developed using the 2010 TAZ population and employment data. The 2010 volumes generated by the model were compared to the available historical traffic count data. Where there were large discrepancies between the 2010 volumes and the historical counts, model parameters were adjusted until the 2010 model volumes were similar to the historical counts. Once the 2010 conditions model was calibrated, a 2030 horizon year baseline model was developed using the 2030 TAZ population and employment data and the existing roadway network. The 2030 volumes generated by the model were reviewed for reasonableness and minor adjustments were made as needed. **Figure 14** shows the projected baseline 2030 study area traffic volumes.

4.3.6 Roadway Levels of Service

Future roadway levels of service were identified by comparing the projected baseline 2030 daily traffic volumes to the daily volume LOS thresholds presented previously in **Table 5**. The roadway segments projected to have LOS D or LOS E in 2030 are shown in **Figure 15**. With the assumed LOS threshold being LOS C, the capacity of the roadway segments shown as LOS D or LOS E in **Figure 15** are projected to be deficient (i.e., capacity improvements will likely be needed). The locations of the current and future capacity-deficient roadway segments based on a LOS C threshold are shown in **Figure 16**.

4.3.7 Intersection Levels of Service

The major intersections within the identified capacity-deficient roadway segments may need additional capacity improvements to be able to provide acceptable traffic operations at the intersections. Traffic signals may also be warranted at some of the intersections within the identified capacity-deficient roadway segments.

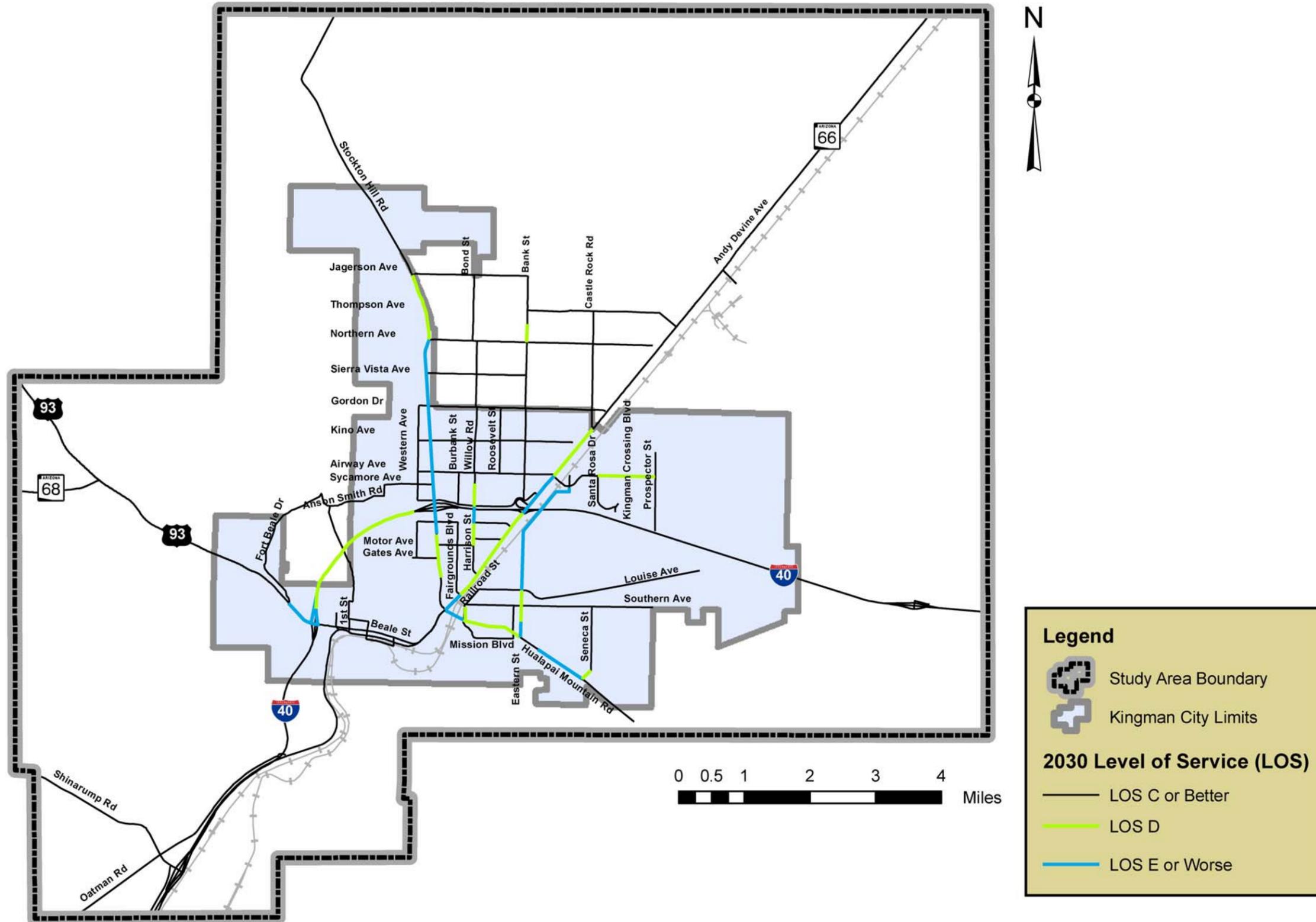


Figure 15: Baseline 2030 Roadway Segments with LOS D or LOS E

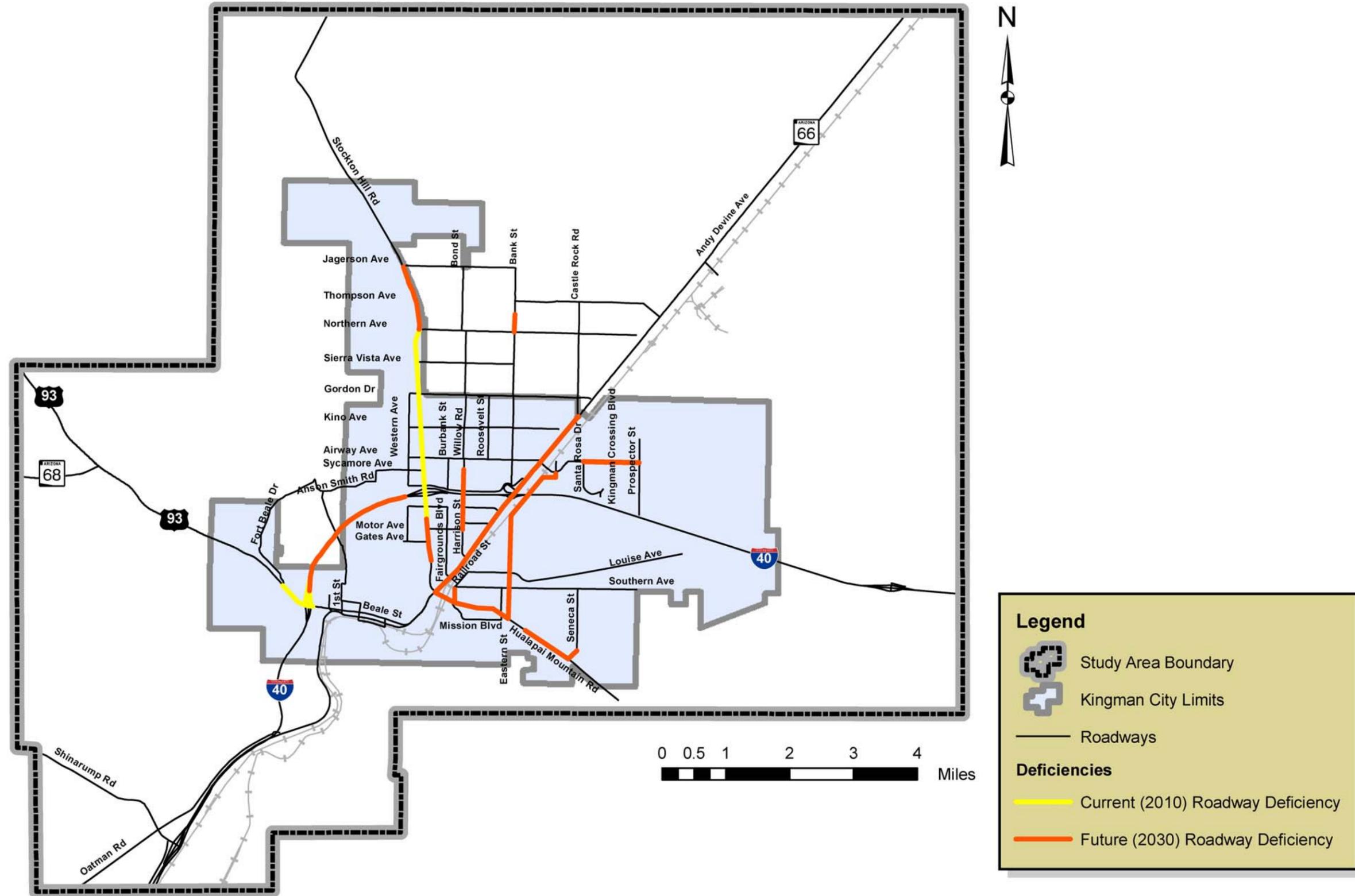


Figure 16: Current and Future Roadway Deficiencies with LOS C Threshold

4.4 Alternate Modes of Transportation

4.4.1 Public Transit

Future local public transit services in the study area are anticipated to be provided by KART. There are no “committed” expansion projects for additional KART routes or new public transit facilities such as bus bays and commuter park-and-ride lots. If the recent decline in available public transit funding continues, KART has tentative plans to further reduce service hours.

WACOG and ADOT recently completed a *Connector Program Transit Feasibility and Implementation Plan* that identified the need for, and the feasibility to implement, a regional transit service that connects Kingman, Bullhead City, and Lake Havasu City. If funding can be secured, regional transit service will likely be provided in the study area in the future, with transfer points between KART and the regional transit service anticipated to be located at major retail, medical, educational, and government facilities in the study area.

4.4.2 Specialty Transit

Specialty transit providers are anticipated to continue to operate in the study area to serve specific passenger groups.

4.4.3 Rail

Railroad traffic is anticipated to increase in the future as population and employment increase in the United States in general. The City has plans to provide several additional grade-separated roadway crossings of the railroad tracks but funding has not been secured for any of these crossings.

The City has initiated a study to determine the feasibility of establishing a railroad “quiet zone” at the three downtown Kingman at-grade crossings. When a quiet zone is established, trains are not permitted to blow their horns within the quiet zone except in emergencies. To establish a quiet zone, certain improvements to the crossing roadway and the associated signage must be implemented to meet the FRA quiet zone requirements. A preliminary review of existing conditions indicates that a quiet zone could likely be established with some improvements (i.e., installing raised medians and additional signage) to the three at-grade crossings.

There has been much discussion and planning recently at the national level regarding high-speed passenger rail. High-speed rail travel is generally economically competitive with highway and air travel between cities that are within the 100- to 600-mile range. According to the *2010 Statewide Rail Framework Study*, there is great potential to connect the cities of Phoenix and Las Vegas with a high-speed rail corridor, and the likely route for this high-speed rail corridor would pass through the Kingman area somewhere near the existing I-40/US 93/Beale Street TI. If a high-speed rail stop is located in Kingman, it could result in further economic and population growth in Kingman.

4.4.4 Bicycles and Pedestrians

At the national level, there is emphasis on complying with the Americans with Disabilities Act and providing more bicycle and pedestrian facilities along roadways to create “complete streets” (see www.completestreets.org). Complete streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities should be able to safely move along and across a complete street.

Elements of a complete street can include sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible transit stops, frequent crossing opportunities, median islands, accessible pedestrian signals, curb extensions, and more. A complete street in a rural area may have quite a different cross-section than a complete street in an urban area, but both should be designed to balance safety and convenience for everyone using the roadway.

Table 13 shows the future committed bicycle and pedestrian improvement projects in the study area. Other improvement projects are planned but funding has not been secured.

Table 13. Future Committed Bicycle and Pedestrian Improvement Projects

Committed Bicycle and Pedestrian Improvement Project Description	Year	Jurisdiction
Construct the Eastern Pathway along Railroad Street between Hualapai Mountain Road and Louise Avenue	2012	City of Kingman
Provide sidewalk and bike lanes as part of the widening of Gordon Drive from 2 to 5 lanes between Stockton Hill Road and Bank Street	2014	City of Kingman

4.4.5 Kingman Airport

To accommodate anticipated growth in aviation operations, the *2006 Kingman Airport Master Plan* recommends constructing a new terminal building, several new taxiways, and an extension of Runway 3-21 to 7,000 feet. The master plan also recommends reserving the lands south and east of the airport along the edge of airport property for potential industrial uses. Both the Kingman and Mohave general plans identify this area surrounding the airport as industrial and mention that the majority of new industrial businesses should be directed to this area.

5 IDENTIFIED CURRENT AND FUTURE NEEDS

Based on the analysis of current and future conditions, as well as comments from the TAC, the public, and community leaders, transportation system needs in the study area were identified. The needs result from a variety of factors, including roadway congestion, high crash areas, physical barriers such as I-40 and the railroad, inadequate traffic control devices, land development and growth projections, gaps in pedestrian and bicycle facilities, and inadequate transit service. The identified needs are discussed below, grouped by type of need.

5.1 Existing and Future Roadway Capacity Deficiencies

Capacity deficiencies were evaluated for intersections and roadway segments. Existing deficiencies were identified using a LOS C threshold for locations where existing traffic volume data was available. Future deficiencies were also identified using a LOS C threshold and were based on the 2030 traffic forecasts prepared for the study. The following locations were noted to have existing or future capacity deficiencies.

5.1.1 Roadway Segments

- US 93: I-40 to Fort Beale Drive
- I-40: Beale Street to Stockton Hill Road
- Hualapai Mountain Road: Andy Devine Avenue to Seneca Street
- SR 66/Andy Devine Avenue: I-40 to Castle Rock Road
- Eastern Street/Railroad Street: Airway Avenue to Hualapai Mountain Road
- Stockton Hill Road: Andy Devine Avenue to Jagerson Avenue
- Harrison Street: Motor Avenue to Airway Avenue
- Bank Street: Northern Avenue to Thompson Avenue
- Airway Avenue: Santa Rosa Drive to Prospector Street

5.1.2 Intersections

- I-40 WB Ramps and US 93
- I-40 EB Ramps and US 93
- Stockton Hill Road and Airway Avenue
- Stockton Hill Road and Andy Devine Avenue
- Stockton Hill Road and I-40 EB Ramps
- Stockton Hill Road and I-40 WB Ramps
- Stockton Hill Road and Sycamore Avenue

5.2 Roadway Safety

A review of recent crash history was completed and the highest roadway segment and intersection crash locations based on crash rates were identified. They are as follows.

5.2.1 Roadway Segments

- Beale Street: 2nd Street to 7th Street
- Bank Street: Northern Avenue to John L Avenue
- Harrison Street: Detroit Avenue to Beverly Avenue
- I-40: vicinity of south City limit
- Northern Avenue: vicinity of Bond Street

- Stockton Hill Road: vicinity of Sierra Vista Avenue
- Stockton Hill Road: Pasadena Avenue to Kino Avenue
- Andy Devine Avenue: Pasadena Avenue to Harrison Street
- SR 66/Andy Devine Avenue: Michael Street to Airway Avenue
- Townsend Street: Bank Street to Armour Avenue

5.2.2 Intersections

- Andy Devine Avenue and 4th Street
- SR 66/Andy Devine Avenue and Armour Avenue
- Andy Devine Avenue/SR 66 and I-40 WB Ramps
- Stockton Hill Road and Airway Avenue
- Stockton Hill Road and Andy Devine Avenue
- Stockton Hill Road and Beverly Avenue
- Stockton Hill Road and Detroit Avenue
- Stockton Hill Road and Gordon Drive
- Stockton Hill Road and I-40 EB Ramps
- Stockton Hill Road and Sycamore Avenue
- Northern Avenue and Bond Street

5.3 Access

The railroad and I-40 are transportation corridors that have created physical barriers for other transportation facilities that restrict access – including emergency access – to various parts of the region. There are a limited number of crossings of these facilities, and in the case of the railroad, some of the crossings are at-grade crossings. As a result, the choice of travel routes is limited.

Good access and services can provide a direct economic benefit to an area. Providing access can help spur development and allow for new homes and businesses to be built, which leads to other improvements. Currently, the majority of the land north of I-40 and east of the railroad tracks is vacant. Existing access to and from the rest of the City is limited to Eastern Street and Airway Avenue. Additional access will increase the development potential of this area. Also, the Kingman Airport Authority has indicated the need for additional airport access in order to be able to attract new businesses.

5.4 Transit

New and stable funding sources are needed to replace the recent loss of the LTAF funding for public transit operations and ensure the long-term viability of KART. Bus pullouts are desired, as are complete streets cross-sections that better accommodate transit operations. As population and employment grow and sustainable transportation becomes a bigger issue, expansion of KART's routes and an increase in service frequency will likely be needed, as will a regional transit system that links Kingman with Bullhead City and Lake Havasu City.

5.5 Rail

More grade-separated crossings are needed to improve mobility in Kingman across the railroad tracks. To better promote livability and sustainability, particularly in the downtown area, the City should pursue the establishment of railroad quiet zones.

The City should advocate the development of a high-speed rail stop in Kingman if a high-speed rail line is constructed between Phoenix and Las Vegas.

5.6 Bicycles and Pedestrians

Complete streets cross-sections should be developed that better accommodate bicycle and pedestrian travel. Grade-separated crossings of major roadways may be needed at select locations to better promote safety for bicyclists and pedestrians.

Several of the major roadways do not include bicycle facilities such as bike lanes, wide curb lanes, or paved shoulders. There is a need for a clearly-defined, continuous bicycle network.

Wider sidewalks are needed on the arterial roadways to provide better pedestrian mobility. Sidewalks are also needed on many of the major roadways that currently do not provide any pedestrian facilities. There is a need for a clearly-defined, continuous pedestrian network.

Mohave County is planning on securing a Safe Routes to School (SRTS) grant to improve bicycle and pedestrian facilities and travel near Manzanita Elementary. Other school sites in the region would benefit from future SRTS grants to improve bicycle and pedestrian facilities near schools.

As population and employment grow and sustainable transportation becomes a bigger issue, additional bicycle and pedestrian facilities will be needed.

5.7 Kingman Airport

To accommodate anticipated growth in aviation operations, a new terminal building, several new taxiways, and an extension of Runway 3-21 to 7,000 feet are needed.

6 EVALUATION OF IMPROVEMENT OPTIONS

Evaluation measures were created against which potential improvement options could be compared to determine how well the improvement options address the identified needs and meet the study's goals and objectives.

6.1 *Evaluation Measures*

Evaluation measures are factors that should be considered in the analysis of a potential improvement project to identify potential benefits, impacts, and constraints. The measures are not all quantifiable; some are purely qualitative. More detailed analysis of evaluation measures would be required during the scoping, concept development, and design phase of an improvement project. The following is a description of the evaluation measures used in this study.

6.1.1 Cost

Planning level construction cost estimates are estimated for each potential improvement. The costs are based on unit costs for each project type. The cost is calculated in 2010 dollars.

6.1.2 Right-of-Way Impacts

The need for new right-of-way for a potential improvement should be determined early in the project development process because the acquisition of right-of-way can take longer than the design and construction and because the project budget needs to include funds for acquisition of right-of-way. This is a quantitative measure that identifies if and how much right-of-way is anticipated to be needed. It does not include right-of-way for easements or construction activities.

6.1.3 Impacts to Existing Businesses/Residences

This is a quantitative measure that documents the number of buildings expected to be acquired as part of a potential improvement. The number is a conservative estimate at the planning stage.

6.1.4 Engineering Challenges

Engineering challenges require special design features in order to make a potential improvement feasible. Engineering challenges could include drainage, terrain, railroad crossings, and utilities.

6.1.5 Level of Service/Delay

Level of service and delay are quantitative measures for how much traffic congestion occurs. These measures give an indication of the overall impact of a potential improvement on the efficiency of the transportation system.

6.1.6 Accessibility/ Mobility

This is a qualitative measure of a potential improvement's ability to improve the overall transportation system in terms of accessibility and mobility.

6.1.7 Network Continuity

This is a qualitative measure to assess a potential improvement's impact on providing a continuous transportation system by eliminating gaps that may exist in the current system.

6.1.8 Environmental Impacts

This is a qualitative review that notes potential environmental issues. At the planning level, it is a visual observation of possible environmental constraints such as adjacent schools or parks or natural habitat.

6.1.9 Multimodal Compatibility

This is a qualitative measure that considers whether a potential improvement addresses multiple modes of travel.

6.1.10 Safety

This is a qualitative assessment that considers the impact a potential improvement may have on safety.

6.2 Improvement Options

A variety of multimodal improvement options were developed that address the issues previously outlined. A description of each improvement option is provided along with an estimated construction cost. The construction cost is a planning estimate in current dollars based on the general description of the improvement. More detailed project costs will need to be developed during the scoping phase of each project and included in the City of Kingman or Mohave County Capital Improvement Program (CIP) and the WACOG Transportation Improvement Program (TIP).

6.2.1 New or Improved Two-Lane Roadway

The two-lane cross-section includes one travel lane in each direction plus a two-way left-turn lane. This cross-section may be applied where no road, a dirt road, or a two-lane road without a two-way left-turn lane exists today. The outside features of the cross-section include curb, gutter, and sidewalk, or shoulders, depending on the character of the area and the available roadway drainage infrastructure. Bike lanes should be included if the street provides a logical connection for bicycle circulation. If it is a section-line street, the recommended right-of-way is 84-100 feet, or 10.2 to 12.1 acres per mile. If it is a midsection-line street, the recommended right-of-way is 60-80 feet, or 7.3 to 9.7 acres per mile. The estimated construction cost for one mile of new two-lane road is \$1.0 to \$3.0 million, which includes the cross-section described above, drainage, and irrigation improvements, as well as intersection improvements where needed.

6.2.2 New or Widened Four-Lane Roadway

The four-lane cross-section includes a bike lane and two travel lanes in each direction with a center two-way left-turn lane (unless safety or access considerations indicate a raised median should be provided). The outside features of the cross-section include curb, gutter, and sidewalk. If the improvement is along a transit route, bus pull-outs and/or shelters are also included. For this analysis, it is assumed that any existing pavement would not be salvaged. A four-lane street at a major intersection would include one left-turn lane and one right-turn lane on each approach.

The suggested right-of-way for this cross-section is 100 feet widening to 110 feet at major intersections. While this right-of-way width is considered desirable, there may be instances where less than 100 feet exists and the cross-section can be adapted to fit within available right-of-way. The estimated construction cost for one mile of four-lane road is \$3.0 to \$5.0 million, which includes the cross-section described above, street lighting, traffic signals, drainage, and landscaping.

6.2.3 Widened Six-Lane Roadway

The six-lane cross-section includes a bike lane, three travel lanes in each direction, and a raised median. The outside features of the cross-section include removal and replacement of existing curb, gutter, and sidewalk. It is assumed that the existing pavement does not have to be reconstructed, but would receive an overlay. A six-lane street at a major intersection would include two left-turn lanes and one right-turn lane on each approach.

The desirable right-of-way for this cross-section is 130 feet, widening to 150 feet at major intersections. There may be instances where less than 130 feet exists, in which case it may be possible to adapt the cross-section to fit within the available right-of-way. The estimated construction cost for widening one mile of four-lane road to a six-lane road is \$3.0 to \$4.0 million, which includes the cross-section described above, street lighting, traffic signals, drainage, and landscaping.

6.2.4 Intersection Improvement

The scope of an intersection improvement could include additional turn lanes and/or additional through lanes, traffic signal modifications, bus pull-outs and shelters, or safety improvements. Signalized intersections are often the capacity bottleneck along an arterial street and appropriate intersection improvements can delay the need for arterial street widening. The estimated construction cost for an intersection improvement is \$1.0 to \$3.0 million.

6.2.5 New Freeway Interchange

A new freeway interchange provides a grade-separated intersection(s) between I-40 and a crossing street and typically includes bridges, ramps, traffic signals, and additional improvements for the crossing street. Spacing of interchanges is important so as not to negatively impact the operation of I-40. The estimated construction cost for a new interchange is \$20.0 to \$40.0 million.

6.2.6 Reconstruct Interchange

Improvements to an existing interchange vary depending on the identified need. Improvements can include modifications to the local street/ramp intersections, changes to the freeway to add auxiliary lanes or two-lane ramps, or major changes to provide directional freeway ramps. The estimated construction cost for interchange modifications varies from \$5.0 to \$40.0 million.

6.2.7 New Crossing of I-40

There are existing streets in the study area that are not continuous because they do not cross I-40. This type of project involves connecting or extending an existing street across I-40 with an overpass or underpass to improve access and mobility. There are no ramp connections between the crossing street and I-40. The estimated construction cost for a new crossing of I-40 is \$10.0 to \$15.0 million.

6.2.8 Railroad Grade Separation

A railroad grade separation provides a crossing of the railroad where the road crosses over or under the railroad so that there is no conflict between the train and vehicles. A grade-separated crossing provides a safety benefit and reduces delay compared to an at-grade crossing. The estimated cost for a grade separated crossing is \$8.0 to \$12.0 million.

6.2.9 Railroad Quiet Zone Improvements

A railroad quiet zone can be applied to one or more railroad/roadway at-grade crossings. If satisfactory supplemental safety measures can be implemented at each of the crossings within the planned quiet zone, then a quiet zone can be established and the train horn/whistle is not allowed to sound when passing through the quiet zone except in case of emergencies.

6.2.10 Highway Safety Improvement Program

The Highway Safety Improvement Program (HSIP) was established as a core federal program as part of SAFETEA-LU. Per the Arizona HSIP Manual, WACOG is currently allocated 10 percent of the funding set aside for local roadways that are regionally managed, which translates to \$600,000 of safety-related funding for WACOG per year. WACOG member agencies can submit applications for local eligible safety improvement projects to utilize the HSIP funding allocated to WACOG.

6.2.11 Improve Transit Frequency

This improvement increases the frequency of transit vehicles along a particular route. Currently, all the KART transit routes operate on one-hour headway (i.e., during operating hours, a bus will pass a specific stop once every 60 minutes). In order to increase the frequency of transit service, additional buses and operators will be required. The estimated annualized cost of doubling the transit frequency during the peak periods (i.e., 30-minute headways) is \$500,000 per year per route.

6.2.12 New Transit Route

This improvement is for the start of a new transit route that does not exist today. The new transit route would serve parts of the study area that do not have transit service but exhibit characteristics that indicate transit service would be beneficial. New transit routes would require additional buses and operators. The estimated annualized cost of a new local transit route (including capital and operating costs) is \$500,000 per year.

6.2.13 Add Bus Pull-Outs and Shelters

The addition of bus pull-outs and shelters would normally be included with a roadway improvement. However, there may be locations where no roadway improvements are planned, but bus pull-outs and shelters would provide a significant benefit to the transit user. If bus pull-outs are constructed, shelters would be included; however, shelters could be constructed without pull-outs. The estimated cost is \$50,000 to \$150,000 for each shelter/bus pull-out.

6.2.14 Add Bike and Pedestrian Facilities

This improvement includes the addition of bike lanes along an existing roadway either by re-striping or roadway widening and the addition of sidewalk. The purpose of this improvement is to close a gap in existing bike and/or pedestrian facilities. The estimated cost is \$100,000 to \$500,000 per mile.

6.2.15 Add Sidewalk

This improvement includes the addition of sidewalk along an existing roadway. The purpose of this improvement is to close a gap in existing pedestrian facilities. The estimated cost is \$250,000 to \$500,000 per mile.

6.2.16 Safe Routes to School

The purpose of the federal Safe Routes to School (SRTS) Program is to make walking and bicycling to school a safe and routine activity. The Program makes funding available for a wide variety of programs and projects – from building safer street crossings to establishing programs that encourage children and their parents to walk and bicycle safely to school.

SRTS programs are sustained efforts by parents, schools, community leaders and local, state, and federal governments to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school.

6.2.17 Multi-Use Pathway

A multi-use pathway is generally a facility on its own right-of-way separate from the roadway. It can be associated with other infrastructure such as drainage facilities, railroads, or linear parks. The estimated cost is \$150,000 to \$250,000 per mile.

7 RECOMMENDED IMPROVEMENTS

Based on the outcome of the evaluation of the potential improvement options, the following are the recommended improvements to address the study area's identified current and future needs.

7.1 Recommended Roadway Improvements

The recommended improvements related to roadway segments are grouped in categories by type of improvement. These roadway improvement projects, where feasible, should incorporate complete streets concepts that accommodate multimodal travel and not just automobile travel. Recommended roadway cross-sections for different types of local roadway classifications are provided in **Appendix 9-5**.

A 2030 travel forecasting model run that incorporates the recommended roadway segment improvement projects was prepared. The resulting 2030 traffic volume forecasts are presented in **Figure 17**. A review of the forecasts indicates that only one roadway segment – Stockton Hill Road from I-40 to Airway Avenue – is expected to operate at LOS D when all the roadway improvements are constructed. All other roadways are expected to operate at LOS C or better with the recommended improvements.

7.1.1 New or Improved Two-Lane Roadway

There are areas of the region that do not have a well-defined street system or where existing streets are unpaved, without curb and gutter, or do not provide left-turn lanes. New or improved two-lane collector roadways are recommended for the following roadway segments.

- Glen Road: Airway Avenue to Gordon Drive (in current City CIP)
- Central Street: Hualapai Mountain Road to Airfield Avenue
- Seneca Street: Hualapai Mountain Road to Southern Avenue
- Cherokee Street: Cheyenne Avenue to Airfield Avenue
- Cheyenne Avenue: Seneca Street to Cherokee Street
- Dakota Avenue: Central Street to Cherokee Street
- Airfield Avenue: Eastern Avenue to Cherokee Street
- Castle Rock Road: Thompson Avenue to Grace Neal Parkway
- Prospector Street: Thompson Avenue to Grace Neal Parkway
- Western Avenue: Beverly Avenue to Gordon Drive
- Anson Smith Road/White Cliffs Road: Stockton Hill Road to 1st Street
- Fort Beale Drive: Anson Smith Road to US 93
- Southern Avenue: Eastern Street to Rancho Santa Fe Parkway (in current City CIP)
- Rancho Santa Fe Parkway: Hualapai Mountain Road to Louise Avenue (in current City CIP)
- Rancho Santa Fe Parkway: Airway Avenue to Industrial Boulevard (in current City CIP)
- Airway Avenue: Prospector Street to Rancho Santa Fe Parkway
- Industrial Boulevard: Rancho Santa Fe Parkway to Mohave Airport Drive
- Slaughter House Canyon Road: Mission Boulevard to Topeka Street (in current City CIP)

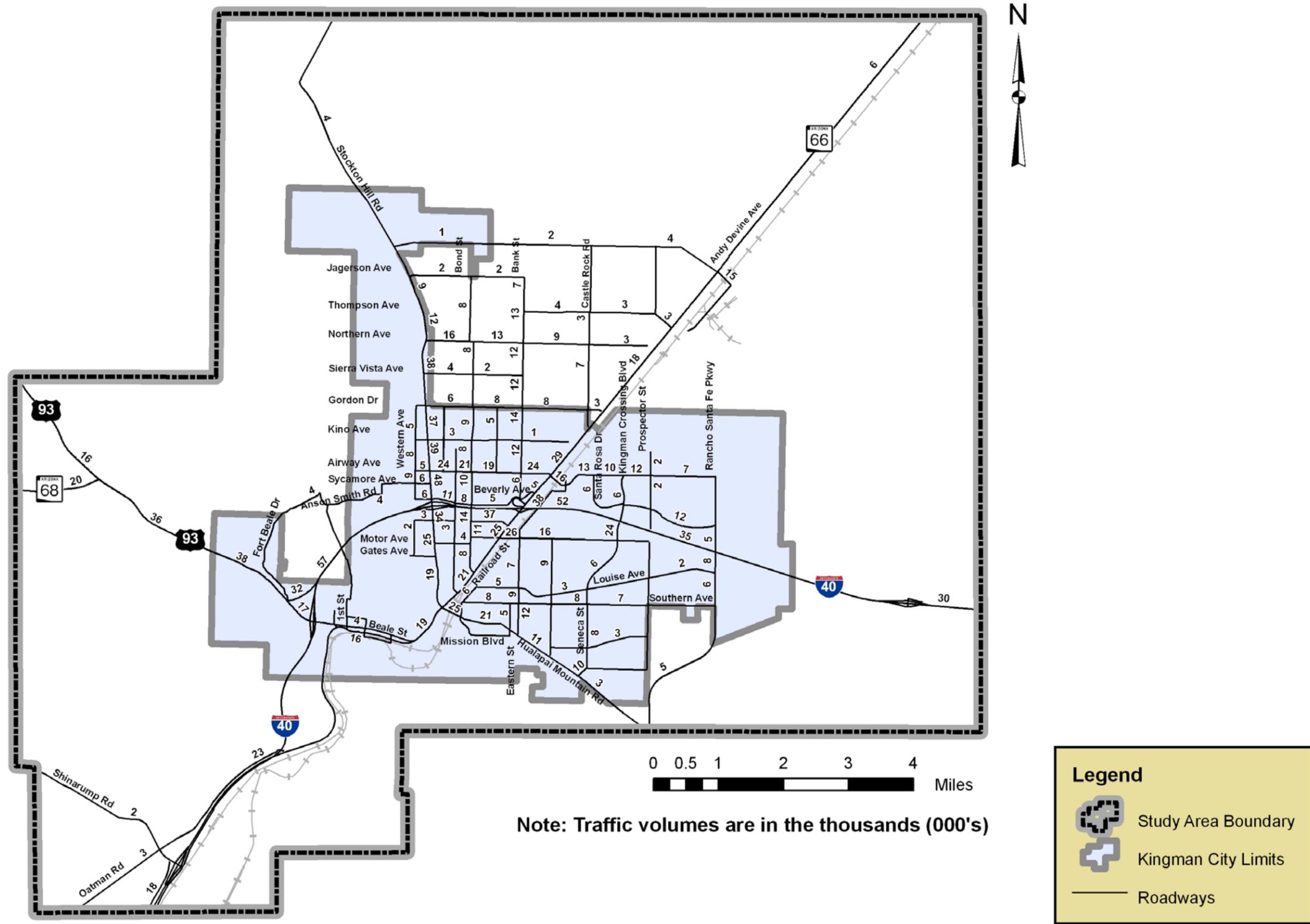


Figure 17: 2030 Daily Traffic Volumes with Recommended Improvements

7.1.2 New Four-Lane Roadway or Widen to Four-Lane Roadway

Providing a new four-lane arterial roadway, or widening an existing two-lane roadway to a four-lane arterial roadway, is recommended for the following roadway segments.

- Airway Avenue: Western Avenue to Stockton Hill Road
- Rancho Santa Fe Parkway: Louise Avenue to Airway Avenue
- Hualapai Mountain Road: Fripps Ranch Road to Seneca Street
- Gordon Drive: Stockton Hill Road to Bank Street
- Stockton Hill Road: Northern Avenue to Grace Neal Parkway
- Airway Avenue: Sage Street to Kingman Crossing Boulevard
- Harrison Street/Willow Road: Andy Devine Avenue to Airway Avenue
- Eastern Street: Airway Avenue to Hualapai Mountain Road
- Kingman Crossing Boulevard: I-40 to Airway Avenue
- Kingman Crossing Boulevard: I-40 to Airfield Avenue
- Kingman Crossing Boulevard: Airfield Avenue to Southern Avenue
- Beverly Avenue: Stockton Hill Road to Bank Street
- Airway Avenue: Kingman Crossing Boulevard to Rancho Santa Fe Parkway
- Grace Neal Parkway: Stockton Hill Road to SR 66
- Santa Rosa Drive: Kingman Crossing Boulevard to Rancho Santa Fe Parkway

7.1.3 Add Median to Four-Lane Roadway

It is recommended that a raised median be added to the following two four-lane roadway segments.

- Stockton Hill Road: Airway Avenue to Gordon Drive
- Andy Devine Avenue/SR 66: Detroit Avenue to Airway Avenue

ADOT previously studied constructing a raised median on Andy Devine Avenue/SR 66. One finding of the study was that a raised median would increase the need for U-turns and the existing geometry may not permit large trucks to make U-turns. As a result, any future evaluation to add a raised median should include recommendations to accommodate truck movements.

7.1.4 Widen to Six-Lane Roadway

Widening an existing four-lane roadway to a six-lane arterial roadway is recommended for the following roadway segments. Because these widening projects are expected to require additional right-of-way and could have significant impacts, design concept reports for these roadway segments should be conducted to evaluate alternatives and document impacts.

- Stockton Hill Road: Detroit Avenue to Airway Avenue
- Stockton Hill Road: Airway Avenue to Northern Avenue
- Stockton Hill Road: Andy Devine Avenue to Detroit Avenue
- Andy Devine Avenue/SR 66: I-40 to Gordon Drive
- I-40: US 93 to Stockton Hill Road
- Hualapai Mountain Road: Andy Devine Avenue to Eastern Street

7.1.5 Intersection Improvements

It is recommended that intersection improvements be implemented at the following intersections.

- Stockton Hill Road and Airway Avenue
- Stockton Hill Road and Gordon Drive
- Stockton Hill Road/Hualapai Mountain Road and Andy Devine Avenue
- Bank Street and Northern Avenue
- SR 66/Andy Devine Avenue and Armour Avenue
- Andy Devine Avenue and 4th Street

7.1.6 Traffic Signal Improvements

Intersections currently controlled by traffic signals should regularly be monitored to ensure that traffic signal timing and phasing is appropriate for traffic conditions at the intersections.

Unsignalized intersections that in the future experience congestion, high crash rates, or major changes in traffic patterns should be studied to determine if traffic signalization may be warranted.

It is recommended that countdown pedestrian signal heads be provided at all locations where the pedestrian clearance interval is longer than seven seconds. Upgrading to these pedestrian signal heads can be accomplished as part of regularly scheduled upgrades to traffic signal equipment.

7.1.7 Freeway Interchange Improvements

It is recommended that improvements be made to the following two existing freeway TIs. Design concept reports should be conducted for these TI improvement projects to evaluate alternatives and document impacts.

- I-40/US 93/Beale Street
- I-40 and Stockton Hill Road

It should be noted that ADOT has already initiated the design concept report for I-40/US 93/Beale Street that is focusing on implementing free-flow ramps connecting I-40 and US 93, essentially converting the TI into a system-to-system interchange. The ongoing design concept report will also evaluate if additional interim improvements to the I-40/Beale Street TI are needed until such time that the system interchange improvements are constructed.

7.1.8 New Freeway Interchanges

Per the recommendations in previous studies completed by others, it is recommended that the following two new freeway TIs be constructed. It should be noted that design concept reports have already been conducted by others for these two new TIs.

- I-40 and Rancho Santa Fe Parkway
- I-40 and Kingman Crossing Boulevard

7.1.9 New Crossing of I-40

It is recommended that an underpass be constructed to connect Fairgrounds Boulevard and Burbank Street across I-40. A preliminary evaluation indicates that I-40 would have to be raised 10-15 feet in order to provide the needed underpass. In addition, new structures would be required to carry the Stockton Hill Road ramps over Fairgrounds Boulevard, which in turn would also require raising I-40 over Stockton Hill Road.

7.1.10 New Railroad Crossings

It is recommended that the City of Kingman evaluate the feasibility of providing new grade-separated railroad crossings at the following two locations. Both projects are included in the current City of Kingman CIP and no additional evaluation was conducted as part of this study.

- Topeka Street (eastbound railroad track only)
- Airfield Avenue

In addition, it is recommended that the City of Kingman evaluate the feasibility of a new at-grade railroad crossing at Slaughter House Canyon Road (eastbound railroad track only). This project is included in the current City CIP and no additional evaluation was conducted as part of this study. This crossing should be coordinated with the recommended roadway improvement project on Slaughter House Canyon Road between Mission Boulevard and Topeka Street.

7.1.11 Railroad Quiet Zone

It is recommended that the City of Kingman establish a railroad quiet zone at the three at-grade railroad crossings within the downtown area to reduce noise and improve livability. It should be noted that the City of Kingman has already initiated a railroad quiet zone feasibility study.

7.1.12 Roadway Federal Functional Classification Revisions

A review of the current federal functional classification of the study area roadways indicates that the proportion of collector roadways in the study area is higher than the FHWA recommended percentage allocation. It is recommended that the following roadway segments be reclassified from urban collectors to urban minor arterials. These changes must be reviewed with WACOG and submitted to ADOT for approval.

- Airway Avenue: Western Avenue to Rancho Santa Fe Parkway
- Gordon Drive: Stockton Hill Road to SR 66/Andy Devine Avenue
- Northern Avenue: Stockton Hill Road to Castle Rock Road
- Harrison Street/Willow Road: Andy Devine Avenue to Airway Avenue
- Bank Street: Airway Avenue to Northern Avenue
- Hualapai Mountain Road: Andy Devine Avenue to Seneca Street

7.1.13 Highway Safety Improvement Program

It is recommended that the City of Kingman, Mohave County, and ADOT consider applying for HSIP funding for roadway segment and intersection projects related to correcting the safety-related needs identified as part of this study.

7.2 Recommended Transit Improvements

The focus of the recommended transit improvements is to improve the experience of riders and manage system growth in a way that attracts new ridership. Recommended transit improvements include better service through increased frequency, enhanced accessibility, and rider comfort and protection.

7.2.1 Improve Frequency to 30-Minute Headways

It is recommended that the frequency of transit service on all KART routes be improved, providing 30-minute headways between buses during the peak periods. This improvement should first be implemented on KART's blue route and then incrementally on the other routes.

7.2.2 New KART Routes

New transit routes are recommended for the following general areas as warranted by growth, development, and available funding.

- Seneca Street/Kingman Crossing Boulevard: Hualapai Mountain Road to Airway Avenue
- Gordon Drive: Stockton Hill Road to Castle Rock Road
- Kino Avenue: Stockton Hill Road to Bank Street
- Northern Avenue: Stockton Hill Road to Castle Rock Road
- Southern Avenue: Railroad Street to Cherokee Street
- Airport employment area

7.2.3 Bus Pull-Outs and Shelters

It is recommended that bus pull-outs and shelters be added along transit routes, particularly on the roadway segments and near the intersections that are often congested. Some bus pull-outs and shelters will likely be able to be incorporated into some of the recommended roadway and intersection improvements.

7.2.4 New Transit Transfer Center

It is recommended that a new transit transfer center be provided that serves the local KART routes as well as future regional transit service.

7.2.5 Future Regional Transit and Rail Opportunities

It is recommended that study TAC member agencies be active participants in upcoming discussions on regional transit and rail opportunities such as regional transit service, expanded Amtrak service, and a high-speed passenger rail line between Phoenix and Las Vegas that could potentially include a stop in Kingman. To the extent possible, study TAC member agencies should support development of regional facilities and transfer points within the study area to further increase multimodal opportunities in the study area.

7.3 Recommended Non-Motorized Improvements

The focus of the recommended non-motorized (i.e., pedestrian and bicycle) improvements is to provide a safe and effective environment for pedestrians and bicyclists. The following design elements should be incorporated to help create complete streets.

- Provide continuous sidewalks and bicycle lanes
- Provide comfortable pedestrian and bicycle access to shopping, schools, and other activity centers
- Provide pedestrian facilities that meet ADA requirements

7.3.1 Add Bicycle and Pedestrian Facilities

It is recommended that bicycle and pedestrian facilities be provided along the following roadway segments.

- Harrison Street/Willow Road: Andy Devine Avenue to Gordon Drive
- Airway Avenue: Stockton Hill Road to Andy Devine Avenue
- Gordon Drive: Stockton Hill Road to Andy Devine Avenue
- Beverly Avenue: Willow Road to Bank Street

- Bank Street: Beverly Avenue to Northern Avenue
- Hualapai Mountain Road: Andy Devine Avenue to Seneca Street
- Northern Avenue: Stockton Hill Road to Bank Street
- Willow Road: Gordon Drive to Northern Avenue

7.3.2 New Multi-Use Pathway

It is recommended that a multi-use pathway be provided along the east side of the railroad tracks from Hualapai Mountain Road to Airway Avenue. The pathway, called the Eastern Pathway, is already in the current City of Kingman CIP for the section between Hualapai Mountain Road and Louise Avenue.

7.3.3 Sidewalk and ADA Improvements

It is recommended that sidewalks in the downtown area be improved to more fully comply with the latest ADA requirements and with the complete streets concept. This includes the following recommendations.

- Construct new sidewalk ramps
- Provide unobstructed sidewalk at least five feet in width
- Construct shorter street crossings using curb bulb-outs
- Upgrade traffic signal equipment so it is ADA-compliant

7.3.4 Safe Routes to School

It is recommended that TAC member agencies examine conditions in the vicinity of schools and submit applications for SRTS funding for projects and activities that improve safety and accessibility and reduce traffic and air pollution in the vicinity of schools.

8 IMPLEMENTATION PLAN

An implementation plan has been developed to prioritize the recommended improvements into short-range (2011-2015), mid-range (2016-2020), and long-range (2021-2030) timeframes. **Table 14** presents the implementation plan, which summarizes the short-range, mid-range, and long-range improvements by mode. The cost estimate in 2011 dollars is \$26.6 million for the short-range timeframe, \$141.4 million for the mid-range timeframe, and \$221.5 million for the long-range timeframe, for a total plan cost of \$389.5 million. It should be noted that these plan costs do not include the annual operating costs for adding transit routes or improving the frequency from 60 minutes to 30 minutes.

The actual phasing of implementation of the recommended improvements will be determined by a variety of factors, including funding availability, development activity, traffic patterns, and private participation. The need for improvements should be re-evaluated each year as part of the various implementing agencies' budget processes or as needed if conditions and travel patterns change significantly.

The overall transportation improvement plan, combining the short-range, mid-range, and long-range recommended improvements, is presented in **Figure 18**.

8.1 Revenue

The City and County have traditionally used LTAF, LTAF2, Highway User Revenue Fund (HURF), General Fund, and federal money administered through WACOG to fund transportation improvements. These sources can be used for capital projects or for operations and maintenance. These are briefly described below.

However, due to recent economic conditions, these sources have been reduced or temporarily eliminated. HURF and general fund revenue have been reduced as a result of lower sales tax collection and reduced mileage. The State legislature has stopped distribution of LTAF funds to cities, and LTAF2 is set to expire at the end of fiscal year 2011.

8.1.1 Local Transportation Assistance Fund (LTAF) and LTAF2

The Local Transportation Assistance Fund is generated by the state lottery. This money is distributed on a population basis to incorporated cities. LTAF can be used for any transportation purpose including streets, traffic, transit, airports, and bicycles and can be used for operations and maintenance or capital improvements. LTAF2 will be eliminated after FY 2011.

8.1.2 Highway User Revenue Fund (HURF)

The Highway User Revenue Funds are primarily derived from gasoline and vehicle license taxes. They are available to the State, counties, cities, and towns. The state receives 50.5 percent of the HURF dollars to be used statewide, cities and towns receive 27.5 percent, cities over 300,000 population receive an additional 3 percent, and counties receive 19 percent. The local distribution is based on population and gasoline sales. HURF can be used for streets only, but can be used for operations and maintenance or capital improvements.

8.1.3 Surface Transportation Program (STP)

The Surface Transportation Program (STP) provides flexible funding that may be used by States and localities for projects on any Federal-aid highway including the National Highway System (NHS), bridge projects on any public road, transit capital projects, and public bus terminals and facilities. These funds are distributed by ADOT and WACOG.

Table 14. Implementation Plan

Project Location	Improvement Description	Cost (thousand \$)		
		Short Range	Mid Range	Long Range
Short-Range Roadway Improvements				
Airfield Avenue	Design Concept Report for railroad grade separation	500		
Airway Avenue: Western Avenue to Stockton Hill Road	Widen to four lanes	1,000		
Andy Devine Avenue & 4 th Street	Safety improvements	250		
Andy Devine Avenue/SR 66: Detroit Avenue to Airway Avenue	Raised median	250		
Downtown at-grade railroad crossings	Quiet zone improvements and establishment	350		
Glen Road: Airway Avenue to Gordon Drive	New two-lane collector	2,000		
Gordon Drive: Stockton Hill Road to Bank Street	Widen to four lanes	6,000		
I-40/US 93 TI	Design Concept and Environmental Study for system TI	500		
SR 66/Andy Devine Avenue & Armour Avenue	Safety improvements	250		
Stockton Hill Road: Andy Devine Avenue to Northern Avenue	Design Concept Report	500		
Stockton Hill Road & Airway Avenue	Intersection widening/safety improvements	2,500		
Stockton Hill Road & Gordon Drive	Intersection widening/safety improvements	2,500		
Stockton Hill Road/Hualapai Mountain Road & Andy Devine Avenue	Intersection widening/safety improvements	2,500		
Stockton Hill Road: Airway Avenue to Gordon Drive	Raised median	250		
Topeka Street	Design Concept Report for railroad grade separation	500		
Western Avenue: Beverly Avenue to Gordon Drive	Improved two-lane collector	3,000		
Short-Range Transit Improvements				
KART blue route	Provide 30-minute headways during peak periods	500*		
KART blue route	Add bus pull-outs and shelters	1,000		
Short-Range Non-Motorized Improvements				
Airway Avenue: Stockton Hill Road to Andy Devine Avenue	Add bike facilities	500		
Beverly Avenue: Harrison Street to Bank Street	Add bike and pedestrian facilities	250		
Downtown sidewalks	ADA-related improvements	1,000		
Eastern Pathway: Hualapai Mountain Road to Louise Avenue	Multi-use path	200		
Harrison Street/Willow Road: Andy Devine Avenue to Gordon Drive	Add bike and pedestrian facilities	625		
Safe routes to school	Various locations	150		
Subtotal Short-Range Improvements Cost*		\$26,575		

Project Location	Improvement Description	Cost (thousand \$)		
		Short Range	Mid Range	Long Range
Mid-Range Roadway Improvements				
Airfield Avenue: Seneca Street to Kingman Crossing Boulevard	New two-lane collector		1,000	
Airfield Avenue	Railroad grade separation		10,000	
Airway Avenue: Prospector Street to Rancho Santa Fe Parkway	New two-lane collector		2,000	
Airway Avenue: Sage Street to Kingman Crossing Boulevard	Widen to four lanes		2,000	
Central Street: Hualapai Mountain Road to Airfield Avenue	New/improved two-lane collector		4,000	
Fairgrounds Boulevard at I-40	Design Concept Report for grade separation		500	
Harrison Street/Willow Road: Andy Devine Avenue to Airway Avenue	Widen to four lanes		10,000	
Hualapai Mountain Road: Fripps Ranch Road to Seneca Street	Widen to four lanes		4,400	
Hualapai Mountain Road: Andy Devine Avenue to Eastern Street	Design Concept Report		250	
I-40: US 93 to Stockton Hill Road	Design Concept Report		500	
I-40/Stockton Hill Road TI improvements	Design Concept Report		500	
I-40/US 93 TI	Construct interim improvements		10,000	
I-40/Kingman Crossing Boulevard TI	Construct new interchange		25,000	
I-40/Rancho Santa Fe Parkway TI	Construct new interchange		25,000	
Industrial Boulevard: Rancho Santa Fe Parkway to Mohave Airport Drive	Improved two-lane collector		3,000	
Kingman Crossing Boulevard: I-40 to Airway Avenue	New four-lane arterial		3,000	
Kingman Crossing Boulevard: I-40 to Airfield Avenue	New four-lane arterial		800	
Rancho Santa Fe Parkway: Hualapai Mountain Road to Louise Avenue	New two-lane collector		5,000	
Rancho Santa Fe Parkway: Airway Avenue to Industrial Boulevard	New two-lane collector		5,000	
Rancho Santa Fe Parkway: Louise Avenue to Airway Avenue	New four-lane arterial		6,000	
Southern Avenue: Eastern Street to Rancho Santa Fe Parkway	New two-lane collector		6,000	
SR 66/Andy Devine Avenue: I-40 to Gordon Drive	Design Concept Report		500	
Stockton Hill Road: Detroit Avenue to Airway Avenue	Widen to six lanes		3,500	
Topeka Street	Railroad grade separation		10,000	

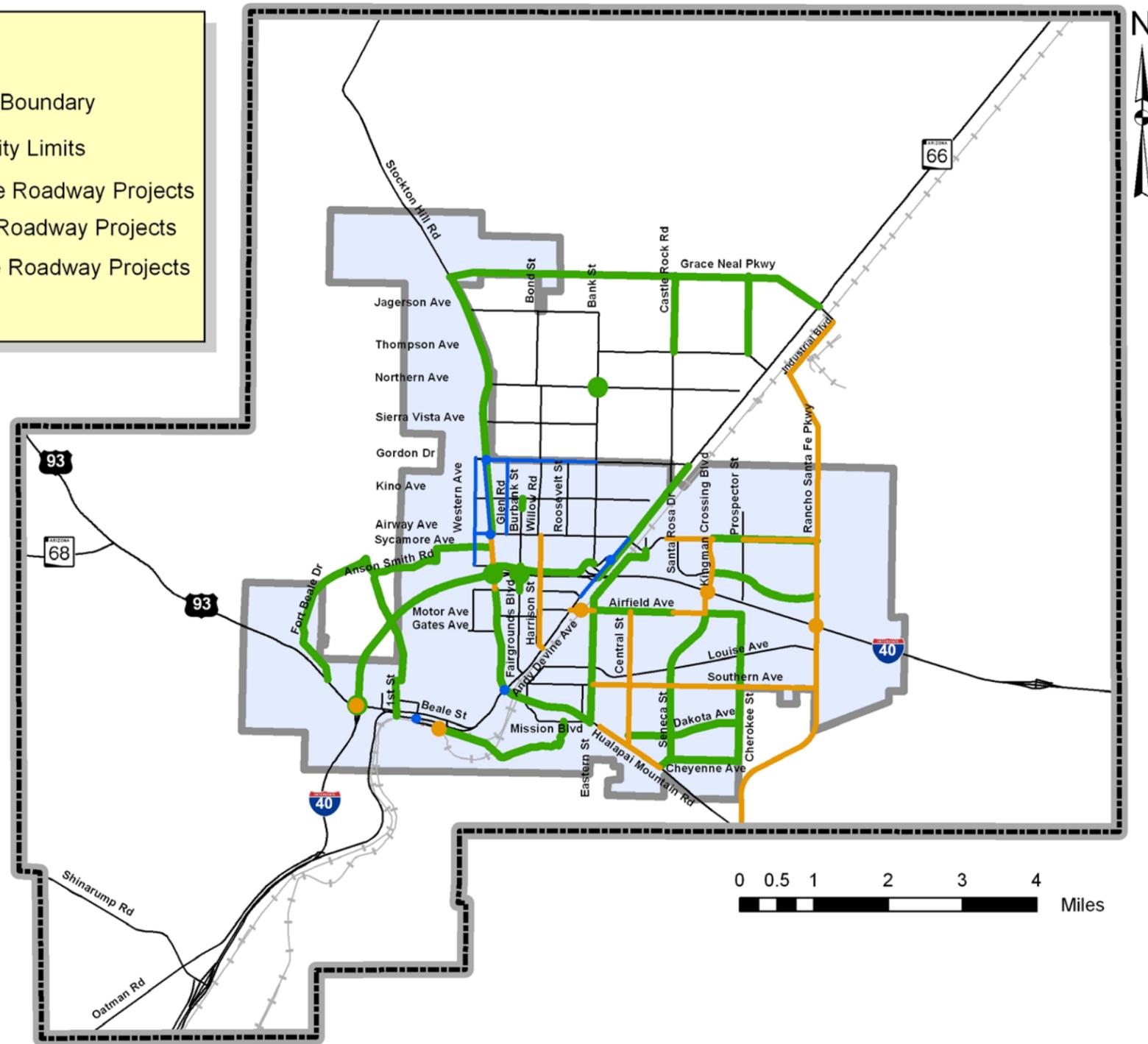
Project Location	Improvement Description	Cost (thousand \$)		
		Short Range	Mid Range	Long Range
Mid-Range Transit Improvements				
All KART routes	30-minute headway during peak periods		1,500*	
All KART routes	Add bus pull-outs and shelters		2,000	
Gordon Drive	New KART route		500*	
New/modified route	Provide service to airport		500*	
Mid-Range Non-Motorized Improvements				
Bank Street: Beverly Avenue to Northern Avenue	Add bike and pedestrian facilities		625	
Eastern Pathway: Louise Avenue to Airfield Avenue	Multi-use path		200	
Gordon Drive: Stockton Hill Road to Andy Devine Avenue	Add bike and pedestrian facilities		625	
Subtotal Mid-Range Improvements Cost*			\$141,400	
Long-Range Roadway Improvements				
Airfield Avenue: Eastern Street to Seneca Street	New/improved two-lane collector			3,000
Airfield Avenue: Kingman Crossing Boulevard to Cherokee Street	New two-lane collector			4,000
Airway Avenue: Kingman Crossing Boulevard to Rancho Santa Fe Parkway	Widen to four lanes			4,000
Andy Devine Avenue/SR 66: I-40 to Airway Avenue	Widen to six lanes			7,900
Anson Smith Road/White Cliffs Road: Stockton Hill Road to 1 st Street	Improved two-lane collector			8,000
Bank Street and Northern Avenue	Intersection improvement			1,500
Beverly Avenue: Stockton Hill Road to Bank Street	Widen to four lanes			7,000
Castle Rock Road: Thompson Avenue to Grace Neal Parkway	New two-lane collector			2,000
Cherokee Street: Cheyenne Avenue to Airfield Avenue	New two-lane collector			4,000
Cheyenne Avenue: Hualapai Mountain Road to Cherokee Street	Improved two-lane collector			2,000
Dakota Avenue: Central Street to Cherokee Street	New/improved two-lane collector			3,000
Eastern Street: Hualapai Mountain Road to Airway Avenue	Widen to four lanes			8,000
Fairgrounds Boulevard/Burbank Street	Grade separation at I-40 and extend to Kino Avenue			12,000
Fort Beale Drive: Anson Smith Road to US 93	Improved two-lane collector			3,000
Grace Neal Parkway: Stockton Hill Road to SR 66	New four-lane arterial			22,000
Hualapai Mountain Road: Andy Devine Avenue to Eastern Street	Widen to six lanes			8,400
I-40/Stockton Hill Road TI	Reconstruct TI/safety improvements			20,000

Project Location	Improvement Description	Cost (thousand \$)		
		Short Range	Mid Range	Long Range
<i>Long-Range Roadway Improvements</i>				
I-40: US 93 to Stockton Hill Road	Widen to six lanes			12,000
I-40/US 93 TI	Construct system interchange improvements			50,000
Kingman Crossing Boulevard: Airfield Avenue to Southern Avenue	New four-lane arterial			3,200
Prospector Street: Thompson Avenue to Grace Neal Parkway	New two-lane collector			2,000
Santa Rosa Drive: Kingman Crossing Boulevard to Rancho Santa Fe Parkway	New four-lane arterial			6,000
Seneca Street: Hualapai Mountain Road to Southern Avenue	Improved two-lane collector			2,500
SR 66/Andy Devine Avenue: Airway Avenue to Gordon Drive	Widen to six lanes			4,250
Stockton Hill Road: Northern Avenue to Jagerson Avenue	Widen to four lanes			6,000
Stockton Hill Road: Airway Avenue to Northern Avenue	Widen to six lanes			7,000
Stockton Hill Road: Andy Devine Avenue to Detroit Avenue	Widen to six lanes			4,400
<i>Long-Range Transit Improvements</i>				
All KART routes	Add bus pull-outs and shelters			2,000
Kino Avenue	New KART route			500*
Northern Avenue	New KART route			500*
Seneca Street/Kingman Crossing Boulevard	New KART route			500*
Southern Avenue	New KART route			500*
Transit transfer center	New facility			1,000
<i>Long-Range Non-Motorized Improvements</i>				
Eastern Pathway: Airfield Avenue to Airway Avenue	Multi-use path			200
Hualapai Mountain Road: Andy Devine Avenue to Seneca Street	Add bike and pedestrian facilities			500
Northern Avenue: Stockton Hill Road to Bank Street	Add bike and pedestrian facilities			375
Willow Road: Gordon Drive to Northern Avenue	Add bike and pedestrian facilities			250
Subtotal Long-Range Improvements Cost*				\$221,475
Total Plan Cost*				\$389,450

*annual operating cost, not included in the total plan cost

Legend

- Study Area Boundary
- Kingman City Limits
- Short-range Roadway Projects
- Mid-range Roadway Projects
- Long-range Roadway Projects
- Roadways



Additional Projects – Short Range Studies

- Design Concept Report
 - Airfield Avenue railroad grade separation
 - Topeka Street railroad grade separation
 - I-40/US 93 TI
 - Stockton Hill Road: Andy Devine Avenue to Northern Avenue
- Quiet zone improvements at downtown railroad crossings

Transit

- Provide 30-minute frequency during peak periods
- KART blue route
- Add bus pull-outs and shelters
- KART blue route

Non-Motorized

- Add bike facilities
- Airway Avenue: Stockton Hill Road to Andy Devine Avenue
- Add bike and pedestrian facilities
- Beverly Avenue: Harrison Street to Bank Street
- Harrison Street/Willow Road: Andy Devine Avenue to Gordon Drive
- ADA-related improvements
- Downtown sidewalks
- Multi-use path
- Eastern Pathway: Hualapai Mountain Road to Louise Avenue
- Safe Routes to school
- Various locations

Additional Projects – Mid Range Studies

- Design Concept Report
- Fairgrounds Boulevard grade separation at I-40
- Hualapai Mountain Road: Andy Devine Avenue to Eastern Street
- I-40: US 93 to Stockton Hill Road
- I-40/Stockton Hill Road TI improvements
- SR 66/Andy Devine Avenue: I-40 to Gordon Drive

Transit

- Provide 30-minute frequency during peak periods
- All KART routes
- Add bus pull-outs and shelters
- All KART routes
- New KART route
- Gordon Drive
- Service to airport

Non-Motorized

- Add bike and pedestrian facilities
- Bank Street: Beverly Avenue to Northern Avenue
- Gordon Drive: Stockton Hill Road to Andy Devine Avenue
- Multi-use path
- Eastern Pathway: Louise Avenue to Airfield Avenue

Additional Projects – Long Range Studies

Transit

- Add bus pull-outs and shelters
- All KART routes
- New KART route
- Kino Avenue
- Northern Avenue
- Seneca Street/Kingman Crossing Boulevard
- Southern Avenue
- New transit transfer center

Non-Motorized

- Add bike and pedestrian facilities
- Hualapai Mountain Road: Andy Devine Avenue to Seneca Street
- Northern Avenue: Stockton Hill Road to Bank Street
- Willow Road: Gordon Drive to Northern Avenue
- Multi-use path
- Eastern Pathway: Airfield Avenue to Airway Avenue

Figure 18: Improvement Plan

8.1.4 Developer Contributions

It is common practice for study TAC member agencies to require developers to dedicate right-of-way for all streets adjacent to the development and to construct the adjacent half street. For large developments requiring or desiring significant transportation improvements such as a freeway TI, agreements between the developer and the governing agency spell out each party's responsibilities. For example, the proposed Kingman Crossing Boulevard TI is currently expected to be funded by a developer.

8.1.5 Revenue Opportunities

Projected revenues for study TAC member agencies are significantly less than the estimated costs of the recommended improvements. Additional revenue sources will need to be secured if the recommended improvements are to be constructed within the recommended timeframes.

Revenue opportunities have been identified that could potentially provide funding for the implementation of recommended improvements. Potential revenue opportunities, including existing revenue sources already in use as well as new revenue sources, are provided below.

8.1.5.1 Local

- Bonds
- General funds
- Sales tax
- Impact fees
- Improvement districts
- Transit authorities

8.1.5.2 State

- LTAF
- PARA

8.1.5.3 Federal

- HURF
- STP
- HSIP
- National Highway System (NHS), Interstate Maintenance (IM), and Bridge funds
- Transportation Enhancement grants
- Other miscellaneous grants or stimulus programs
- Transit Programs: 5307, 5309, 5311

8.1.5.4 Developer

- Sales tax reimbursement
- Right-of-way dedication

8.1.5.5 Public-private partnerships

- Toll roads
- Managed lanes
- Advertising

8.2 Title VI Impacts

The U.S. Department of Transportation regulations related to disadvantaged, or Title VI, populations (i.e., minority, low-income, elderly) state that in determining the site or location of transportation facilities, selection cannot be made with the purpose or effect of excluding persons from, denying them the benefits of, or subjecting them to discrimination under any program to which this regulation applies. According to the regulations, a project cannot be implemented that will cause disproportionately high and adverse impacts to disadvantaged populations.

The Kingman Area Transportation Study Update is a long-range multi-modal planning study that was prepared to address the transportation needs in the region for the next twenty years. The recommended improvements are expected to improve the overall transportation system of the region and benefit the region as a whole. Recommended improvement projects were not selected based on the population that would be impacted, but rather were selected to address an identified transportation need.

More detailed analysis will be needed for individual projects that are federally-funded to ensure that there are no disproportionately high and adverse impacts to disadvantaged populations.

9 APPENDIX

Appendix 9-1: 2010 Population and Employment Estimates by Traffic Analysis Zone

Appendix 9-2: Recommended FHWA Functional Classification Allocation of Streets in an Urban System

Appendix 9-3: City of Kingman Traffic Count Summary

Appendix 9-4: 2030 Population and Employment Estimates by Traffic Analysis Zones

Appendix 9-5: Typical Complete Streets Cross-Sections

Appendix 9-1: 2010 Population and Employment Estimates by Traffic Analysis Zone

TAZ	2010 Population	2010 Employment				
		Retail	General	Office	Shopping Center	Total
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	189	103	31	0	0	134
4	62	194	27	3	0	224
5	249	0	50	0	0	50
6	366	63	48	0	0	111
7	378	25	171	163	0	359
8	399	122	437	68	0	627
9	413	122	428	158	0	708
10	50	57	31	245	0	333
11	89	31	28	0	0	59
12	518	0	95	0	0	95
13	326	0	19	0	0	19
14	0	117	87	0	0	204
15	0	157	81	18	0	256
16	0	158	90	96	0	344
17	61	117	126	0	0	243
18	213	14	14	0	0	28
19	31	30	23	0	0	53
20	0	32	32	0	0	64
21	595	42	65	0	0	107
22	90	0	102	0	0	102
23	1,597	0	0	0	0	0
24	3,390	5	75	0	55	135
25	899	10	52	0	0	62
26	950	102	58	0	0	160
27	53	53	43	0	0	96
28	330	22	69	30	0	121
29	582	72	122	106	0	300
30	776	24	28	26	0	78
31	959	0	78	0	0	78

TAZ	2010 Population	2010 Employment				
		<i>Retail</i>	<i>General</i>	<i>Office</i>	<i>Shopping Center</i>	<i>Total</i>
32	1,779	37	200	133	0	370
33	0	111	0	0	221	332
34	0	182	11	61	0	254
35	234	0	59	0	0	59
36	785	23	0	50	0	73
37	0	0	123	0	0	123
38	0	0	37	0	0	37
39	814	0	110	44	0	154
40	415	3	0	0	0	3
41	22	77	93	0	0	170
42	48	80	85	0	0	165
43	10	148	262	0	0	410
44	1,462	0	148	0	0	148
45	2	20	596	177	0	793
46	0	0	183	0	562	745
47	2	80	182	100	0	362
48	798	108	161	89	0	358
49	19	163	99	0	0	262
50	0	192	95	0	73	360
51	722	21	50	0	0	71
52	1,785	0	0	0	0	0
53	232	72	88	109	37	306
54	0	84	117	142	222	565
55	1,557	37	37	28	0	102
56	555	151	74	0	0	225
57	120	61	253	292	0	606
58	7	50	128	0	55	233
59	50	106	54	19	44	223
60	1	52	50	0	105	207
61	823	71	0	0	0	71
62	1,220	46	124	0	0	170
63	0	6	90	0	0	96
64	78	0	140	107	0	247
65	1,349	0	99	0	0	99
66	201	5	60	0	0	65

TAZ	2010 Population	2010 Employment				
		<i>Retail</i>	<i>General</i>	<i>Office</i>	<i>Shopping Center</i>	<i>Total</i>
67	8	5	84	0	0	89
68	599	0	0	0	0	0
69	0	18	18	18	0	54
70	7	101	86	0	0	187
71	0	138	36	0	0	174
72	36	170	28	76	0	274
73	74	100	0	112	0	212
74	68	62	0	0	0	62
75	8	71	0	0	0	71
76	2,368	50	0	0	0	50
77	1,303	70	0	0	0	70
78	976	25	0	0	0	25
79	2,813	0	53	0	0	53
80	13	0	2,324	0	0	2,324
81	107	0	78	0	0	78
82	1,571	0	50	0	0	50
83	394	0	109	0	0	109
84	986	0	269	0	0	269
85	31	0	0	0	0	0
86	0	0	28	0	0	28
87	51	91	92	122	111	416
88	1,940	0	0	0	0	0
89	1,318	0	0	0	0	0
90	1,971	74	160	115	0	349
91	1,814	2	100	0	75	177
92	838	5	0	0	0	5
93	901	0	0	0	0	0
94	747	50	57	0	0	107
501	0	0	0	0	0	0
502	49	10	7	0	0	17
503	12	0	0	0	0	0
504	0	0	0	0	0	0
505	0	10	250	0	0	260
506	5	10	50	0	0	60
507	635	10	80	0	0	90



TAZ	2010 Population	2010 Employment				
		<i>Retail</i>	<i>General</i>	<i>Office</i>	<i>Shopping Center</i>	<i>Total</i>
508	44	10	100	5	0	115
509	287	30	100	10	0	140
510	0	0	0	0	0	0
511	106	5	30	0	0	35
512	897	0	100	0	0	100
513	170	0	50	0	0	50
514	128	10	30	5	0	45
515	119	0	20	0	0	20
Total	52,049	4,785	10,707	2,727	1,560	19,779

Appendix 9-2: Recommended FHWA Allocation of Streets in an Urban System

Principal Arterials (5%-10% of system miles)

- Includes freeway and expressway
- Provides regional connectivity
- Mobility is the primary objective
- Serve the highest volume generators
- Limited access with capability of moving high volumes at high speeds.

Minor Arterials (10%-15% of system miles)

- Higher speed than collector or local
- Longer trip length compared to collector and local
- Carries the majority of trips entering or leaving the area
- Do not usually connect through neighborhoods
- Usually carry local bus routes

Collectors (5%-10% of system miles)

- Distribute traffic to/from arterials
- Collect traffic from local streets
- May access neighborhoods

Local Roads (65-80% of system miles)

- Provide direct access to abutting land
- Discourage through traffic
- Lower speed limit than other classifications
- Conducive to all modes of travel

Appendix 9-3: City of Kingman Traffic Count Summary

STREET	X-STREET	ADT	DATE	COUNTER
Adams St	South of Southern Av	1,558	7-20-09	3
Airway Av	East of Stockton Hill Rd	16,952	6-30-10	1,2
Airway Av	East of Stockton Hill Rd	14,564	9-9-08	1,3
Airway Av*	East of Stockton Hill Rd	11,530	5-6-03	n/a
Airway Av	West of Stockton Hill Rd	2,602	3-22-04	3
Airway Av	West of Harrison St	15,116	7-7-10	4,3
Airway Av	West of Harrison St	14,974	2-13-08	4,3
Airway Av	East of Harrison St	14,497	8-11-10	2,2
Airway Av	East of Harrison St	13,792	2-13-08	1,2
Airway Av	East of Bank St	11,954	2-24-10	3,2
Airway Av	East of Bank St	12,523	10-23-06	4,2
Airway Av	East of Bank St	9,413	6-12-06	3,2
Airway Av	East of Bank St	8,283	5-27-03	1,2
Airway Av	West of Cypress St	3,471	1-11-10	1
Airway Av	West of Cypress St	592	3-25-03	3
Airway Av	West of Western Av	620	9-14-09	2
Airway Av	East of Western Av	3,029	9-7-09	2
Airway Av	East of Western Av	3,353	4-22-09	3
Andy Devine Av	South of Airway Av	18,328	7-28-10	2,3
Andy Devine Av	South of Airway Av	19,261	9-18-08	2,1
Andy Devine Av	North of Airway Av	15,888	7-13-10	3,2
Andy Devine Av	North of Airway Av	17,066	9-18-08	3,4
Andy Devine Av	West of Harrison St	12,478	7-21-10	4,1
Andy Devine Av	West of Harrison St	14,655	4-2-08	3,1
Andy Devine Av	West of Harrison St	19,273	5-1-03	2,1
Andy Devine Av	East of 5th St	9,849	2-15-10	3,2
Andy Devine Av	East of 5th St	12,183	5-1-03	3,4
Anson Smith Rd	West of N. 4th St	1,297	6-11-03	1

Armour Av	North of Andy Devine Av	4,162	2-10-10	1
Armour Av	North of Andy Devine Av	4,622	3-15-04	2
Bank St	South of Airway Av	1,762	3-9-09	3
Bank St	North of Gordon Dr	7,952	3-12-10	3
Bank St	North of Gordon Dr	7,435	5-28-07	1,4
Bank St	North of Gordon Dr	6,874	9-11-06	2
Bank St	South of Gordon Dr	7,797	3-3-10	2,1
Bank St	South of Gordon Dr	6,658	5-28-07	2,3
Bank St	South of Gordon Dr	5,101	9-11-06	4
Bank St	South of Kino Av	5,946	4-8-03	2
Beale St	West of 10th St	2,671	5-7-03	3
Beverly Av	West of Harrison St	6,367	6-3-09	3
Beverly Av	West of Harrison St	5,123	10-17-05	2
Beverly Av	West of Harrison St	6,993	6-11-03	2
Beverly Av	East of Harrison St	4,099	5-20-09	1
Beverly Av	East of Harrison St	3,817	10-17-05	3
Beverly Av	East of Harrison St	4,556	5-29-03	3
Burbank St	North of Beverly Av	1,482	4-3-03	4
Chambers Av	East on Monroe St	170	4-27-04	2
Chambers Av	West of Monroe St	207	4-27-04	1
Chambers Av	West of Washington St	197	5-5-04	3
Chambers Av	East of Washington St	127	5-5-04	2
Club Av	West of Stockton Hill Rd	537	4-1-03	4
Club Av	East of Stockton Hill Rd	810	3-27-03	4
Crestwood Dr	East of Gordon Dr	278	8-31-04	2
Crestwood Dr	West of Gordon Dr	436	8-31-04	3
Dawes St	East of Harrison St	649	10-10-05	3
Detroit Av	East of Western Av	2,382	1-14-09	1
Detroit Av	East of Western Av	3,059	9-21-04	4
Detroit Av	West of Western Av	864	1-28-09	1
Detroit Av	West of Western Av	1,182	9-21-04	2

Detroit Av	West of Rutherford St	2,022	4-3-03	1
Detroit Av	West of LaSalle St	2,788	4-1-03	2
Eastern St	South of Calumet St	5,938	1-28-10	1
Eastern St	South of Calumet St	6,967	10-30-06	4
Eastern St	South of Calumet St	4,330	9-26-06	2
Eastern St	South of Southern Av	3,634	4-15-10	3
Eastern St	South of Southern Av	3,258	9-24-08	1
Eastern St	South of Southern Av	2,787	11-20-03	4
Eastern St	North of Southern Av	3,820	4-15-10	2
Eastern St	North of Southern Av	3,396	9-24-08	2
Eastern St	North of Southern Av	2,150	11-17-03	4
Eastern St	South of Louise Av	1,816	6-10-03	1
Eastern St	North of Hualapai Mtn Rd	1,936	3-25-03	4
Fairgrounds Blvd	South of Airfield Av	2,107	1-28-09	2
Fairgrounds Blvd	South of Airfield Av	2,286	3-27-03	1
Gates Av	West of Western Av	1,152	4-1-03	1
Gordon Dr	East of Bank St	3,113	6-10-09	2
Gordon Dr	East of Bank St	3,625	5-28-07	2
Gordon Dr	East of Bank St	3,403	9-11-06	3
Gordon Dr	West of Bank St	4,230	6-10-09	1
Gordon Dr	West of Bank St	5,083	5-28-07	1
Gordon Dr	West of Bank St	4,184	9-11-06	1
Gordon Dr	North of Crestwood Dr	863	8-31-04	1
Gordon Dr	South of Crestwood Dr	598	8-31-04	4
Gordon Dr	East of Castle Rock Rd	1,006	3-15-04	3
Harrison St	South of Airway Av	7,940	4-28-10	2
Harrison St	South of Airway Av	8,241	1-23-08	2
Harrison St	North of Beverly Av	9,077	10-17-05	4
Harrison St	North of Beverly Av	7,952	4-3-03	2
Harrison St	South of Beverly Av	8,504	6-24-09	2
Harrison St	South of Beverly Av	11,870	10-17-05	1

Harrison St	North of Motor Av	7,458	11-16-09	1
Harrison St	North of Motor Av	9,811	10-10-05	4
Harrison St	South of Motor Av	4,392	1-13-10	3
Harrison St	South of Motor Av	7,307	10-10-05	2
Harrison St	South of Club Av	5,955	3-27-03	2
Hillcrest Dr	East of Western Av	881	7-19-05	2
Hillcrest Dr	West of Western Av	533	7-19-05	4
Hualapai Mtn Rd**	@ Jackson St	14,554	11-29-06	n/a
Hualapai Mtn Rd	West of Railroad St	19,007	5-26-10	1/4
Hualapai Mtn Rd	West of Railroad St	19,395	10-1-08	2/4
Hualapai Mtn Rd**	@ Railroad St	18,678	11-29-06	n/a
Hualapai Mtn Rd	West of Washington St	10,200	5-6-10	3,2
Hualapai Mtn Rd	West of Washington St	10,794	10-1-08	3,4
Hualapai Mtn Rd	West of Washington St	8,294	5-5-03	2,1
Hualapai Mtn Rd	West of Rosslyn Dr	3,400	3-25-03	1
Hwy 93	West of Ft. Beale Rd	22,160	5-12-10	4,1
Hwy 93	West of Ft. Beale Rd	21,890	10-29-08	4,3
Hwy 93	West of Ft. Beale Rd	19,561	5-7-03	1,2
Kino Av	East of Eaglerock Rd	850	1-28-09	3
Kino Av	East of Stockton Hill Rd	3,333	10-22-07	2
Kino Av	East of Bank St	973	7-6-09	1
Kino Av	East of Bank St	914	3-15-04	1
Kino Av	East of Bank St	829	5-27-03	3
Kino Av	East of N. Glen St	3,316	8-17-09	1
Kino Av	East of N. Glen St	2,364	4-8-03	3
Louise Av	West of Railroad St	8,658	4-13-05	1
Louise Av	West of Railroad St	8,117	2-23-04	2
Louise Av	East of Railroad St	7,521	4-13-05	2
Louise Av	East of Railroad St	6,511	2-23-04	4
Louise Av	West of Jackson St	7,564	4-13-05	4
Louise Av	West of Jackson St	6,656	1-12-04	1

Louise Av	West of Jackson St	7,635	5-5-03	3
Louise Av	East of Washington St	1,118	12-1-09	1
Louise Av	East of Washington St	5,252	4-13-05	3
Louise Av	East of Washington St	4,852	1-12-04	4
Louise Av	East of Franklin St	2,007	5-12-10	3
Louise Av	East of Franklin St	1,869	12-3-08	3
Louise Av	East of Sage St	1,993	5-12-10	2
Louise Av	East of Sage St	1,784	12-3-08	2
Louise Av	East of Sage St	1,912	3-25-03	2
Louise Av	West of Cherokee St	1,778	12-10-08	1
Monroe St	North of Chambers Av	165	4-27-04	3
Monroe St	South of Chambers Av	225	4-27-04	4
Motor Av	West of Harrison St	3,042	7-13-09	1
Motor Av	West of Harrison St	4,086	10-10-05	1
Motor Av	West of Harrison St	3,750	3-27-03	3
Prospector St	South of Airway Av	836	3-31-10	1
Prospector St	North of Airway Av	1,257	3-31-10	2,3
Railroad St	North of Louise Av	2,203	2-23-04	1
Railroad St	South of Louise Av	1,739	2-23-04	3
Railroad St	North of Hualapai Mtn Rd	3,443	8-10-09	3
Railroad St	North of Hualapai Mtn Rd	3,461	10-30-06	3
Railroad St	North of Hualapai Mtn Rd	1,463	5-5-03	2
Riata Valley Rd	West of Western Av	1,392	6-15-04	4
Riata Valley Rd	East of Western Av	1,454	6-15-04	1
Santa Rosa Blvd	South of Airway Av	1,037	4-7-10	2,3
Seneca St	North of Dakota St	626	11-2-09	1
Seneca St	South of Southern Av	592	10-8-08	1
Seneca St	South of Southern Av	878	3-19-03	1
Seneca St	North of Hualapai Mtn Rd	1,852	10-8-08	4
Seneca St	North of Hualapai Mtn Rd	2,039	3-19-03	4
Simms Av	East of Monroe St	173	1-12-04	3

Southern Av	East of Washington St	3,106	5-27-09	3
Southern Av	West of Washington St	915	11-19-03	3
Southern Av	East of Eastern St	2,688	4-20-10	2
Southern Av	East of Eastern St	2,642	10-15-08	4
Southern Av	East of Eastern St	1,986	11-17-03	3
Southern Av	East of Eastern St	1,551	6-10-03	2
Southern Av	West of Eastern St	2,428	4-20-10	3
Southern Av	West of Eastern St	2,344	10-15-08	3
Southern Av	West of Eastern St	1,163	11-17-03	2
Southern Av	West of Seneca St	1,227	3-19-03	2
Southern Av	West of MustangSprg Rd	1,135	3-19-03	3
Stockton Hill Rd	South of Jagerson Av	5,876	10-14-09	1
Stockton Hill Rd	South of Jagerson Av	4,656	4-28-03	2
Stockton Hill Rd	South of College Dr	9,332	10-21-09	2
Stockton Hill Rd	South of College Dr	8,217	5-27-03	4
Stockton Hill Rd	South of Northern Av	16,716	6-10-03	4
Stockton Hill Rd	North of Riata Valley Rd	22,939	4-24-03	4,3
Stockton Hill Rd	North of Airway Av	25,804	8-4-10	3,2
Stockton Hill Rd***	North of Airway Av	28,208	3-11-08	n/a
Stockton Hill Rd	North of Detroit Av	24,370	8-4-10	1/3
Stockton Hill Rd***	North of Detroit Av	26,368	3-11-08	n/a
Stockton Hill Rd	South of Airway Av	25,681	9-26-06	3,4
Stockton Hill Rd*	South of Airway Av	31,510	5-6-03	n/a
Stockton Hill Rd	South of Motor Av	18,458	8-25-10	4,2
Stockton Hill Rd	South of Motor Av	18,959	10-9-09	1,2
Stockton Hill Rd	South of Motor Av	18,726	4-24-03	1,2
Sycamore Av	West of Stockton Hill Rd	3,767	11-23-09	2
Sycamore Av*	West of Stockton Hill Rd	1,410	5-6-03	n/a
Sycamore Av*	East of Stockton Hill Rd	300	5-6-03	n/a
Topeka St	West of 8th St	950	4-28-03	1
Townsend St	North of Bank St	2,791	3-15-04	4

Wallapai Av	East of Monroe St	148	1-12-04	2
Washington St	South of Southern Av	822	6-15-09	1
Washington St	South of Southern Av	551	11-19-03	4
Washington St	North of Southern Av	291	11-19-03	2
Washington St	South of Chambers Av	286	5-5-04	1
Washington St	North of Chambers Av	295	5-5-04	4
Western Av	North of Crestwood Dr	2,100	4-8-03	1
Western Av	North of Riata Valley Rd	2,974	6-15-04	2
Western Av	South of Riata Valley Rd	2,865	6-15-04	3
Western Av	South of Hillcrest Dr	2,979	8-31-09	1
Western Av	South of Hillcrest Dr	2,930	7-19-05	3
Western Av	North of Hillcrest Dr	3,106	8-31-09	2
Western Av	North of Hillcrest Dr	2,978	7-19-05	1
Western Av	North of Airway Av	4,186	9-14-09	1
Western Av	North of Airway Av	4,688	5-4-09	3
Western Av	South of Airway Av	5,097	9-7-09	1
Western Av	South of Airway Av	5,831	5-4-09	2
Western Av	South of Airway Av	4,081	4-3-03	3
Western Av	South of Detroit Av	1,034	8-18-10	2
Western Av	South of Detroit Av	611	6-7-10	1
Western Av	South of Detroit Av	980	12-15-08	1
Western Av	South of Detroit Av	984	9-21-04	1
Western Av	North of Detroit Av	748	9-21-04	3
Western Av	South of Golden Gate Av	450	4-1-03	3
Willow Rd	North of Airway Av	5,726	8-18-10	4
Willow Rd	North of Airway Av	6,452	1-23-08	1
Willow Rd	At Mohave Wash X-ing	5,147	11-16-09	2
Willow Rd	At Mohave Wash X-ing	5,619	7-2-07	2
Willow Rd	At Mohave Wash X-ing	4,865	4-8-03	4

ADT = Average Daily Traffic

* Count information provided by Carter Burgess

** Count information provided by SWTE

*** Count information provided by Lee Engineering

Appendix 9-4: 2030 Population and Employment Estimates by Traffic Analysis Zones

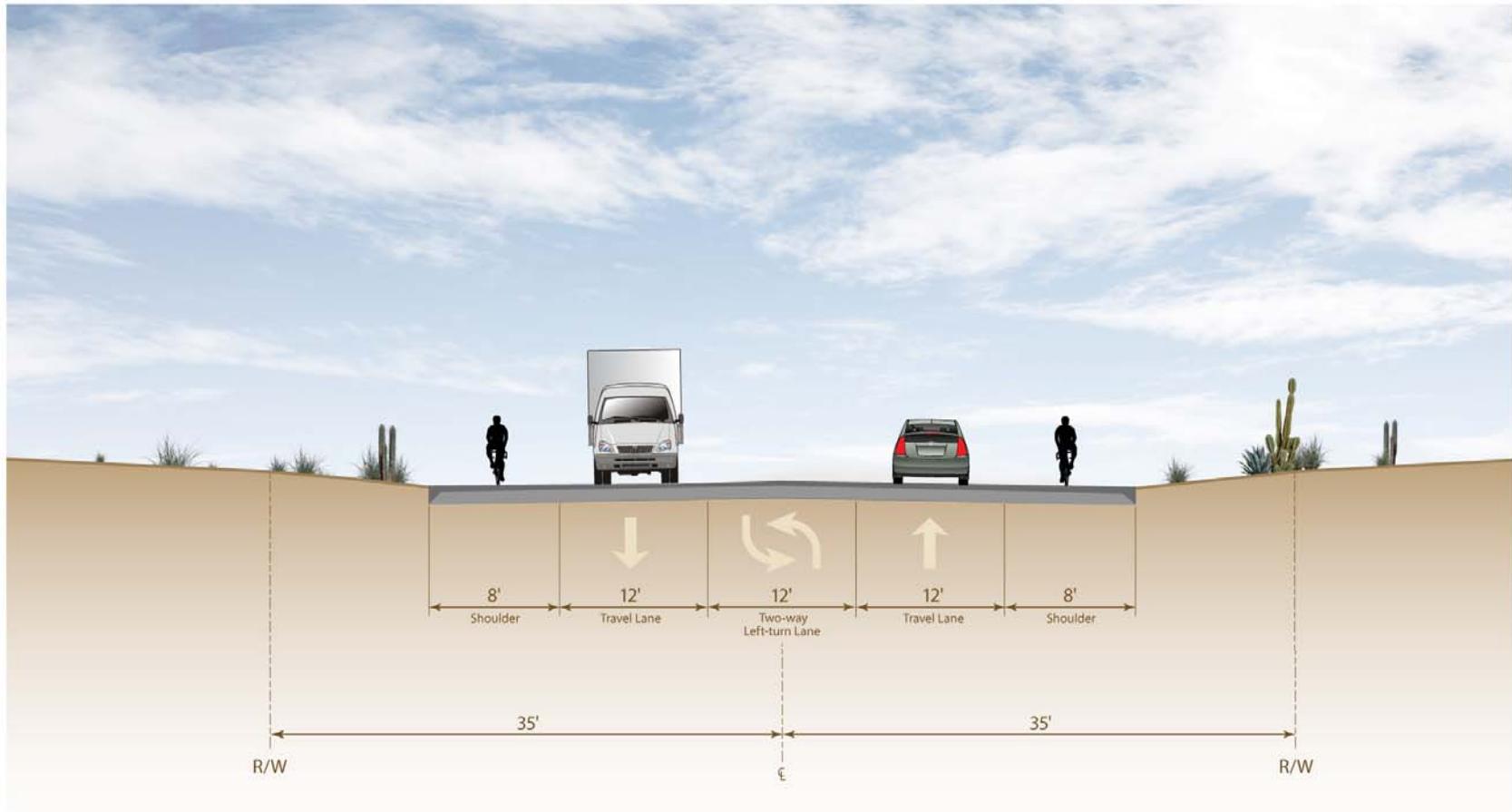
TAZ	2030 Population	2030 Employment				
		Retail	General	Office	Shopping Center	Total
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	190	153	55	0	0	208
4	200	287	55	4	0	346
5	271	0	75	0	0	75
6	366	53	61	0	0	114
7	408	0	175	200	0	375
8	399	125	400	225	0	750
9	413	125	400	250	0	775
10	165	57	31	245	0	333
11	90	61	0	0	0	61
12	600	0	99	0	0	99
13	400	0	22	0	0	22
14	0	110	129	0	0	239
15	0	164	120	26	0	310
16	0	166	134	142	0	442
17	61	110	186	0	0	296
18	213	14	14	0	0	28
19	31	44	33	0	0	77
20	0	44	44	0	0	88
21	900	180	150	125	0	455
22	909	68	233	34	0	335
23	2,600	50	50	0	0	100
24	6,000	0	225	100	110	435
25	1,100	20	55	0	0	75
26	973	225	115	70	0	410
27	53	75	45	65	0	185
28	408	33	131	44	0	208
29	628	90	150	140	0	380
30	920	35	55	55	0	145

TAZ	2030 Population	2030 Employment				
		<i>Retail</i>	<i>General</i>	<i>Office</i>	<i>Shopping Center</i>	<i>Total</i>
31	1,100	0	116	0	0	116
32	2,841	55	296	197	0	548
33	200	135	0	0	270	405
34	0	225	22	75	0	322
35	1,984	0	88	0	0	88
36	785	23	0	50	0	73
37	0	0	123	0	0	123
38	0	0	55	0	0	55
39	978	0	175	66	0	241
40	532	4	0	0	0	4
41	22	125	150	55	0	330
42	48	105	150	22	0	277
43	10	210	325	75	0	610
44	1,754	0	219	110	0	329
45	2	40	675	240	0	955
46	0	0	329	55	656	1040
47	2	160	364	200	0	724
48	900	215	419	200	0	834
49	19	200	120	0	0	320
50	0	150	210	0	110	470
51	3,745	75	100	25	0	200
52	2,200	0	0	0	0	0
53	232	205	110	200	55	570
54	0	234	173	300	329	1036
55	2,679	55	55	42	0	152
56	935	223	110	0	0	333
57	120	61	253	292	0	606
58	7	0	142	0	110	252
59	100	164	44	33	66	307
60	1	110	77	33	220	440
61	951	200	0	0	0	200
62	1,281	200	200	0	0	400
63	1,018	77	147	60	0	284
64	78	0	135	115	0	250
65	1,349	0	147	0	0	147

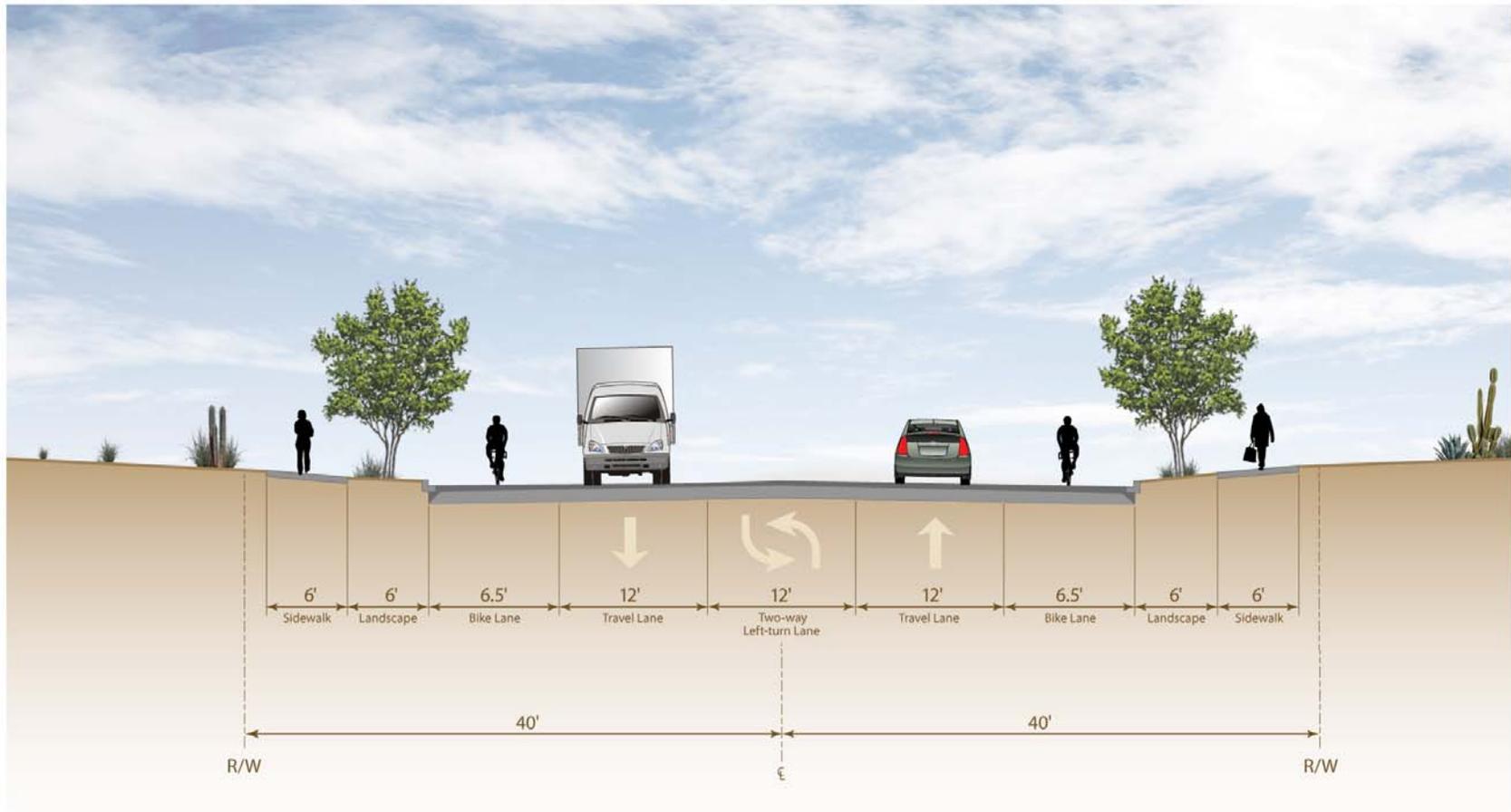
TAZ	2030 Population	2030 Employment				
		<i>Retail</i>	<i>General</i>	<i>Office</i>	<i>Shopping Center</i>	<i>Total</i>
66	201	10	80	25	0	115
67	8	10	140	25	0	175
68	692	0	0	0	0	0
69	0	26	26	26	0	78
70	7	136	70	0	0	206
71	0	274	22	0	0	296
72	36	219	42	112	0	373
73	74	100	0	112	0	212
74	68	92	0	0	0	92
75	8	105	0	0	0	105
76	2,474	50	0	0	0	50
77	1,368	103	0	0	0	103
78	1,050	25	0	0	0	25
79	3,016	0	55	0	0	55
80	13	0	2600	25	0	2625
81	2,101	100	100	0	0	200
82	2,322	0	115	0	0	115
83	609	0	175	0	0	175
84	2,213	0	388	60	0	448
85	335	34	0	34	0	68
86	1,200	0	28	0	0	28
87	51	164	150	250	164	728
88	2,080	0	0	0	0	0
89	1,465	0	0	0	0	0
90	2,421	110	245	190	0	545
91	2,163	175	200	50	150	575
92	1,090	5	0	0	0	5
93	996	0	0	0	0	0
94	1,550	100	83	50	0	233
501	0	0	0	0	0	0
502	72	15	10	0	0	25
503	18	0	0	0	0	0
504	0	0	0	0	0	0
505	0	15	364	0	0	379
506	7	15	73	0	0	88

TAZ	2030 Population	2030 Employment				
		<i>Retail</i>	<i>General</i>	<i>Office</i>	<i>Shopping Center</i>	<i>Total</i>
507	927	15	117	0	0	132
508	64	15	145	7	0	167
509	419	44	145	15	0	204
510	0	0	0	0	0	0
511	155	7	44	0	0	51
512	1,309	0	146	0	0	146
513	248	0	73	0	0	73
514	174	15	44	7	0	66
515	187	0	29	0	0	29
Total	77,363	7,519	14,480	5,158	2,240	29,397

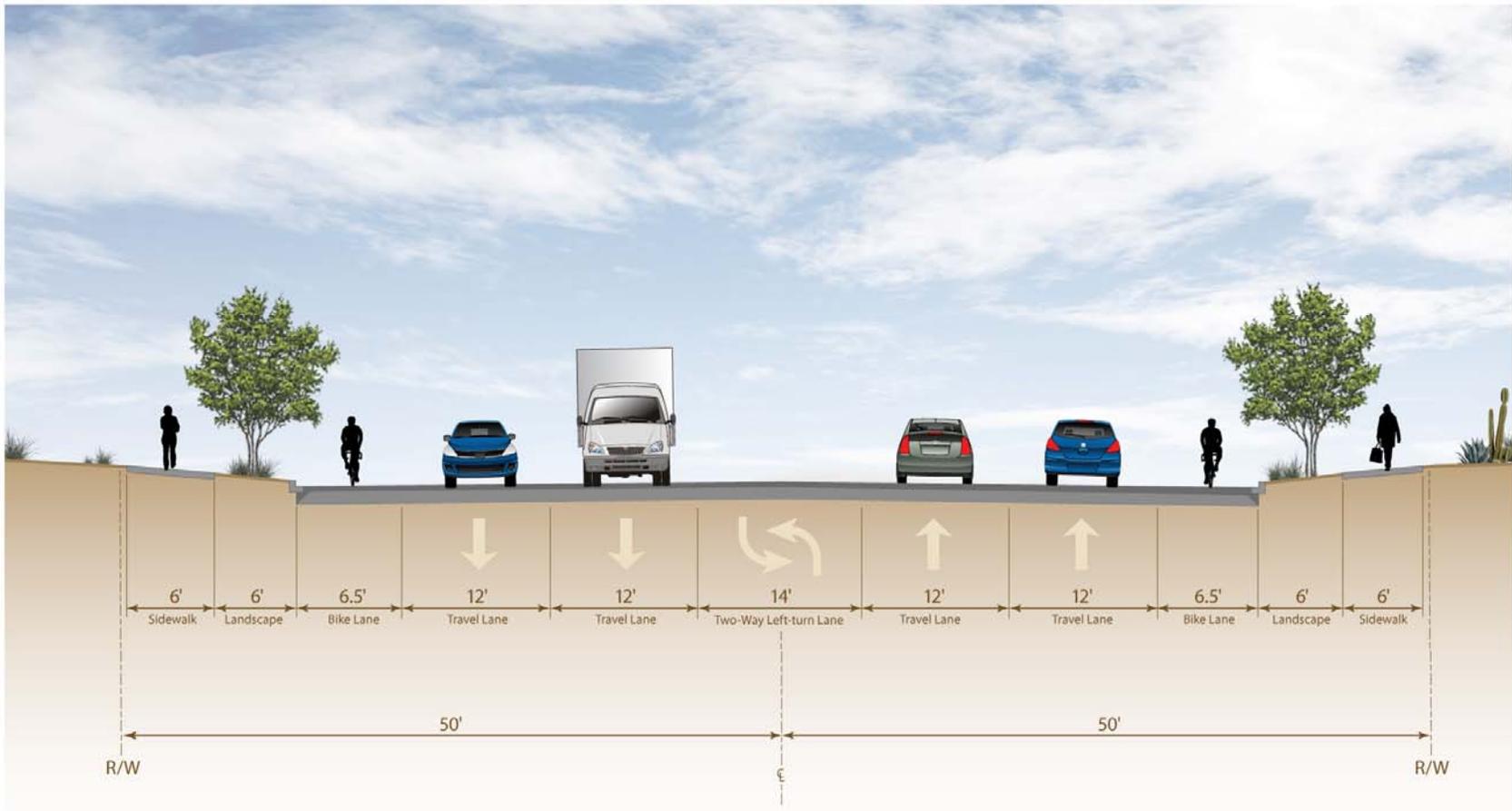
Appendix 9-5: Typical Complete Streets Cross-Sections



2-Lane Collector Without Curb



2-Lane Collector With Curb



4-Lane Arterial With Two-Way Left-Turn Lane



4-Lane Arterial With Median



6-Lane Arterial With Median