

## **5. FUTURE CONDITIONS AND ALTERNATIVES ANALYSIS**

### **INTRODUCTION**

This chapter summarizes the analysis of the 2025 socioeconomic and transportation conditions for the Coolidge-Florence transportation study area, and the analysis of alternative road networks. First, the 2025 socioeconomic projections area are presented and analyzed. The methods to forecast future traffic and road deficiencies are then described. Next, the conditions of the 2025 existing street network with the 2025 growth projections are analyzed. Sections follow discussing the analysis of alternative street networks to address roadway deficiencies and spatial allocation of the socioeconomic data among Transportation Analysis Zones (TAZs) defined in the study area.

### **SUMMARY OF FINDINGS**

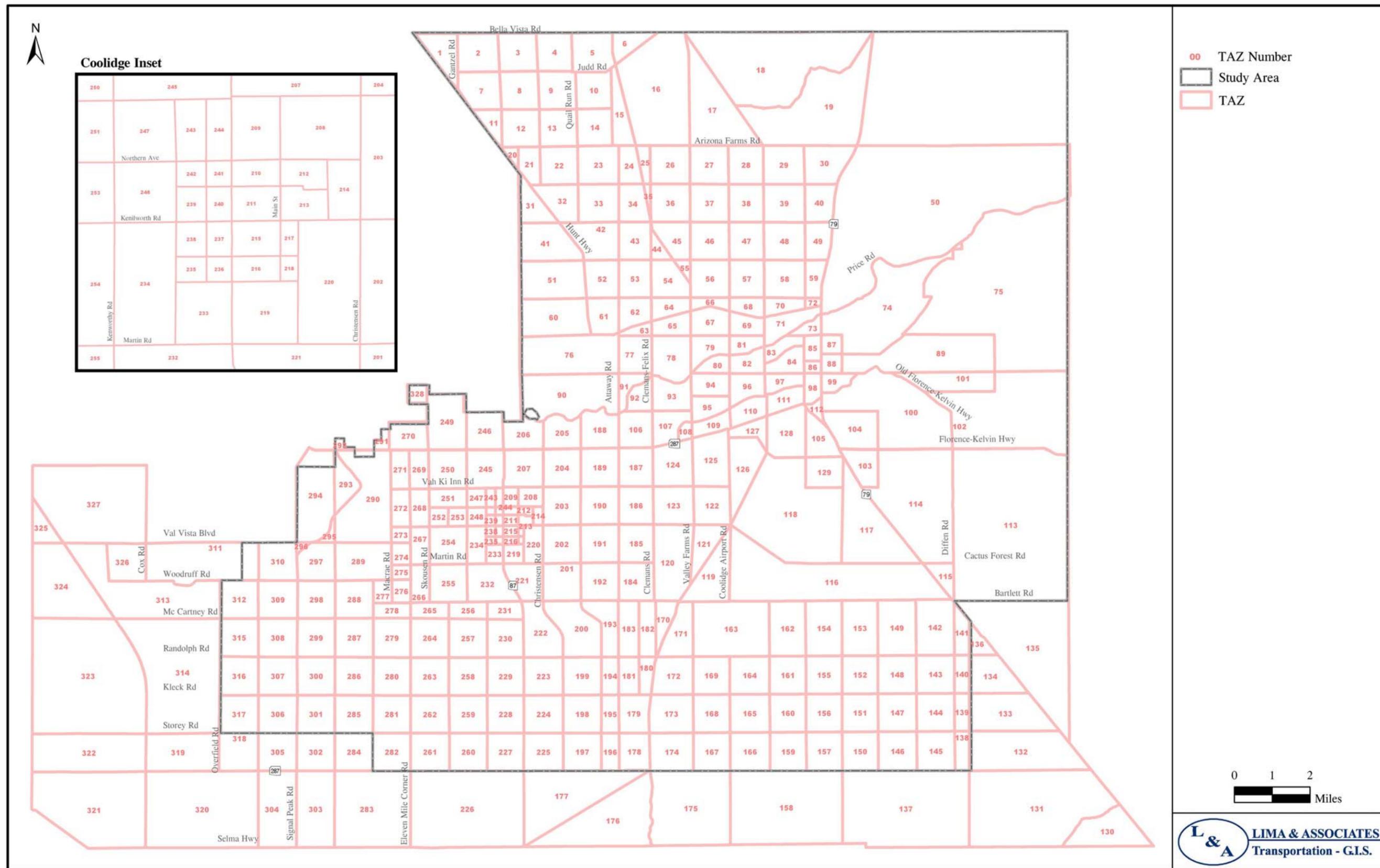
- Population in the study area is growing rapidly, and is anticipated to grow from 35,700 residents in 2005 to 336,500 residents by 2025.
- Employment is also expected to grow substantially by 2025 from 14,700 employees in 2005 to 134,000 employees by the year 2025.
- Major road deficiencies include a lack of road connectivity between activities and limited capacity.
- If growth occurs as expected, the current road network will experience gridlock if major improvements are not made to the road network.
- Road deficiencies can be corrected through the addition of roads and the widening of existing roads.

### **METHODOLOGY FOR DEVELOPING FUTURE SOCIOECONOMIC DATA**

The following steps were taken to estimate 2025 socioeconomic data including dwelling units, population, and number of employees.

1. The study area was subdivided into TAZs representing distinct geographical areas (see Figure 5-1). A TAZ is generally bounded by either the roads or other geographic boundaries such as the Gila River. Estimated households, population, and employees are allocated to each TAZ within the study area.
2. The Central Arizona Association of Governments (CAAG) Planned Area Development database for proposed residential and commercial acres (see Figure 5-2) was reviewed.
3. Coordinated with the Town of Florence and City of Coolidge to identify potential residential and commercial growth areas and the timing of these areas.
4. Reviewed locations of planned infrastructure (power, sewer, water).
5. Reviewed the housing permit history in the study area.

FIGURE 5-1. TRAFFIC ANALYSIS ZONES



6. Reviewed the amount and timing of housing development and commercial and office development growth in urban areas in the Phoenix and Tucson area.
7. Estimated 2025 dwelling units in each TAZ.
8. Estimated employees among retail, office, industrial, government, and other types of employment and allocated to TAZs.

## SUMMARY OF 2025 SOCIOECONOMIC DATA

Table 5-1 presents a summary of the socioeconomic projections for the year 2025. Population in the study area is growing very rapidly. The estimated total 2005 population is expected to grow to a projected 2025 population of approximately 337,500 residents, almost an 846 percent increase—42 percent yearly average growth rate. The 2025 population in the study area is allocated among the jurisdictions as follows:

- 114,000 in the Florence Metropolitan Planning Area
- 72,100 in the Coolidge Metropolitan Planning Area
- 151,400 in the Pinal County and Casa Grande portions of the study area.

**TABLE 5-1. SUMMARY OF 2025 SOCIOECONOMIC DATA  
COOLIDGE-FLORENCE STUDY AREA**

Area	2005				2025			
	DUS	Pop.	Emp	Emp/ Pop	DUS	Pop	Emp	Emp/ Pop
Coolidge Planning Area	4,223	12,275	3,897	0.32	25,608	72,153	22,269	0.31
Florence Planning Area	3,494	8,662	5,553	0.64	41,094	113,942	57,241	0.50
County Portion	6,635	14,723	5,247	0.36	57,086	151,419	54,425	0.36
<b>Total Study Area</b>	<b>14,352</b>	<b>35,660</b>	<b>14,697</b>	<b>0.41</b>	<b>123,788</b>	<b>337,514</b>	<b>133,935</b>	<b>0.40</b>

Source: Elliot Pollack & Company, Lima & Associates

DU=dwelling units, Pop=Population, Emp=Number of employees, Emp/Pop=Ration of employees to population

\*Population does not include prison population

Employment in the study area is also projected to grow rapidly to 134,000 employees, approximately 811 percent increase. This is a 40 percent yearly average growth rate.

The high projected growth rates for Coolidge-Florence compare to other high growth areas in the Phoenix metropolitan area and in other areas of Pinal County. For example, the population in the Town of Buckeye in Maricopa County grew from approximately 8,500 residents in the year 2000 to an estimated population of 31,800 residents in 2006—45.6 percent average yearly growth rate. The City of Maricopa in Pinal County grew from approximately 1,500 residents in the year 2000 to an estimated population of 25,800 residents in 2006—274 percent average yearly growth rate.

## **TRANSPORTATION ANALYSIS ZONE ALLOCATION**

The 2025 population density distribution among the TAZs in the study area is illustrated in Figure 5-2. Figure 5-3 illustrates the 2025 employment density distribution among the TAZs.

## **TRAFFIC FORECASTING PROCESS OVERVIEW**

A traffic forecasting model was developed and validated for the Coolidge-Florence Regional Transportation Study area to estimate future traffic volumes. The model was developed using the TransCAD transportation forecasting software and was calibrated using the year 2005 transportation network and estimated 2005 socioeconomic data. The transportation planning model is a representation of the study area transportation facilities and the travel patterns using these facilities. The traffic model contains inventories of the 2005 roadway facilities and of residential and non-residential units by traffic analysis zones.

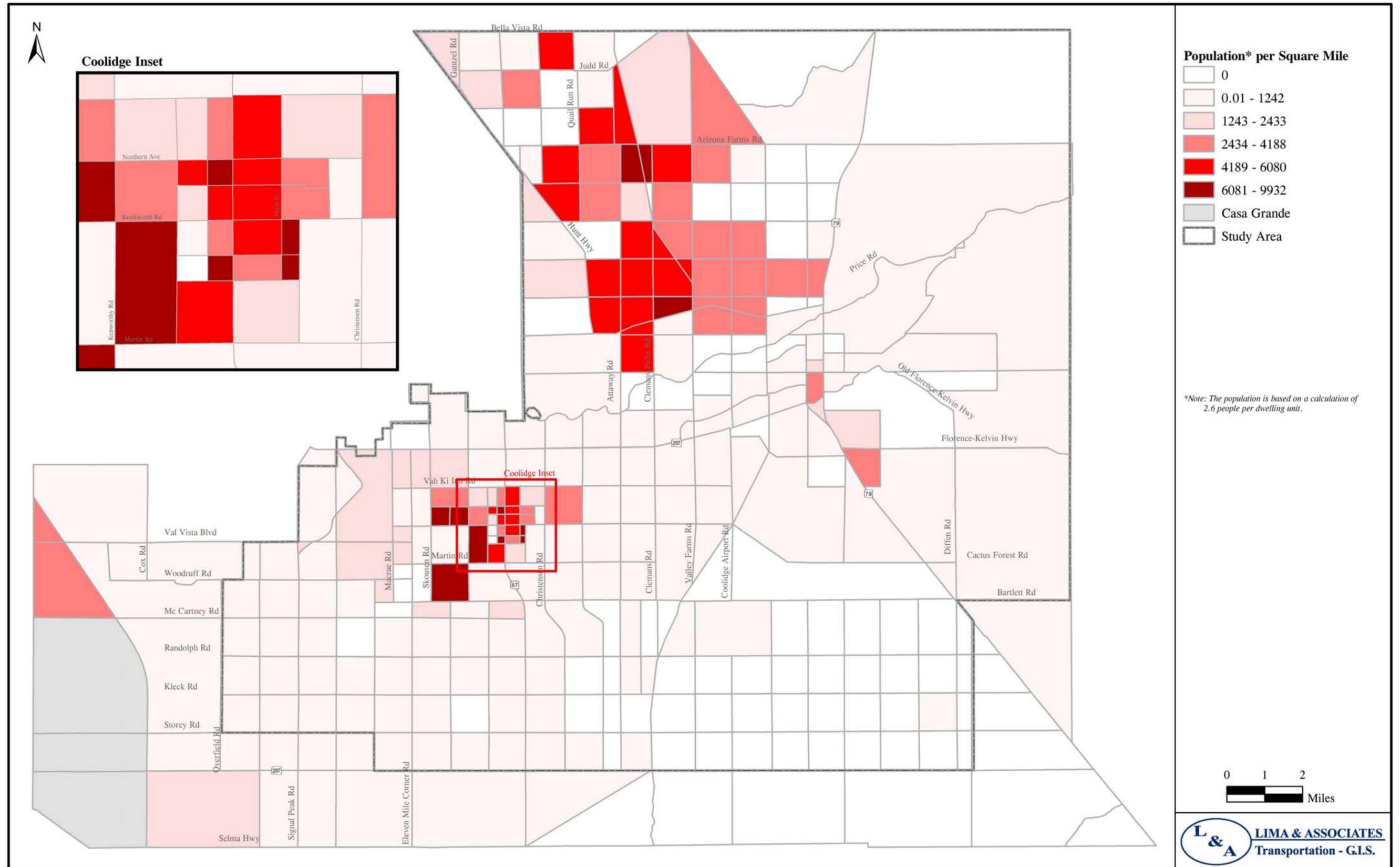
In general, the traffic model process consists of several steps including estimating the number of daily vehicle trips by TAZ from the socioeconomic inventory, distribution of vehicle trips by TAZ, and then assigning the vehicle trips to the street network. The traffic model is calibrated by comparing the daily traffic volumes produced by the model with current daily traffic counts. When the model matches the traffic counts within acceptable ranges of error the model can then be used to test future year scenarios. These scenarios may contain changes in numbers of housing units, employment centers, travel behavior patterns, or roadway improvements. The transportation planner or engineer, using the traffic-forecasting model can project future traffic volumes, which in turn can aid in making planning and project programming decisions.

The transportation modeling process included the following steps:

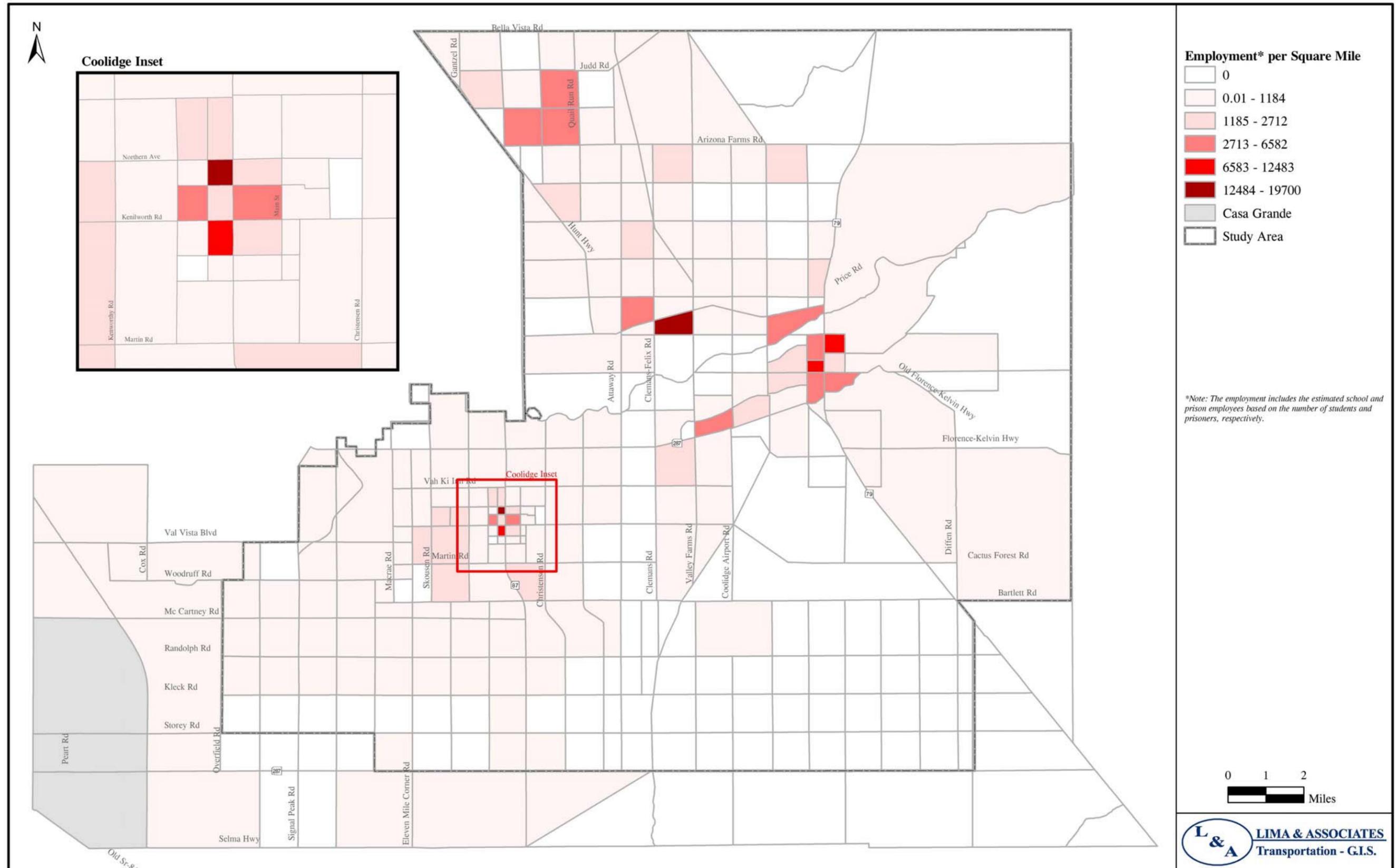
- Development of 2005 transportation roadway network.
- Determination of 2005 land use data working with the City of Coolidge and Town of Florence.
- Generation of daily vehicle trips in the trip generation phase.
- Distribution of vehicle trips in the trip distribution phase - geographical distribution of vehicle trips between origin and destination zones.
- Assigning vehicle trips to the 2005 road network in the trip assignment phase.

The next step in the traffic forecasting process was to apply the calibrated model to forecast 2025 traffic volumes. For this, the 2025 socioeconomic TAZ data was used to forecast the 2025 daily traffic volumes.

**FIGURE 5-2. 2025 POPULATION DENSITIES**



**FIGURE 5-3. 2025 EMPLOYMENT DENSITIES**



## METHOD TO IDENTIFY ROAD DEFIECIENCES

Roadway deficiencies were identified using traffic level of service. Level of service (LOS) is a qualitative measure of traffic operations stated in terms of factors such as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. Level of service ranges from LOS A to LOS F, where LOS A represents unrestricted traffic flow and LOS F represents a severely congested traffic condition. In an urban area, the acceptable level of service ranges between LOS C and D.

Table 5-2 presents the planning criteria used for determining level of service based on volume-to-capacity ratio. As the ratio of daily traffic volume increases, the level of service experienced by drivers deteriorates until it exceeds the road capacity and bottle necks occur. Figure 5-4 presents a visual depiction of the various levels of service.

**TABLE 5-2. LEVEL OF SERVICE CRITERIA**

LOS	Maximum V/C
A	0.29
B	0.54
C	0.75
D	0.90
E	1.00
F	> 1.00

Source: Transportation Research Board,  
*Highway Capacity Manual*

## PERFORMANCE OF 2005 NETWORK

The Coolidge-Florence TransCAD travel demand model was used to estimate 2025 daily traffic volumes on the existing road network assuming the projected 2025 socioeconomic conditions. Figure 5-5 illustrates the 2025 level of service on the existing roads in the study area if no improvements are made on the network. Virtually all the roadways are at a level of service F, indicating complete gridlock on the existing system if the study area grows as expected and no roadway improvements are made.

## PERFORMANCE OF 2025 ALTERNATIVE NETWORKS

In coordination with the Technical Advisory Committee (TAC), alternative 2025 road networks were identified to meet the future travel demand. Beginning with a Base 2025 Road Network, alternative road networks evolved as alternatives were analyzed and as changes were made to the Florence and Coolidge General Plans. The following sections describe alternative networks and the results of the analysis of those alternatives.

**FIGURE 5-4. EXAMPLES OF ROADWAY LEVEL OF SERVICE**

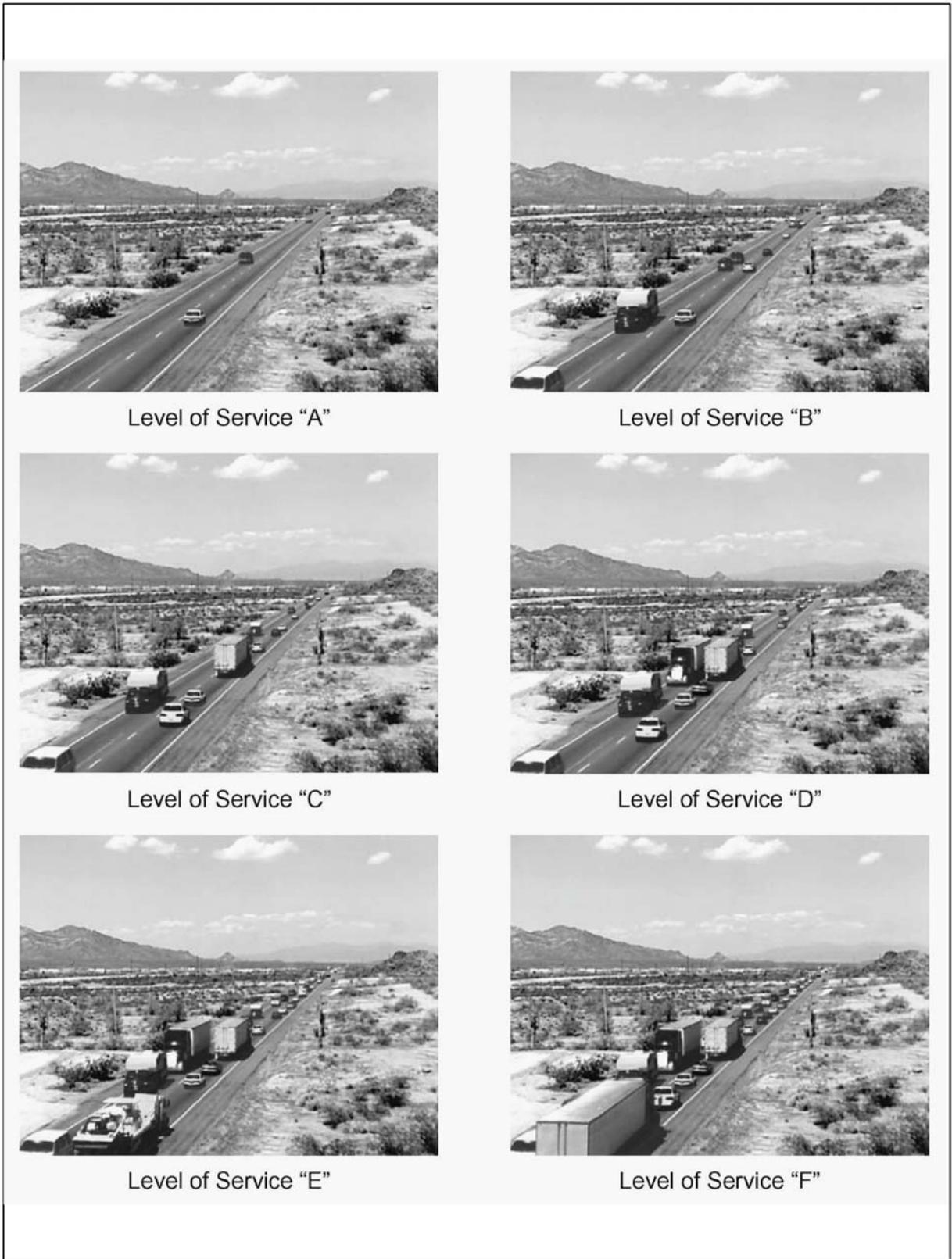
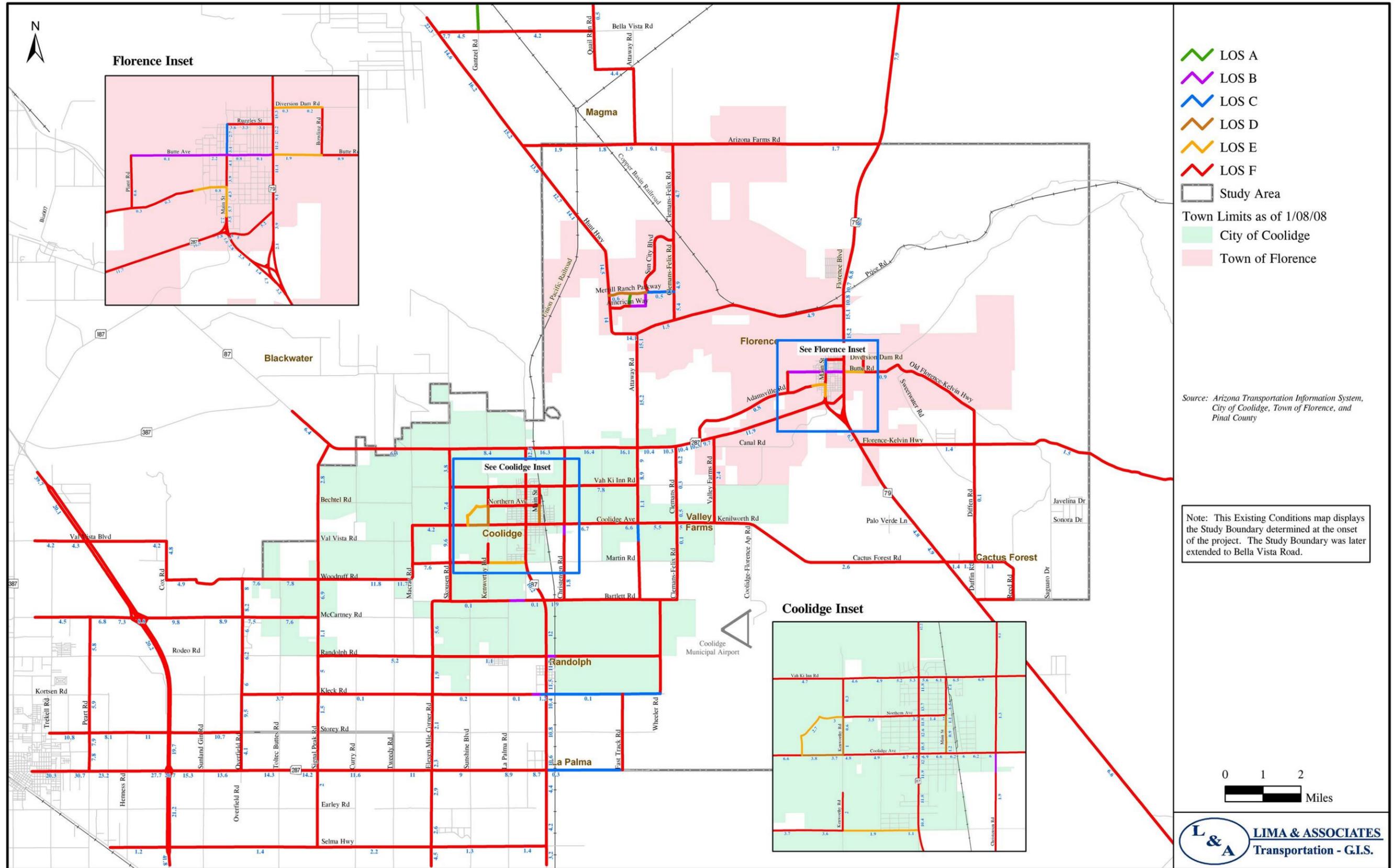


FIGURE 5-5. 2005 ROAD NETWORK WITH 2025 SOCIOECONOMIC PROJECTIONS - LEVEL OF SERVICE



## **Base 2025 Road Network**

As noted above, a Base 2025 Street Network was developed in coordination with the Technical Advisory Committee (TAC) as illustrated in Figure 5-6. The network was developed based on the following information;

- Coolidge General Plan Land Use Plan
- Florence General Plan Land Use Plan
- Development plans in both Florence and Coolidge
- Regionally Significant Routes for Safety and Mobility
- Forecasted 2025 Traffic Volumes in the study area

The Base 2025 Network includes new roadways, improvements to existing roadways, and the proposed North-South Freeway Corridor. Figure 5-6 illustrates the number of lanes on the Base 2025 Road Network. Figure 5-7 illustrates the level of service on the Base 2025 network with the 2025 socioeconomic numbers.

## **Base 2025 Road Network Without The North-South Freeway Corridor**

In order to illustrate the impact of the North-South Freeway Corridor in the region, daily traffic volumes were estimated on the Base 2025 Street Network without the North-South Freeway Corridor. Figure 5-8 shows the level of service on the streets without the North-South Freeway Corridor.

## **2025 ALTERNATIVE ROAD NETWORK**

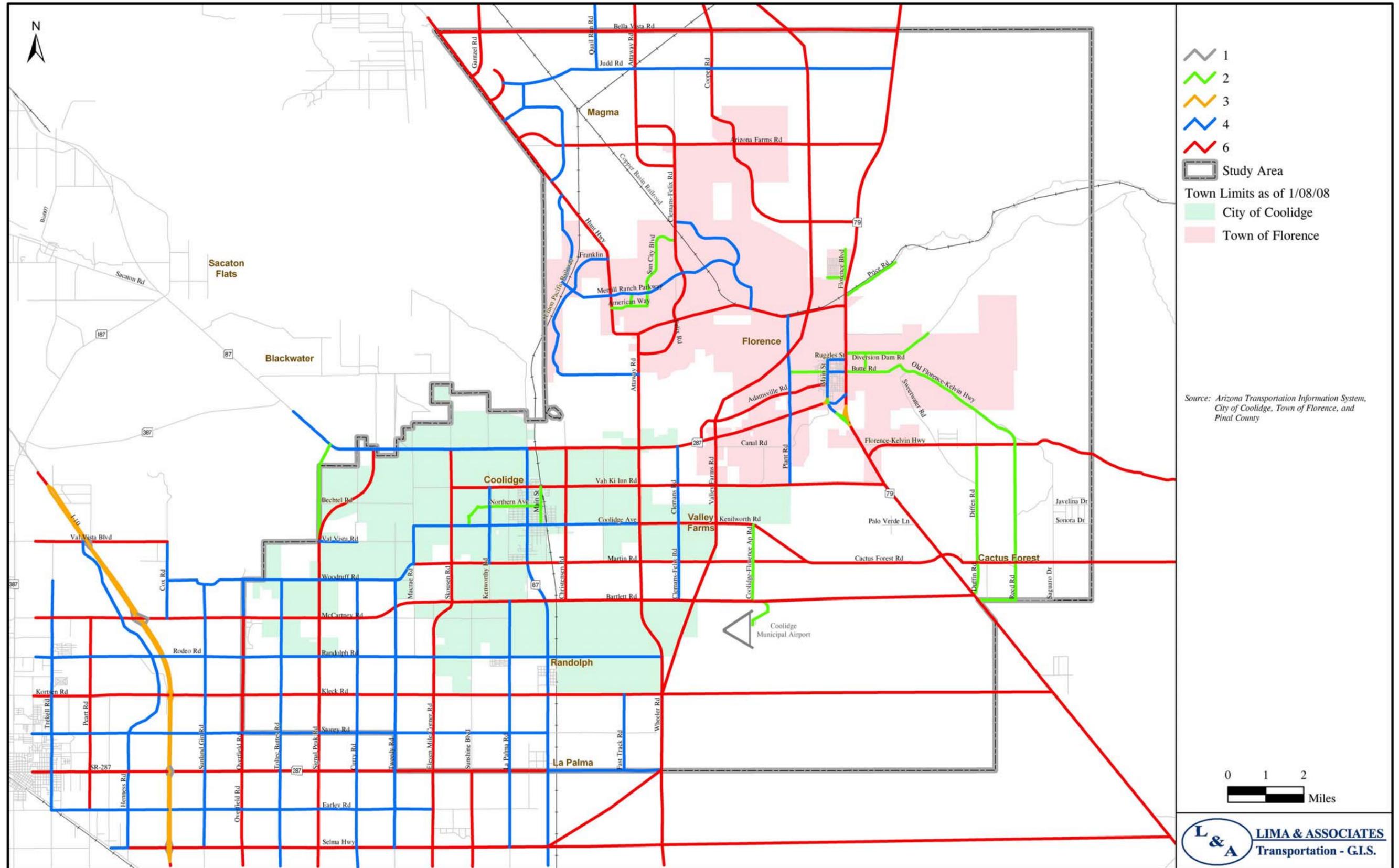
The Base 2025 Road Network was modified to reflect changes in the road network of the Florence land use plan. Figure 5-9 illustrates the level of service on the alternative road network.

## **North-South Freeway Terminated at SR 287**

The Alternative Network was modified to analyze the impact of terminating the North-South Freeway Corridor at SR 287. Figure 5-10 illustrates the daily traffic volumes with this scenario. The impacts of terminating the North-South Freeway Corridor at SR 287 include the following:

- Increase traffic volumes on SR 287 west of the North-South Corridor.
- Increase traffic volumes on SR 87 south of the North-South Corridor.

**FIGURE 5-6. BASE 2025 ROAD NETWORK - NUMBER OF LANES**



Source: Arizona Transportation Information System, City of Coolidge, Town of Florence, and Pinal County



FIGURE 5-7. BASE 2025 ROAD NETWORK - LEVEL OF SERVICE

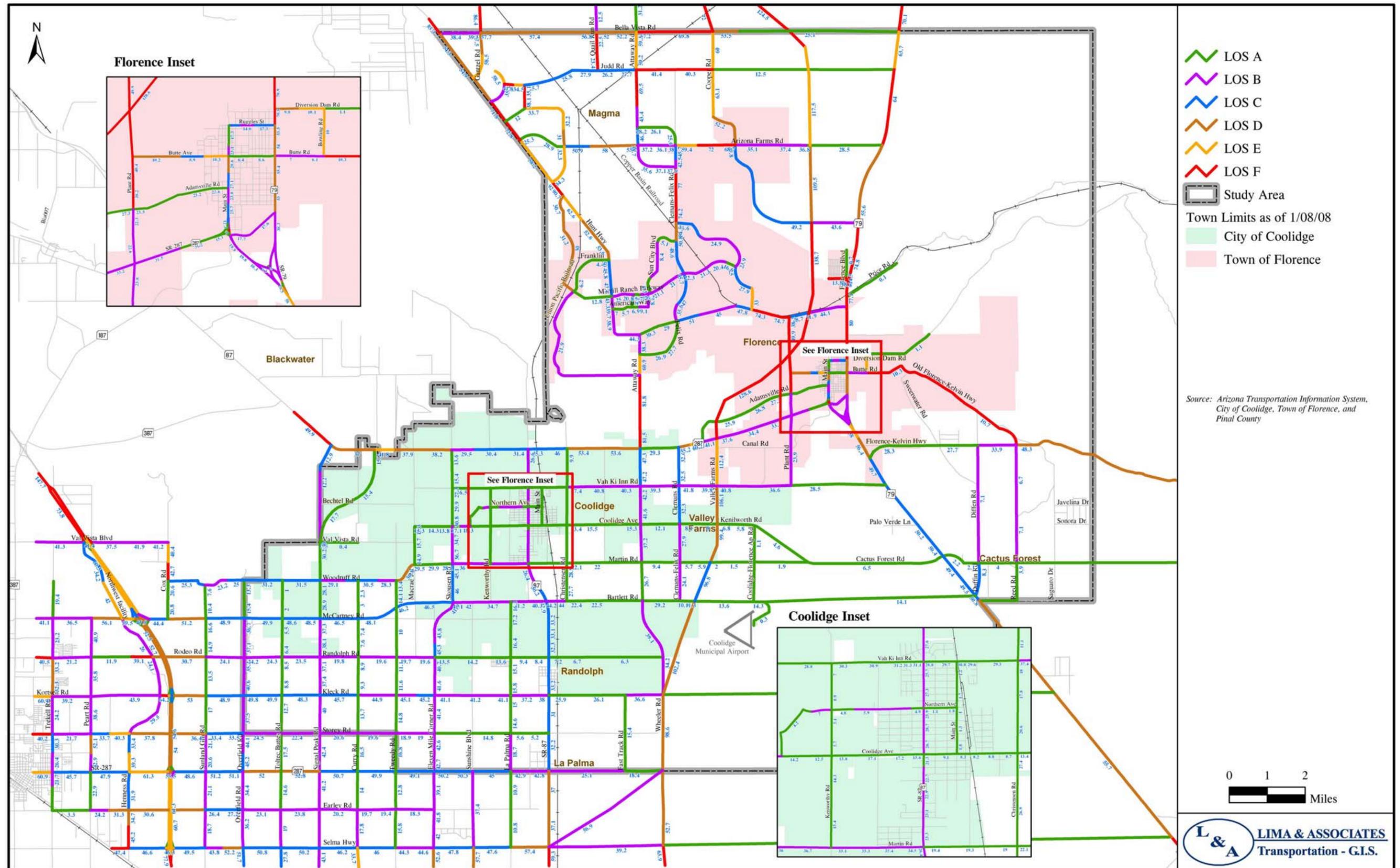


FIGURE 5-8. 2025 BASE ROAD NETWORK WITHOUT NORTH-SOUTH FREEWAY CORRIDOR - LEVEL OF SERVICE

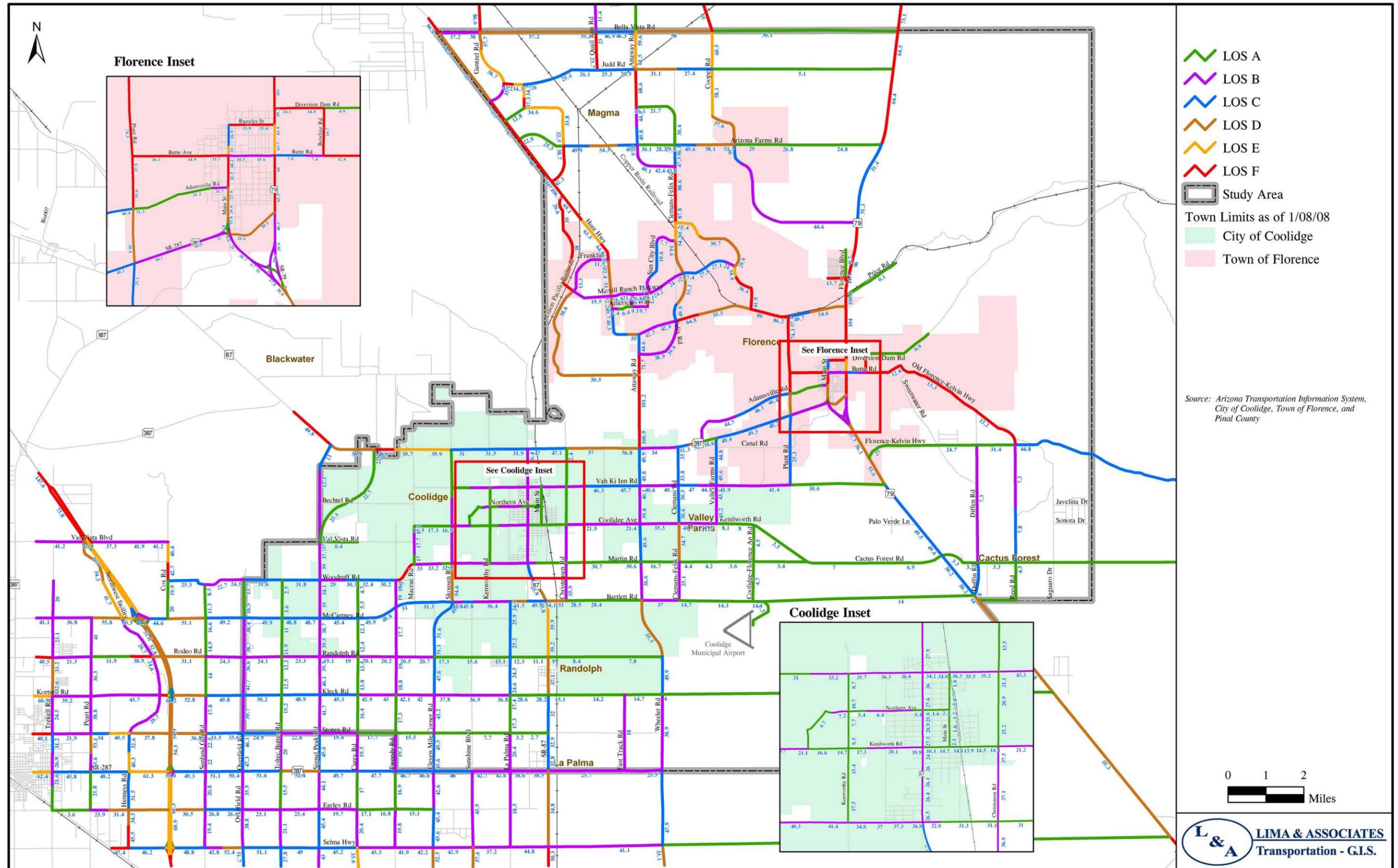


FIGURE 5-9. 2025 ALTERNATIVE 1 ROAD NETWORK 1 - LEVEL OF SERVICE

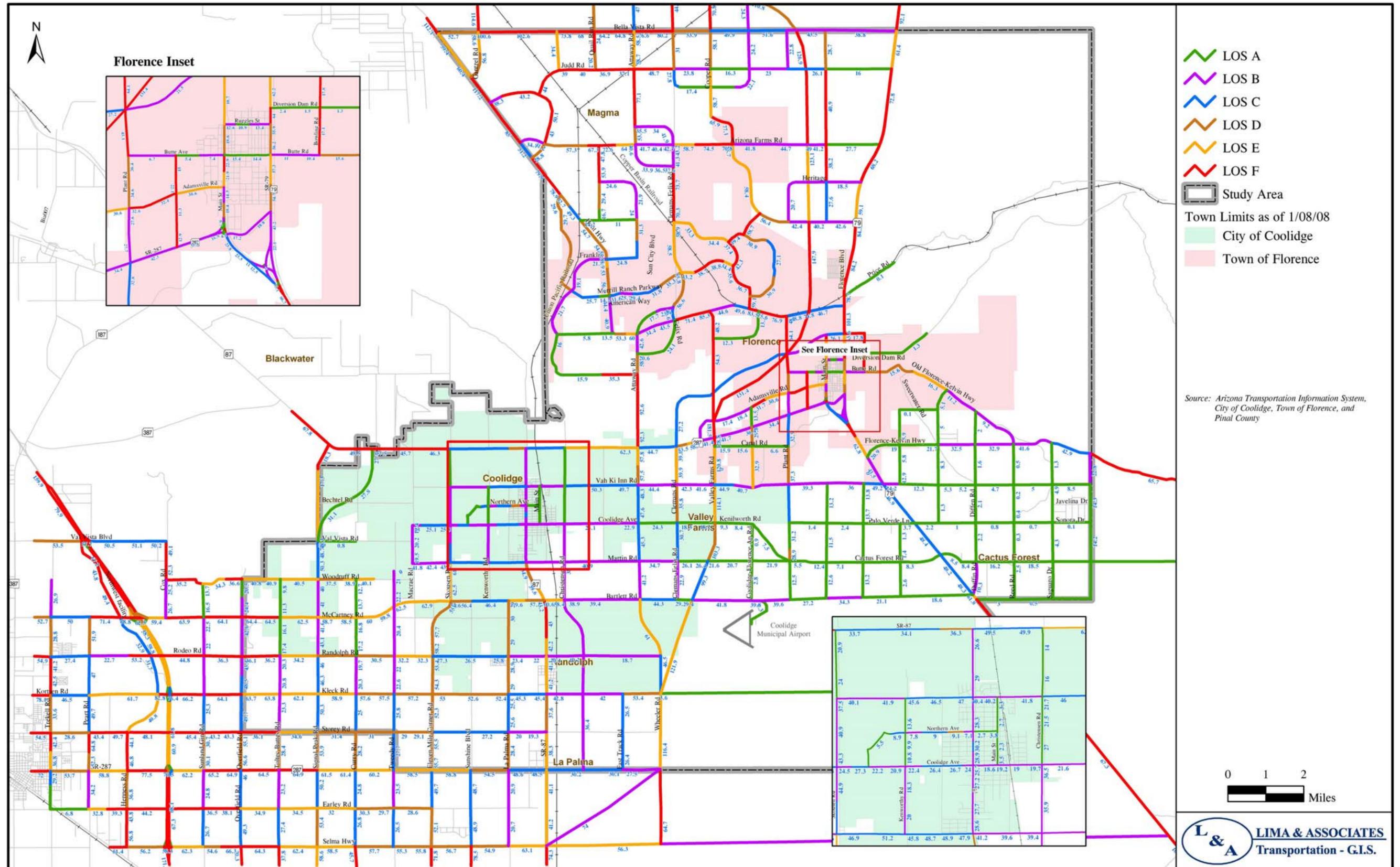


FIGURE 5-10. 2025 ALTERNATIVE 1 ROAD NETWORK 1 (NORTH-SOUTH FREEWAY CORRIDOR TERMINATED AT SR 287) – LEVEL OF SERVICE

