CITY OF EL PASO, TEXAS
AGENDA ITEM
AGENDA SUMMARY FORM

DEPARTMENT: Mayor & Council

AGENDA DATE: December 11, 2018

CONTACT PERSON NAME AND PHONE NUMBER:
Representative Peter Svarzbein, 915-212-0001)

DISTRICT(S) AFFECTED: District 1

STRATEGIC GOAL: Goal 2 - Set the Standard for a Safe and Secure City

SUBJECT:
Discussion on the authorization and direction to the City Manager to perform/update traffic studies for the following street located within the Northwest Upper Valley Plan: Gomez Road, Upper Valley Road, Westside Drive, Borderland Road, and Montoya Drive.

BACKGROUND / DISCUSSION:
The Upper Valley area has experienced growth to a level that is exceeding the capacity of its current infrastructure. It is essential to conduct and update studies to initiate a comprehensive masterplan for the area. Evaluating the need for enhancements for the roads listed on the item are a start to a larger conversation to address this growing section of the city and the vision District 1 constituents have for their community.

PRIOR COUNCIL ACTION:
Has the Council previously considered this item or a closely related one? No

AMOUNT AND SOURCE OF FUNDING:
How will this item be funded?
Has the item been budgeted? No
If so, identify funding source by account numbers and description of account. Does it require a budget transfer?

********************REQUIRED AUTHORIZATION********************

Upper Valley Traffic Study

El Paso, Texas

VOLUME 1

Interim Review Only
Document Incomplete: Not intended for permit or construction Engineer: Lourdes Cardenas, P.E. Texas P.E. Serial No.: 67602 Date: December 1, 2008

Interim Review Only
Document Incomplete: Not intended for permit or construction Engineer: Gary W. Schatz, P.E., PTOE New Mexico P.E. Serial No.: 18835 Date: December 1, 2008

Prepared for

City of El Paso

Prepared by

WALTER P MOORE

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El Paso, Texas 79925

December 2008

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INTRODUCTION

The City of El Paso, Texas has identified the need to improve capacity, operation, circulation, access, and safety in the area described as the Upper Valley in northwest El Paso. The City of El Paso is also concerned with the fast growing area in and around the City of Sunland Park, New Mexico and connections to the Santa Teresa port of entry which directly border the Upper Valley area. This study examines the growth forecasted for the Upper Valley area and provides recommendations on the necessary road improvements required to meet the future travel demand. To address these issues, the City of El Paso commissioned a team led by Walter P Moore to prepare the Upper Valley Traffic Study.

The Walter P Moore team includes: Walter P. Moore and Associates, Inc. as the prime consultant; AIA Engineers, Ltd.; Moreno Cardenas Inc.; and Suzanne Michaels Communications.

STUDY OBJECTIVES

There were several study objectives outlined by the City of El Paso at the beginning of this project. Below is a list of the major objectives addressed in this document:

- To determine projected growth in the northwest sector of El Paso known as the Upper Valley related to residential and commercial development in and around the City of Sunland Park, existing and planned connections to the Santa Teresa Port of Entry, new entertainment complexes and other projected traffic generators
- To consider proposed improvements along IH 10, Doniphan, and Paisano planned by the Texas Department of Transportation
- To provide proposed improvements phased with major milestones at 2017, 2025, and 2035
- To provide phased improvements designed to maintain an acceptable level of service (LOS)
- To review the existing roadway layouts for existing and future land use patterns
- To provide future roadway network planning
- To identify and respond to local residents' concerns on road and traffic related issues
- To provide concept design of recommended improvements

STUDY AREA

The study area is illustrated in **Figure 1** and includes the area bounded by:

- Borderland on the north
- Doniphan (US20) on the east
- Racetrack Drive on the south
- Westside Drive on the west

There are several major features of the area that should be identified. The major roadways include Interstate Highway 10 to the east of the Upper Valley area. The New Mexico state border is adjacent to the west and southern boundaries of the Upper Valley study area. The Rio Grande travels through the Upper Valley area between the southwest and northeast portions. In addition, the Burlington Northern Santa Fe Railway (BNSF) is just west of Doniphan Drive. These features all impact the transportation system in the Upper Valley region making it a very complex study area. While the study concentrates on conditions and solutions within the study area boundary, all traffic forecasts include trips from the entire El Paso region.

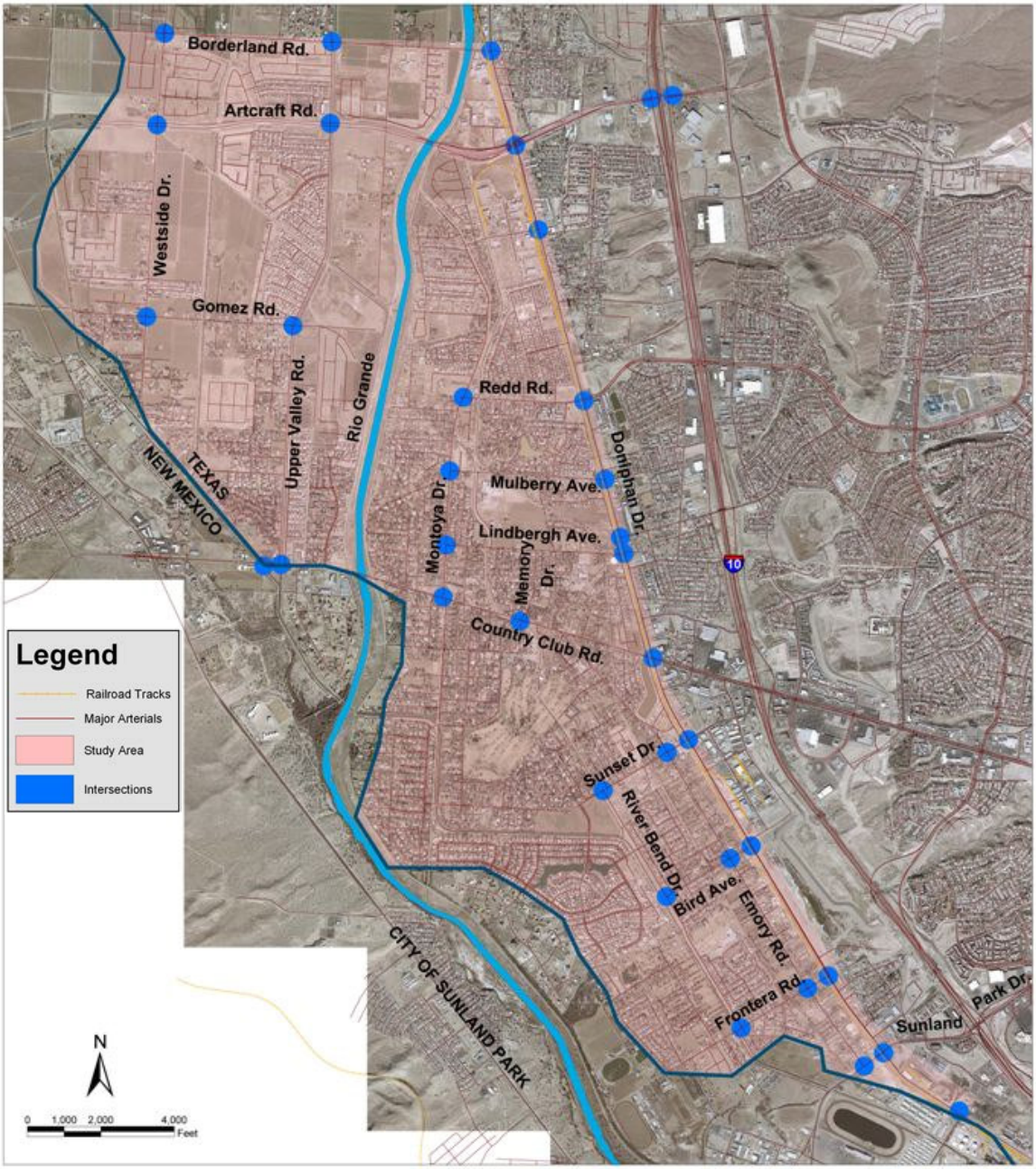


Figure 1: Study Area

METHODOLOGY

The Upper Valley Traffic Study includes several key components including gathering data from public agencies, traffic forecasting, traffic analysis, simulation, recommending improvements, and public involvement. These steps are described briefly below and in greater detail throughout the report.

DATA FROM AGENCIES

The Upper Valley Traffic Study involved multiple jurisdictions. Major traffic generators located in New Mexico that impact the Upper Valley area were also included. Each agency provided information about short-term, mid-term, and long-term development and improvement plans that were considered in the study. In addition, other information was obtained including land uses, utilities, property ownership data, and political boundaries. The agencies that provided data include the following:

- City of El Paso
- Texas Department of Transportation (TxDOT)
- El Paso Metropolitan Planning Organization (MPO)
- Sun Metro
- New Mexico Department of Transportation (NMDOT)
- Doña Ana County, New Mexico
- Santa Teresa, New Mexico
- City of Sunland Park, New Mexico
- Verde Group
- Burlington Northern Santa Fe Railway (BNSF)
- El Paso Water Improvement District #1
- El Paso Water Utilities
- Texas Gas Service
- El Paso Electric Company
- AT&T
- Time Warner Cable
- El Paso Natural Gas Company
- Paso Del Norte Mapa

REVIEW EXISTING CONDITIONS

The Walter P Moore team collected a variety of data in order to understand existing conditions. Geographic Information System (GIS) technology was used for developing and analyzing land uses, utilities, and property ownership in the Upper Valley corridor data. Traffic data was collected at major intersections to determine peak hour volumes for use in the analysis. In addition, field data was collected to identify intersection lane configurations and traffic control. The details of the existing conditions are described later in the report.

PUBLIC INPUT USING SURVEY

In order to gather public input about traffic conditions in the Upper Valley area, a survey was developed. The survey was mailed to residents in zip codes 79922 and 79932. The returned surveys were then tabulated to determine general trends in comments about traffic conditions that should be addressed in the study. The details of the survey are described later in the report.

FORECASTING USING *TRANSCAD*

The Walter P Moore team utilized the MPO's TransBorder 2035 Metropolitan Transportation Plan (MTP) model for forecasting the traffic volumes for this study. The MPO utilizes *TransCAD*, software developed by Caliper Corporation and commonly used in transportation planning, to develop these forecasts. The planning model is based on demographic changes expected in the 2017, 2025, and 2035 design years. Adjustments were made to the data to create a common base year of 2017. For each design year the forecasting approach consists of the following:

- Collect population, employment, and demographic data;
- Make forecasts for alternative network configurations;
- Incorporate roadway improvements expected to be provided by the City of El Paso, TxDOT, NMDOT, and any other transportation agencies in the immediate area into the model;
- Utilize traffic volume output in analysis.

The details of the forecasting are described later in the report.

ANALYSIS USING *SYNCHRO*

The next step of the project was to conduct capacity analysis at major intersections in the Upper Valley area. The traffic software, *Synchro*, is based on the *Highway Capacity Manual* and was used in the analysis. Peak hour traffic counts, existing lane configurations, and existing traffic signal timings were entered for 2007 and each design year: 2017, 2025, and 2035. The results of the

analysis are letter grade levels of service based on the average delay at each intersection. Where unacceptable levels of service are found, mitigation measures have been suggested and analyzed. The details of the traffic analysis are described later in the report.

SIMULATION USING *VISSIM*

After completing the capacity analysis, the operating conditions were simulated using *VISSIM*, a micro-simulation software developed by PTV Solutions. The software allows for simulation of vehicles, buses, trains, and pedestrians. Existing conditions and the design years of 2017, 2025, and 2035 were simulated in *VISSIM*. The details of the simulation are described later in the report.

RECOMMENDED IMPROVEMENTS

The Upper Valley Traffic Study incorporates the principles of context sensitive solutions (CSS) to assist in developing alternatives. Briefly, the seven principles of CSS which are used to judge and measure success are:

- The project satisfies the purposes and needs as agreed to by a full range of stakeholders. This agreement is forged in the earliest phase of the project and amended as warranted during the project's development.
- The project is a safe facility for both the user and the community.
- The project is in harmony with the community, and it preserves environmental, scenic, aesthetic, historical and natural resource values of the area; in other words, exhibits context sensitive design.
- The project exceeds the expectations of both designers and stakeholders and achieves a level of excellence in people's minds.
- The project involves efficient and effective use of the resources (time, budget and community) of all involved parties.
- The project is designed and built with a minimal disruption to the community.
- The project is seen as having added lasting value to the community.

Considering a systems-level approach using context-sensitive solutions, the Upper Valley Traffic Study approach to developing roadway network improvement options considers the following criteria:

- Consider the needs of all roadway users – bicyclists, pedestrians, motorists, and transit riders;

- Explore design options which require minimal or no additional right-of-way;
- Improve throughput of corridors with higher levels of regional and area mobility before considering improvements to lower level corridors;
- Develop improvement strategies that are in context with the corridors and intersections where they are proposed;
- Consider improvements to existing intersections first to improve corridor throughput;
- Explore improvements to existing corridors before considering new corridors.

The details of the recommendations for each design year, 2017, 2025, and 2035, are described later in the report.

EXISTING CONDITIONS

STREET SYSTEM

The primary streets in the analysis area are described below. As used in this report, the classification of a street is based on the existing conditions along that street and its relative level of functionality within the existing roadway network. Thus this report's classification of a street may differ from the planning classification listed in the City of El Paso's *2025 Proposed Thoroughfare System Comprehensive Plan*. Considerations for any future improvements do attempt to preserve the comprehensive plan's overall intent.

Doniphan Drive is a north-south major arterial that extends through the northern and southern project limits. The road provides two lanes of travel in each direction with a continuous left turn lane. The posted speed limit on Doniphan from Borderland Road to Redd Road is 45 mph; from Redd Road to Mesa Street, 40 mph; from Sunset Road to Frontera Road, 50 mph; and from Frontera Road to Racetrack Drive, 45 mph. From Country Club Road northward, Doniphan Drive is also designated Texas State Highway 20.

Emory Road is a north-south local street that provides one lane of travel in each direction from Sunland Park Drive to Sunset Road. The posted speed on Emory Road is 30 mph.

Memory Drive is a north-south local street from Country Club Road to Lindbergh Avenue that provides one lane of travel in each direction. The posted speed on Memory Drive is 30 mph.

Montoya Drive is a north-south local collector street that provides one lane of travel in each direction from Doniphan Drive to Sunset Road. The posted speed on Montoya Drive is 30 mph.

Upper Valley Road is a north-south minor collector from Country Club Road to Borderland Road that provides one lane of travel in each direction. The posted speed on Upper Valley Road is 45 mph.

River Bend Drive is a north-south local collector that provides one lane of travel in each direction from Sunset Road to Frontera Road. The posted speed on River Bend Drive is 35 mph.

Westside Drive is a north-south minor collector that provides one lane of travel in each direction from Country Club Road to Borderland Road and continues outside the study area into New Mexico. The posted speed on Westside Drive is 45 mph.

Borderland Road is an east-west minor collector that provides one lane of travel in each direction from Doniphan Drive to Westside Drive and continues outside the study area into New Mexico. The posted speed on Borderland Road is 40 mph.

Artcraft Road is an east-west controlled access expressway that provides two lanes of travel in each direction from IH-10 to Westside Drive and continues outside the study area boundary into New Mexico and the Santa Teresa Port of Entry. The name of this roadway changes to Peter Domenici International Highway once it enters New Mexico and is also designated as New Mexico State Highway 136. The posted speed on Artcraft Road is 60 mph.

Redd Road is an east-west major arterial that provides two lanes of travel in each direction from Doniphan Drive to Montoya Drive. The posted speed on Redd Road is 40 mph.

Mulberry Avenue is an east-west local street from Doniphan Drive to Montoya Drive that provides one lane of travel in each direction. The posted speed on Mulberry Avenue is 30 mph.

Lindbergh Avenue is an east-west local street that provides two lanes of travel in each direction from Doniphan Drive to Montoya Drive. The posted speed on Lindbergh Avenue is 30 mph.

Country Club Road is an east-west major collector that provides one lane of travel in each direction from Doniphan Drive to Westside Drive into New Mexico. The posted speed on Country Club Road is 40 mph. East of its intersection with Doniphan Drive, Country Club Road becomes N. Mesa Street.

Sunset Road is an east-west local street from Doniphan Drive to Montoya Drive that provides one lane of travel in each direction. The posted speed on Sunset Road is 30 mph.

Bird Avenue is an east-west local street that provides one lane of travel in each direction from Doniphan Drive to River Bend Drive. The posted speed on Bird Avenue is 30 mph.

Frontera Road is an east-west local street that provides one lane of travel in each direction from Doniphan Drive to La Adelita Drive. The posted speed on Frontera Road is 30 mph.

Sunland Park Drive is an east-west major arterial that provides two lanes of travel in each direction and a continuous left turn lane from Doniphan Drive to McNutt Road in New Mexico. The posted speed on Sunland Park Drive is 30 mph.

Racetrack Drive is an east-west minor arterial that provides two lanes of travel in each direction from Doniphan Drive to McNutt Road in New Mexico. The posted speed on Racetrack Drive is 45 mph.

Gomez Street is an east-west street providing one lane of travel in each direction from east of Upper Valley to west of Westside.

McNutt Road – NM 273 is a north-south major arterial to the west of the study area located in New Mexico that provides two lanes of travel in each direction from Racetrack Drive to just south of Country Club and one lane of travel in each direction thereafter to its limit with Pete Domenici International Highway.

Table 1 summarizes the street features for the study area. The table includes number of lanes, curb/gutter, left turn lanes, median, approximate right-of-way, pavement width, sidewalk, and whether it has a railroad crossing.

Table 1: Existing Roadway Conditions								
Street Name	# Lanes	Curb/ Gutter?	Left Turn?	Median?	Approx. ROW Width	Pavement Width	Sidewalk?	R.R. Crossing?
Racetrack	2	---	---	Yes	40	22-24	---	Yes
Sunland Park (Emory - Doniphan)	4	Yes	Yes	Yes	115-132	90	Yes	Yes
Frontera (Emory-Doniphan)	2	---	---	---	55	28	---	Yes
Frontera (Emory-River Bend)	2	---	---	---	55-67	28	---	---
Bird (Emory-Doniphan)	2	---	---	---	50-52	22	---	Yes
Bird (Emory-River Bend)	2	---	---	---	50	22	---	---
Sunset (Emory-Doniphan)	2	---	---	---	50	33	---	Yes
Sunset (Emory-Riverbend)	2	---	---	---	50	22	---	---
River Bend (Frontera-Bird)	2	---	---	---	64	26	---	---
River Bend (Bird-Sunset)	2	---	---	---	64	26	---	---
Emory (Sunland Park-Frontera)	2	---	---	---	50	20	---	---
Emory (Frontera-Bird)	2	---	---	---	50	20	---	---
Emory (Bird-Sunset)	2	---	---	---	50	20	---	---
Montoya (Country Club-Lindbergh)	2	---	---	---	60	22	---	---
Montoya (Lindbergh-Mulberry)	2	---	---	---	60	21	---	---
Montoya (Mulberry- Redd)	2	---	---	---	41	22	---	---
Lindbergh (Doniphan-Montoya)	2	---	---	---	50	22-24	---	Yes
Mulberry (Doniphan-Montoya)	2	Yes	---	---	45-60	24-35	---	Yes
Redd (Doniphan-Montoya)	2	---	---	---	59-110	25-65	Yes	Yes
Upper Valley (Country Club-Gomez)	2	---	---	---	77-105	24	---	---
Upper Valley (Gomez-Artcraft)	2	---	---	---	67-85	27-63	---	---
Upper Valley (Artcraft-Borderland)	2	---	---	---	62-71	36-58	---	---
Country Club (Doniphan-Westside)	2	---	Yes	---	60-80	24-30	---	Yes

Table 1: Existing Roadway Conditions (continued)								
Street Name	# Lanes	Curb/ Gutter?	Left Turn?	Median?	Approx. ROW Width	Pavement Width	Sidewalk?	R.R. Crossing?
Gomez (Westside-Upper Valley)	2	---	---	---	67-76	20	---	---
Borderland (Westside-Upper Valley)	2	---	---	---	32-100	24-28	---	---
Borderland (Upper Valley-Doniphan)	2	---	---	---	41-59	24-25	---	Yes
Westside (Gomez-Artcraft)	2	---	---	---	47-55	23-26	---	---
Westside (Artcraft-Borderland)	2	---	---	---	50	26	---	---
Doniphan (Racetrack-Sunland Park)	4	Yes	Yes	---	100	64	Yes	---
Doniphan (Sunland Park-Frontera)	4	Yes	Yes	---	100	64	Yes (EAST)	---
Doniphan (Frontera-Bird)	4	Yes	Yes	---	100	64	Yes (EAST)	---
Doniphan (Bird-Sunset)	4	Yes	Yes	---	100	64	Yes (EAST)	---
Doniphan (Sunset-Mesa)	4	Yes	Yes	---	100	64	Yes(EAST)	---
Doniphan (Mesa-Lindbergh)	4	Yes	Yes	---	80	66	Yes (EAST)	---
Doniphan (Lindbergh-Thorn)	4	Yes	Yes	---	80	66	Yes (EAST)	---
Doniphan (Thorn-Mulberry)	4	Yes	Yes	---	80	66	---	---
Doniphan (Mulberry-Redd)	4	Yes	Yes	---	80	66	Yes (EAST)	---
Doniphan (Redd-Montoya)	4	Yes	Yes	---	80	66	---	---
Doniphan (Montoya- Artcraft)	4	Yes	Yes	---	80	66	---	---
Doniphan (Artcraft-Borderland)	4	Yes	Yes	Yes	80	66	---	---
Artcraft (I10)	4-6	---		Yes	205-230	102-130		---
Artcraft (I10-Doniphan)	4-6	---		Yes	205-230	102-130		---
Artcraft (Doniphan-Upper Valley)	4-6	---		Yes	205-230	102-130		---
Artcraft (Upper Valley-Westside)	4-6	---		Yes	205-230	102-130		---

INTERSECTIONS

The major intersections in the study area are listed below and presented graphically in **Figure 2**. The type of control at the intersection, whether STOP controlled or signalized, is also indicated in the figure. Field data of each intersection can be found under **Tab One** in the Appendix.

1. Borderland at Westside
2. Borderland at Upper Valley
3. Borderland at Strahan
4. Borderland at Doniphan
5. Artcraft at Westside
6. Artcraft at Upper Valley
7. Artcraft at Doniphan
8. Artcraft at Desert N/S
9. Doniphan at Montoya
10. Gomez at Westside
11. Gomez at Upper Valley
12. Montoya at Redd
13. Doniphan at Redd
14. Montoya at Mulberry
15. Doniphan at Mulberry
16. Lindbergh at Montoya
17. Doniphan at Thorn
18. Doniphan at Lindbergh
19. Country Club at McNutt
20. Country Club at Westside
21. Country Club at Upper Valley
22. Country Club at River Run
23. Country Club at Montoya
24. Country Club at Memory
25. Country Club at Doniphan
26. Sunset at Riverbend
27. Emory at Sunset
28. Doniphan at Sunset
29. Bird at Riverbend
30. Bird at Emory
31. Bird at Doniphan
32. Frontera at Riverbend
33. Frontera at Emory
34. Frontera at Doniphan
35. Gibson Veck at Sunland Park
36. Emory at Sunland Park
37. Doniphan at Sunland Park
38. Doniphan at Racetrack
39. Racetrack Ramp @ Doniphan
40. Racetrack Ramp @ SB Paisano
41. Racetrack Ramp @ NB Paisano
42. McNutt at Country Club

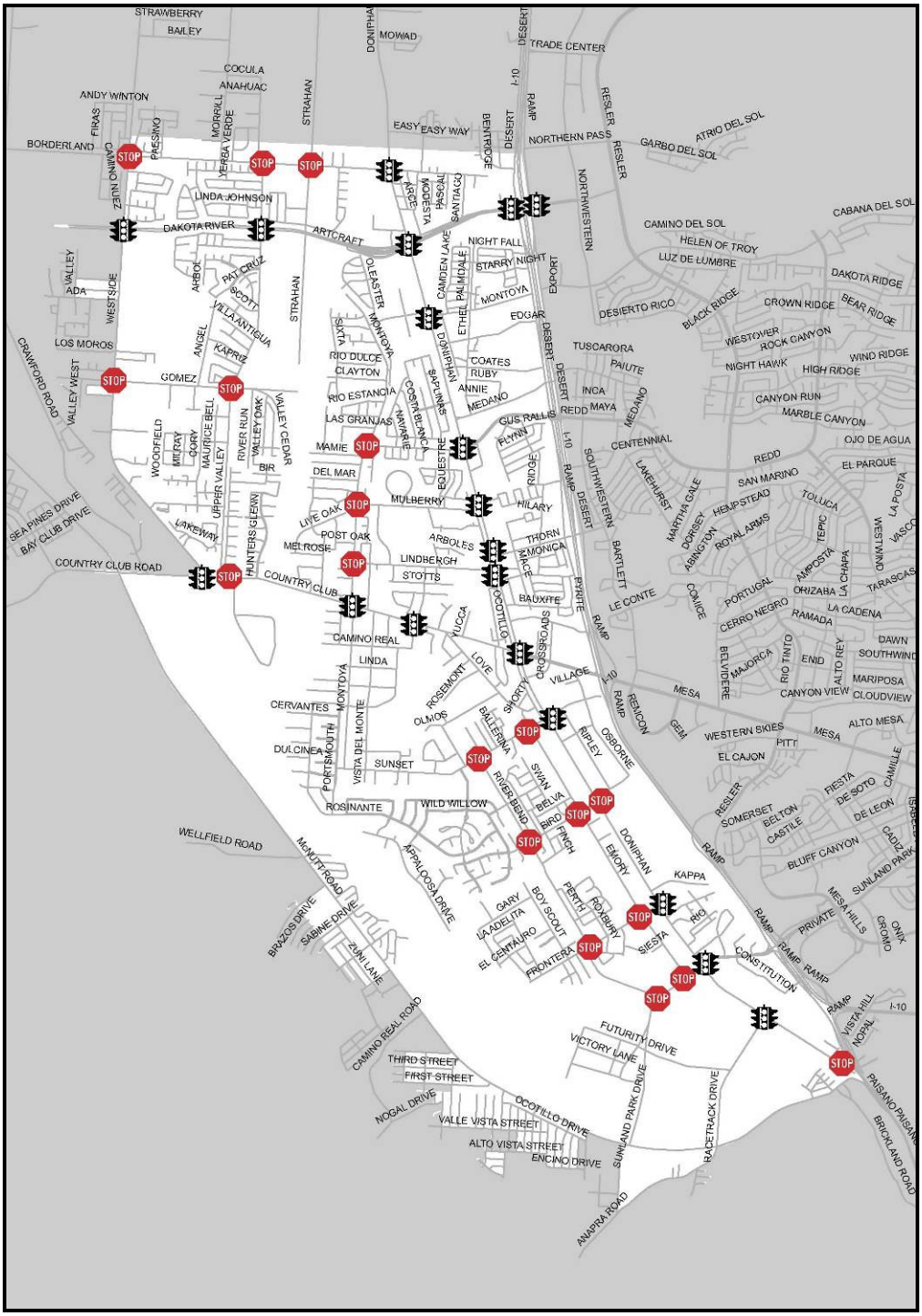


Figure 2: Major Intersections

LAND USE

The existing land use map for the study area was generated using current land uses, zoning, and existing public facilities. **Figure 3** shows residential, commercial, church, farm/ranch, industrial and school/park land uses in the Upper Valley area.

The 2025 general land use map for the study area, shown in **Figure 4**, was generated using information from the City of El Paso's Department of Planning. Land use classifications include boundary areas, parks, waterways, residential uses, commercial uses, industrial uses and ranch-farm uses.

UTILITIES

The utility data that was gathered consists of approximate locations of major utility lines based on information provided by utility companies with facilities in the study area. The GIS mapping contains information on water mains, sanitary sewer mains, gas pipelines, power transmission lines, cable television lines, petroleum transmission pipelines, and telephone lines. **Figures 5 through 11** indicate the existing utility lines in the Upper Valley area.

STREET LIGHTS

Appropriate street lighting is critical to roadway safety during hours of darkness. A cursory review of roadways in the study area reveals very few street lights exist along the roadways. Street lighting does exist along Doniphan and a portion of Artcraft from IH-10 to just west of Doniphan. Most intersections are not illuminated. Streetlights are owned by the City of El Paso. Poles, luminaires, and aerial electrical conductors are maintained by the El Paso Electric Company; underground electrical conductors are maintained by the City of El Paso.

RAILROADS

A railroad owned by Burlington Northern Santa Fe Railway (BNSF) parallels Doniphan along the eastern boundary of the study area. This line, referred to as the El Paso Sub, is a single track which at present has an average of seven trains per day. According to information provided by BNSF, there are no plans to add a second track to this corridor at this time. However, it is anticipated that train traffic will increase along this line in the near future. All at-grade crossings have gates, bells and flashers for crossing protection and have constant-warning detection track circuitry. The train timetable speed (i.e. the train's speed limit) along the El Paso Sub is 49 MPH. All traffic signals

along Doniphan are interconnected with the railroad crossing signal system and include railroad preemption in their timing and phasing plans.

PROPERTY OWNERSHIP

The El Paso County Central Appraisal District provided ownership information for current property records. The graphical map includes subdivision boundaries, tract boundary lines, lot lines, parcel boundaries, City of El Paso limits, City of Sunland Park limits and state line boundaries for New Mexico and Texas. The property database contains identification numbers, property descriptions, area of properties, subdivision names, land values of properties, improvement values of properties, total values of properties, property owners, and property owner's addresses.

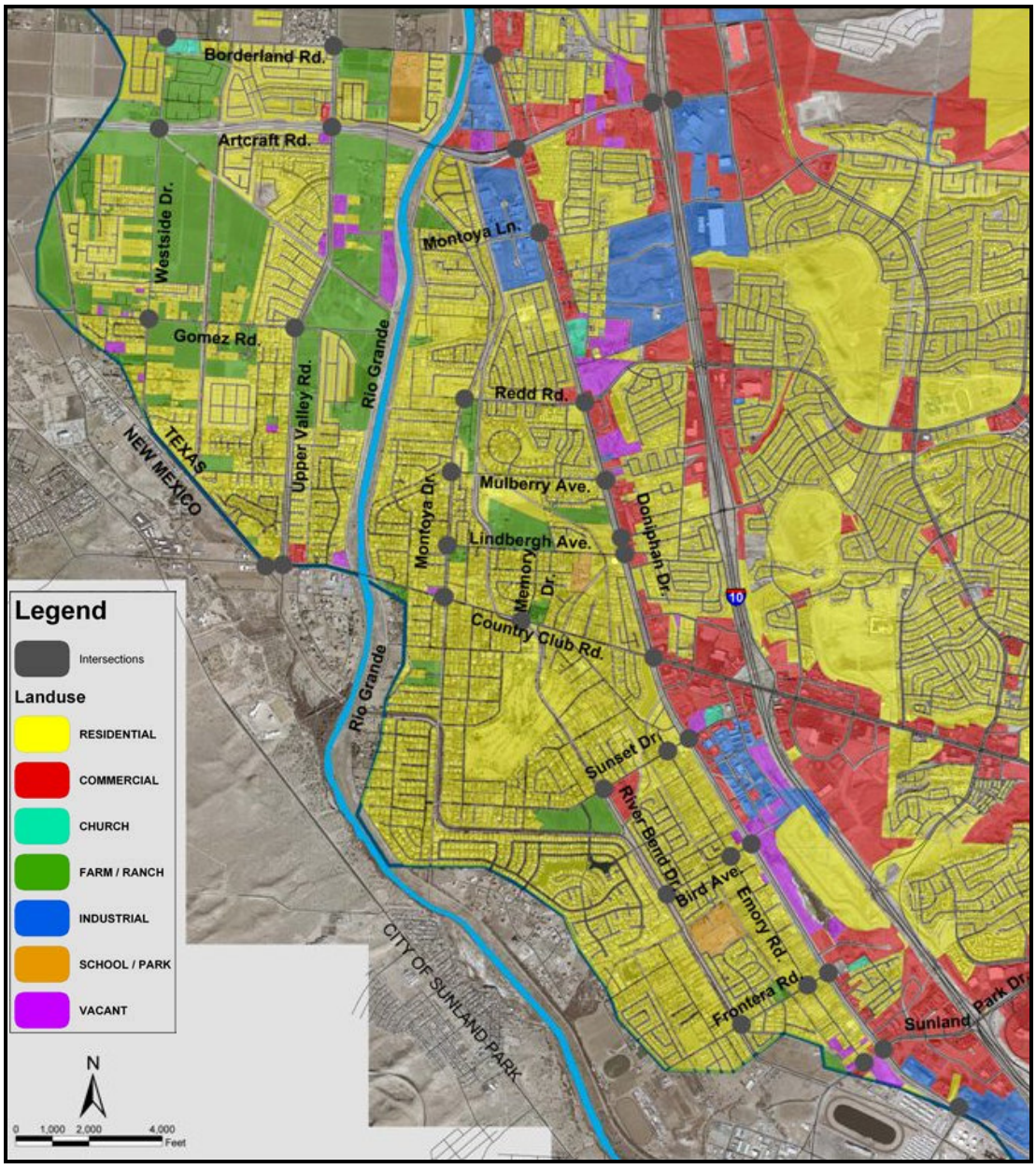


Figure 3: Existing Land Use

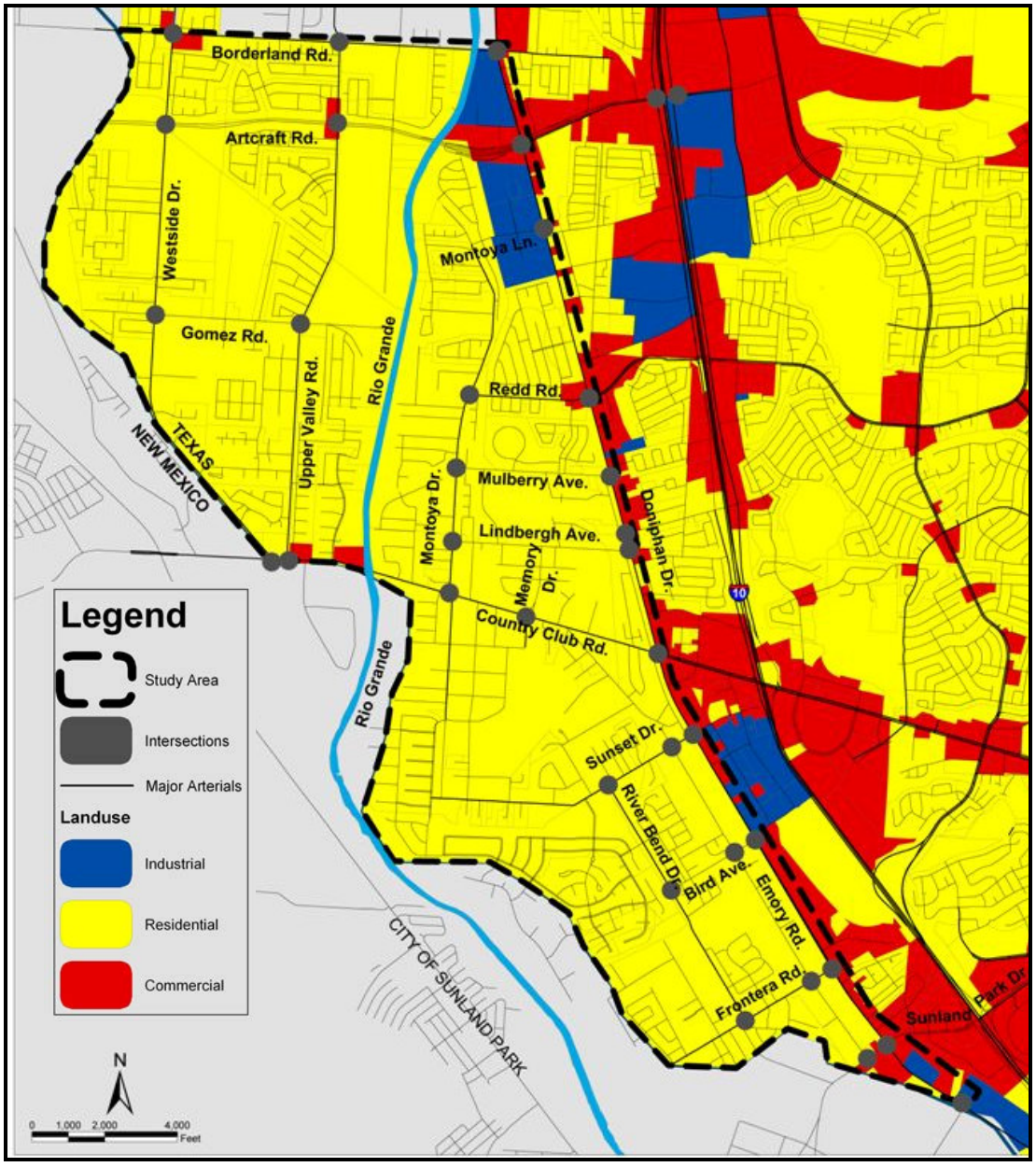


Figure 4: 2025 General Land Use Plan

Figure 5: Electric Distribution Lines

Figure 6: Sanitary Sewer Lines

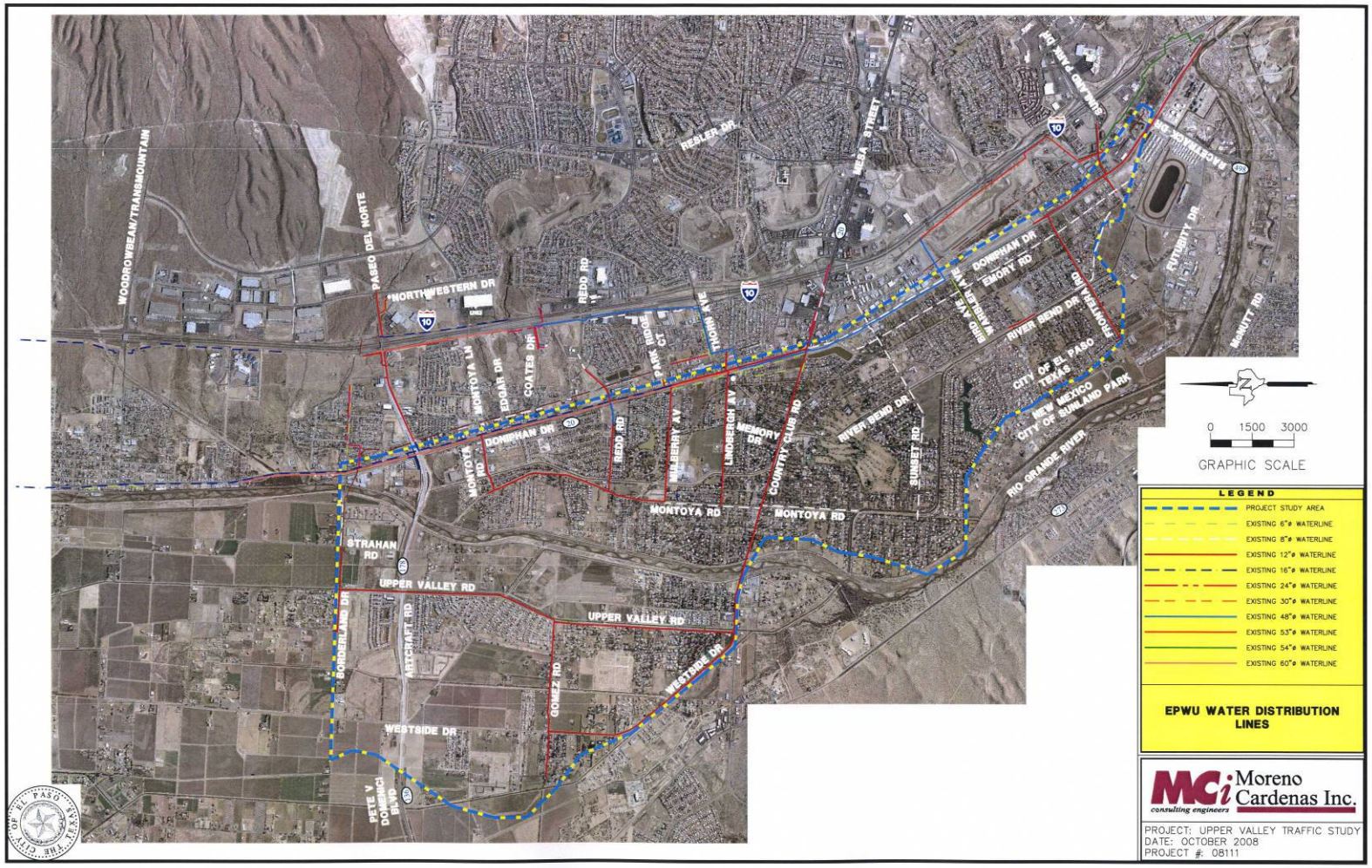


Figure 7: Water Distribution Lines

Figure 8: Communication Lines

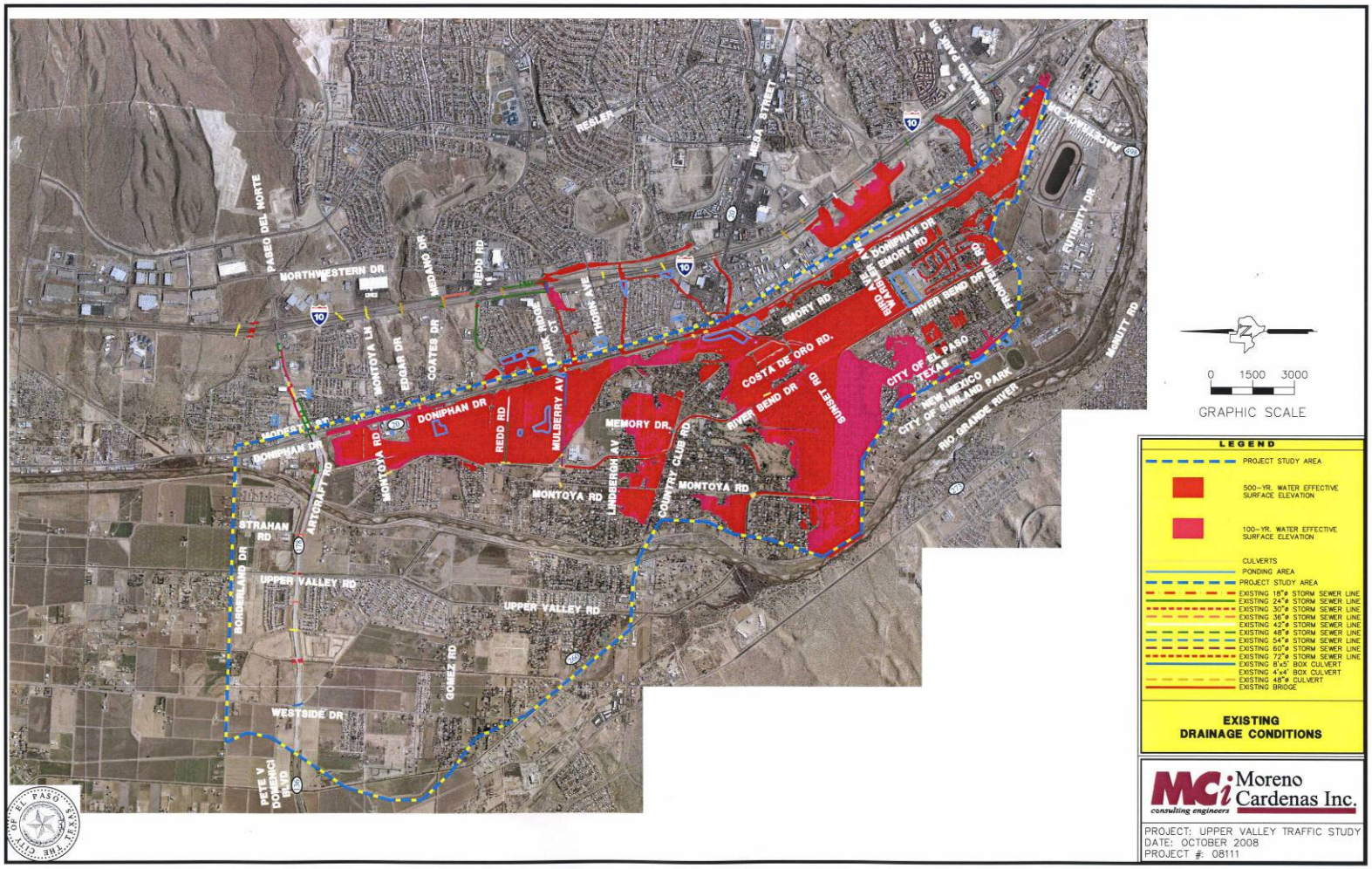


Figure 9: Drainage Conditions

Figure 10: Irrigation Structures

Figure 11: Natural Gas Pipelines

TRAFFIC VOLUMES

The City of El Paso provided turning movement counts (TMCs) at 17 intersections and 24-hour counts at 21 locations in the Upper Valley study area. To supplement the data provided by the City of El Paso, AIA Engineers Ltd. (AIA) collected additional traffic counts at 11 intersections; turning movement counts at nine intersections, and 24-hour approach counts at two intersections. All counts were obtained on a representative weekday (Tuesday, Wednesday, or Thursday) between 7:00 AM to 7:00 PM, at 15 minute intervals while school was in session. The traffic count data used in the study can be found under **Tab Two** in the Appendix.

PUBLIC TRANSPORTATION

Transit service is provided by Sun Metro, which operates within the El Paso city limits. Sun Metro and the County of El Paso collaborate to provide services to the City of Sunland Park, located on the southern boundary of the study area. There are four routes that provide service to the Upper Valley area:

- *Route 12 - Country Club via Sunland Park* operates between downtown and Doniphan with a short loop within the Redd Road/Country Club/Montoya area. Using two buses, service is provided once an hour. Ridership statistics provided by Sun Metro indicate there are approximately 23 passengers per hour on week days and 18 passengers per hour on weekends. Weekday passenger ridership is below the system average; weekend ridership is about average.

- *Route 16 – Sunland Park/Buena Vista* operates between downtown and Doniphan with a short loop within the Upper Valley/Gomez/Country Club area. Using one bus, service is provided once every two hours. There are approximately 17 passengers per hour on weekdays and 9 passengers per hour on Saturdays. This route does not circulate on Sundays. Weekday passenger ridership is below the system average; Saturday ridership is about average.

- *Route 18 – Westside/Downtown Express* is a combined local/express route that circulates from downtown to the Doniphan/Borderland area. Using two buses, service is provided once every 45 minutes. There are approximately 40 passengers per hour on weekdays, 28

passengers per hour on Saturdays and 20 passengers per hour on Sundays. Weekday and weekend ridership is above the system average.

- *Route 83 – New Mexico Sunland Park* circulates in the City of Sunland Park on the southern boundary of the Upper Valley study area. This route is operated by the County and is funded by New Mexico and Sunland Park. This route circulates through neighborhoods as well as the Sunland Park Casino, making it a high ridership route on weekends. There is one bus that circulates once every 90 minutes. There are approximately 27 passengers per hour on weekdays and on Saturdays, and about 18 passengers per hour on Sundays. Ridership is at or above the system average.

With the completion of the Westside Terminal at Remcon Circle, the introduction of Bus Rapid Transit (BRT) is anticipated along Country Club Road. Routes 12 and 16 will continue to operate as circulators while express routes such as Route 18 and the proposed express route along Country Club Rd would run between downtown and the terminal. It is also anticipated that bus service will be once every 30 minutes on weekdays.

Public transit is an important component that should be included in the consideration of any transportation system. For some households, it is a primary means of transportation between home, work, shopping or other attractions. For others it presents a viable option to travelling by automobile, thus addressing issues of air quality and congestion. Specifically for the Country Club corridor, the bus routes described above do help to reduce the number of overall trips along the corridor. The introduction of BRT to the corridor will also be beneficial as BRT vehicles typically have a capacity of 50 to 70 passengers, depending on type and configuration, and offer an enhanced level of overall transit service in terms of frequency and travel times. However, to affect a significant change in traffic volumes and levels of service along the corridor would likely require a level of transit ridership much greater than the historical levels reported. Thus by not factoring traffic volumes for transit effects, the traffic modeling and capacity analysis results are considered reasonably conservative. Instead, conceptual designs of roadway features which facilitate ridership by enhancing walkability and reducing delays caused by transit vehicles stopping to pick up and discharge passengers will be considered.

PEDESTRIAN AND CYCLIST ACTIVITIES

Pedestrian and bicycle facilities are a part of the MPO's and regional entities' strategy to help promote alternative forms of transportation to reduce congestion and improve air quality in the region. The Upper Valley has great potential for providing an efficient system for recreational and commuter bicyclists. With this in mind, it is important to consider roadway cross sections that include shared bike/hike trails, shared bike lanes or exclusive bike lanes. In addition, TxDOT and the City of El Paso are currently participating in "Safe Routes to School", a program which promotes walking and bicycling by children to and from school. Safe Routes to School plans have been developed for two elementary schools in the Upper Valley area, Bond and Zach White.

As part of conducting field observations of the Upper Valley area, a team member traveled along select roadways and trails by bicycle. The trails are well-used and reasonably well maintained; however, the intersections of trails and roadways frequently do not have signs or pavement markings to alert users to the presence of the intersection. For the most part, the roadways do not provide facilities for bicyclists and pedestrians. Pedestrians either walk in the roadway or along the unpaved shoulders. The existing traffic signals either do not have pedestrian signals or push buttons, or they are not considered accessible by ADA standards. An example of this condition is shown in Figure 12.

Figure 12: Inaccessible Pedestrian Push Button at Country Club and Montoya

Many recreational and commuter bicyclists were observed riding along the roadways and trails within the study area. Some roadways provided widths adequate for shared use by both bicyclists and motor vehicles; others were narrower and required motorists to pass bicyclists by crossing the centerline or the roadway. The striped shoulder along Country Club functions as a de facto bicycle lane; however, the striped shoulder is eliminated at signalized intersections to provide for separate left turn lanes. At this point cyclists are forced into the travel lane which is too narrow for shared use.

PUBLIC OUTREACH/SURVEYS

The scope for the Upper Valley Traffic Study includes presentation of findings and recommendations to the City of El Paso's Transportation Legislative Review Committee, City Planning Commission, and City Council. These meetings are tentatively scheduled for the first week of December 2008 and early part of January 2009. In addition, the City of El Paso requested that a community survey be conducted to provide residents of the Upper Valley the opportunity to share information regarding traffic issues or concerns in the Upper Valley. The surveys were mailed to Upper Valley residents in zip codes 79922 and 79932.

To maintain the objectivity and integrity of the survey process, responses were limited to one survey per household; surveys were mailed directly to property owners using a specific name and address rather than "occupant" or "resident"; the surveys were serial numbered in red ink to a specific address. Returned surveys were checked off the master mailing list as they were tabulated. In addition, respondents were asked to provide a contact phone number for sample verification. Approximately one of every 25 surveys was authenticated with phone calls to the respondent by the Walter P Moore team. Residents were asked to respond to the survey within five days to encourage a prompt return and to discourage surveys being set aside or lost.

The initial mailing of 7,500 surveys occurred September 17, 2008. Of those surveys, 1,745 were completed and returned, a 23% return rate. During the authentication process, 68 households were contacted by phone to verify that the surveys were returned by the household named on the survey. Shortly after the initial mailing, the team was notified by several neighborhood associations that some residents did not receive surveys and some residents needed surveys printed in Spanish. A supplemental mailing was completed on October 14, 2008 to an additional 33 residents.

The following summarizes the results of the survey:

- Destination on weekdays - approximately 18% west, 11% downtown, 13% Upper Valley; 47% recorded other responses.
- The majority of the trip destinations on weekends occur within the west side of El Paso.
- Weekday Routes – 16% Country Club, 15% Upper Valley, 13% Doniphan, 12% IH 10; 44% recorded other responses.
- Weekend Routes – 19% Country Club, 15% Mesa, 12% Upper Valley, 10% IH 10 and 10% Doniphan; 34% recorded other responses.
- The majority of respondents (95%) do not take the bus.
- Bus Rapid Transit and frequency were noted as the main factor that would entice the use of transit.
- The majority of the respondents (87%) do not walk to their destinations.
- The action most cited by respondents that would entice them to walk to their destinations is if pedestrian/bike paths are provided.
- Between 65% and 79% of respondents are in favor of infrastructure improvements in the Upper Valley. The range of percentages is due to respondents being able to consider separately a variety of infrastructure improvements.
- The widening of Country Club Road was reported as being needed by 46% of the respondents.
- 75% of the respondents do not feel that there are problems with emergency response times due to traffic issues in the Upper Valley.
- Trees were recorded as an important quality of life issue by 31% of respondents; 69% recorded other responses.
- Traffic congestion in the Upper Valley neighborhoods was noted as a very big concern by 31% of respondents.
- There was no majority response on a particular road that is congested in the Upper Valley.
- The action cited most by respondents on how they feel the City of El Paso should mitigate traffic congestion is the widening of Country Club Road. The second most cited action was additional routes in the Upper Valley.

A copy of the questionnaire with a summary of the results is included under **Tab Three** in the Appendix. **Table 2** highlights the answers to the final question in the survey, "Please share with us any additional comments about critical Upper Valley issues we have not touched on."

Table 2: Additional Comments from Upper Valley Survey	
Issue	**No. of Comments**
Country Club Comments	255
Traffic Calming Requests	144
Repave the Roads	126
Growth and Development	90
Police Enforcement	79
Railroad Issues	74
Bicycle related issues	72
Upper Valley Rd Comments	70
Roundabouts/Traffic Circle	59
Redd Rd. Comments	59
Flooding and Poor Drainage	53
Complaints about congestion	48
New Mexico Traffic comments	35
Artcraft Comments	33
IH 10 Comments	30
Keep Low Density	31
Buses or other Mass Transit	23
Install Street Lighting	24
Riverbend comments	18
Install sidewalk, curbs and landscaping	18
Doniphan Comments	10
Borderland Comments	4
Westside Rd Comments	4
Install Horse Trails	3
River Run Comments	2
Sunset Comments	1
Other Comments	*118*
Total Comments	**1,483**

TRAFFIC FORECASTING

Using the MPO's TransBorder 2035 MTP model as a base, Walter P Moore developed revised models to estimate future traffic volumes for the design years 2017, 2025, and 2035. The following is a list of assumptions and modifications made to the base *TransCAD* model to develop forecasts for this study:

- In 2007, 2017, 2025, and 2035 models, added Emory Road, Love Road, and Memory Road to network.
- In 2017, 2025, and 2035 models, changed Country Club from River Run to Doniphan from 4-lanes to 2-lanes to better reflect anticipated conditions.
- In 2025 and 2035 models, added Doniphan Extension to Paisano/US 85. This is a planned project by TxDOT.
- In 2025 and 2035 models, modified IH 10 from 4 lanes to 6 lanes. This is a planned project by TxDOT.
- In all models, adjusted travel times and speeds where necessary to better reflect observed or anticipated traffic conditions.

POPULATION AND EMPLOYMENT PROJECTIONS

The transportation planning model develops population and employment trends based on data described earlier in the report. Traffic volumes are dependent on the travel patterns between homes and workplaces. When high growth population areas are not co-located with workplaces, higher traffic volumes between the two areas can be expected. **Figures 13 through 16** depict the population estimates for 2007, 2017, 2025, and 2035. **Figures 17 through 20** depict the estimates for number of employees for 2007, 2017, 2025, and 2035.

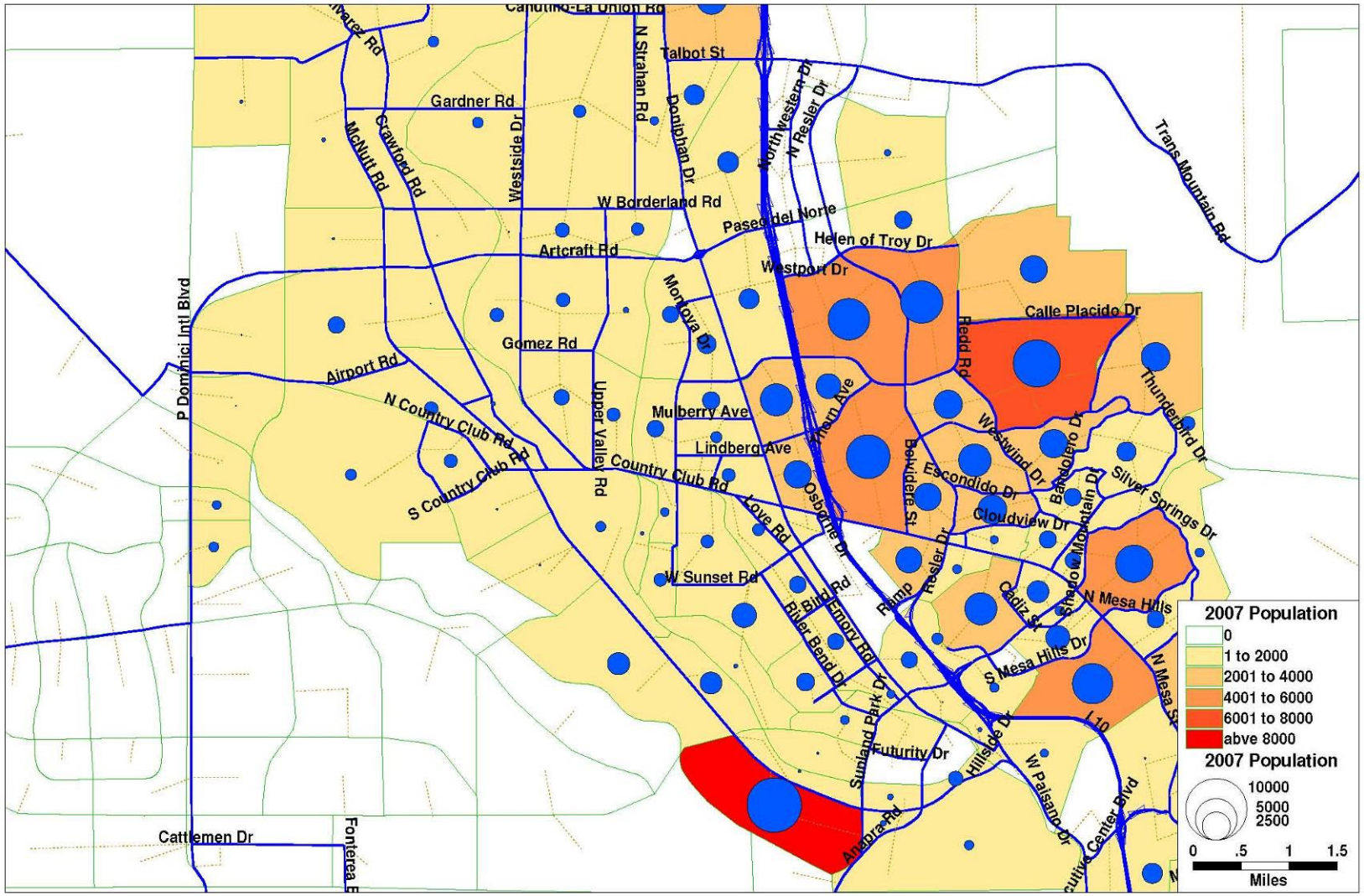


Figure 13: 2007 Population

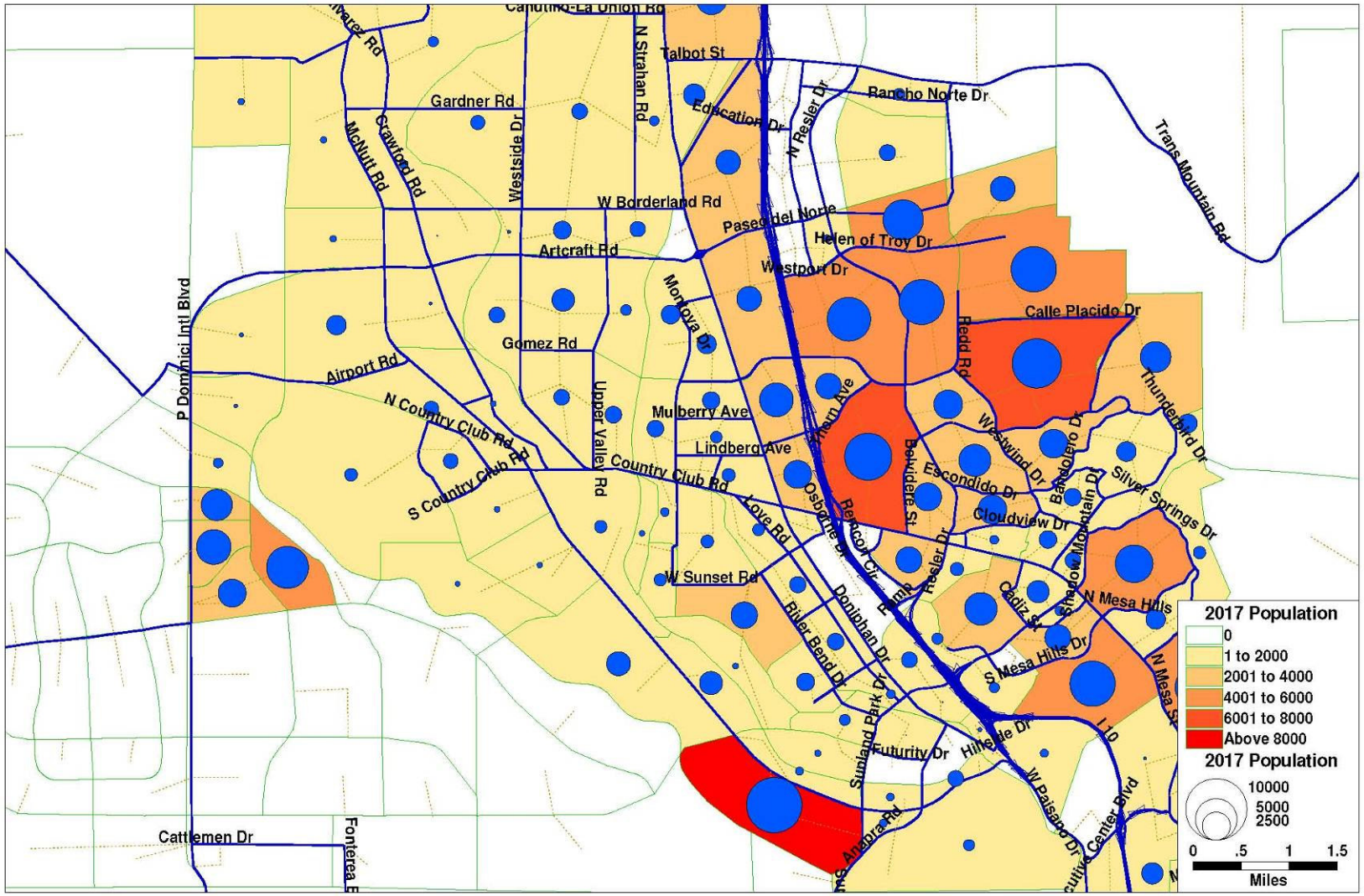


Figure 14: 2017 Population

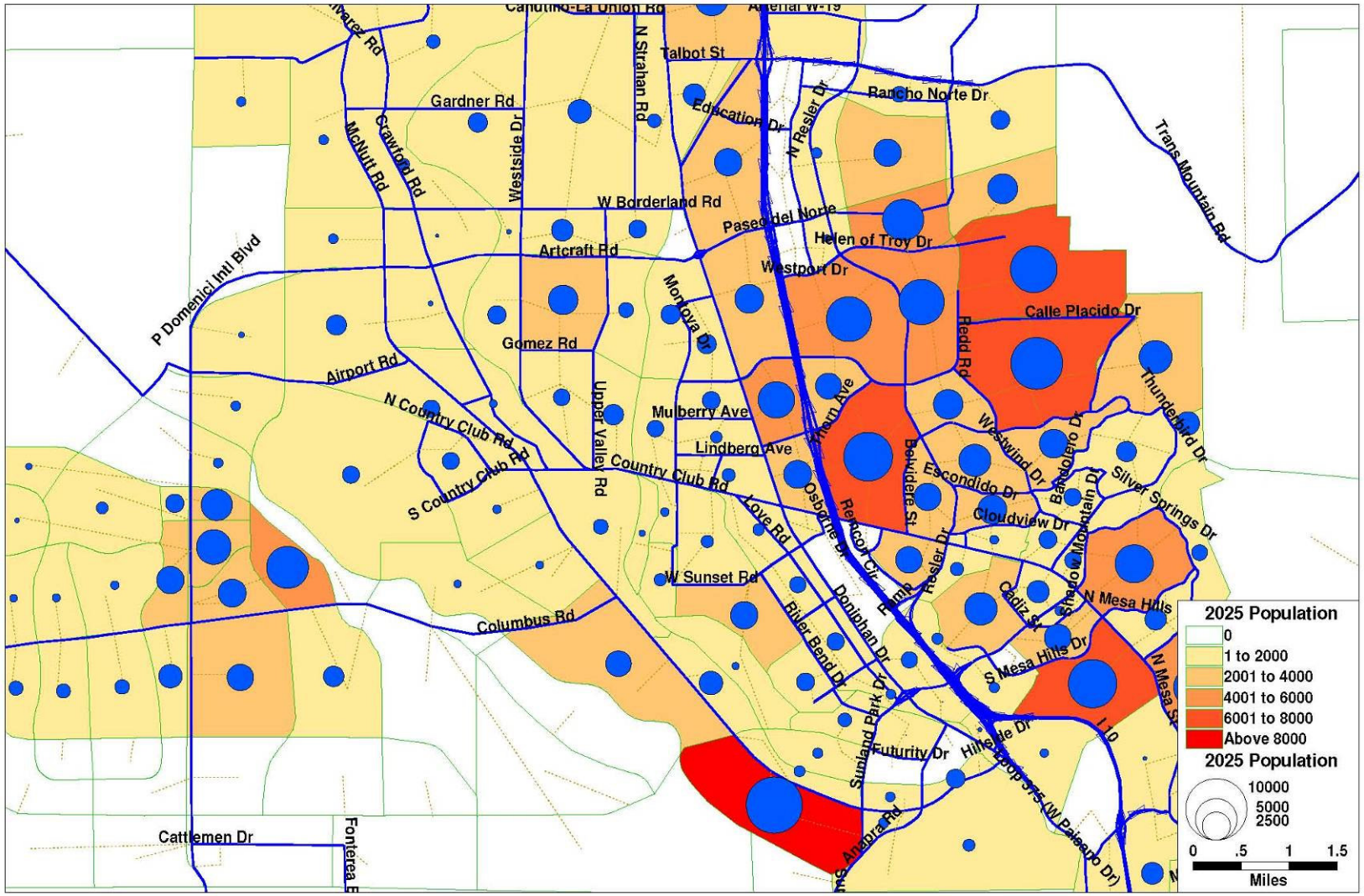


Figure 15: 2025 Population

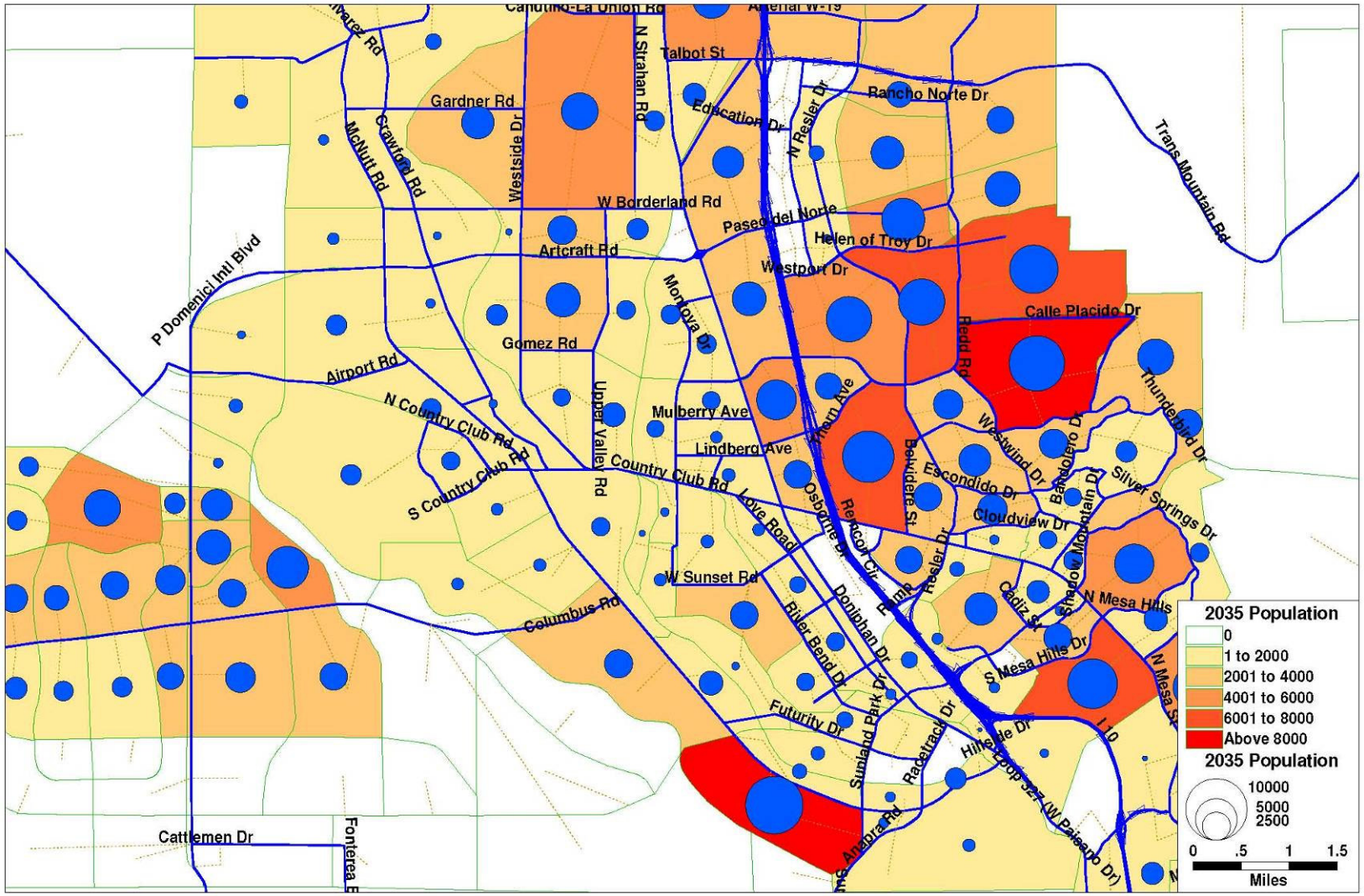


Figure 16: 2035 Population

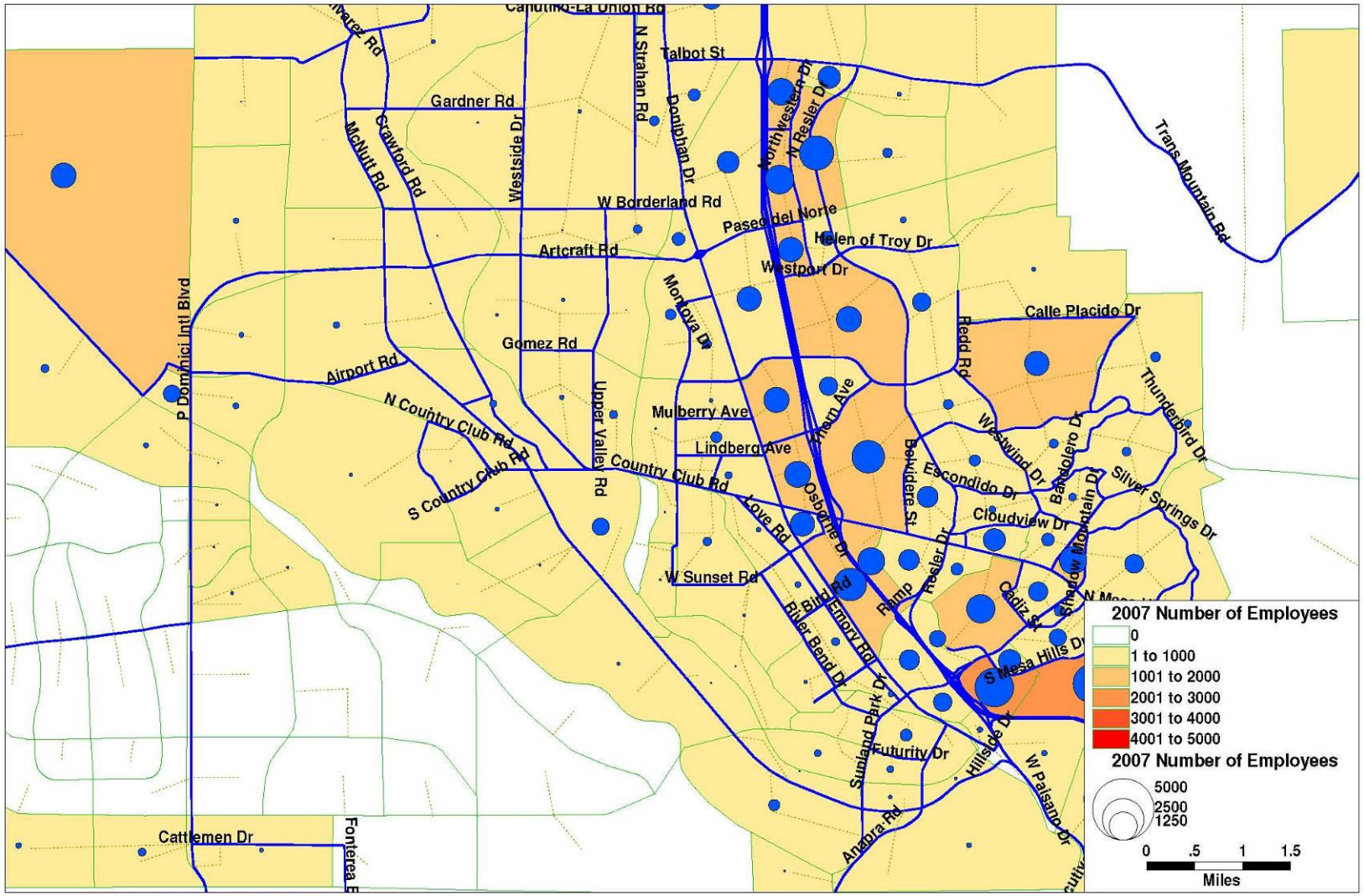


Figure 17: 2007 Number of Employees

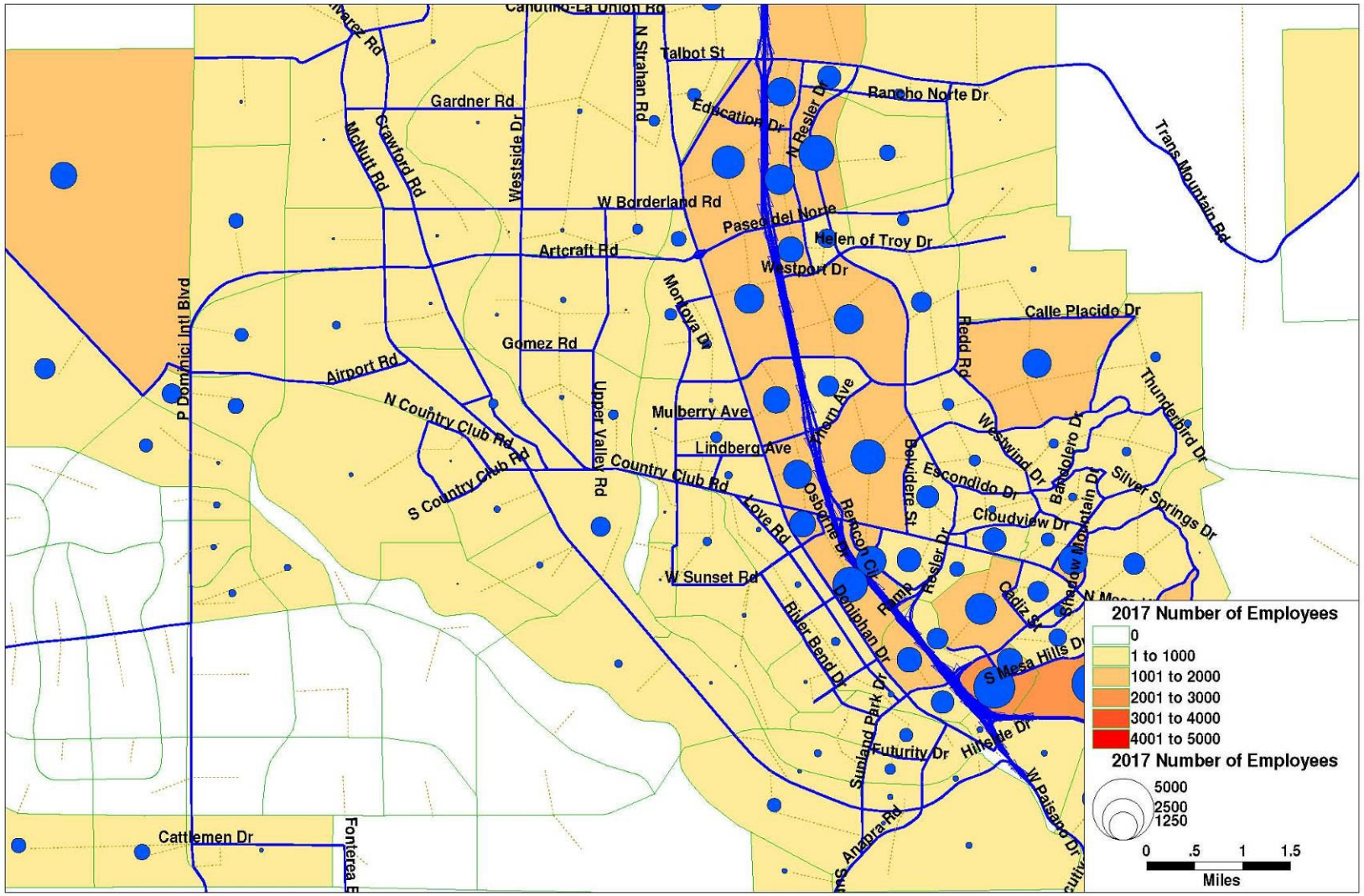


Figure 18: 2017 Number of Employees

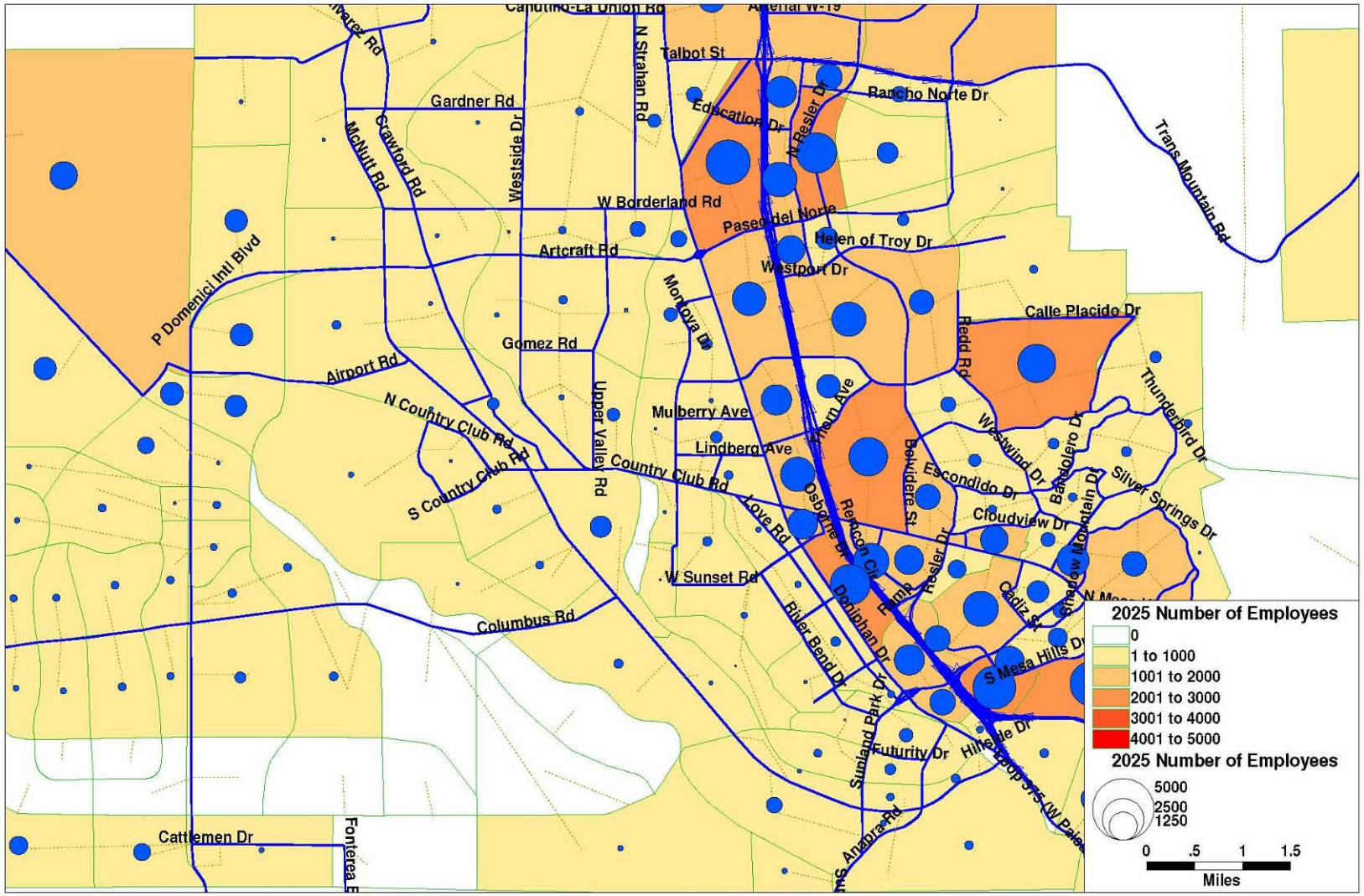


Figure 19: 2025 Number of Employees

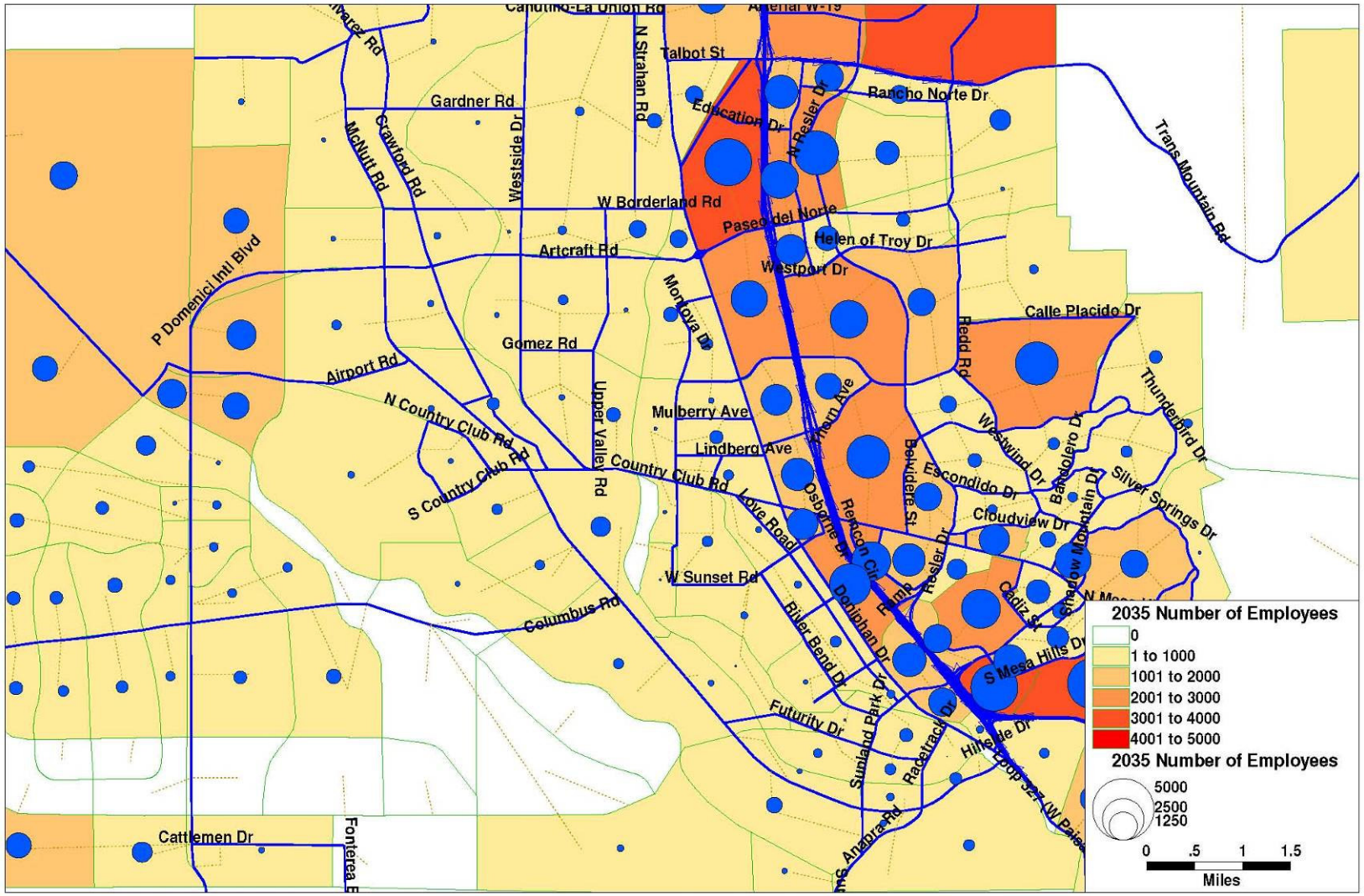


Figure 20: 2035 Number of Employees

TRAFFIC VOLUME PROJECTIONS

Based on the travel trends between homes and workplaces, projections for volume of vehicles along each roadway link in the network can be developed. Through iteration, the model calculates the fastest route traffic would utilize between its origin and destination based on the routes available and the assumed traffic flow parameters associated with that route, i.e. classification, number of lanes, travel speed, etc. When a specific route becomes over-utilized and lower travel times result, a portion of traffic is shifted to the next-fastest route and travel times are recalculated. This continues until travel times along all routes are optimized.

The relationship between the anticipated traffic volumes and the theoretical capacity of the roadways is analyzed by *TransCAD* in terms of volume to capacity ratios. Although the effects of intersections are not specifically modeled, the level of functionality of the corridor taken as a whole can be considered and a relative level of service assumed. Where the ratio is less than 0.85, the corridor is assumed to be below capacity. Where the ratio is between 0.85 and 1.15, the corridor is assumed to be at capacity, the variation being attributable to daily fluctuations in traffic volumes and other similar variables associated with traffic flow theory. Those corridors with a ratio greater than 1.15 are considered to be over capacity. In **Figures 21 through 24**, the relative levels of service for the study area roadways for 2007, 2017, 2025, and 2035 is presented.

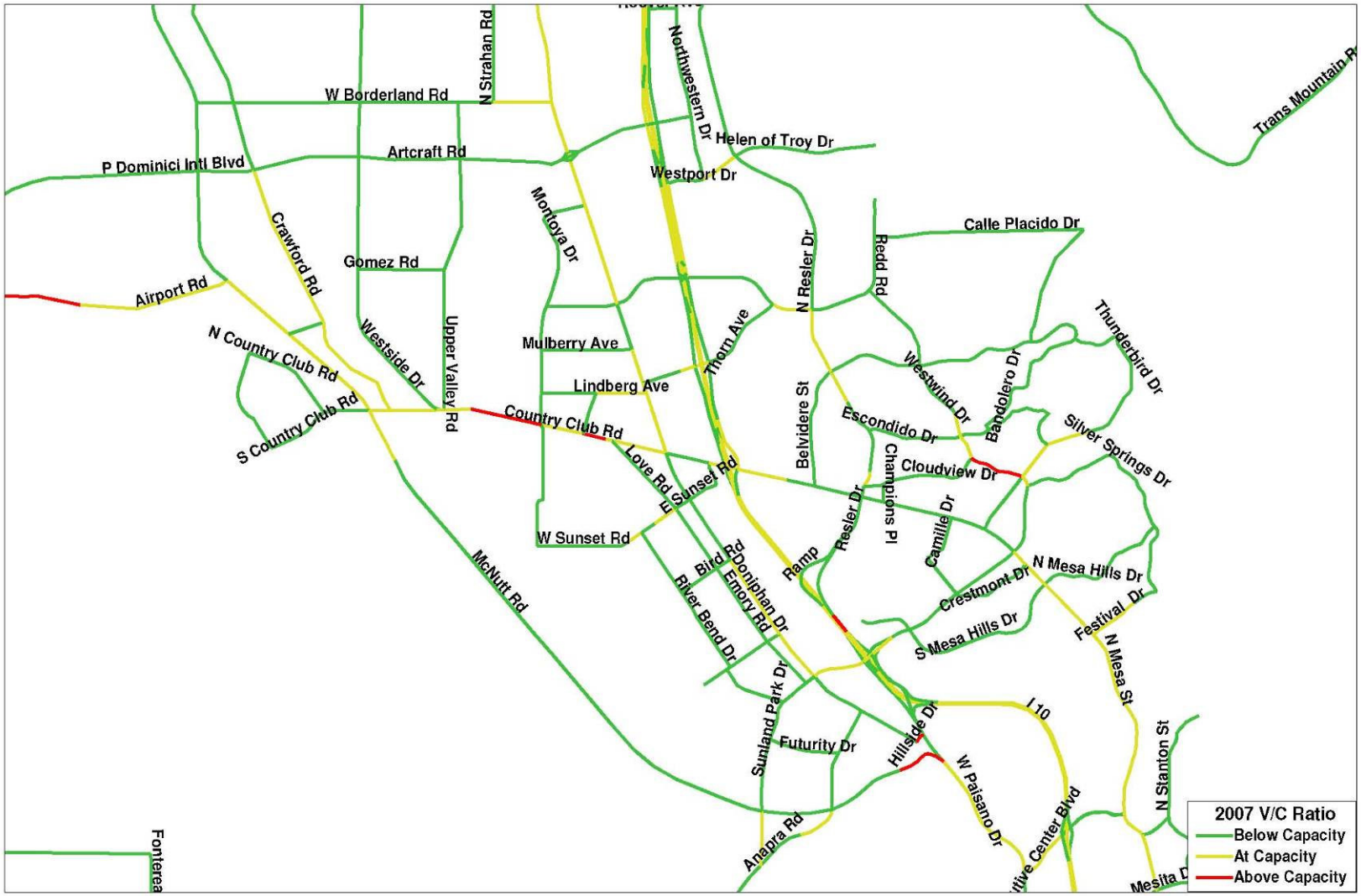


Figure 21: 2007 Roadway Levels of Service

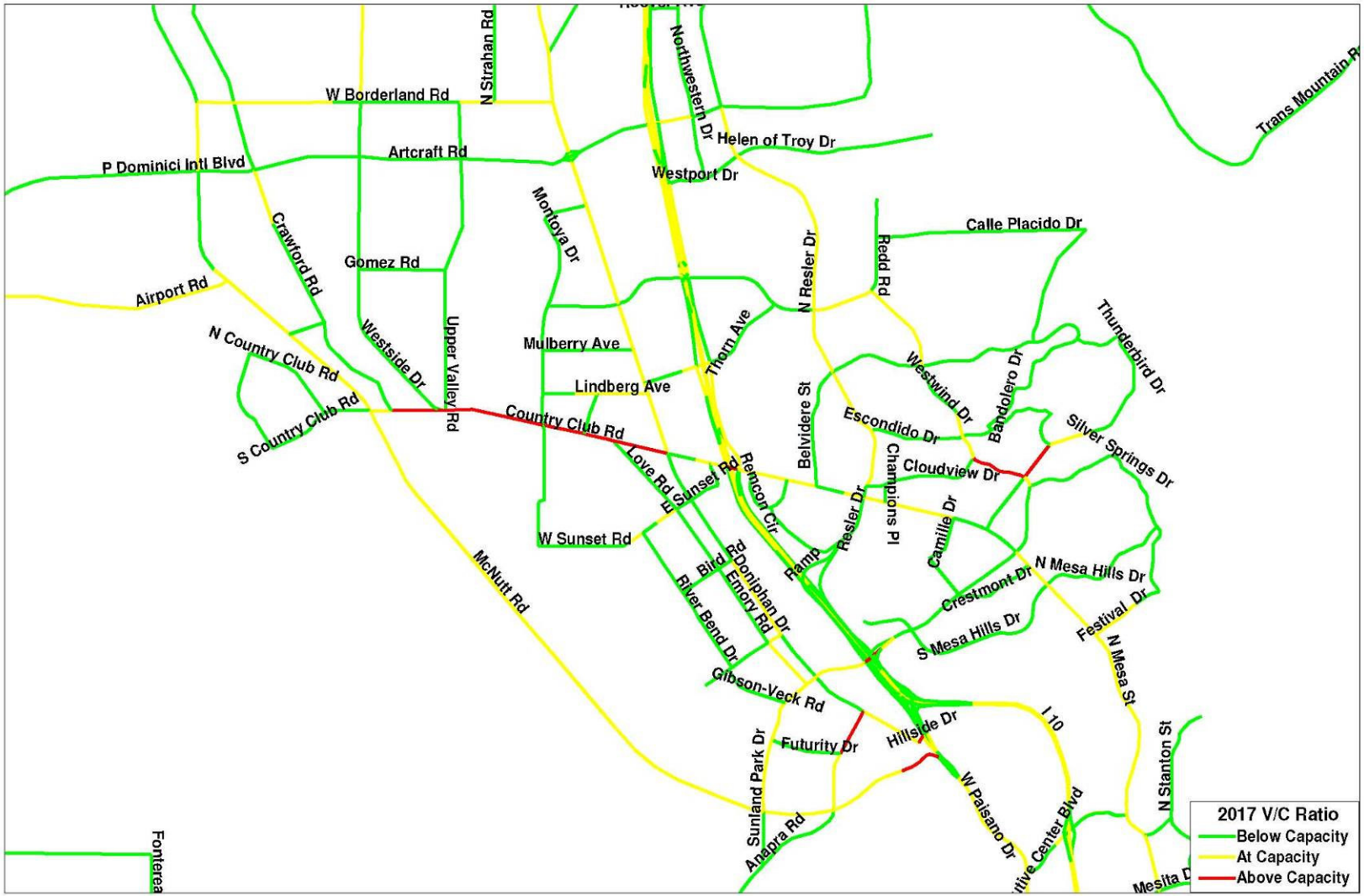


Figure 22: 2017 Roadway Levels of Service

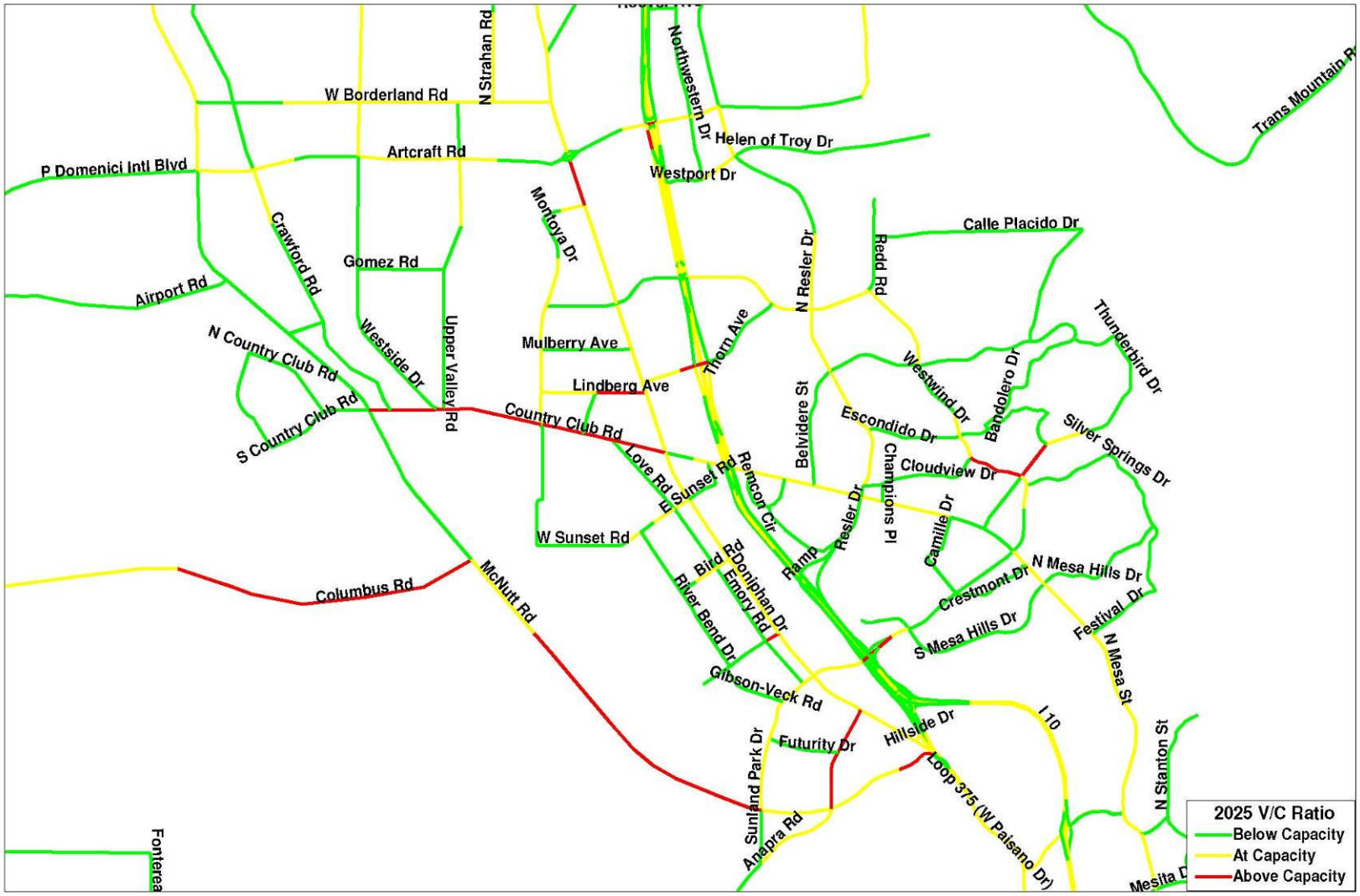


Figure 23: 2025 Roadway Levels of Service

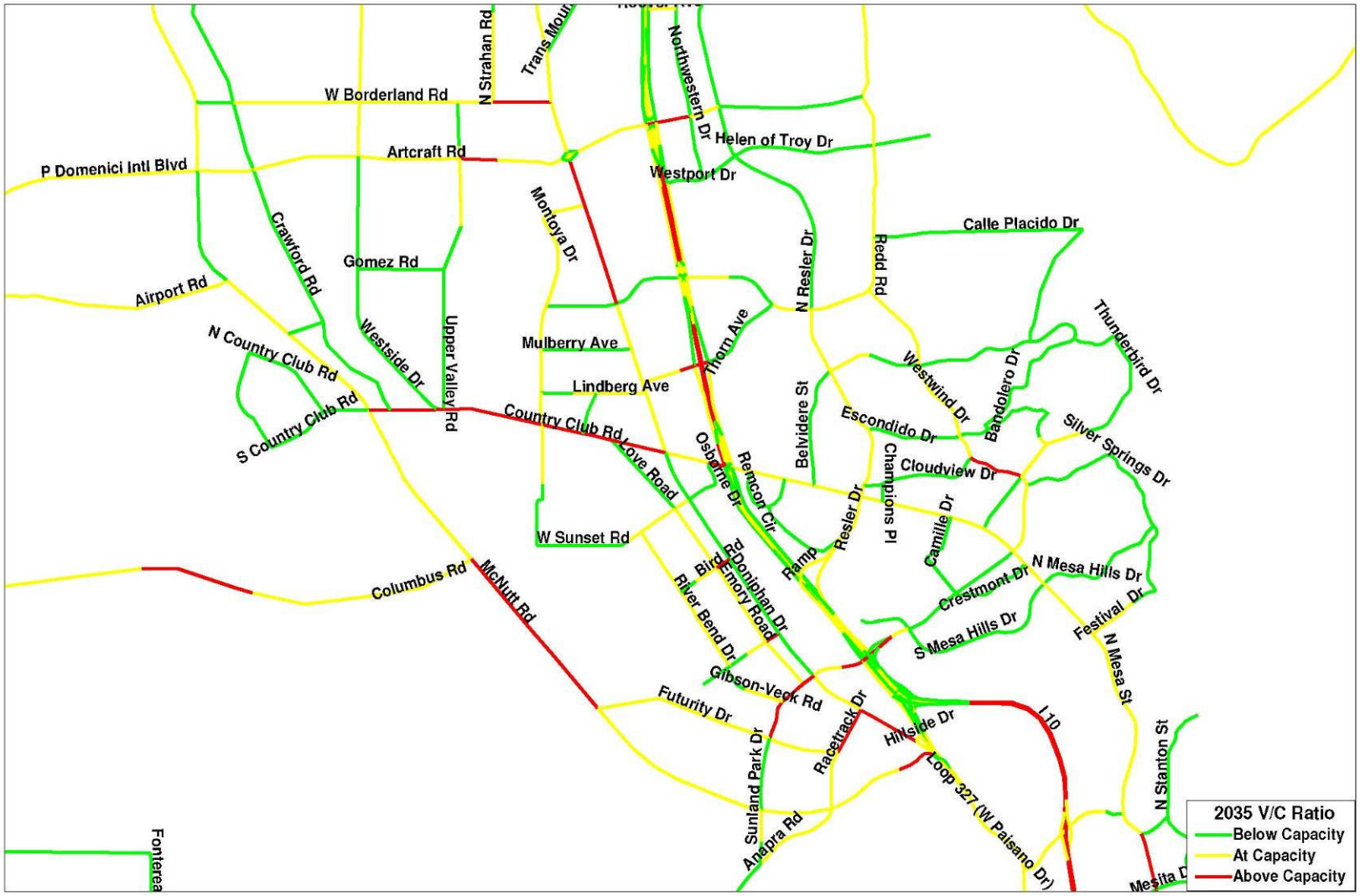


Figure 24: 2035 Roadway Levels of Service

CALIBRATION OF MODEL OUTPUT

The TransCAD model does not model intersections, only the corridors and roadways which connect the intersections. However, the results of the forecasting modeling are traffic volumes that can be imported into *Synchro*, software developed to automate procedures found in the *Highway Capacity Manual,* thus providing analysis of the levels of service at intersections. The traffic volumes generated by the *TransCAD* model were calibrated prior to being imported into *Synchro* for intersection analysis. The 2007 forecasting model output was compared to the existing traffic count data to identify either relative equivalency or substantial difference. Any differences were then further reviewed to determine if there were trends along corridors or if they were at individual locations. Volumes were then calibrated based on analysis of the trends. This calibration methodology was then applied to 2017, 2025 and 2035 forecasted volumes.

SYNCHRO INPUT DATA

Turning movement projections for 2017, 2025, and 2035 were developed based on the planned improvements by various agencies. In addition, TransCAD models were developed for the recommended improvements to evaluate the potential impacts to the roadway network. The output from these models was calibrated and imported into Synchro for analysis.

For the 2007 analysis, the traffic volume data provided by the City of El Paso or collected in the field by AIA was used. When necessary, the data was supplemented by calibrated volumes from the 2007 forecasting model. Existing traffic signal timings as provided by the City of El Paso and lane configurations as observed in the field were also entered into the software to complete the analysis.

For the horizon year analysis, the traffic volumes developed by the forecasting model were used. Traffic signal timings were optimized and existing lane configurations were used except where planned improvements were known.

ANALYSIS

The operation of signalized and unsignalized intersections was analyzed using *Synchro.* Results of the capacity analyses are reported in a standard level of service (LOS) format, with the most favorable conditions being designated as LOS A and the poorest conditions indicated by LOS F. Intersection level of service is based on the amount of delay that each vehicle encounters at a given intersection. The level of service criteria for signalized intersections, along with a brief description of

the conditions experienced for each level of service grade, can be seen in **Table 3**. The level of service criteria for unsignalized intersections can be seen in **Table 4**. Transportation agencies generally consider operations at or above LOS C to be acceptable. Depending upon the location, operations at or above LOS D may also be considered acceptable during peak traffic hours.

Table 3: Level of Service Criteria for Signalized Intersections

Level of Service	Stopped Delay (sec/veh)	Description
A	≤ 10	At a single intersection most vehicles do not stop at all. When linked with other signals, vehicles progress through intersections without stopping.
B	> 10 and ≤ 20	At a single intersection some vehicles stop before getting a green signal. When linked with other signals, some cars may have to stop but most progress through the intersection without stopping.
C	> 20 and ≤ 35	At a single intersection, a significant number of vehicles must stop and wait for a green signal. Some vehicles may have to wait through one full signal cycle before being able to move through the intersection.
D	> 35 and ≤ 55	At this level, congestion is noticeable. Many vehicles have to stop while waiting for a green signal. A noticeable number of vehicles have to wait through one full cycle before being able to continue through the intersection.
E	> 55 and ≤ 80	At this level, almost all vehicles have to wait through one or more full signal cycles before moving through the intersection. When linked with other signals, progression is slow.
F	> 80	At this level, the number of vehicles entering the intersection exceeds its capacity. Vehicles have to wait through multiple full signal cycles before moving through the intersection.

Table 4: Level of Service Criteria for Unsignalized Intersections		
Level of Service	Avg. Total Delay (sec/veh)	Description
A	≤ 10	At most, one vehicle is waiting to move through the intersection when the driver reaches the stop sign. Most often, the driver pulls up to the stop sign and is immediately free to proceed through the intersection.
B	> 10 and ≤ 15	When the driver reaches the intersection, one or two vehicles are in front of him. Once those vehicles proceed through the intersection, the driver is able to continue without opposition.
C	> 15 and ≤ 25	At this level, several vehicles may be in front of the driver at a two-way stop-controlled intersection. At an all-way stop-controlled intersection, there may be two or more vehicles at each approach that the driver has to wait for before getting his turn.
D	> 25 and ≤ 35	At this level, there are at least four vehicles in front of the driver and several vehicles at the other approaches. Also, for two-way stop-controlled conditions, the volume of traffic on the uncontrolled street may be high.
E	> 35 and ≤ 50	When the driver reaches the intersection, there are between five and eight vehicles in front of him and many vehicles at the other approaches that must also proceed through the intersection before the driver may continue.
F	> 50	At this level, the driver must wait for eight to ten cars at his approach to move through the intersection along with at least five vehicles at the other approaches. This level can also occur at two-way stop-controlled intersections when the uncontrolled street has such a high volume that no gaps are available in the traffic stream for the vehicles at the cross street to continue.

Traffic analysis was completed for 2007 existing conditions and proposed conditions in 2017, 2025, and 2035. Capacity analysis was conducted at the major intersections in the Upper Valley study area listed previously in the report.

Synchro is limited in its ability to analyze roundabouts. It will analyze a single lane roundabout in terms of volume to capacity ratios, but it will not report levels of service or delays. It cannot model multi-lane roundabouts. Intersections being considered for conversion to modern roundabouts were simulated and analyzed using *VISSIM*. Using the known or assumed geometric design of the roundabout, the anticipated travel paths through the roundabout were developed. The forecasted traffic volumes were then applied to the modeled travel paths and the software then developed a

simulation of traffic flows and behaviors at the intersection during the design hour. Data from the simulation for each individual vehicle was captured and outputted as average delay per movement, per approach and per intersection in seconds per vehicle. The intersection values were then assigned a letter grade using the unsignalized intersection level of service criteria found in Table 4.

It must be noted that a roundabout's capacity is influenced by its geometric design. Thus the analysis in this report is conducted assuming the conceptual roundabouts are designed appropriately. During the actual design process, the roundabout's performance should be reevaluated using the proposed geometric design to verify the desired operational characteristics can be achieved.

RESULTS

The results of the analysis are summarized in **Table 5**. The term "Forecasted" means conditions that are anticipated to exist with either no improvements or with improvements which are currently planned or programmed by various agencies. The term "Additional Improvements" means improvements identified and recommended by this study which are in addition to those considered in the "Forecasted" conditions.

When intersections were anticipated to have unacceptable levels of service, improvements options were recommended and analyzed. The details of the recommended improvements as well as discussion regarding the selection of the improvements are presented in later sections of the report.

In addition to Table 5, the following figures represent the results of the capacity analysis conducted as part of this study. The colored dots on the figures indicate anticipated intersection conditions and are related to the levels of service previously discussed. Green is representative of "Below Capacity" or Levels of Service A, B, and C. Yellow represents "At Capacity" or Levels of Service D and E. Red represents "Above Capacity" or Level of Service F. **Figures 25 through 31** depict conditions for 2007, 2017, 2025, and 2035 for the northern third of the Upper Valley study area. **Figures 32 through 38** depict conditions for the same horizon years for the central third of the Upper Valley study area. **Figures 39 through 45** depict conditions for the southern third of the Upper Valley study area. The output data for the analysis scenarios can be found under **Tab Four through Tab Ten** in the Appendix.

Table 5: LOS and Delay Comparison														
Intersection	2007 Base PM		2017 Forecasted		2017 With Additional Improvements		2025 Forecasted		2025 With Additional Improvements		2035 Forecasted		2035 With Additional Improvements	
	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*
Borderland at Westside	A	8.4	F	195.0	A	6.6	A	3.9	B	12.8	E	42.1	C	23.3
Borderland at Upper Valley	A	6.3	A	8.4	A	8.4	C	23.3	E	46.1	F	2539.0	A	5.1
Borderland at Strahan	C	23.7	F	131.0	A	2.6	C	17.7	A	1.7	B	12.5	A	6.7
Borderland at Doniphan	B	13.8	D	47.2	D	47.2	F	189.9	D	39.6	E	60.4	E	58.8
Artcraft at Westside	C	20.5	E	57.1	E	57.1	F	245.5	A	7.3	D	48.7	C	22.4
									A	9.3	B	14.6	B	17.7
Artcraft at Upper Valley	C	22.1	F	89.0	D	37.0	F	387.0	B	19.9	F	95.4	D	36.9
									B	12.8	F	87.7	C	33.6
Artcraft at Doniphan WB	A	9.9	B	16.4	B	16.3	D	43.3	D	38.6	F	242.3	C	30.1
Artcraft at Doniphan EB	A	5.2	A	9.5	A	9.6	B	19.1	B	19.3	B	17.9	B	11.9
Artcraft at Desert SB	B	11.3	F	225.4	F	127.3	F	333.9	F	96.5	F	251.5	F	251.5
Artcraft at Desert NB	C	25.0	F	278.2	F	211.4	F	523.0	F	120.0	F	271.9	F	271.9
Doniphan at Montoya Rd	A	7.4	C	21.9	C	21.1	F	87.1	C	22.7	D	51.7	D	43.6
Doniphan at Montoya Ln	B	10.1	B	10.6	B	10.7	C	30.5	C	22.4	C	32.7	C	31.7
Gomez at Westside	A	1.5	A	2.9	A	2.9	A	3.0	A	1.0	A	0.9	A	0.7
Gomez at Upper Valley	A	1.4	A	6.4	A	6.4	A	3.9	A	1.2	A	1.2	A	1.1
Montoya at Redd	A	5.5	A	5.8	A	5.8	A	3.8	A	1.7	A	1.7	A	1.7
Doniphan at Redd	B	18.9	B	19.1	B	19.0	E	56.0	D	37.9	E	70.0	E	58.7
Montoya at Mulberry	A	8.4	A	9.3	A	9.3	B	12.7	C	20.3	D	26.4	D	26.4
Doniphan at Mulberry	A	1.5	A	7.1	A	7.1	A	5.6	A	10.0	B	15.1	B	17.3
Lindbergh at Montoya	A	9.5	B	11.1	B	11.1	F	63.6	E	46.3	C	16.8	C	16.8
Doniphan at Thorn	B	14.6	C	31.9	C	31.9	D	52.0	D	50.7	F	89.6	F	82.9
Doniphan at Lindbergh	A	10.0	B	14.1	B	14.1	C	25.4	C	20.5	D	52.3	D	49.3

*Average delay for the intersection, seconds per vehicle

Table 5: LOS and Delay Comparison (continued)														
Intersection	2007 Base PM		2017 Forecasted		2017 With Additional Improvements		2025 Forecasted		2025 With Additional Improvements		2035 Forecasted		2035 With Additional Improvements	
	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*
Country Club at McNutt	B	10.7	D	39.5	D	36.9	D	51.6	D	50.6	E	73.7	E	73.7
Country Club at Westside	B	15.2	F	125.0	C	22.5	E	58.8	E	62.8	F	147.7	F	147.7
Country Club at Upper Valley	F	60.8	C	16.80	A	8.2	C	16.5	C	18.3	D	27.7	D	27.8
Country Club at River Run	A	1.2												
Country Club at Montoya	C	33.4	F	148.9	F	81.1	F	160.1	F	124.4	F	201.4	F	146.7
Country Club at Memory	B	14.3	C	25.8	C	26.6	F	97.6	E	71.9	E	56.1	D	54.9
Country Club at Doniphan	D	41.4	F	90.1	E	63.9	E	66.4	E	65.4	F	102.5	F	109.1
Sunset at Riverbend	B	11.2	B	13.9	B	13.9	C	18.5	C	22.5	E	39.3	E	39.3
Emory at Sunset	B	14.4	C	20.4	C	20.4	F	154.8	C	15.1	B	15.1	C	15.3
Doniphan at Sunset	C	21.8	D	39.6	C	32.4	C	34.4	C	33.0	C	31.2	C	31.2
Bird at Riverbend	A	1.6	A	2.9	A	2.9	A	6.7	A	6.7	A	9.8	A	9.8
Bird at Emory	B	10.9	B	13.1	B	13.1	F	110.2	A	4.9	A	4.9	A	5.0
Bird at Doniphan	A	3.5	F	79.5	A	6.8	A	8.9	B	12.9	B	12.5	B	12.8
Frontera at Riverbend	A	8.5	A	8.7	A	8.7	A	8.7	B	10.9	D	26.7	D	26.7
Frontera at Emory	A	9.8	F	65.3	A	2.3	A	1.2	B	14.6	C	17.7	C	16.3
Frontera at Doniphan	B	14.2	D	36.1	C	22.7	C	34.3	C	24.8	C	26.0	C	26.6
Gibson Veck at Sunland Park	F	70.5	F	866.7	B	15.4	B	14.1	B	15.9	F	161.0	E	73.9
Emory at Sunland Park	A	1.9	F	999.9	F	1180.7	F	999.9	A	5.4	A	3.7	A	3.7
									A	0.9	A	1.0	A	1.0
Doniphan at Sunland Park	C	30.3	F	135.0	C	34.6	F	171.0	D	41.2	D	43.0	C	26.0
									C	29.4	E	71.4	C	29.1
Doniphan at Racetrack	A	9.5	B	18.5	B	15.8	B	17.0	C	20.5	E	75.7	D	48.8
Racetrack Ramp @ Doniphan	A	8.9	B	10.7	B	10.7	C	25.1	C	22.1	E	73.7	E	73.6
Racetrack Ramp @ SB Paisano	A	8.9	B	12.8	B	12.8	C	27.2	C	27.1	D	52.6	D	52.6
Racetrack Ramp @ NB Paisano	B	11.9	D	30.7	D	30.7	C	22.3	C	22.3	D	38.6	D	38.6

*Average delay for the intersection, seconds per vehicle

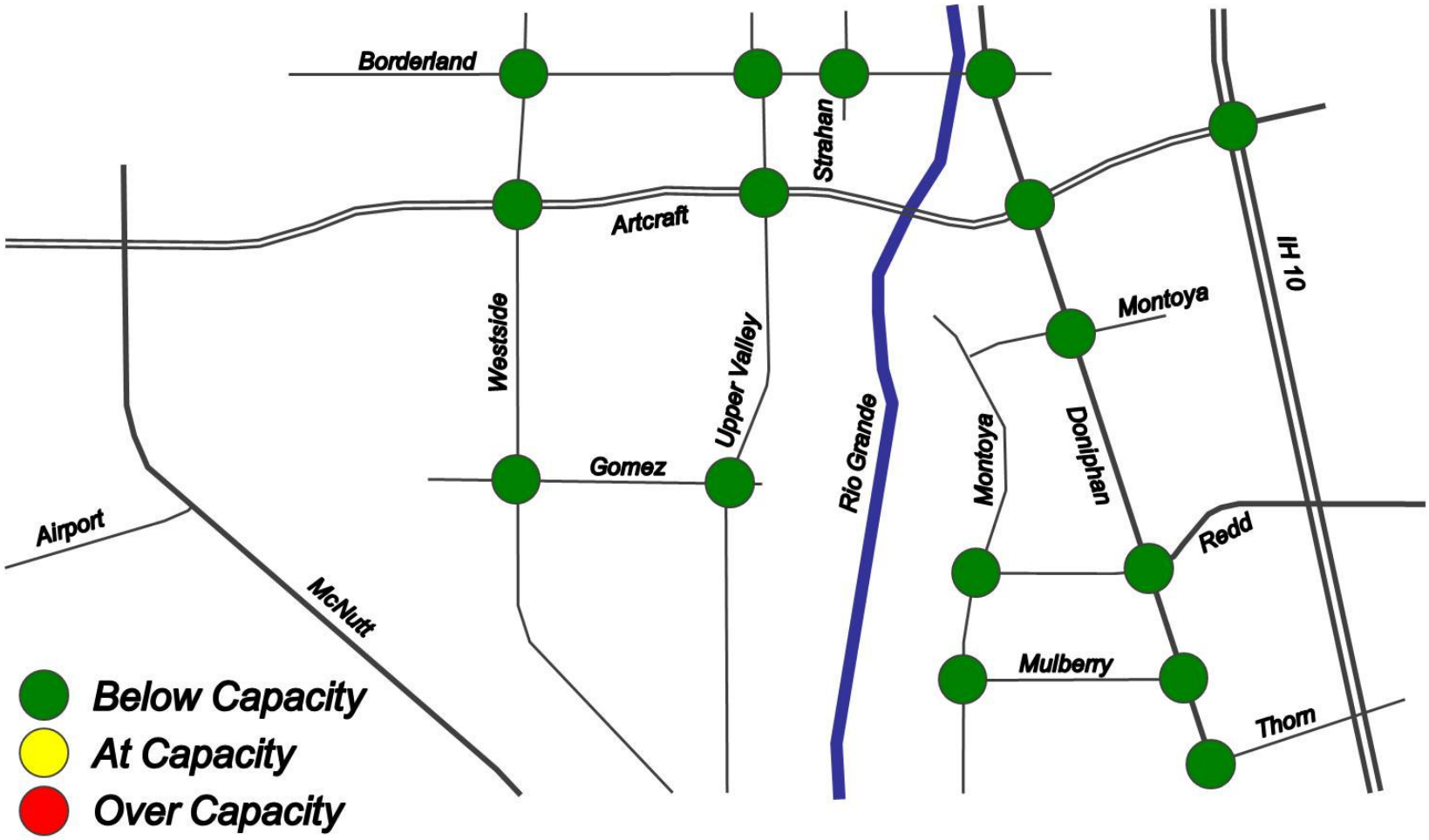


Figure 25: 2007 Levels of Service – Existing Conditions (north)

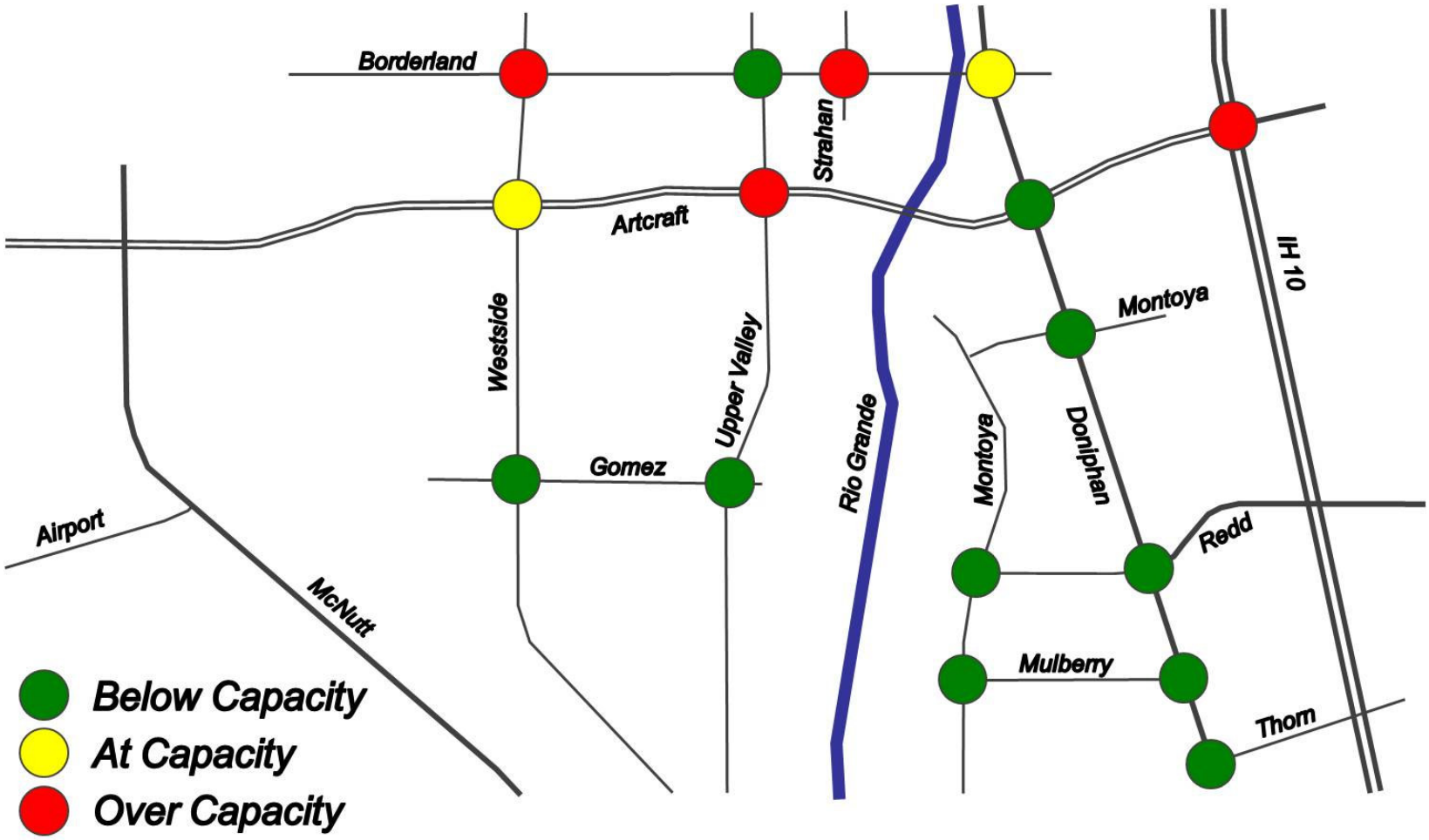


Figure 26: 2017 Levels of Service – Forecasted Conditions (north)

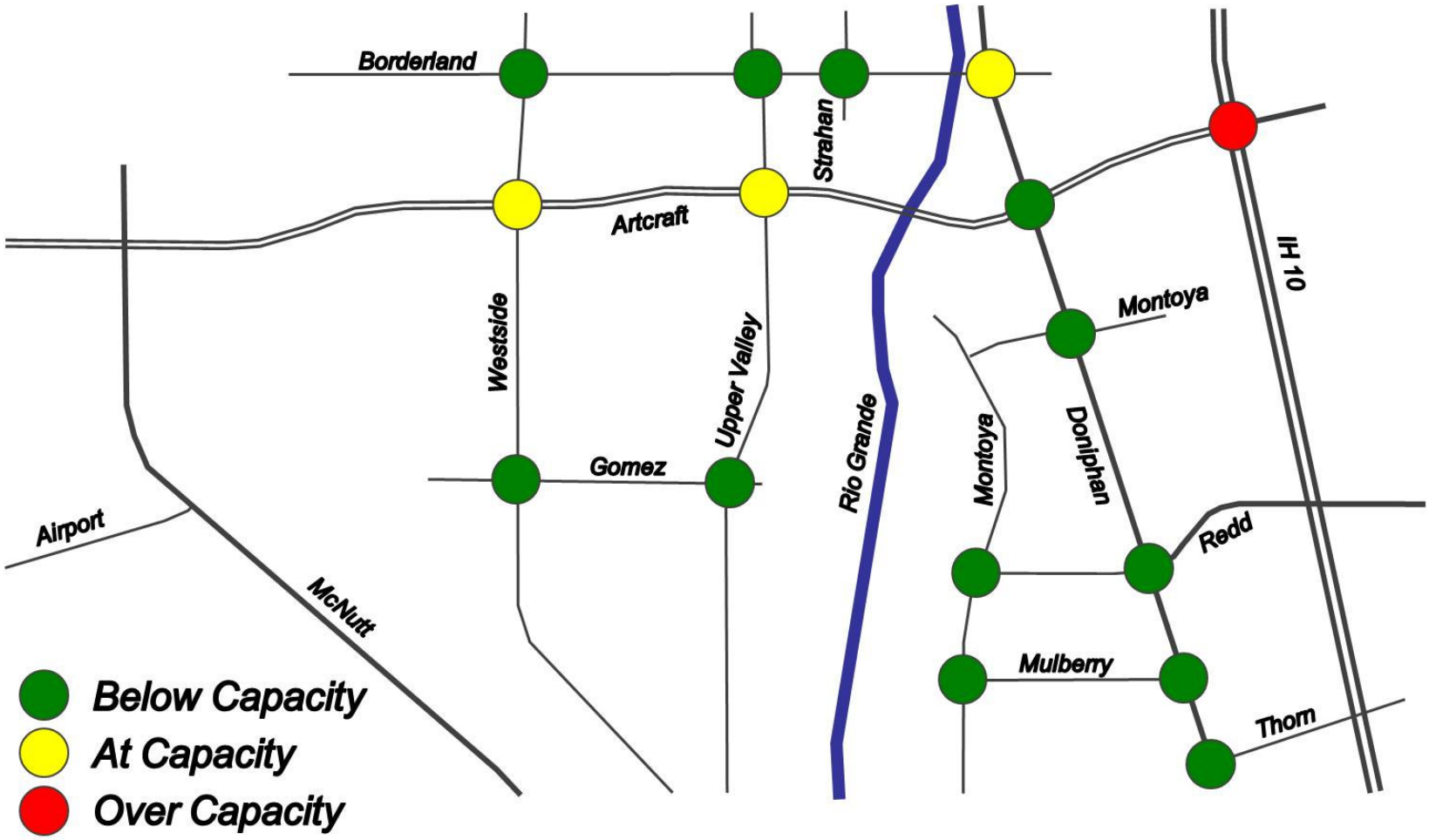


Figure 27: 2017 Levels of Service – With Additional Improvements (north)

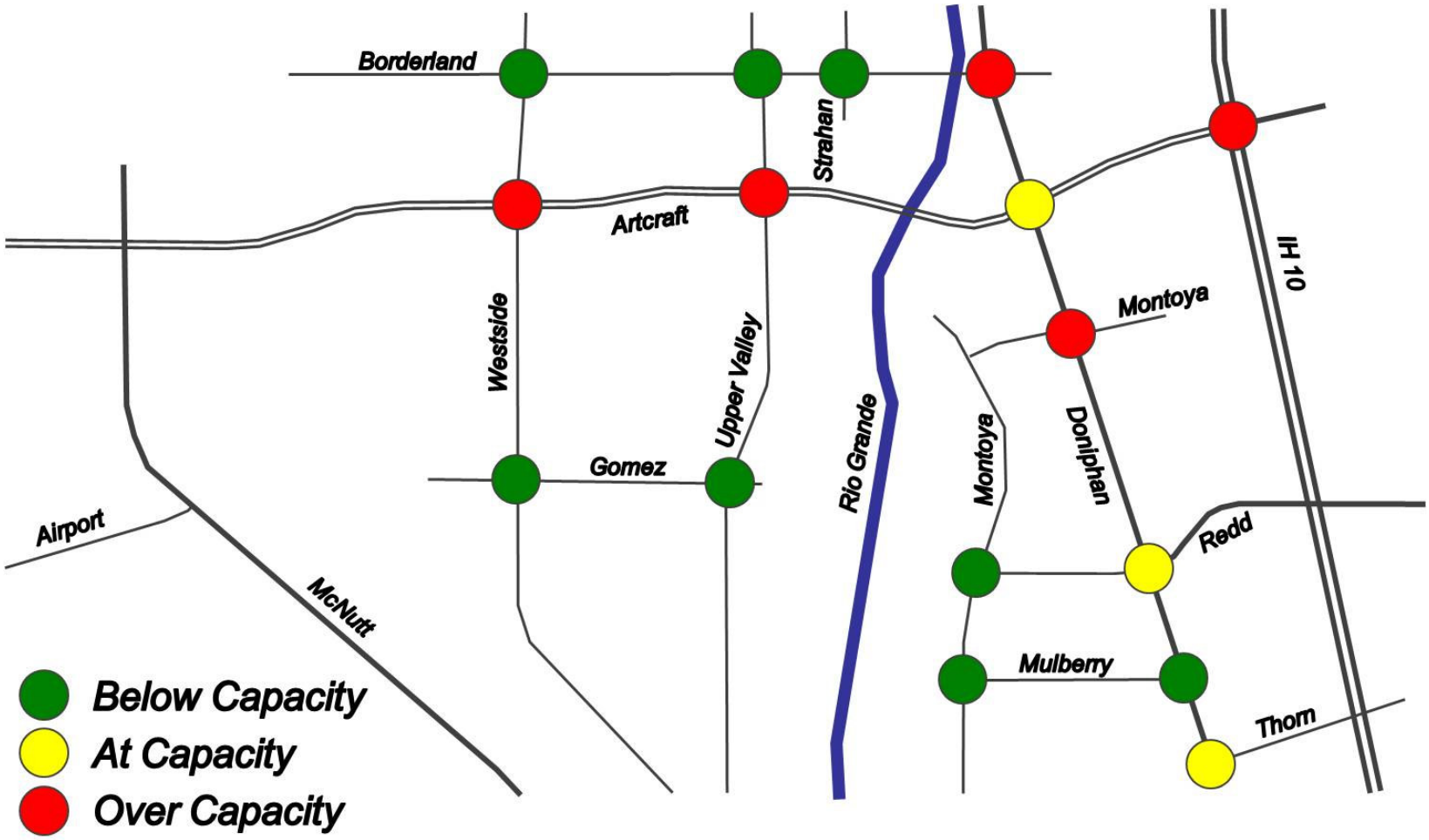


Figure 28: 2025 Levels of Service – Forecasted Conditions (north)

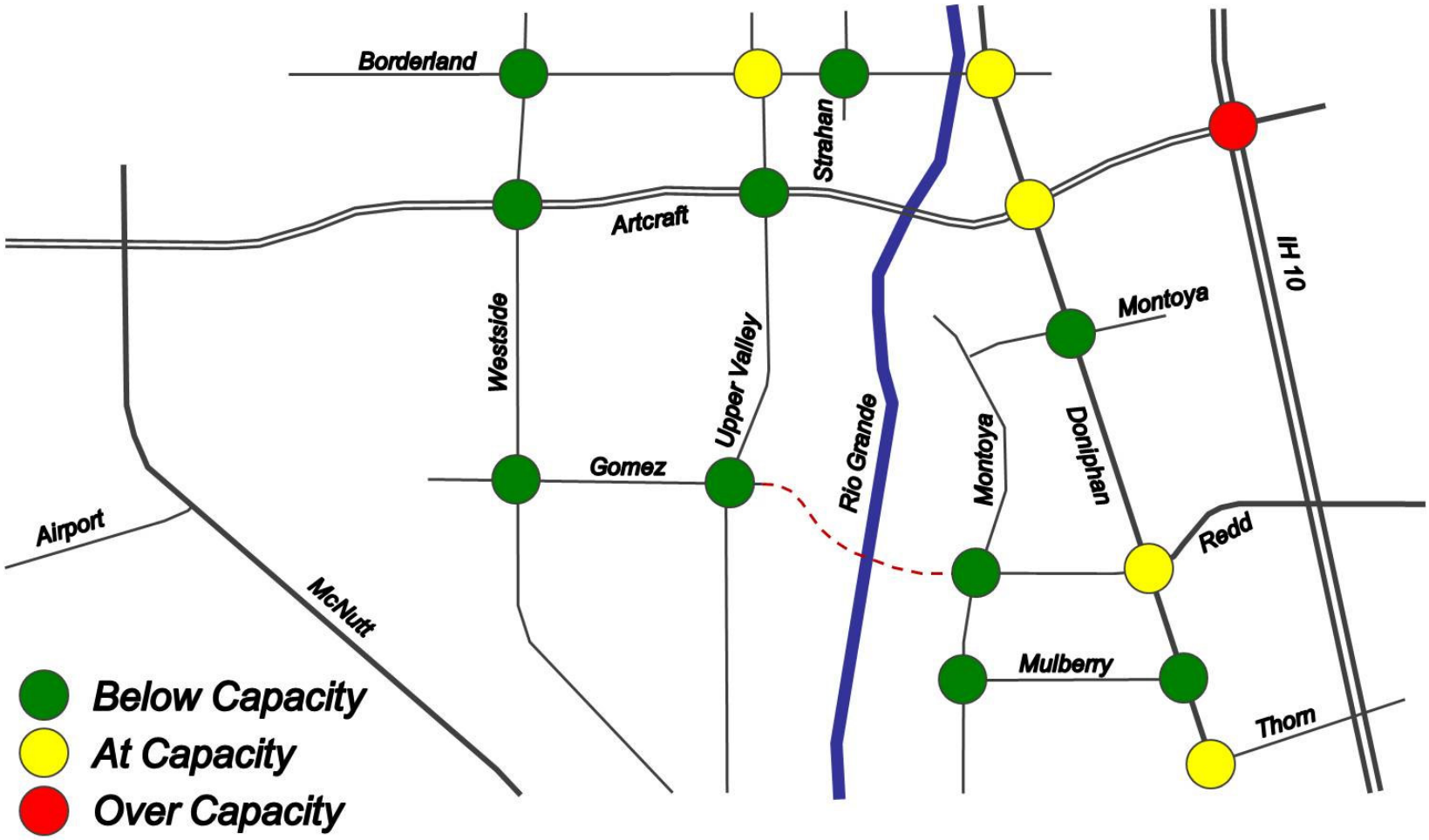


Figure 29: 2025 Levels of Service – With Additional Improvements (north)

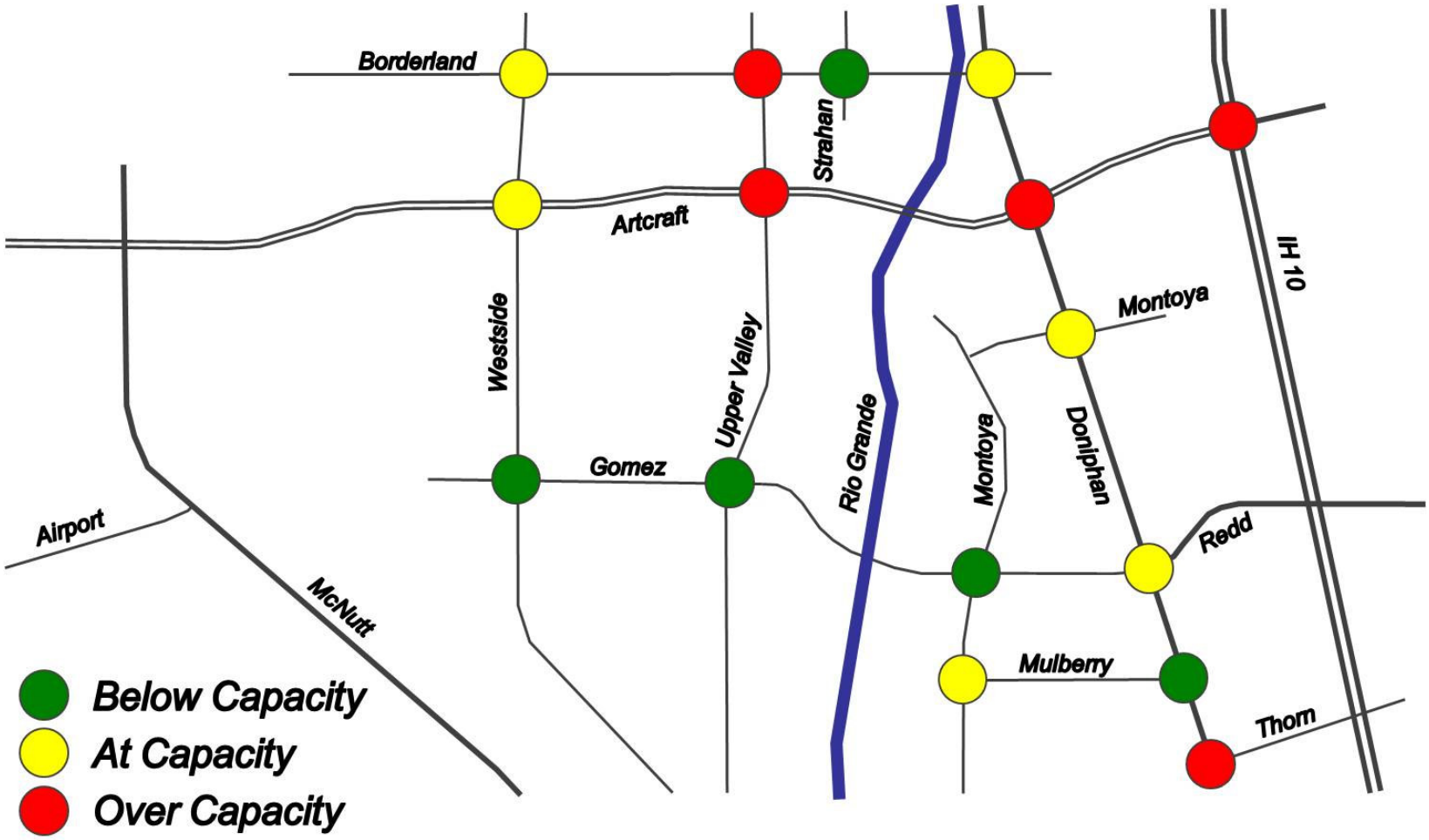


Figure 30: 2035 Levels of Service – Forecasted Conditions (north)

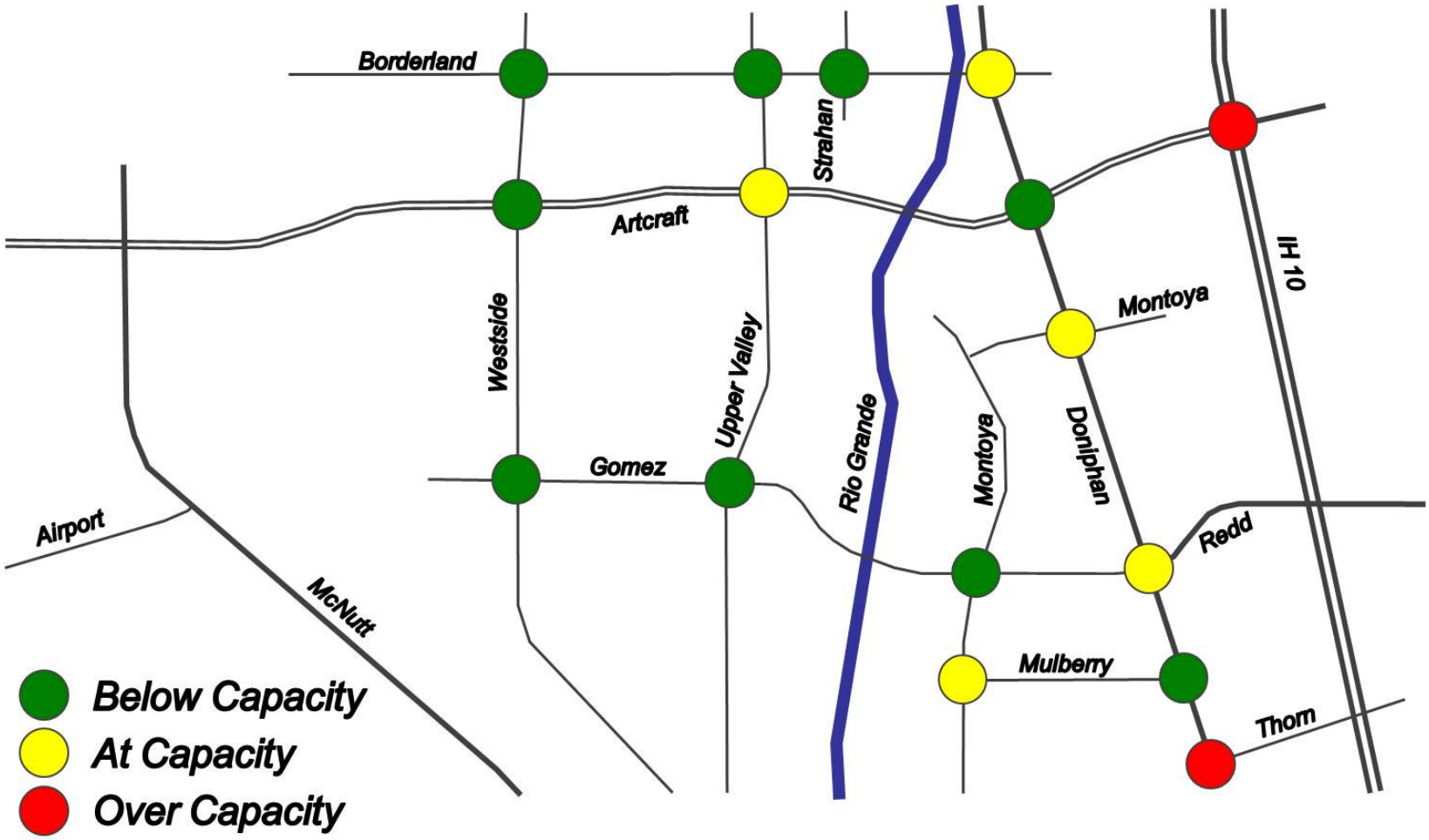


Figure 31: 2035 Levels of Service – With Additional Improvements (north)

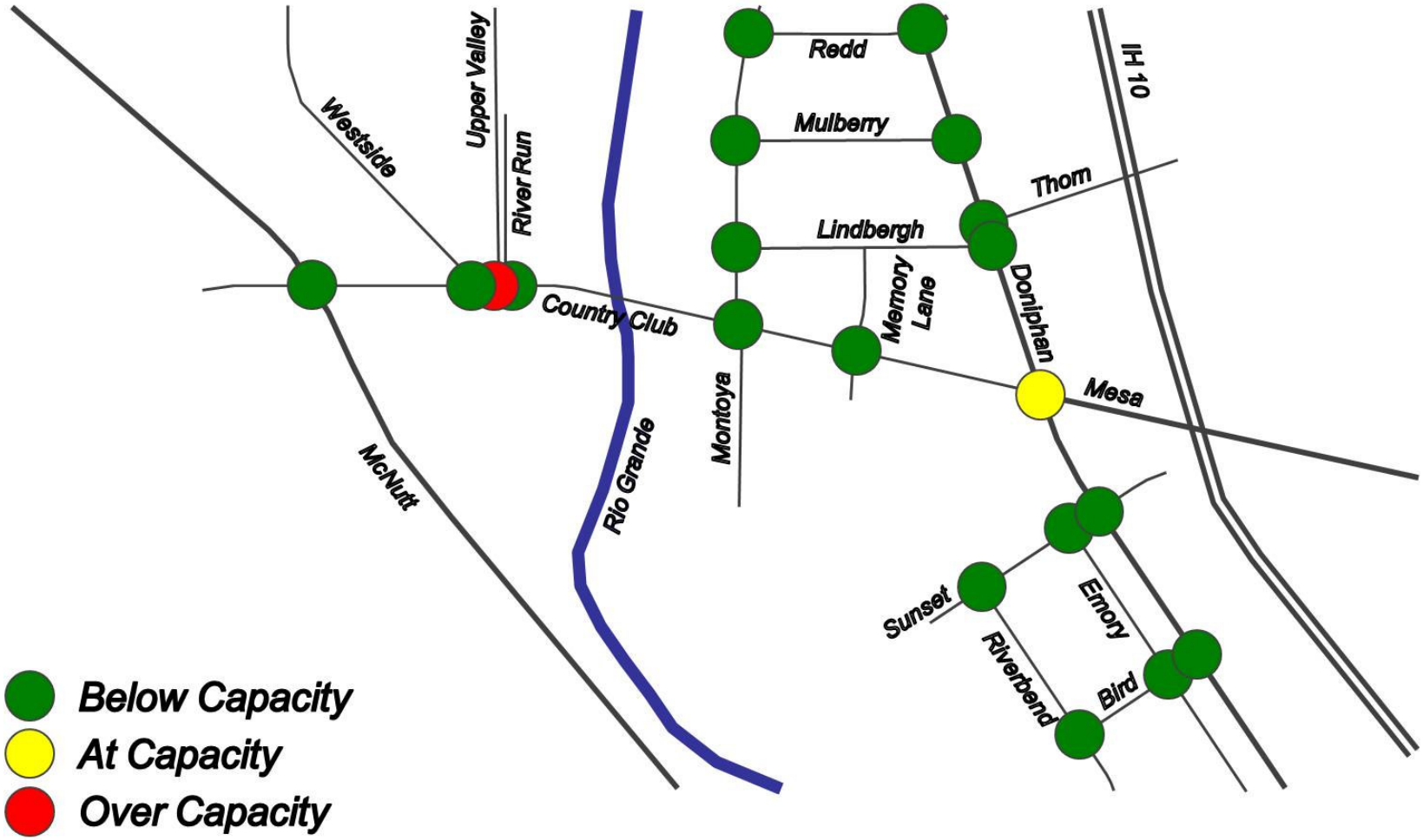


Figure 32: 2007 Levels of Service – Existing Conditions (center)

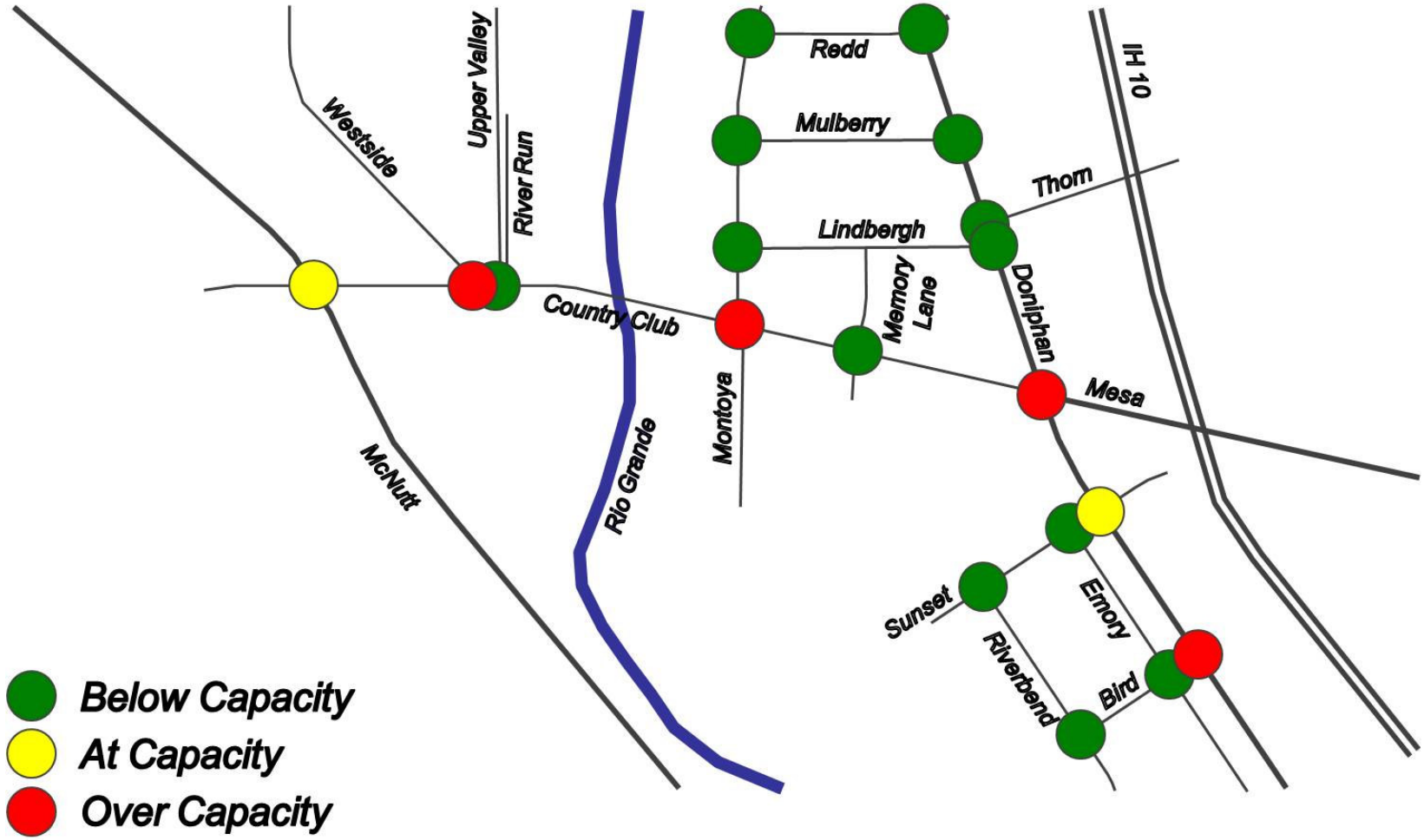


Figure 33: 2017 Levels of Service – Forecasted Conditions (center)

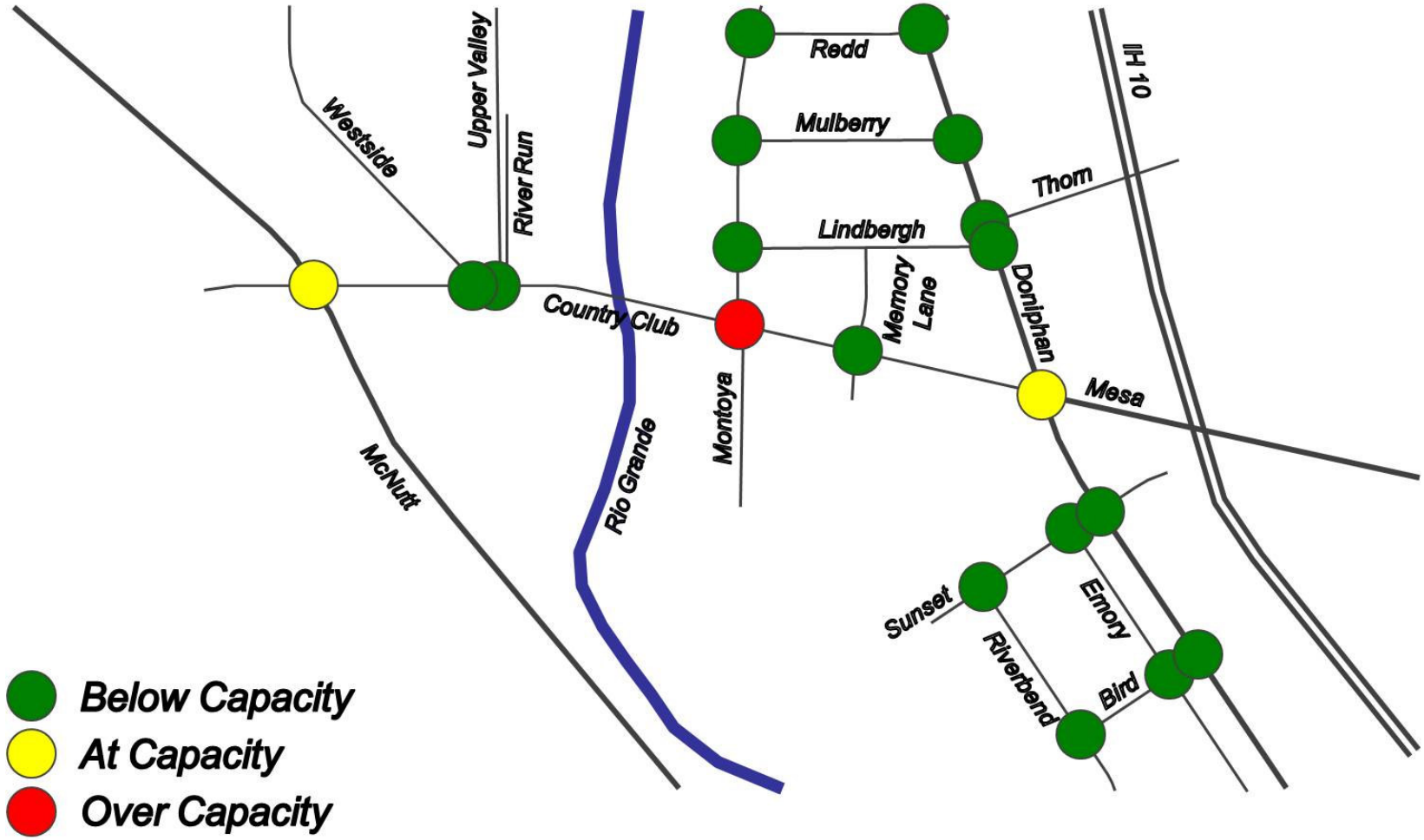


Figure 34: 2017 Levels of Service – With Additional Improvements (center)

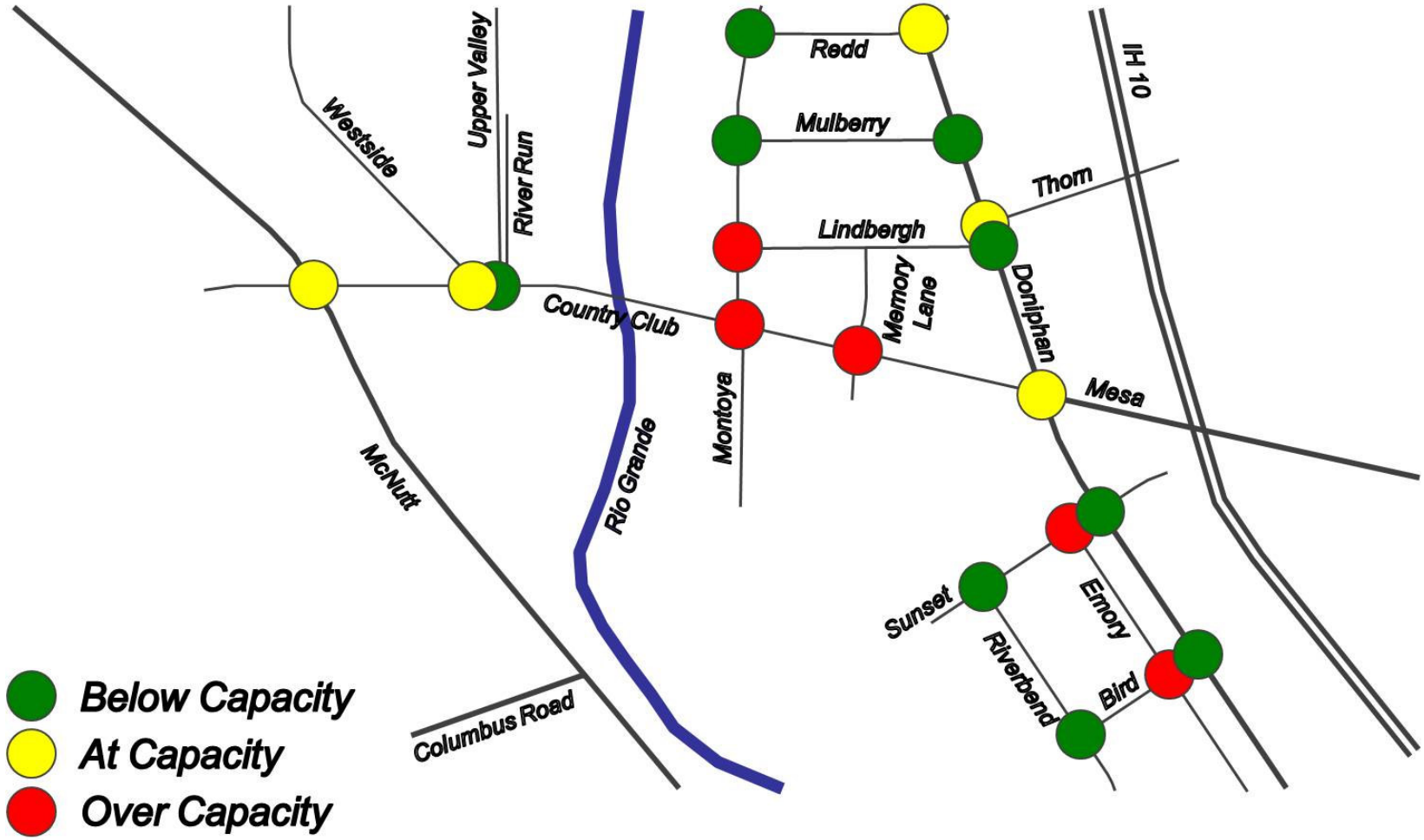


Figure 35: 2025 Levels of Service – Forecasted Conditions (center)

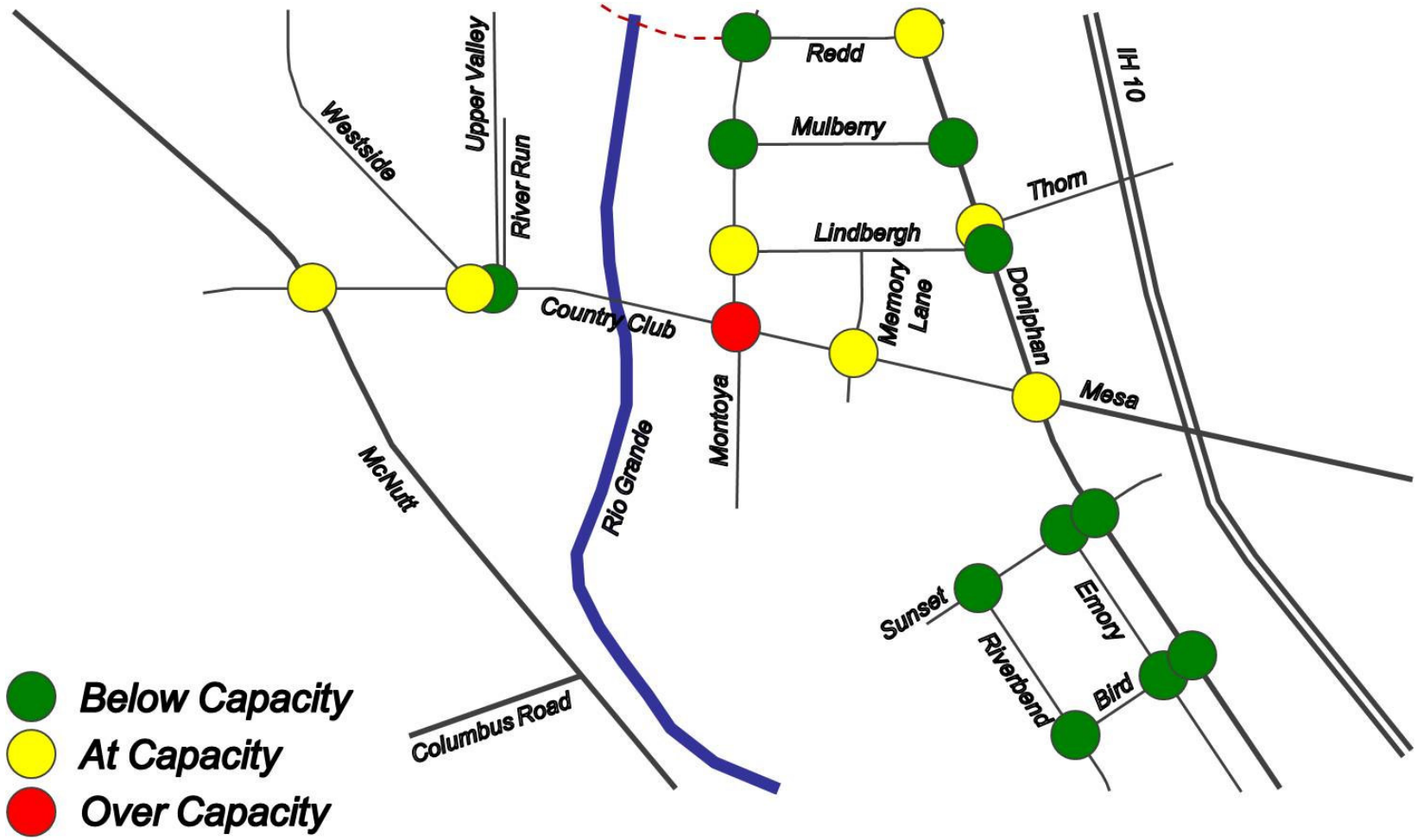


Figure 36: 2025 Levels of Service – With Additional Improvements (center)

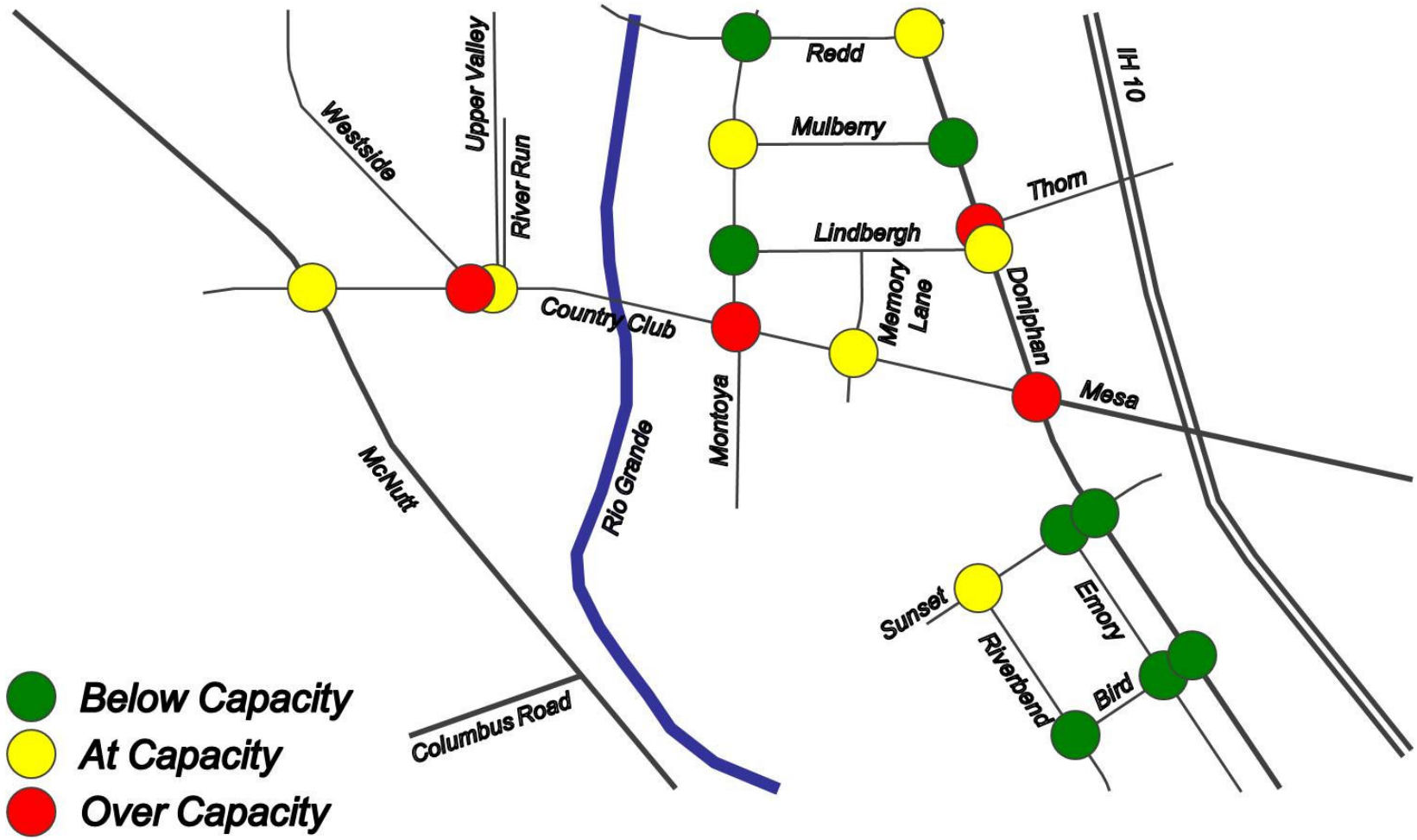


Figure 37: 2035 Levels of Service – Forecasted Conditions (center)

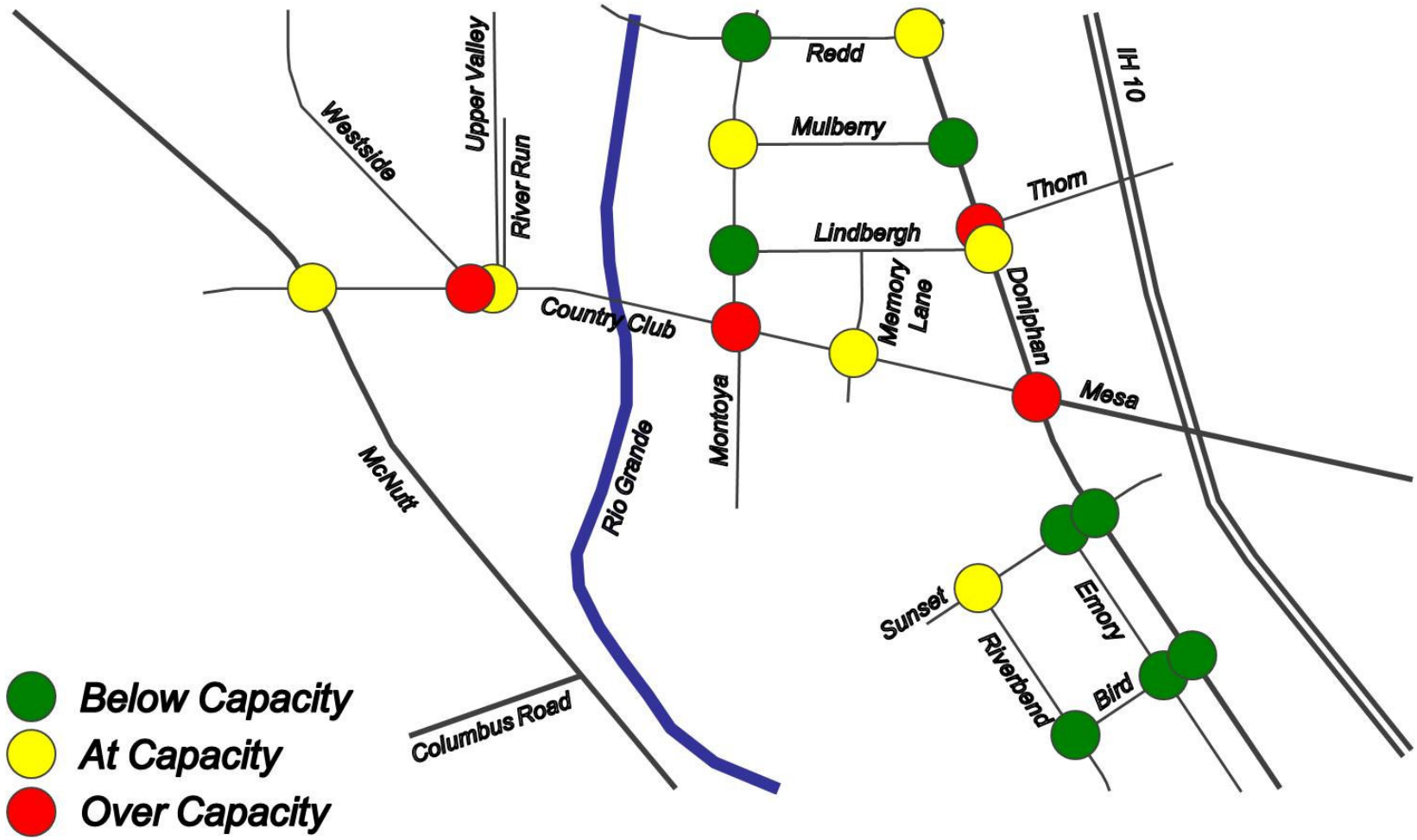


Figure 38: 2035 Levels of Service – With Additional Improvements (center)

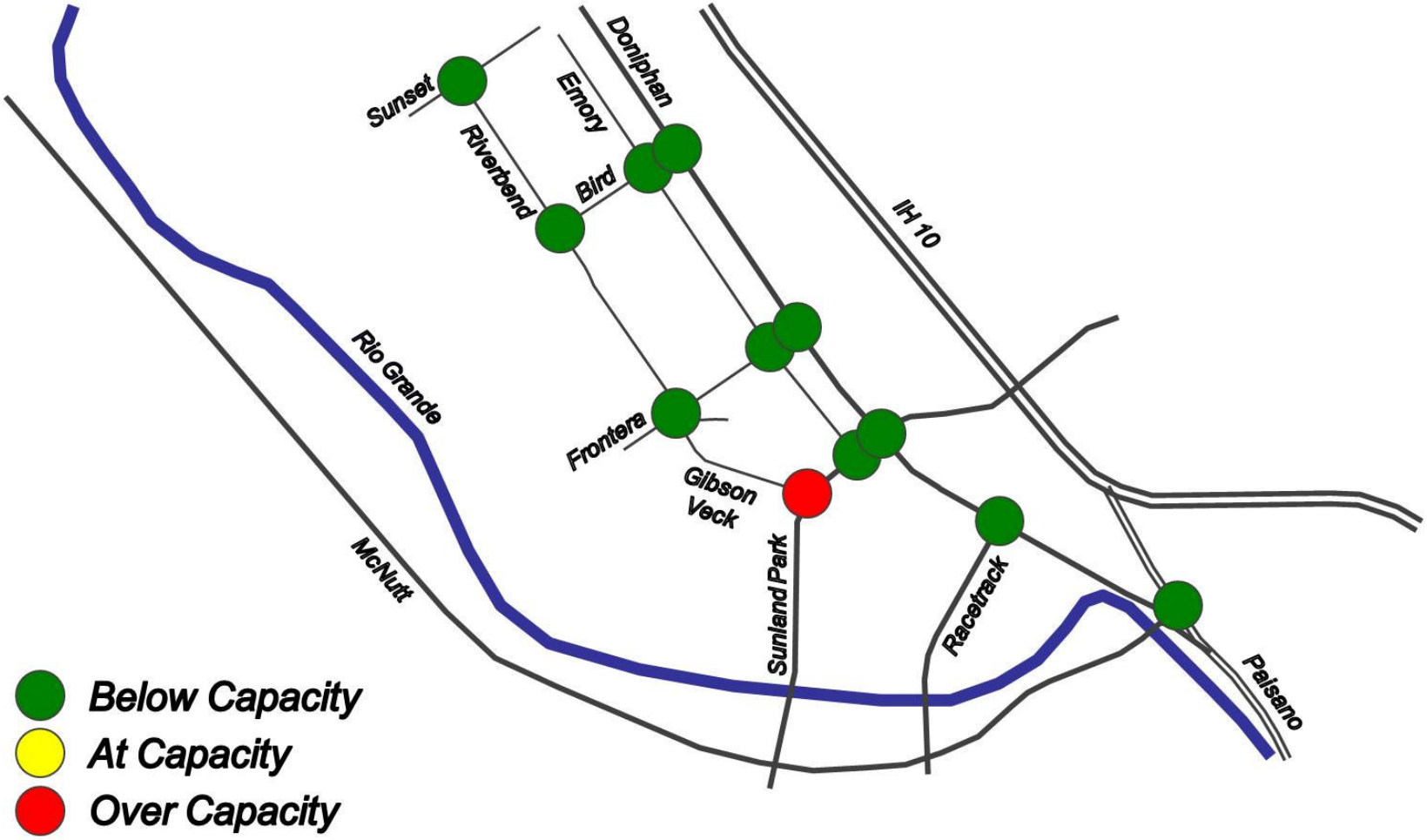


Figure 39: 2007 Levels of Service – Existing Conditions (south)

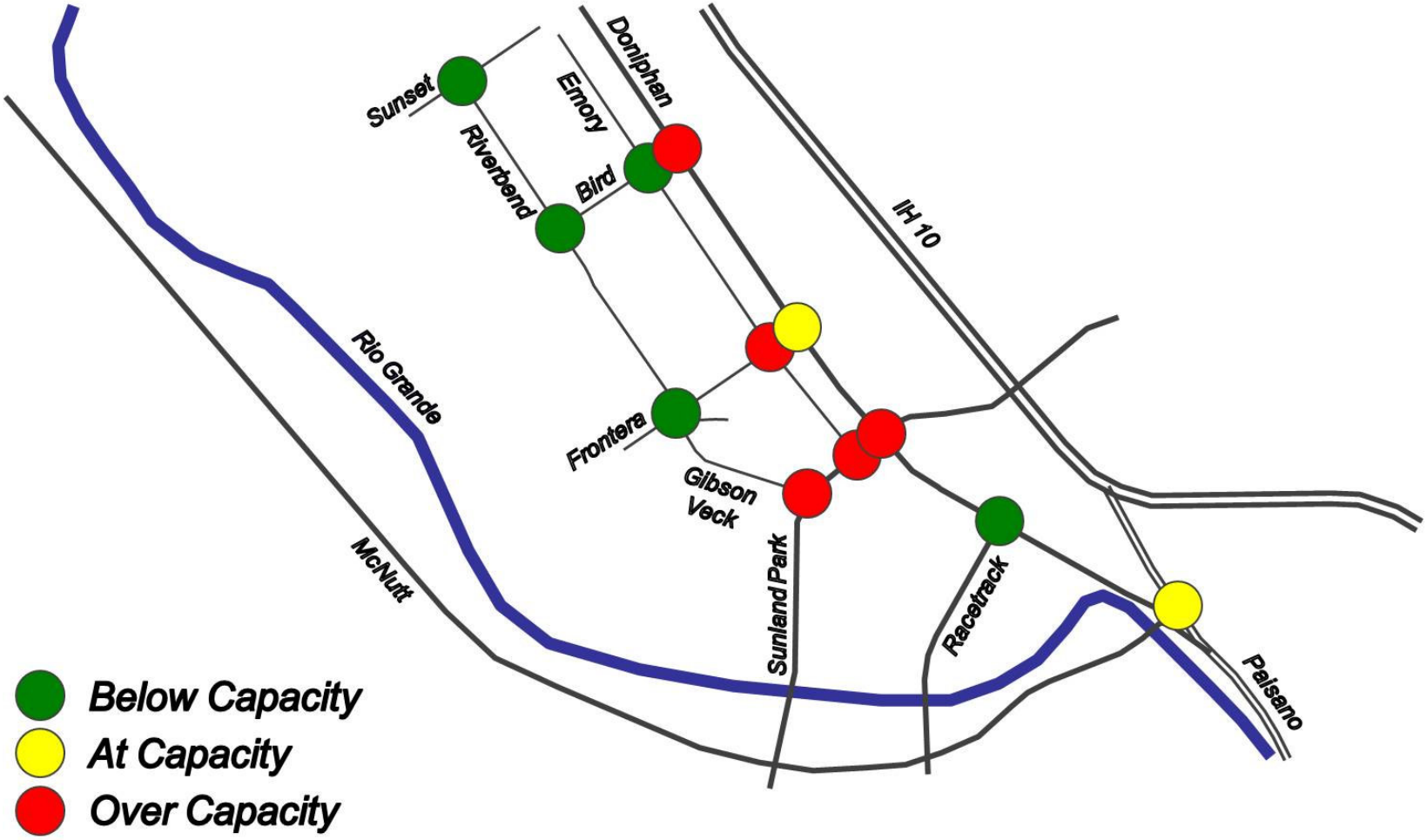


Figure 40: 2017 Levels of Service – Forecasted Conditions (south)

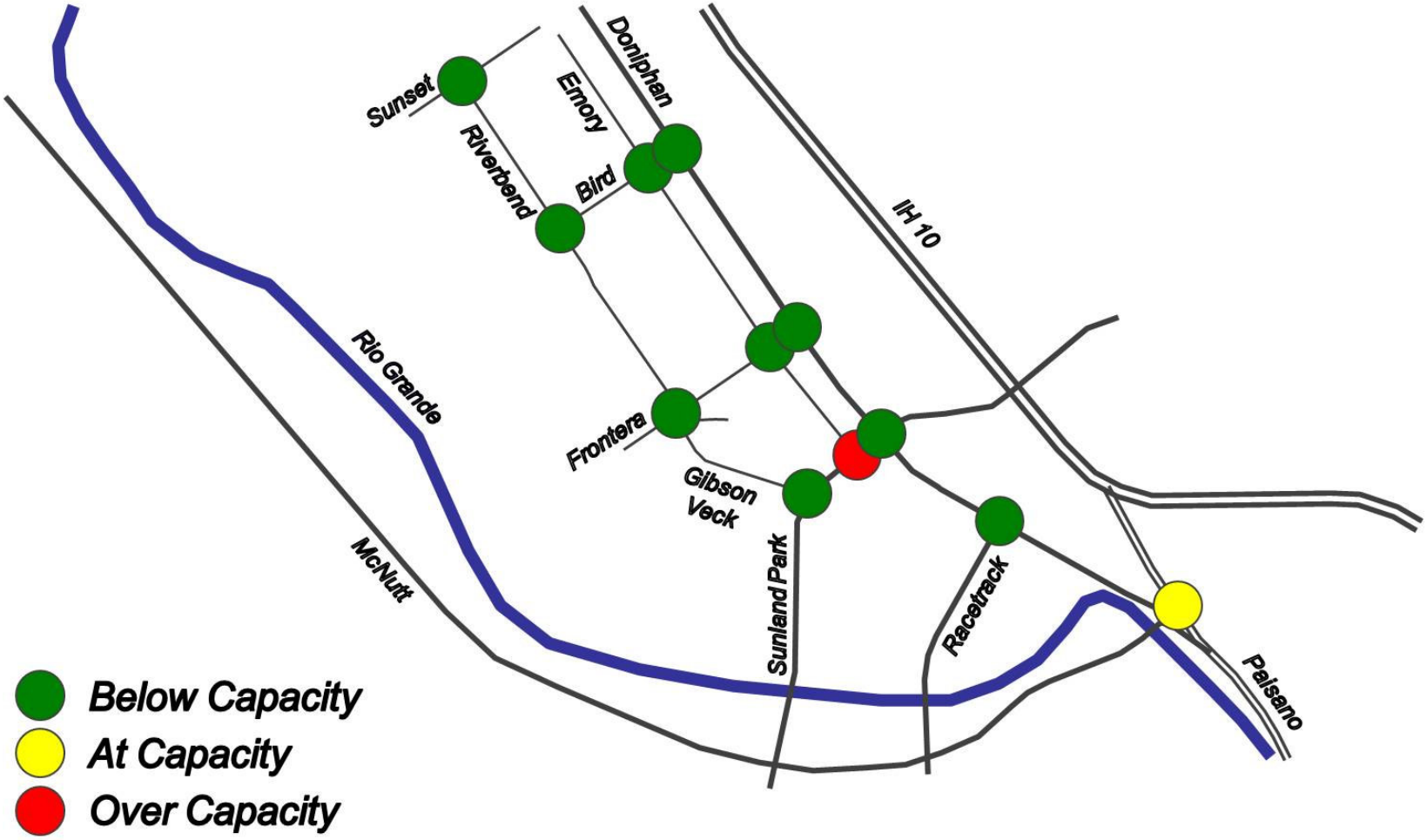


Figure 41: 2017 Levels of Service – With Additional Improvements (south)

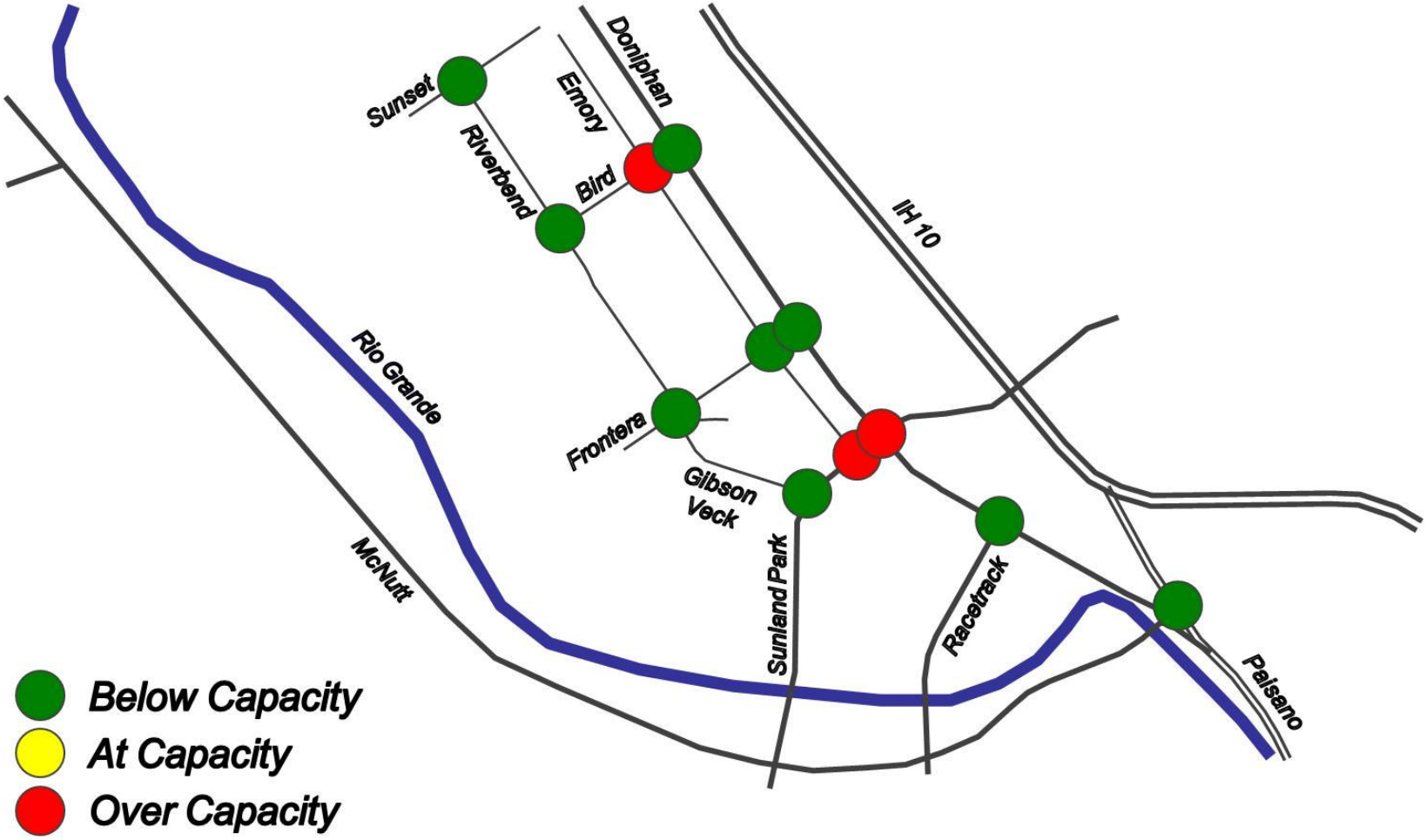


Figure 42: 2025 Levels of Service – Forecasted Conditions (south)

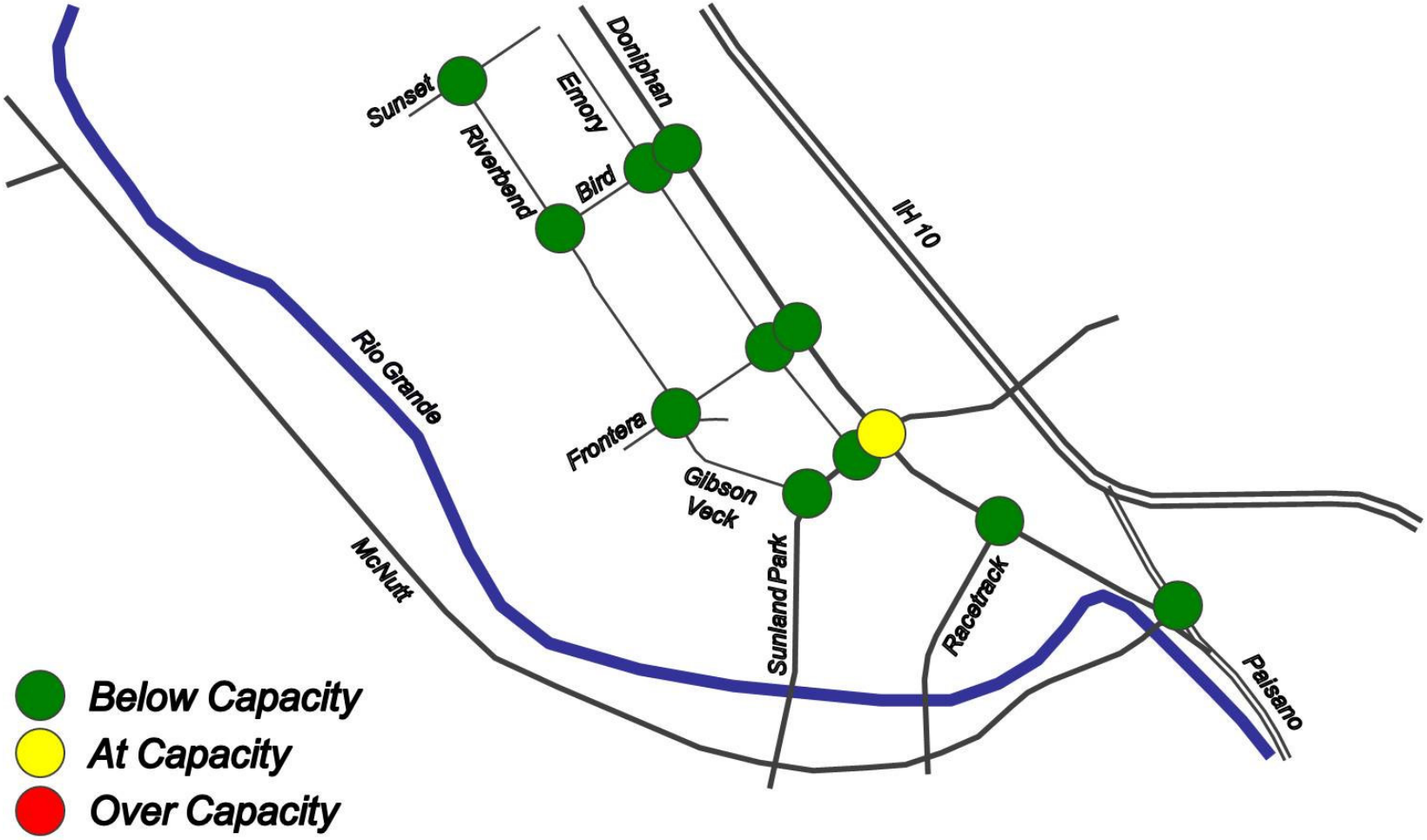


Figure 43: 2025 Levels of Service – With Additional Improvements (south)

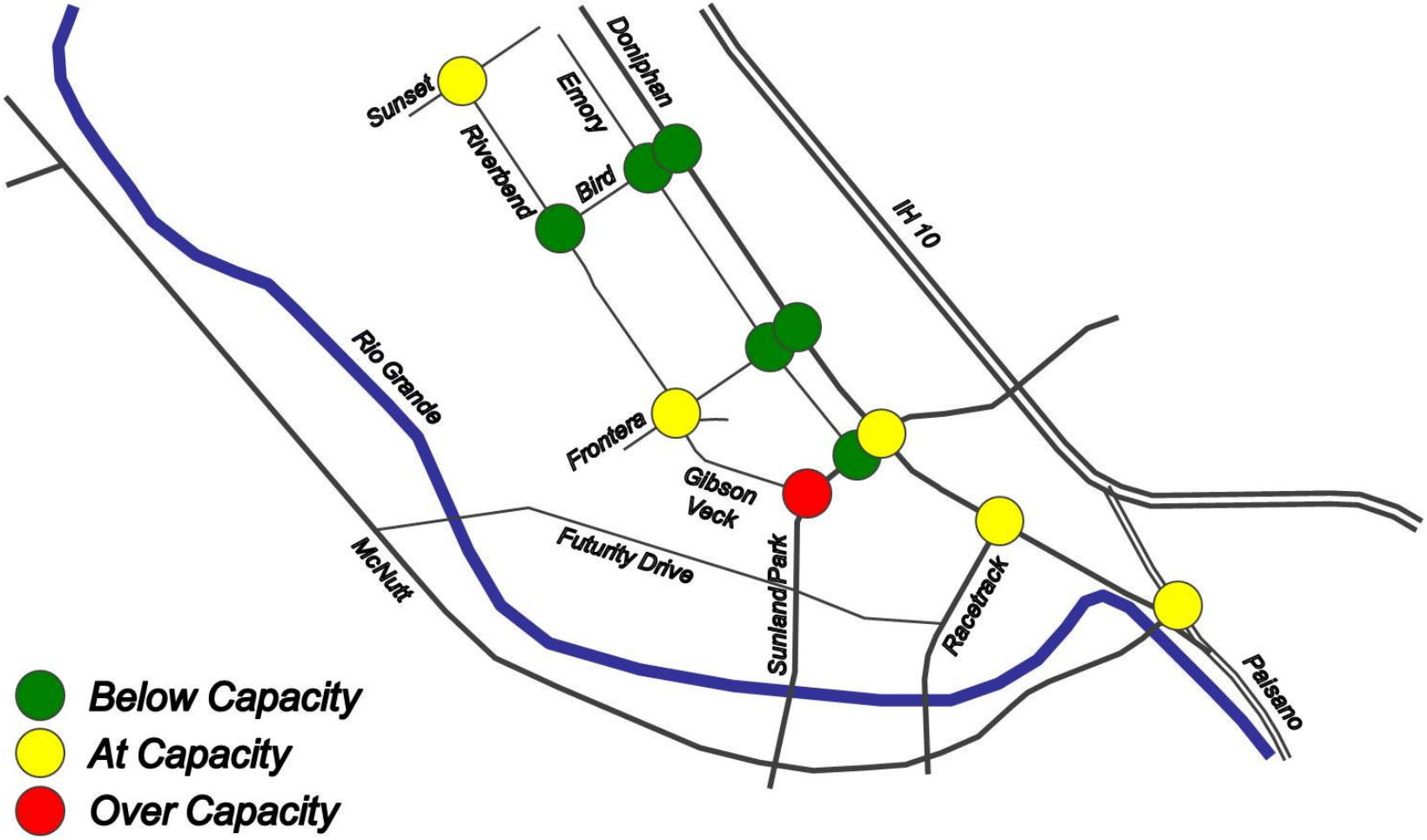


Figure 44: 2035 Levels of Service – Forecasted Conditions (south)

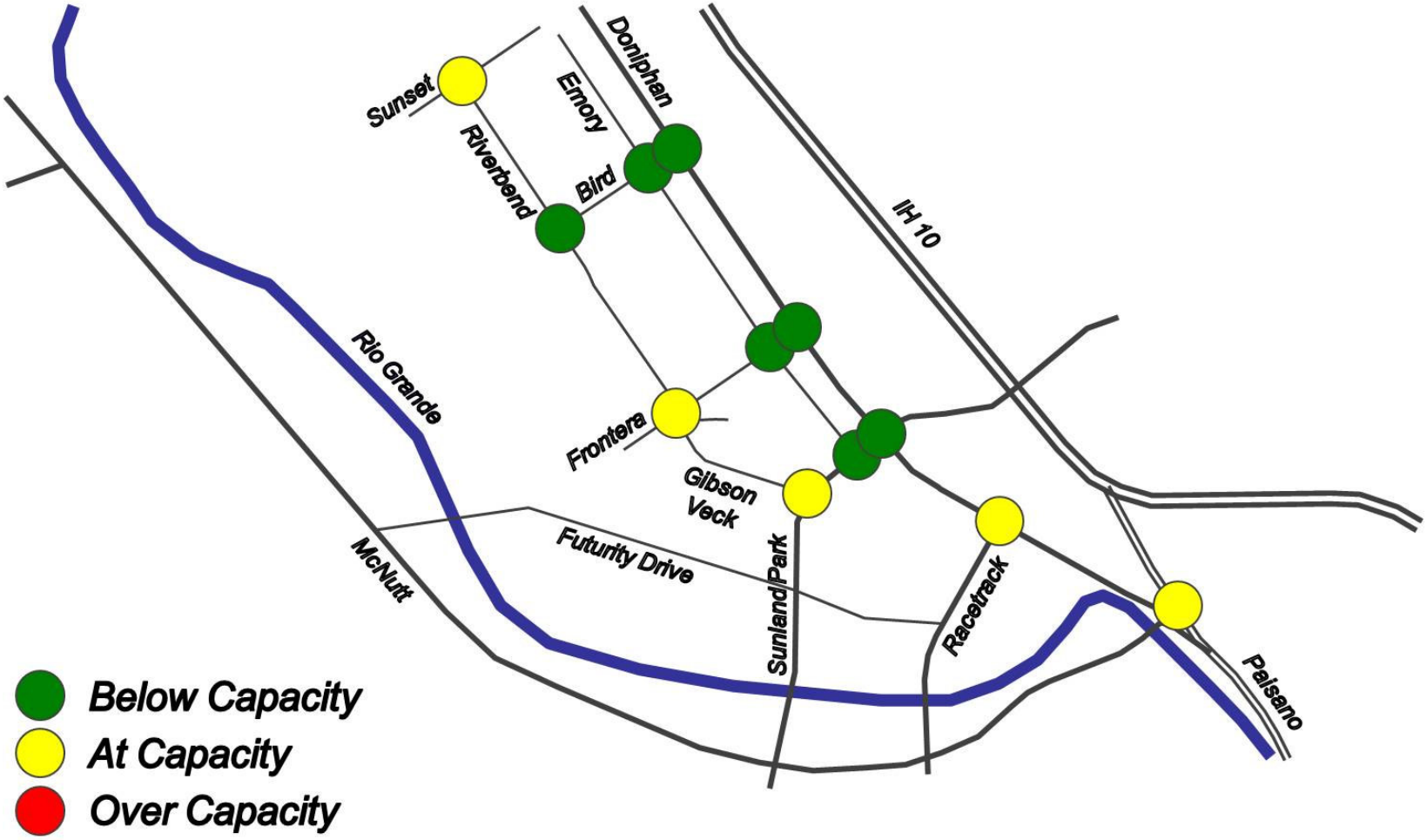


Figure 45: 2035 Levels of Service – With Additional Improvements (south)

TRANSPORTATION IMPROVEMENT RECOMMENDATIONS

The following is a discussion of the recommended transportation improvements to mitigate unacceptable levels of service during the design years. The recommendations are divided by design year with the intent that they would be in place prior to that year. In addition, any recommendation from the previous design year was considered already in place for the next design year's base conditions.

When determining the most appropriate improvement option, both roadway and intersection improvements were considered. Lane for lane, intersections have lower throughput capacity than the roadways feeding them. This is due to a variety of factors, many of which are related to driver behaviors. Thus the throughput of a corridor is determined by the efficiency of its intersections and not necessarily the number of through lanes along the corridor. Where traffic volumes exceed the capacity of a specific intersection or certain movements at that intersection experience significant delays or excessive queue lengths, a variety of traffic control devices or geometric improvements can be considered to mitigate the performance issue as described below.

- *Provide auxiliary lanes.* The installation of separate left turn lanes or right turn lanes increase throughput by separating turning traffic from through traffic. However, there must be an equivalent number of receiving lanes to accommodate the planned improvement. In some instances, additional right-of-way is required to implement this strategy, and the subsequent effectiveness would be dependent on the manner of intersection control chosen for the intersection. However, when these intersections are signalized, additional signal timing must be afforded to allow pedestrians to cross the greater width of roadway. Where these widths are significant, the time available for the movement of motor vehicles may have to be reduced and may offset the gains of adding the auxiliary lanes.

- *Provide grade separation of roadways.* This method can provide for significant gains in throughput capacity, yet it is also the most expensive improvement to implement. Overhead structures can also create issues for the community in terms of visual impacts, loitering, littering, graffiti, or crime. These structures also require a significant "footprint" to implement as their length is dependent on the amount of vertical clearance needed to pass

over the crossing roadway: lengths can approach a half mile. Access impacts to adjacent properties are also an issue. In some instances, additional right-of-way is required to implement this strategy.

- *Use all-way stop control.* The limitation of all-way stop control is that all vehicles must stop whether or not other motorists, cyclists or pedestrians are present. Running of stop signs by inattentive or aggressive motorists is a significant safety issue. Instances of motorists demonstrating discourtesy to pedestrians, bicyclists or other motorists who legally have the right-of-way is commonplace. Throughput of vehicular traffic volumes is the lowest of all intersection control options.

- *Install a traffic signal.* Traffic signals do provide a higher level of throughput than all-way stops and can be timed to reflect demands at different times of day or days of week. Running of red lights by inattentive or aggressive motorists is a significant safety issue. Instances of motorists demonstrating discourtesy to pedestrians, bicyclists or other motorists who legally have the right-of-way is commonplace, particularly during right-turn-on-red maneuvers. Vehicular speeds tend to increase in the vicinity of traffic signals; along the roadways adjacent to the intersection higher vehicular speeds occur when through traffic does not have to stop. Given the operational and maintenance resource expenditures associated with a traffic signal and the accompanying liability, the approval of the installation of traffic signals at relatively minor intersections by governing jurisdictions is very limited. Additionally, signal timing and phasing is by practice not optimized for all traffic conditions such as special events or especially heavy flows during inclement weather or the day before a designated holiday.

- *Construct a modern roundabout.* Circular intersections have been in the US since the 1900s; however their popularity waned in the 1940s and 1950s due to safety concerns. In the 1980s, revised designs (ergo “modern” roundabouts) were exported from Europe and Australia to the United States. Since then further research and design modifications has yielded an intersection control method that offers many unique advantages: it is statistically safer than traffic signals or stop-controlled intersections; it offers high capacity with low delay while reducing speeds of through traffic; it serves all modes of travel (automobiles,

trucks, buses, bicycles and pedestrians); it offers geometric flexibility to minimize impacts to adjacent properties; it provides opportunities for landscaping and other aesthetic treatments. Aside for requiring additional right-of-way at the intersection, the greatest challenge to implementing a modern roundabout is community support. Roundabout experts report public opposition to a roundabout is about two to one before implementation, yet opinions change to about three to one in favor after the project is completed. The overall implementation cost of a roundabout is greater than that of a traffic signal.

2017 ROADWAY IMPROVEMENTS

Country Club Road

Country Club is planned for reconstruction beginning in 2010 to address deficiencies in the existing utility infrastructure. The issue of significant concern to the community is what the cross section of the roadway should be and what level of functionality it should have in terms of area and regional mobility. Some of the parameters various stakeholders have requested for consideration are:

- Preserve trees;
- Avoid or minimize the need for additional right-of-way;
- Provide for bicyclists and pedestrians;
- Provide for existing and future transit needs;
- Provide for local mobility while preserving the existing context of the corridor.

In previous community outreach efforts, a five lane cross section was presented as the recommended cross section for Country Club. While this may be appropriate when viewed solely from a motor vehicle mobility standpoint, significantly higher vehicular speeds are very likely to result. Even with the inclusion of sidewalks, a safer pedestrian environment is not necessarily provided because the distance a pedestrian would have to traverse to cross Country Club increases significantly. Additionally, the proposed cross section would require acquisition of right-of-way along many portions of the corridor and would necessitate the removal of the existing trees. Given the need to provide for a higher degree of roadway safety while still affording an appropriate degree of mobility and accessibility, three context-sensitive design options which better meet the above parameters are presented.

Roadway Option 1 – Three Lane Roadway with a Continuous Left Turn Lane and Shared Use Lanes. A conceptual rendering of this roadway section for a midblock location is shown at Figure 46 and in advance of an intersection at Figure 47.

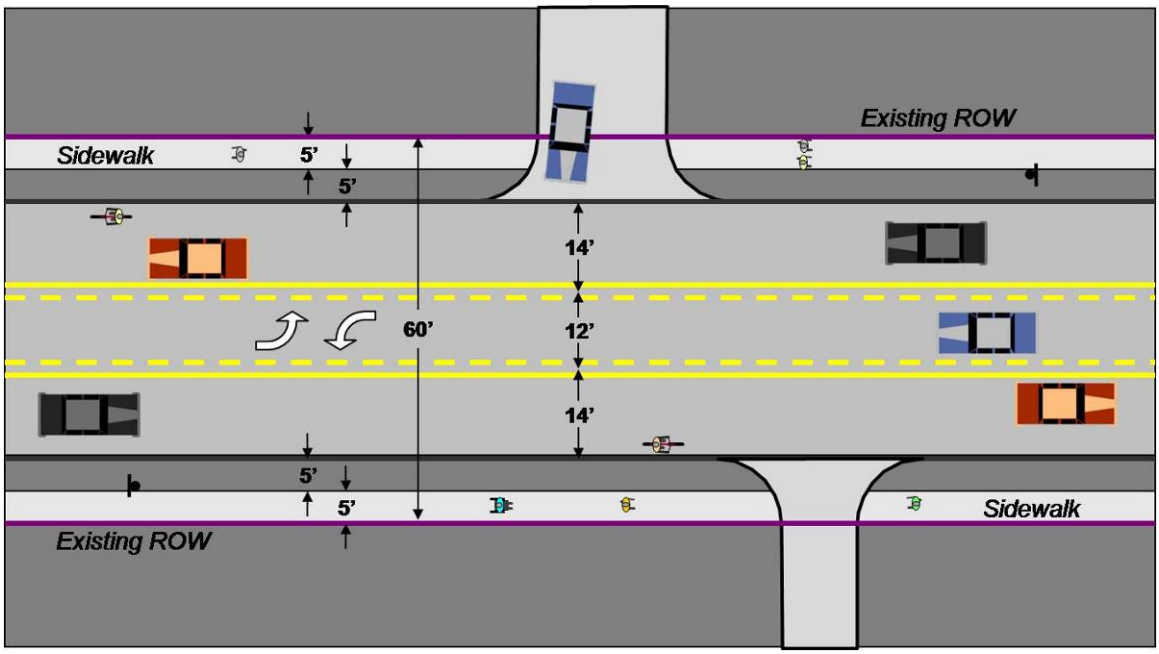


Figure 46: Conceptual Rendering of Three Lane Roadway with Shared Use Lanes - Midblock

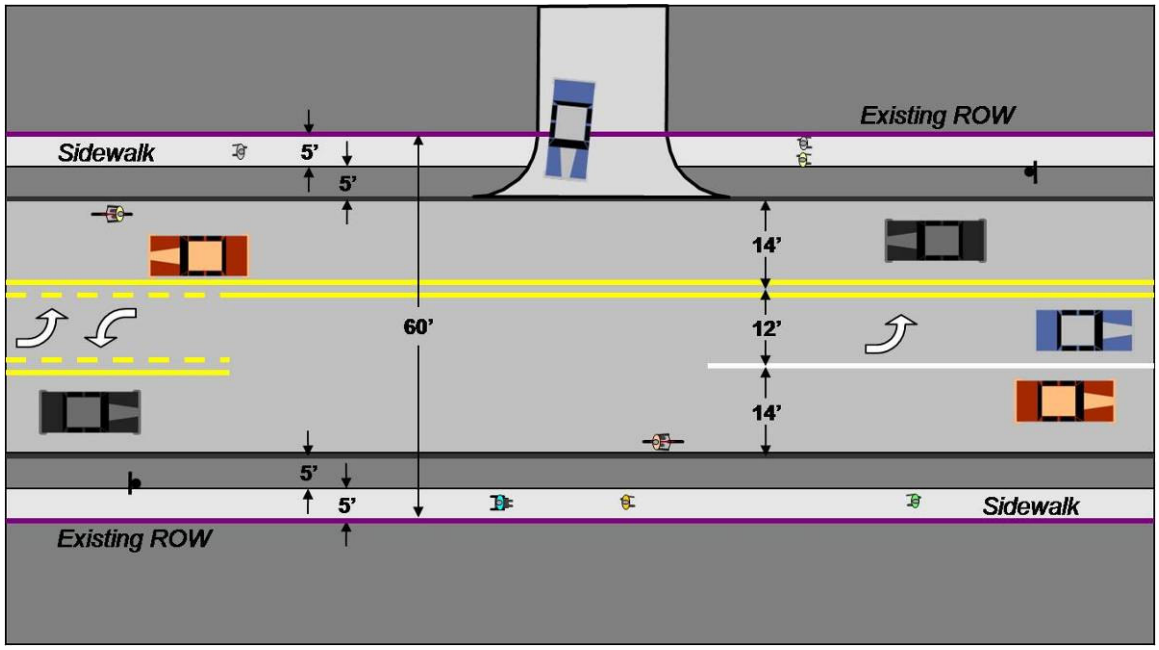


Figure 47: Conceptual Rendering of Three Lane Roadway with Shared Use Lanes - Intersection

This design, which features a curb-and-gutter roadway, remains wholly within a right-of-way width of 60 feet. The concept features through lanes which are 14 feet wide and are intended to be shared by motor vehicles and bicycles. The width is in conformance with guidance found in Reference 5. Sidewalks are five feet in width, which satisfies requirements found in References 1 and Reference 11. A buffer strip five feet in width provides for landscaping opportunities, separation between pedestrians and motor vehicles, and space for the installation of traffic signs and other traffic control devices in conformance with guidance found in Reference 12. The continuous left turn lane provides the opportunity for left turning traffic to wait outside of the main traffic stream for a suitable gap, thus reducing delays along the corridor. Transition between the continuous left turn lane and dedicated left turn lanes at key intersections is accomplished through changes in pavement markings. The sidewalk can meander within the right-of-way to minimize impacts to existing trees and to avoid above-ground utilities; the roadway itself could similarly meander to some degree if needed to further mitigate conflicts. Where realignment of the sidewalk is not feasible, the use of alternative materials such as decomposed granite gravel or footbridges may be considered to minimize impacts to trees.

To provide support for existing and future transit needs, two options for bus stops are presented in **Figure 48** and **Figure 49.**

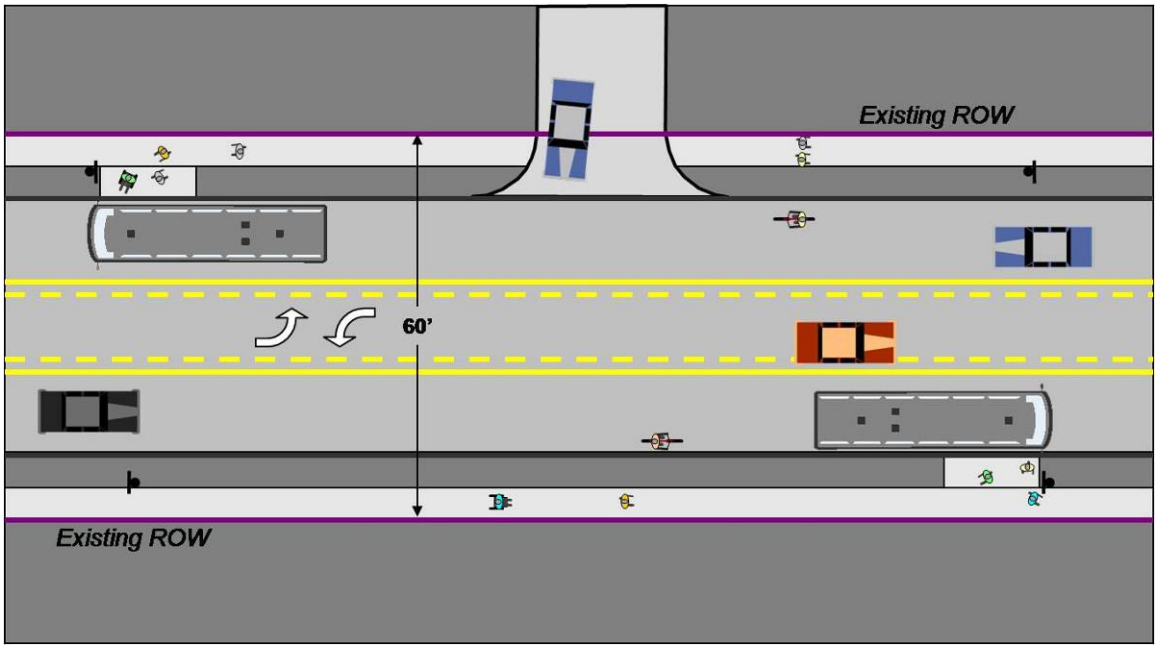


Figure 48: Conceptual Rendering of Roadway Option 1 with Curbside Bus Stops

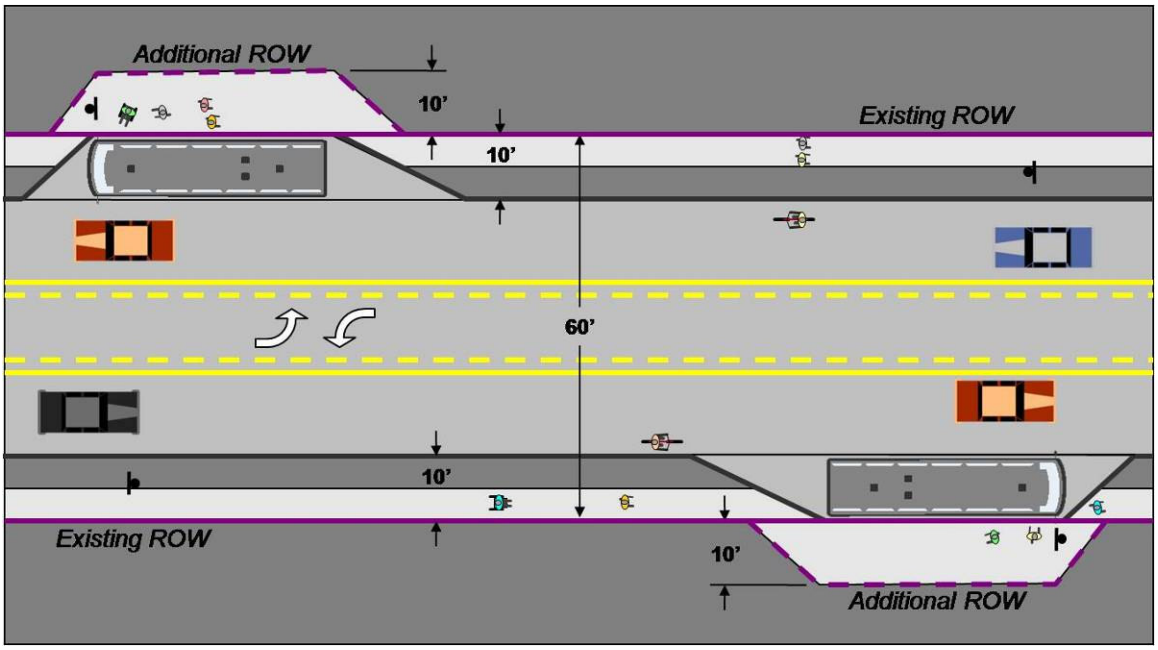


Figure 49: Conceptual Rendering of Roadway Option 1 with Pull-Out Bus Stops

The curbside bus stop is implemented by the installation of surfacing between the back of curb and the sidewalk, thus this design remains wholly within a right-of-way width of 60 feet. Buses which stop to pick up or discharge passengers do impart a degree of delay to the traffic stream. Some degree of street furniture such as benches and trash receptacles can be provided. However, to preserve appropriate clear widths along the sidewalk, the installation of structures which would provide overhead shelter may be challenging. This design requires relatively low effort to implement and has minimal footprint, thus the options for placing these types of stops along the corridor are many. Additionally, as ridership patterns change over time, stops can be added, removed, or relocated relatively easily.

The pull-out bus stop is implemented by constructing additional paving beyond the curb line which affords one bus the opportunity to pull out of the traffic stream to pick up and discharge passengers. To provide for waiting passengers, the sidewalk is extended an additional ten feet beyond and adjacent to the bus pull-out. This provides the opportunity for street furnishings and structures to provide overhead shelter. However, the design requires at least 70 feet of right-of-way width in the vicinity of the bus stop, thus additional right-of-way may be required. This design requires significant effort to implement, thus the options for implementing or relocating these stops along the corridor are limited.

Roadway Option 2 – Three Lane Roadway with a Continuous Left Turn Lane and Separate Bike Lanes. A conceptual rendering of this roadway section for a midblock location is shown at **Figure 50** and in advance of an intersection at **Figure 51.**

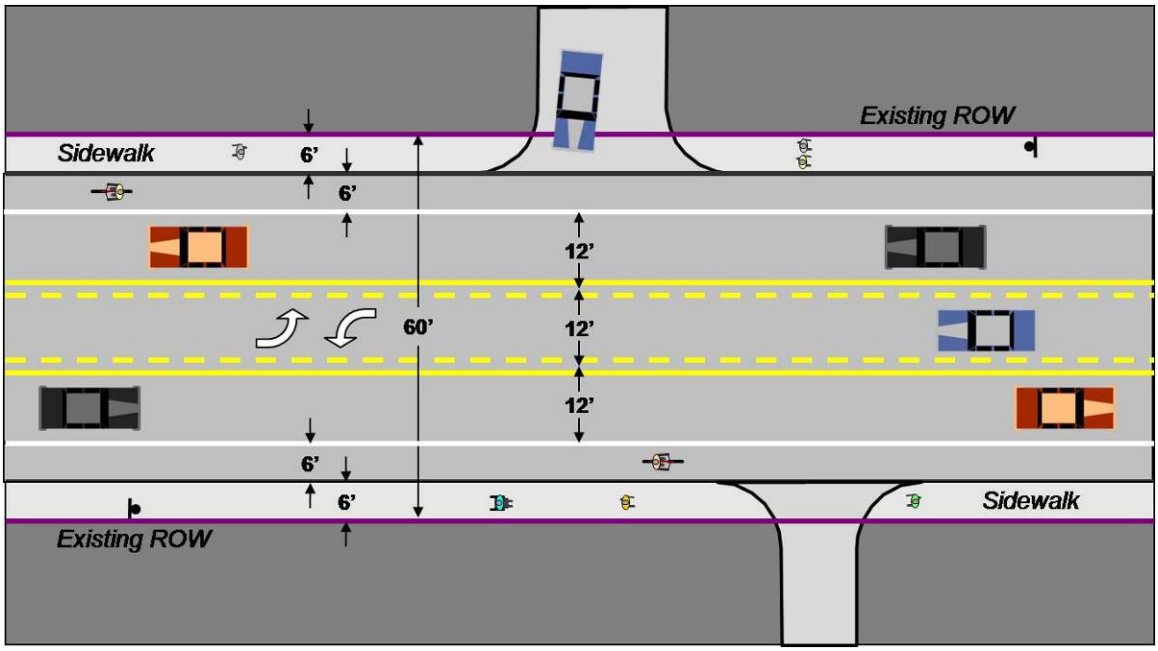


Figure 50: Conceptual Rendering of Three Lane Roadway with Dedicated Bike Lanes - Midblock

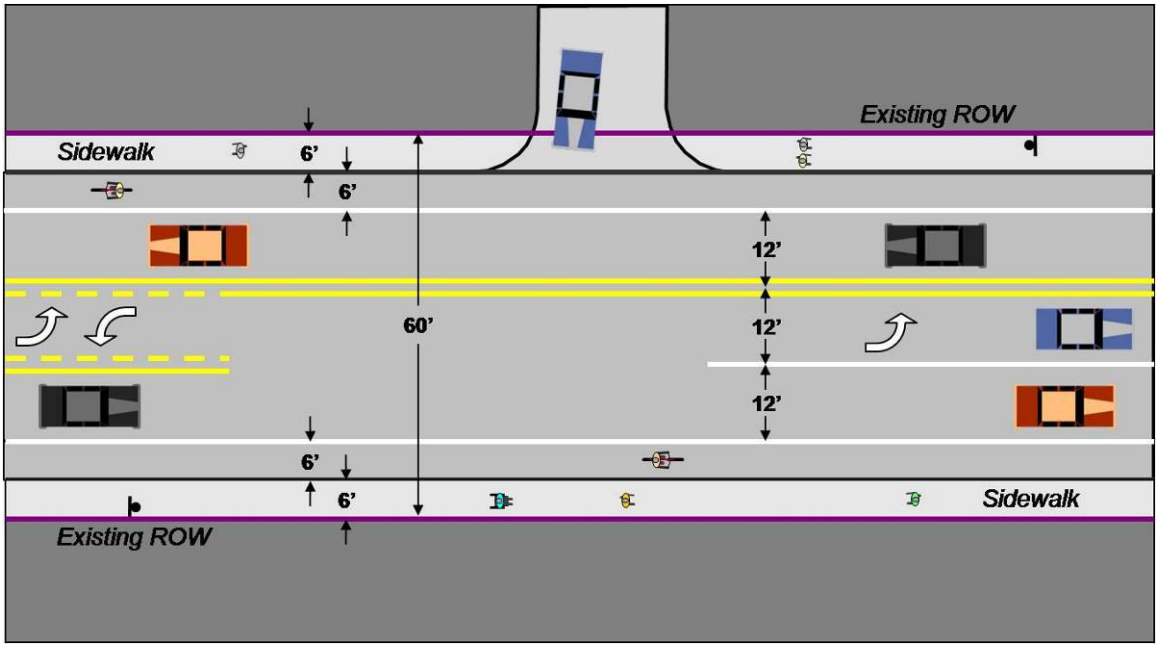


Figure 51: Conceptual Rendering of Three Lane Roadway with Dedicated Bike Lanes - Intersection

This design, which features a curb-and-gutter roadway, remains wholly within a right-of-way width of 60 feet. The concept features through lanes which are 12 feet wide and a separate bike lane which is six feet wide. The bike lane width is in conformance with guidance found in Reference 5. Sidewalks are six feet in width, which satisfies requirements found in Reference 1 and Reference 11. No buffer strip exists between the sidewalk and the roadway, but the additional width of sidewalk and the bike lane provide adequate lateral clearance for pedestrians. The installation of traffic signs and other traffic control devices is more challenging as care must be taken to provide clear widths for passage by pedestrians in conformance with Reference 1 and Reference 11 while also providing lateral clearance from vehicles as described in Reference 12. The continuous left turn lane provides the opportunity for left turning traffic to wait outside of the main traffic stream for a suitable gap, thus reducing delays along the corridor. Transition between the continuous left turn lane and dedicated left turn lanes at key intersections is accomplished through changes in pavement markings. The sidewalk's location is fixed within the corridor, which results in greater conflicts with existing trees and above-ground utilities. The use of alternative materials such as decomposed granite gravel or footbridges may be considered to minimize impacts to trees.

To provide support for existing and future transit needs, two options for bus stops are presented in Figure 52 and Figure 53.

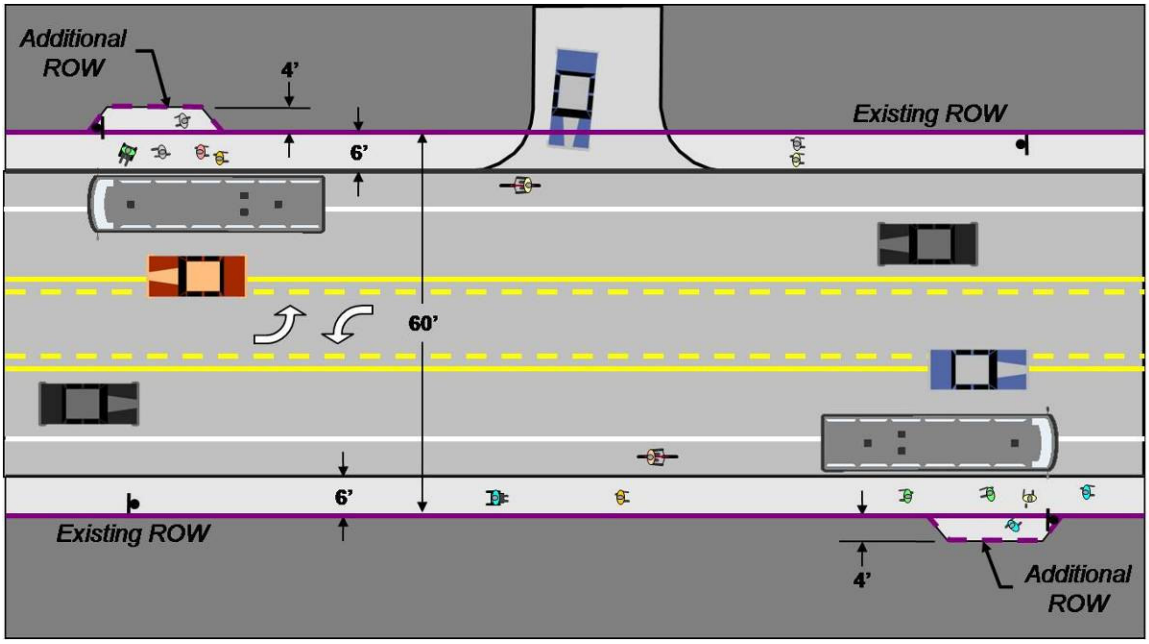


Figure 52: Conceptual Rendering of Roadway Option 2 with Curbside Bus Stops

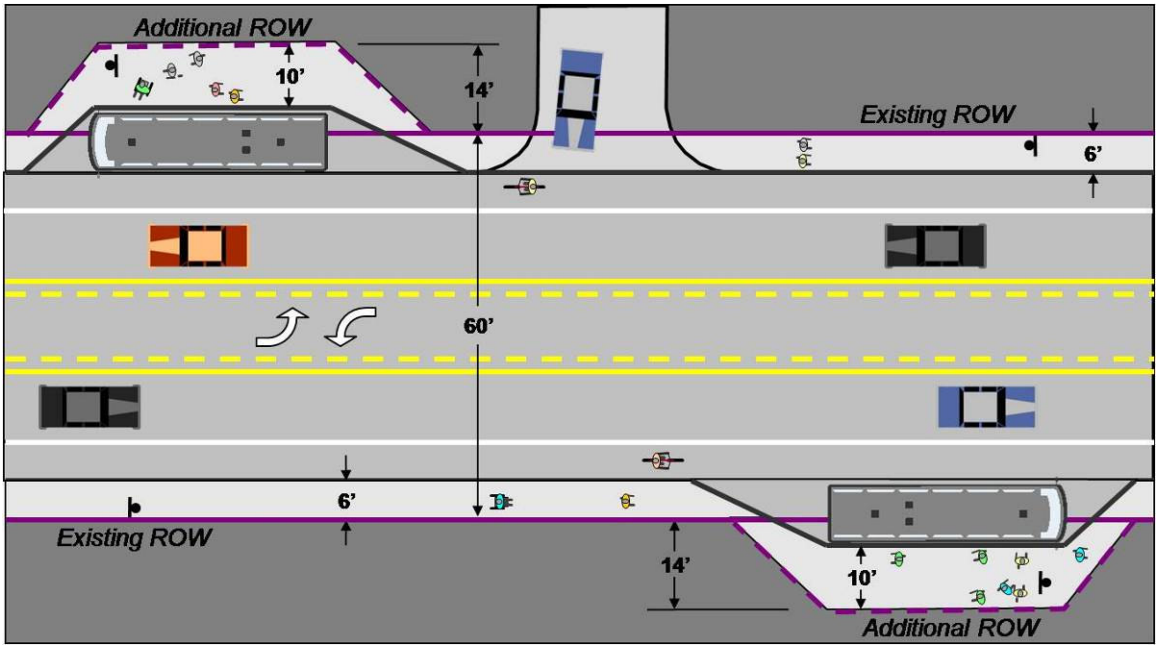


Figure 53: Conceptual Rendering of Roadway Option 2 with Pull-Out Bus Stops

The curbside bus stop is implemented by the installation of surfacing at the back of the sidewalk. This design requires 64 feet of right-of-way in the vicinity of the bust stop, thus additional right-of-way may be required depending on the width of the existing right-of-way. Buses which stop to pick up or discharge passengers impart a moderate degree of delay to the main lanes, but completely block the bike lanes. Street furniture such as benches and trash receptacles can be provided as well as structures which provide overhead shelter. This design requires relatively low to moderate effort to implement depending on right-of-way needs. The options for placing these types of stops along the corridor are moderate. Additionally, as ridership patterns change over time, the ability to add or relocate bus stops depends on the need for additional right-of-way.

The pull-out bus stop is implemented by constructing additional paving beyond the curb line which affords one bus the opportunity to pull out of the traffic stream to pick up and discharge passengers. This design also allows the bike lane to remain unobstructed. To provide for waiting passengers, the sidewalk is extended an additional ten feet beyond and adjacent to the bus pull-out. This provides the opportunity for street furnishings and structures to provide overhead shelter. However, the design requires at least 74 feet of right-of-way width in the vicinity of the bus stop, thus additional right-of-way may be required depending on existing right-of-way widths. This design requires significant effort to implement, thus the options for implementing or relocating these stops along the corridor are limited.

Roadway Option 3 – Three Lane Roadway with a Continuous Left Turn Lane and Bike and Hike Paths. A conceptual rendering of this roadway section for a midblock location is shown at Figure 54 and in advance of an intersection at Figure 55.

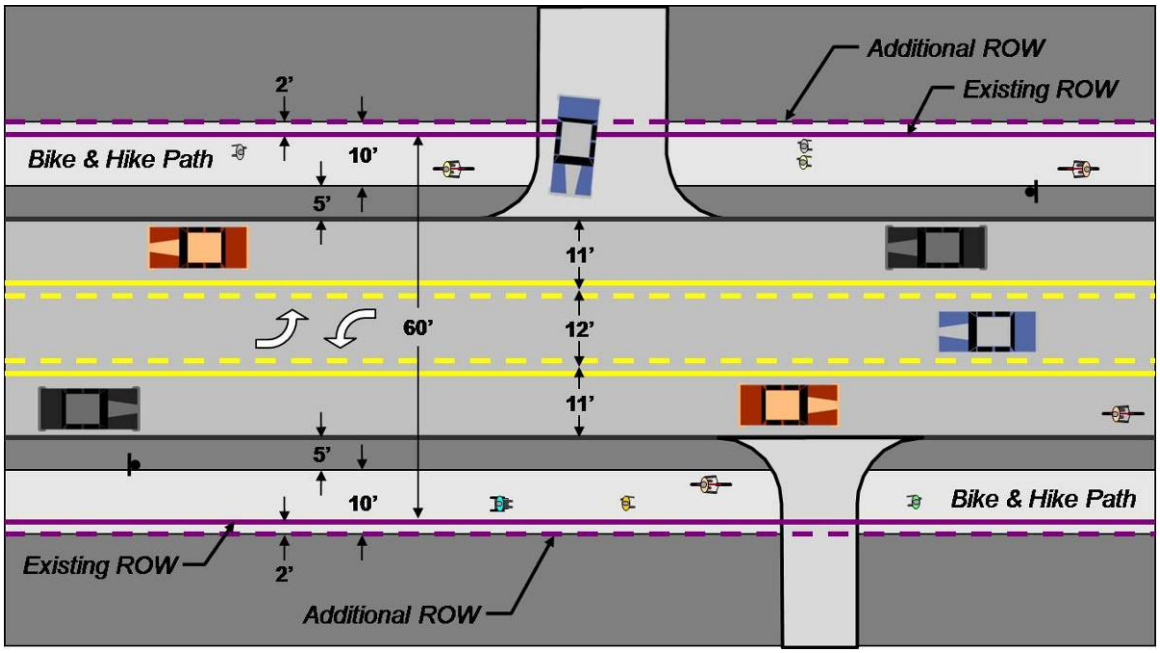


Figure 54: Conceptual Rendering of Three Lane Roadway with Bike and Hike Paths - Midblock

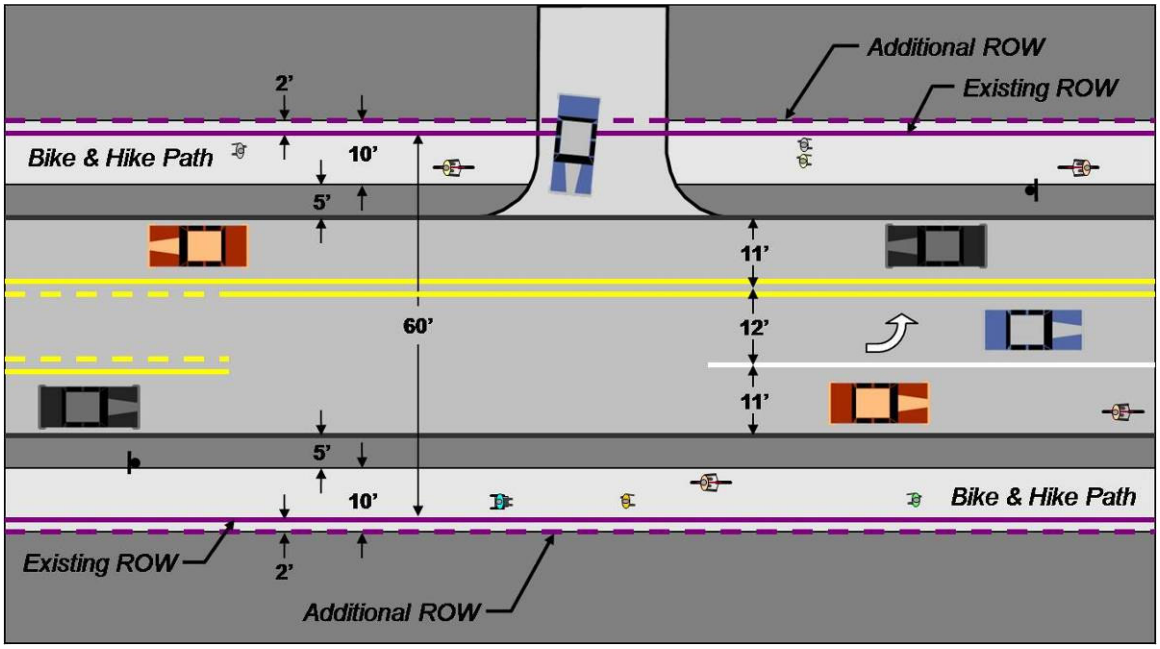


Figure 55: Conceptual Rendering of Three Lane Roadway with Bike and Hike Paths - Intersection

This design, which features a curb-and-gutter roadway, requires a minimum right-of-way width of 64 feet along the corridor. The concept features through lanes which are 11 feet wide and left turn lanes which are 12 feet wide. A buffer strip five feet in width provides for landscaping opportunities, separation between pedestrians and motor vehicles, and space for the installation of traffic signs and other traffic control devices in conformance with guidance found in Reference 12. The continuous left turn lane provides the opportunity for left turning traffic to wait outside of the main traffic stream for a suitable gap, thus reducing delays along the corridor. Transition between the continuous left turn lane and dedicated left turn lanes at key intersections is accomplished through changes in pavement markings. The bike and hike path is ten feet wide. While the bike and hike path is of adequately width for pedestrians, its use as a shared use path is anticipated to create conflicts between bicyclists traveling at speed and pedestrians. The numerous intersections of the bike and hike paths and the driveways and side streets also result in increased conflict points along the corridor. It is likely that bicyclists with advanced riding skills will not use this facility but will instead choose to ride in the through lanes of the roadway. The bike and hike path's can meander somewhat within the corridor, which can reduce some of the conflicts with existing trees and above-ground utilities. The use of alternative materials such as decomposed granite gravel or footbridges may be considered to minimize impacts to trees.

To provide support for existing and future transit needs, two options for bus stops are presented in **Figure 56** and **Figure 57.**

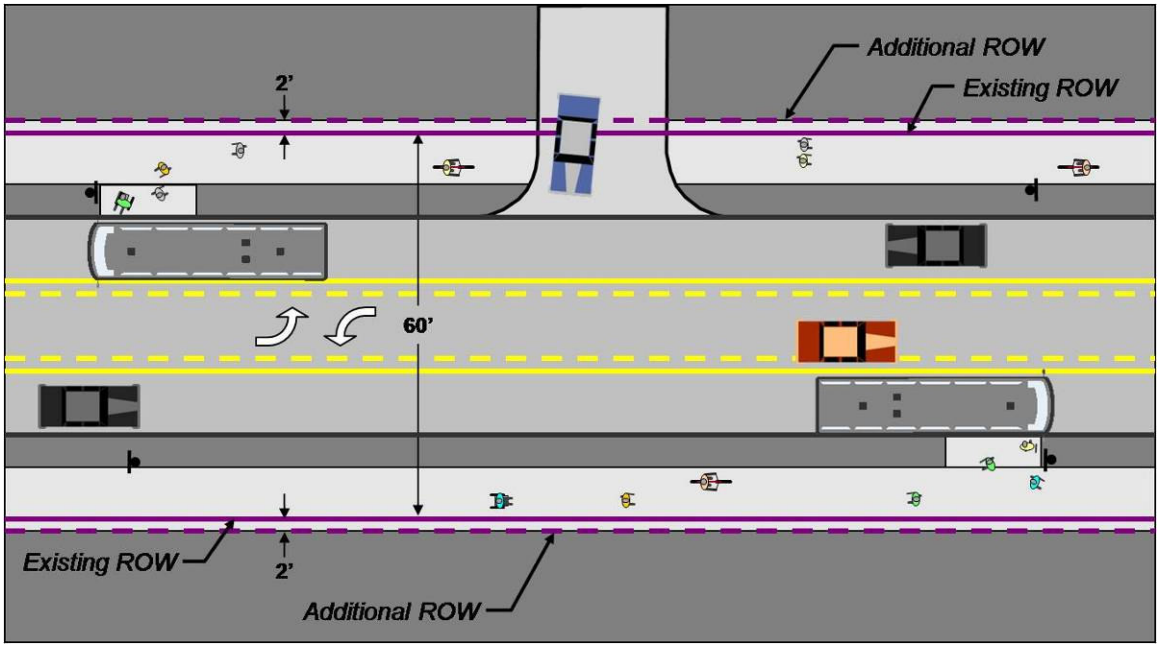


Figure 56: Conceptual Rendering of Roadway Option 3 with Curbside Bus Stops

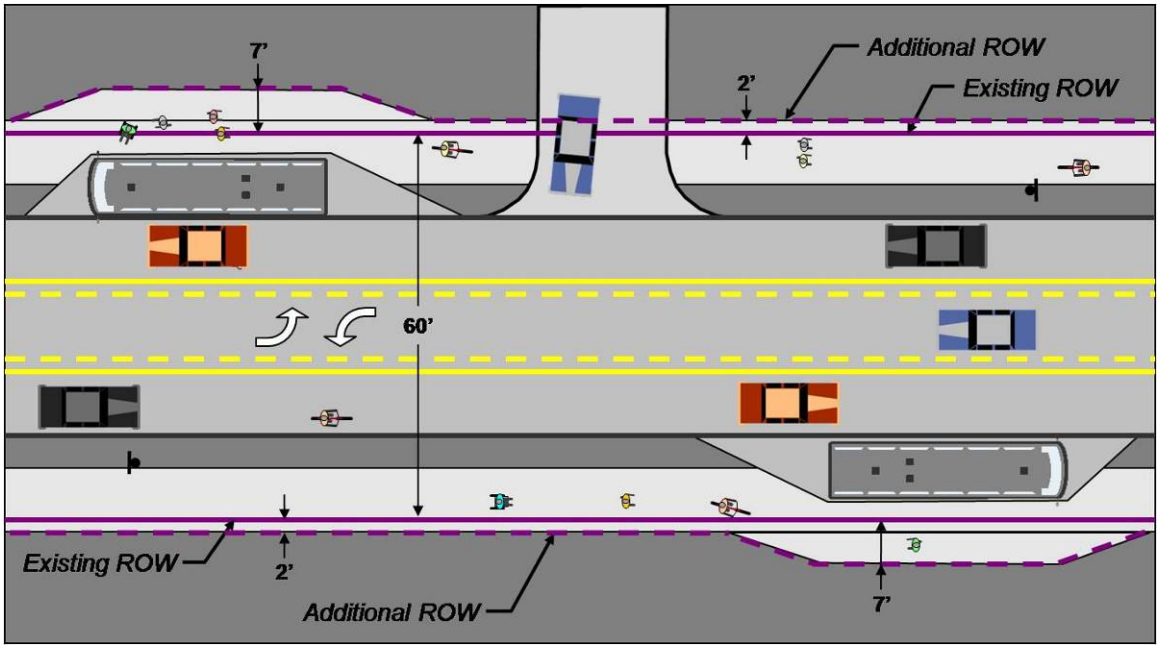


Figure 57: Conceptual Rendering of Roadway Option 3 with Pull-Out Bus Stops

The curbside bus stop is implemented by the installation of surfacing at the back of the sidewalk. This design remains within the minimum right-of-way required for the roadway design, thus no additional right-of-way is required to implement a bus stop. Buses which stop to pick up or discharge passengers impart a notable degree of delay to the through lanes as they completely block those lanes. Street furniture such as benches and trash receptacles can be provided as well as structures which provide overhead shelter; however if inappropriately sited, those facilities can pose a hazard to bicyclists traveling at speed along the bike and hike path. This design requires relatively low effort to implement and has minimal footprint, thus the options for placing these types of stops along the corridor are many. Additionally, as ridership patterns change over time, stops can be added, removed, or relocated relatively easily.

The pull-out bus stop is implemented by constructing additional paving beyond the curb line which affords one bus the opportunity to pull out of the traffic stream to pick up and discharge passengers. This design also allows the bike lane to remain unobstructed. To provide for waiting passengers, the sidewalk is extended an additional ten feet beyond and adjacent to the bus pull-out. This provides the opportunity for street furnishings and structures to provide overhead shelter. However, the design requires at least 69 feet of right-of-way width in the vicinity of the bus stop, thus additional right-of-way may be required depending on existing right-of-way widths. This design requires significant effort to implement, thus the options for implementing these stops along the corridor are limited. Additionally, the addition or relocation of a stop is very complex and requires significant resources.

Given the issues discussed above, Option 1 is recommended for the design of Country Club where the existing right-of-way is 60 feet wide. Where the right-of-way is at least 70 feet wide, a modification of Option 1 which replaces the sidewalks with bike and hike paths is recommended. Elimination of the buffer strip is not recommended. To provide for transit needs, curbside stops are recommended where the existing right-of-way is 60 feet wide; pull-out bus stops are recommended where the existing right-of-way is 70 feet wide or greater.

2017 INTERSECTION IMPROVEMENTS

Additional Lanes or Reassignment of Existing Lanes

The introduction of additional lanes or the reassignment of existing lanes is recommended at the following intersections:

- Artcraft at Westside
- Artcraft at Upper Valley
- Artcraft at Desert N/S
- Country Club at Westside
- Country Club at Montoya
- Country Club at Doniphan
- Doniphan at Bird
- Doniphan at Frontera
- Doniphan at Sunland Park

Artcraft at Westside – It is recommended that left turn bays be provided for the northbound and southbound approach to the intersection of Artcraft at Westside. The City of El Paso is currently developing a project to construct left turn bays; these recommended improvements would be in addition to those proposed by the City of El Paso. (See **Figure 58**)

Artcraft at Upper Valley - It is recommended that left and right turn bays be provided for the northbound and southbound approach to the intersection of Artcraft at Upper Valley. The City of El Paso plans to make improvements on Upper Valley to provide left and right turn bays for both the northbound and southbound approach. We recommend additional improvements to include; a second 250 foot westbound left turn bay on Artcraft with a 550 foot receiving lane on the south approach, the widening of eastbound Artcraft to accommodate a 250 foot through lane, and the widening of the eastbound receiving lane along Artcraft to accommodate three entering lanes. (See **Figure 59**)

Artcraft at Desert South – Two improvements are recommended. The first is to provide a 220 foot right turn bay for heavy right turn movements on the south approach of Desert South at Artcraft.

Heavy through movements prevent right-turning vehicles from making a right turn. This project is intended to improve intersection capacity.

A second improvement is recommended that would provide exclusive dual left turn lanes on the westbound approach of Artcraft. The heavy westbound left turn movement causes long queues especially during peak hours. The striped shoulder on the bridge over IH 10 would be converted into a through lane and the existing lanes reconfigured to provide improved alignment with the roadway lanes beyond the intersections. There is adequate width on the bridge to implement this improvement. (See **Figure 60**)

Artcraft at Desert North- The westbound right turn lane on Artcraft at Desert North is currently striped as a mandatory right turn. We recommend that the right turn lane be striped as a shared through and right lane to align with the proposed additional through lane on the bridge for the westbound movement. (See **Figure 60**)

Country Club at Westside – The eastbound approach on Country Club at Westside does not provide a left turn bay. Increase in volumes at this intersection will require a left turn to separate the left turns from the through movements. This improvement will allow additional road capacity at the intersection. (See **Figure 61**)

Country Club at Montoya – It is recommended that right turn bays be provided for the northbound and southbound approach to the intersection of Montoya at Country Club. Currently this intersection requires a split phasing operation of the signal due to the intersection being offset, which reduces intersection efficiency. The 120 foot right turn bay improvements would require the widening of Montoya by one lane for both northbound and southbound approach. This project is intended to improve capacity at the intersection. (See **Figure 62**)

Country Club at Doniphan – Two improvements are recommended. The first is to provide a 150 foot eastbound right turn bay. Currently there is heavy through movement and long traffic backups at the eastbound intersection approach which prevent right-turning vehicles from turning. The right turn bay will improve intersection capacity by separating the right turns from other vehicles.
A second improvement is recommended that would provide a second left turn lane for an exclusive dual left turn on the southbound approach. Currently there is a left turn lane, an optimal left/through,

and a through lane. This lane configuration requires a split phase operation of the signal at this intersection, which reduces intersection efficiency. The heavy southbound left turn movement causes long queues for the southbound approach. This project would require reconfiguring the striping along the existing roadway to provide six lanes on the north side of the intersection. (See Figure 63)

Doniphan at Bird – Currently there is one lane at the eastbound approach on Bird at Doniphan, and the vast majority of traffic currently makes right turns. It is recommended that a right turn bay be provided for the eastbound approach. The project would require a minor widening of Bird at the eastbound approach to provide a 120 foot right turn bay. Most of the project can be constructed on existing right-of-way, but it may be necessary to acquire a small portion of the right-of-way at the transition. Relocation of the existing railroad crossing equipment is likely required. It is also recommended that this intersection be signalized. (See Figure 64)

Doniphan at Frontera – It is recommended that a right turn bay be provided for the eastbound approach to the intersection of Doniphan at Frontera. Heavy right turn movements have to share the left and through lanes which cause back up along Frontera. The project would require a minor widening of Frontera at the eastbound approach to provide a 120 foot right turn bay. Relocation of the existing railroad crossing equipment is likely required. (See Figure 65)

Doniphan at Sunland Park – As with Country Club at Doniphan, the heavy southbound left turn movement requires a second left turn lane for an exclusive dual left turn on the southbound approach. This project would require that the southbound left turn signal be changed from the current permissive/protected operation to a protected left turn signal operation. This project would require the minor widening of Doniphan to provide the additional lane.

A second improvement is recommended on the eastbound approach of Sunland Park at Doniphan. Currently there is a shared left/through, through only, and a separate free right turn. The current lane configuration prevents through traffic on the left lane from proceeding through the intersection while left turn vehicles wait for gaps to make a left turn. It is recommended that an exclusive left turn lane be provided. This project would require the widening of Sunland Park to provide a left turn lane and the relocation of the existing railroad crossing equipment.

It is also recommended that a right turn lane be provided for the northbound approach to separate right turns from through traffic and increase capacity at the intersection. This project would require some widening along Doniphan to provide an additional lane. (See **Figure 66**)

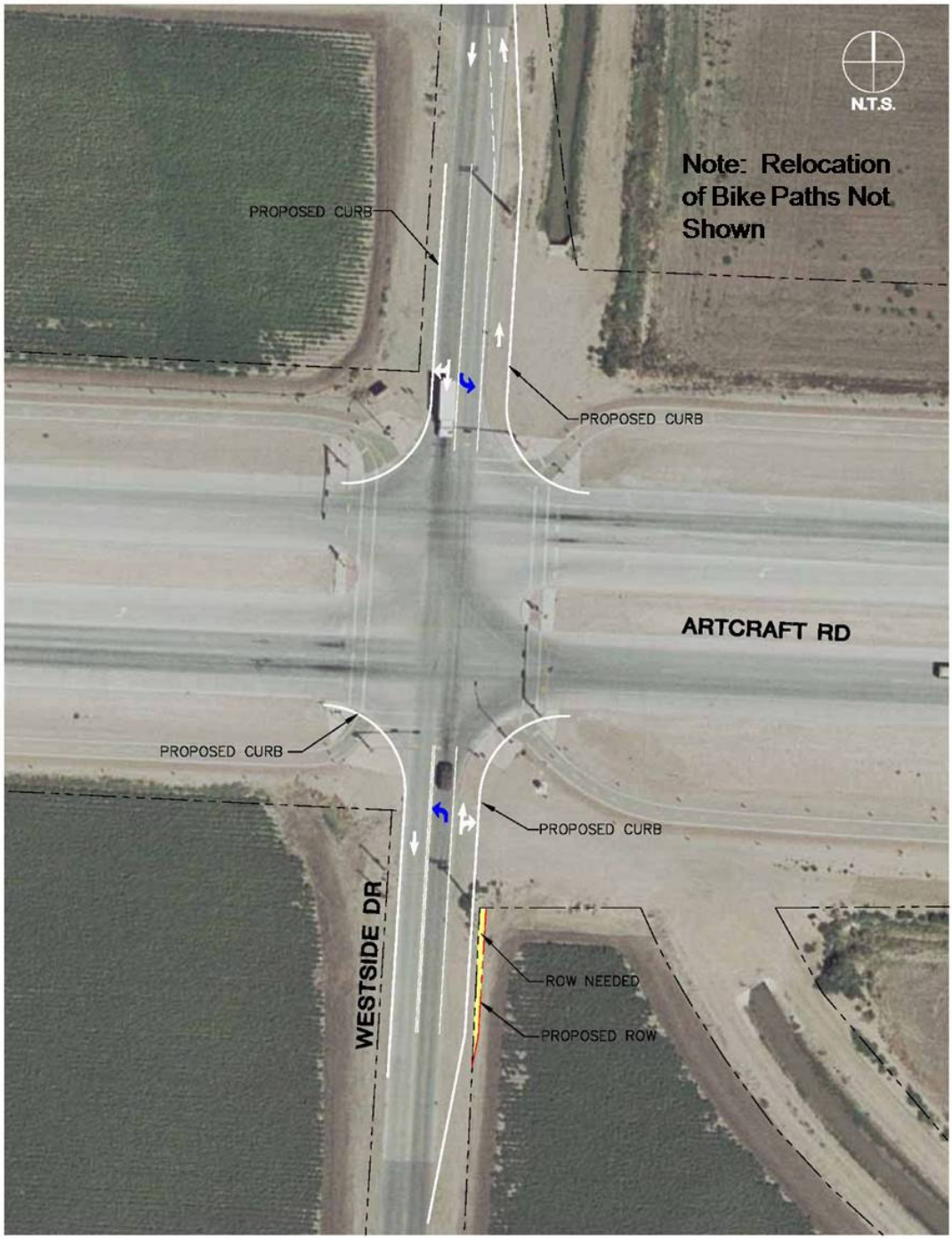


Figure 58: Artcraft at Westside Improvements

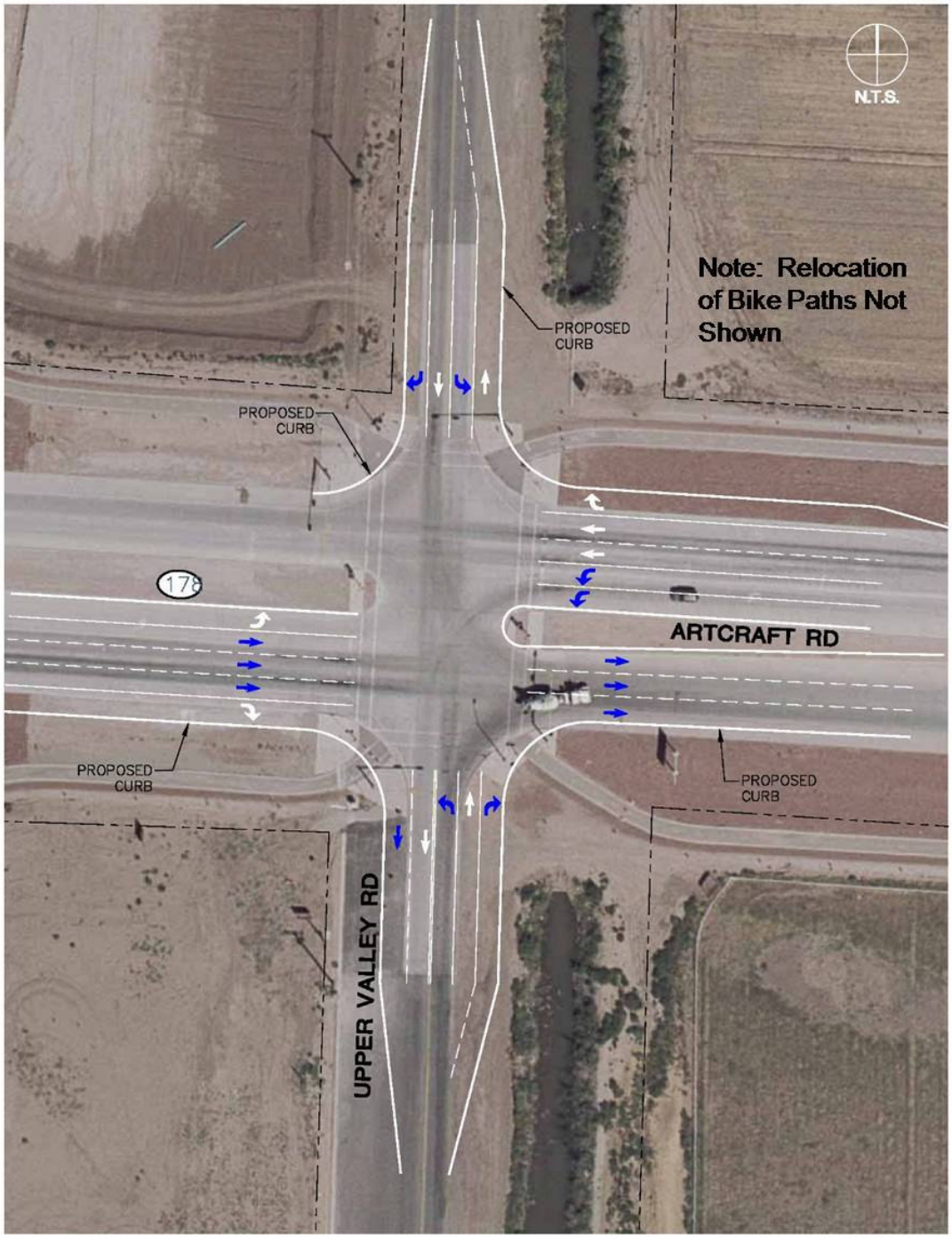


Figure 59: Artcraft at Upper Valley Improvements

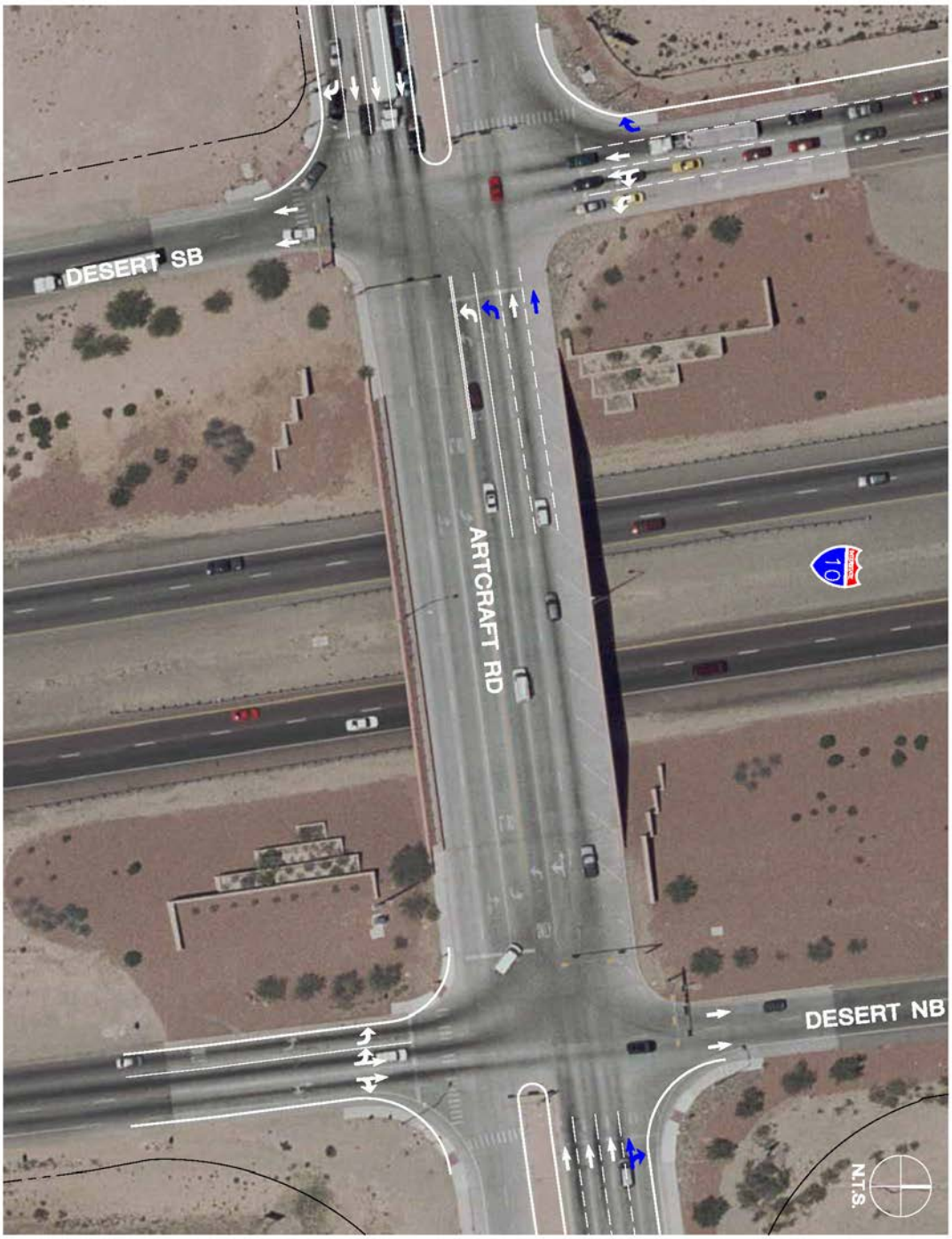


Figure 60: Artcraft at Desert Improvements

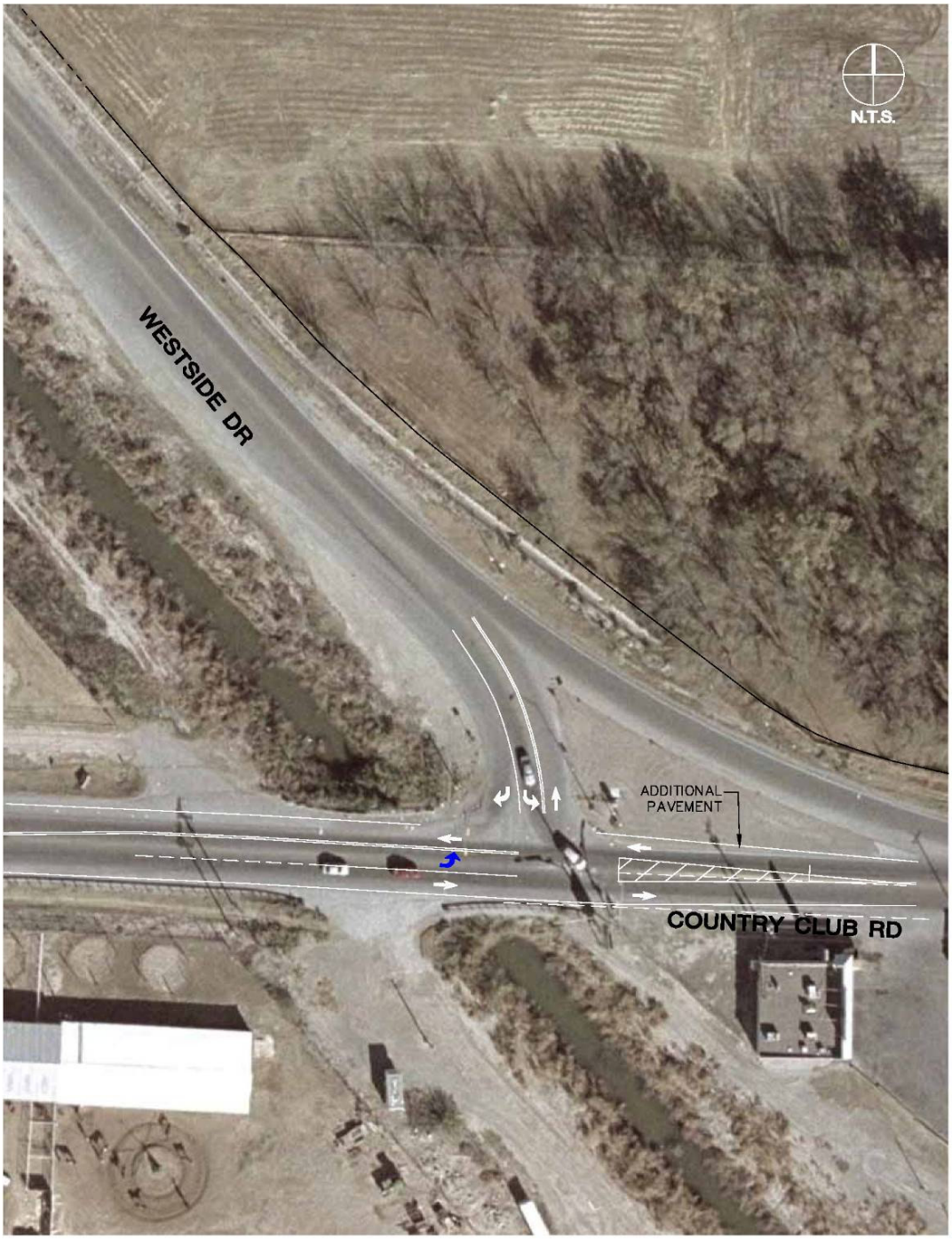


Figure 61: Country Club at Westside Improvements

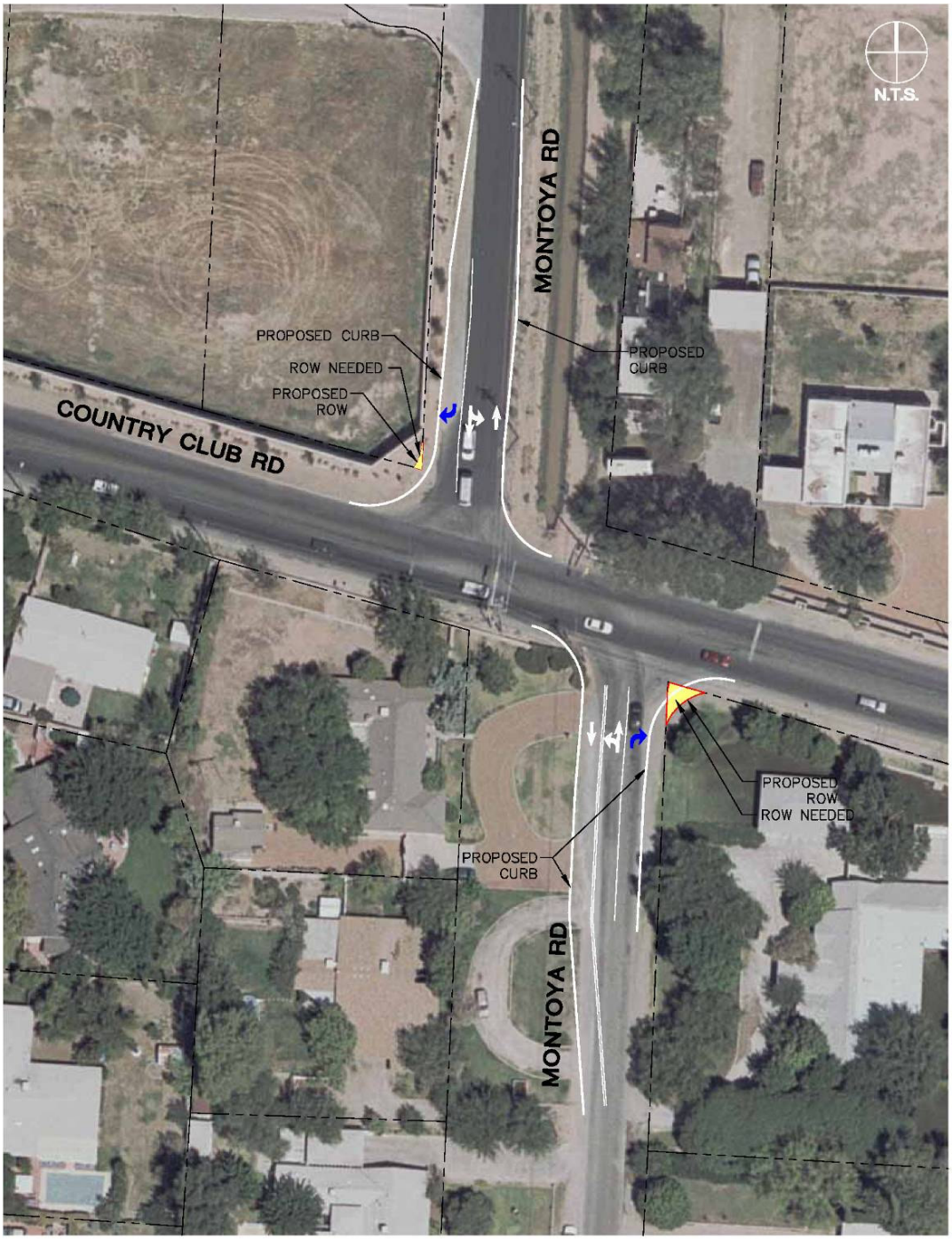


Figure 62: Country Club at Montoya Improvements

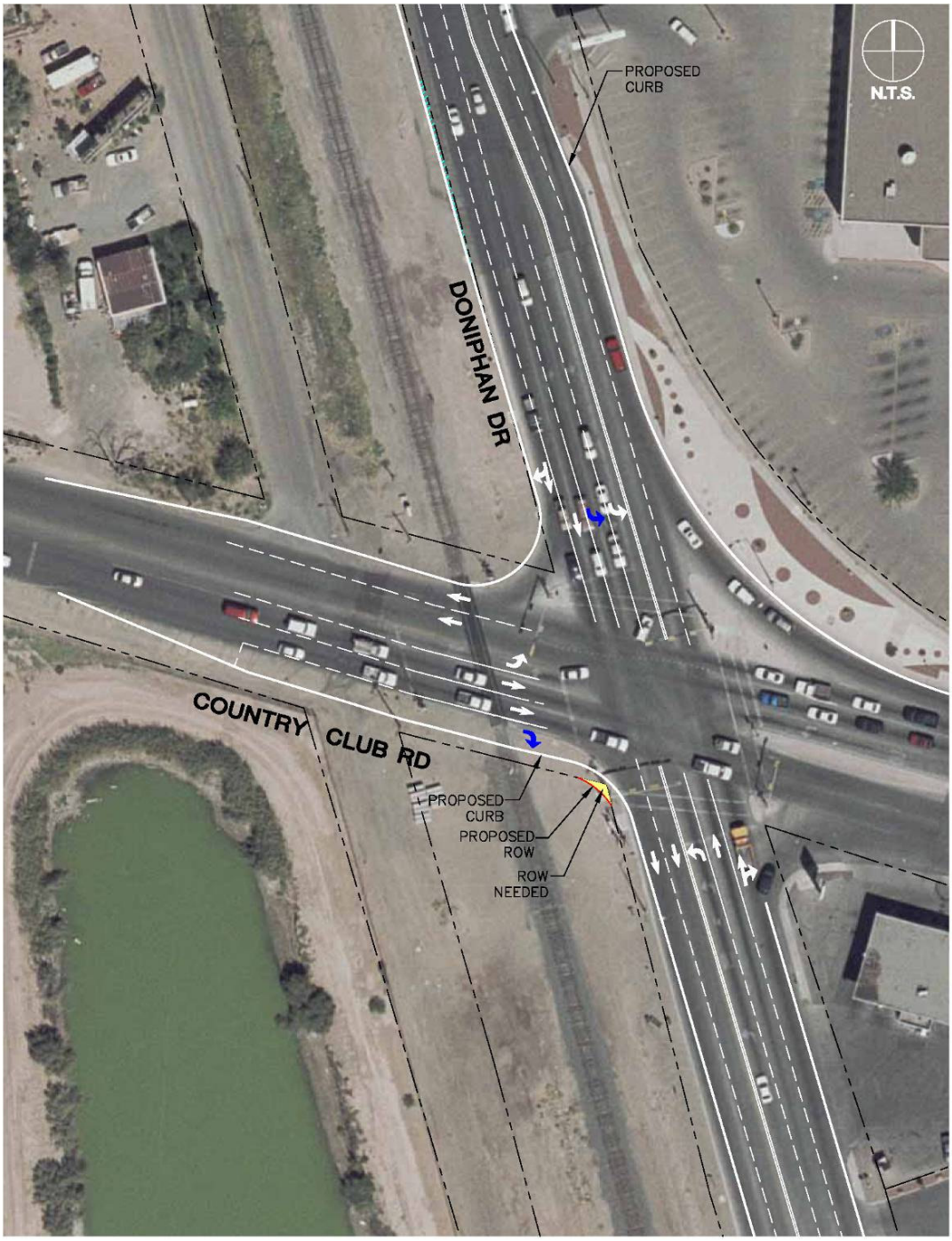


Figure 63: Country Club at Doniphan Improvements

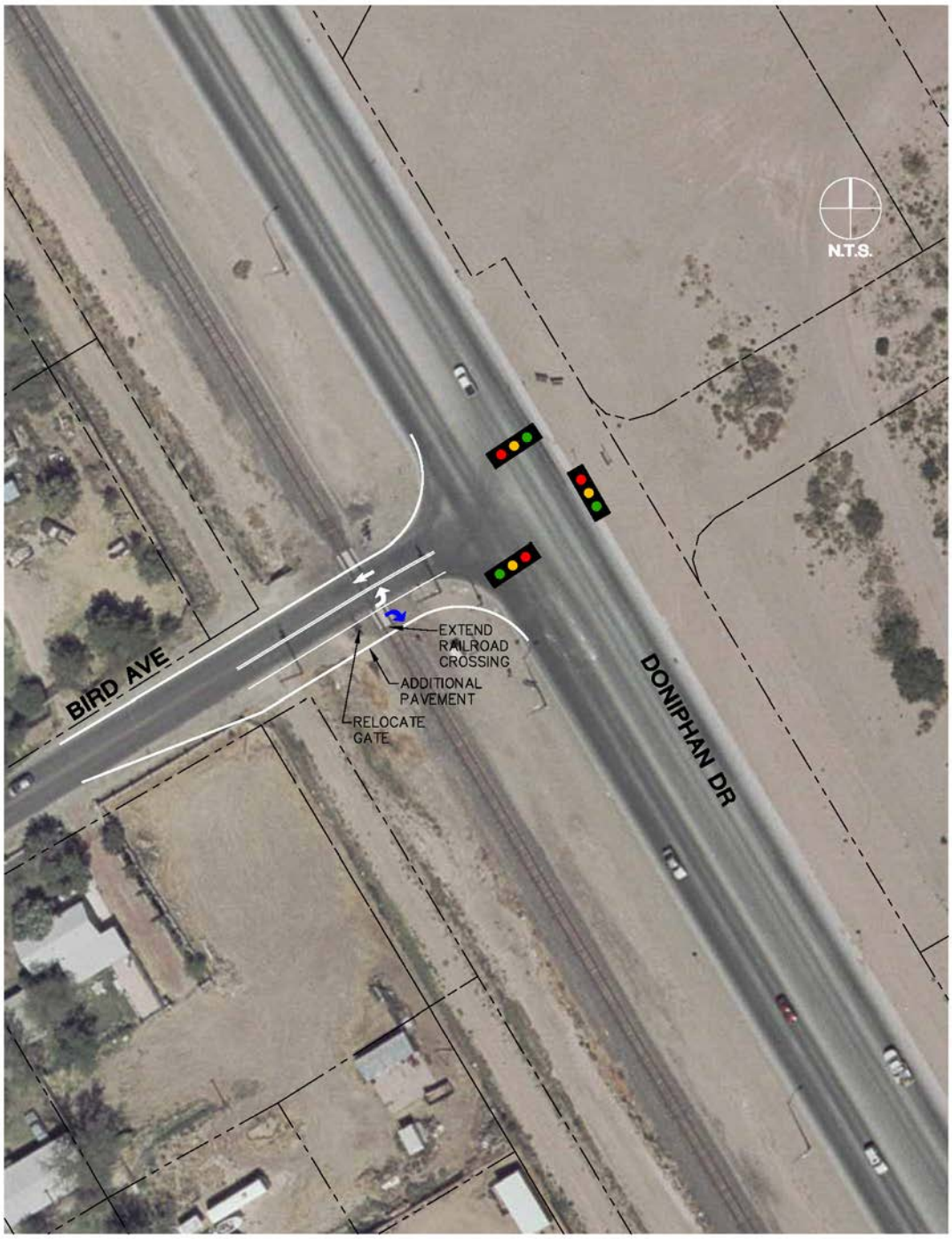


Figure 64: Doniphan at Bird Improvements

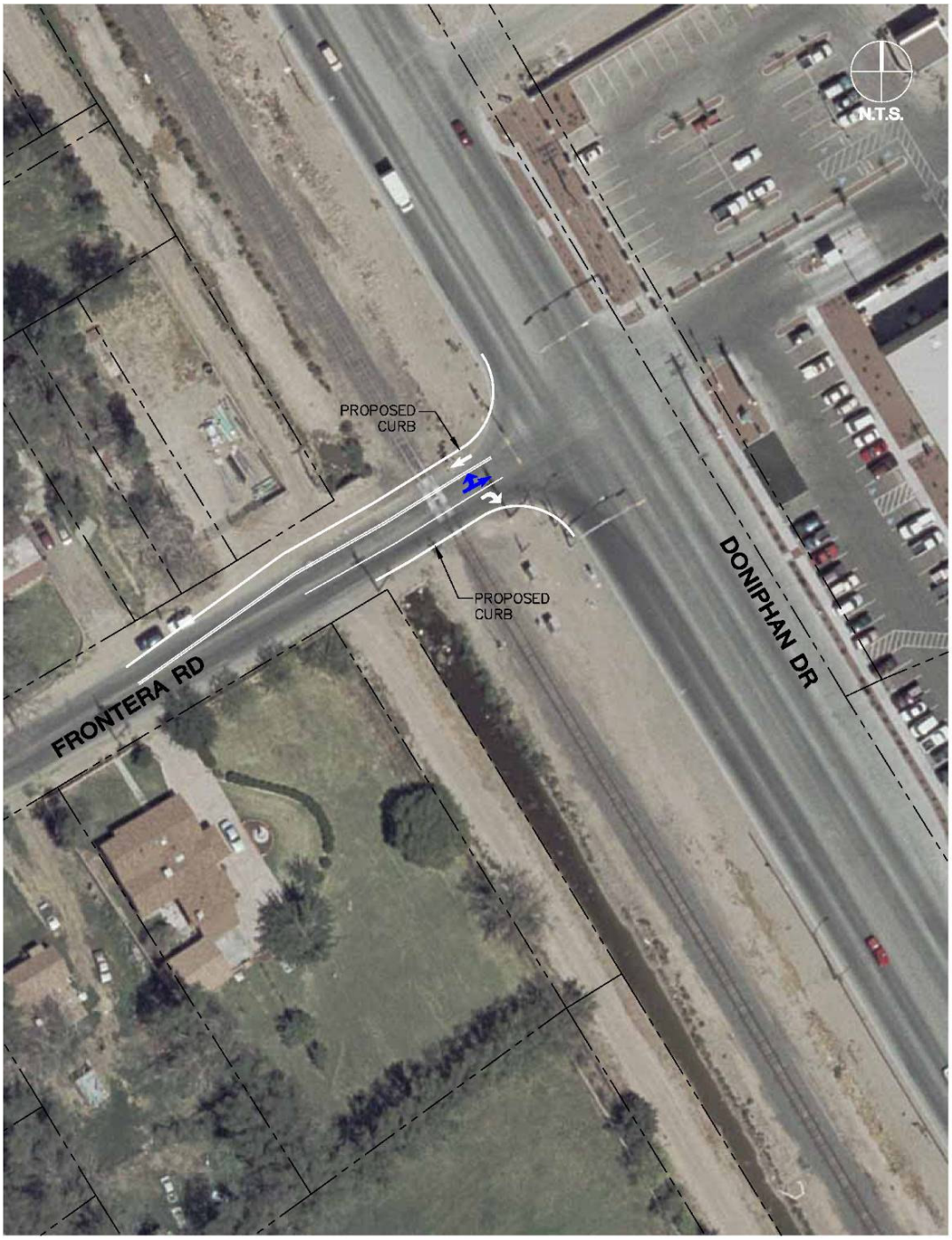


Figure 65: Doniphan at Frontera Improvements

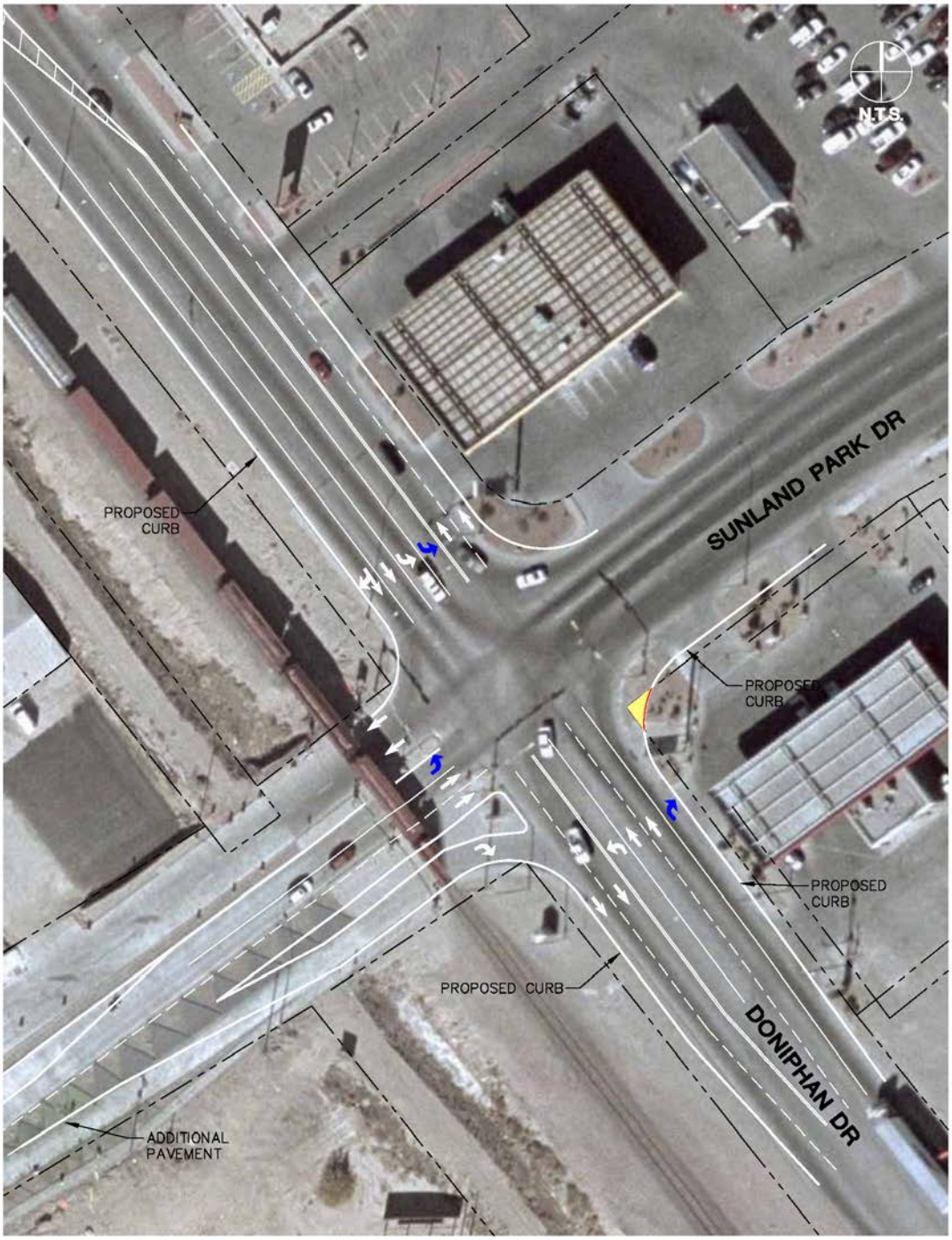


Figure 66: Doniphan at Sunland Park Improvements

Conversion of Existing Intersections to Modern Roundabouts

The City of El Paso plans to implement a single lane roundabout at the intersections of Country Club with Upper Valley and River Run. In addition to this intersection, the following intersections were recommended for conversion to modern roundabouts:

- Borderland at Westside
- Borderland at Strahan
- Frontera at Emory

Given the discussion of the advantages of modern roundabouts over traditional intersection control, these locations were viewed as being appropriate candidates for consideration. The number of lanes for the roundabout was determined by analyzing the anticipated traffic volumes using the methodology outlined in Reference 9. The result of this analysis is included in **Tab Six**.

Figure 67 shows a conceptual rendering for a single lane roundabout at Borderland and Westside and at Borderland at Strahan. The concept anticipates the potential for adding lanes to the roundabout in the future, and is also configured to accommodate fire pumper trucks, garbage trucks, school buses, passenger vehicles, and occasional larger vehicles such as fire ladder trucks and moving vans.

Figure 68 depicts a conceptual rendering for a single lane roundabout at Emory and Frontera. This concept does not anticipate widening in the future; rather efforts are made to minimize impacts to adjacent property. The concept is intended to accommodate fire pumper trucks, garbage trucks, school buses, and passenger vehicles; accommodation of larger vehicles such as fire ladder trucks or moving vans would be accomplished by "hardening" areas which would likely be run over by the wheels of those vehicles.

Figure 67: Conceptual Rendering of a Single Lane Roundabout along Borderland

Figure 68: Conceptual Rendering of a Single Lane Roundabout at Emory and Frontera

Signalization of Existing Intersections

Signalized intersections are recommended at:

- Doniphan at Bird (Presented previously at **Figure 64**)
- Gibson Veck at Sunland Park (See **Figure 69**)

We recommend that traffic signals be considered for installation at these intersections based on the side street delay from the traffic analysis. For these intersections, an independent traffic signal warrant study complying with Reference 8 or Reference 12, as appropriate, should be conducted and submitted for consideration to the governing jurisdiction.

Figure 69: Gibson Veck at Sunland Park Improvements

Gomez/Redd Road Corridor

In 2025, continued traffic growth in the Upper Valley area results in decreasing levels of service at several locations and increased delays along the corridors. Specifically, the area bounded by the Rio Grande and the Texas state border must utilize either Artcraft or Country Club to access points eastward. Providing an alternate route which better distributes the traffic for this area can be accomplished by extending Redd Road across the Rio Grande to connect with Gomez Road. Keeping with the principles of CSS, the corridor is recommended to have a minimal cross section and modern roundabouts at its primary intersections. A conceptual rendering of this roadway section is shown at Figure 70.

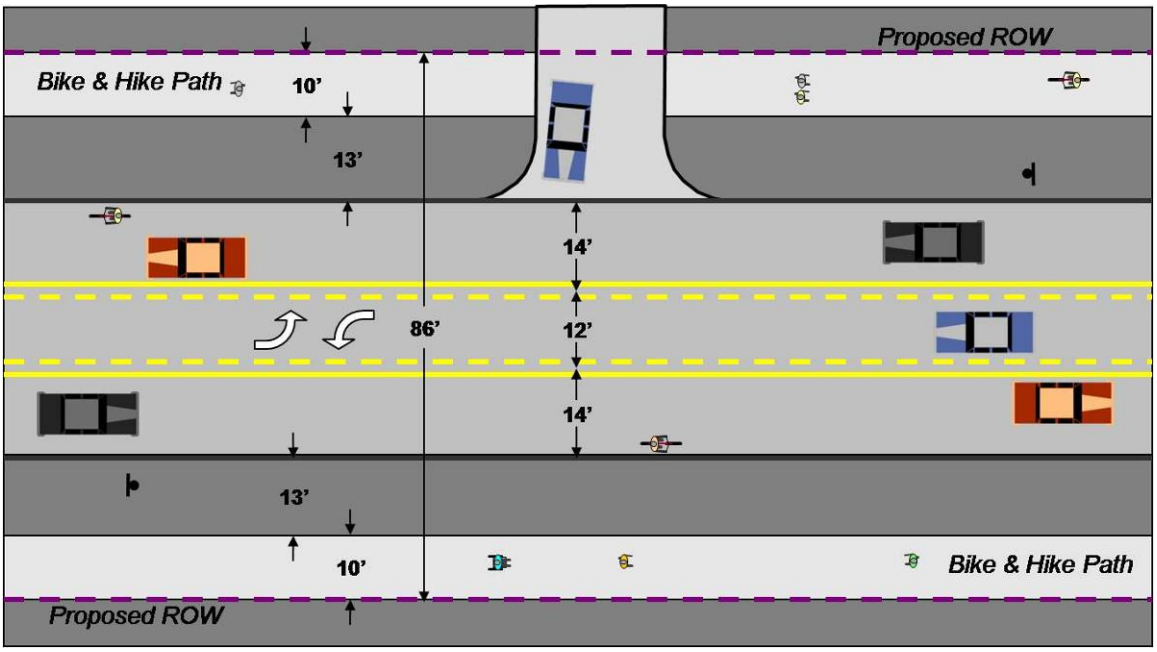


Figure 70: Conceptual Rendering of Three Lane Roadway with Shared Use Lanes along the Gomez/Redd Road Corridor

This design, which features a curb-and-gutter roadway, is a combination of Design Option 1 for Country Club and the design of the pending improvements to Redd Road between Doniphan and Montoya. Existing within a right-of-way width of 86 feet, the concept features through lanes which are 14 feet wide and are intended to be shared by motor vehicles and bicycles. The bike and hike

path is ten feet wide. Providing both shared use lanes and the bike and hike path reduces the potential for conflicts between bicyclists and pedestrians; bicyclists with advanced riding skills can travel at speed along the shared use lanes while novice bicyclists and children can use the bike and hike path. As portions of the corridor would be newly established, the number of intersections of the bike and hike paths and the driveways and side streets is anticipated to be minimal. The bike and hike paths can meander somewhat within the corridor, which can reduce some of the conflicts with existing trees and above-ground utilities. The use of alternative materials such as decomposed granite gravel or footbridges may be considered to minimize impacts to existing trees within the corridor.

A buffer strip 13 feet in width provides for landscaping opportunities, separation between pedestrians and motor vehicles, and space for the installation of traffic signs and other traffic control devices in conformance with guidance found in Reference 12. The continuous left turn lane provides the opportunity for left turning traffic to wait outside of the main traffic stream for a suitable gap, thus reducing delays along the corridor. Transition between the continuous left turn lane and dedicated left turn lanes at key intersections is accomplished through changes in pavement markings. The sidewalk can meander within the right-of-way to minimize impacts to existing trees and to avoid above-ground utilities; the roadway itself could similarly meander to some degree if needed to further mitigate conflicts. Where realignment of the sidewalk is not feasible, the use of alternative materials such as decomposed granite gravel or footbridges may be considered to minimize impacts to trees.

The previously presented cross section could be modified to provide five lanes should area traffic growth exceed predictions. A conceptual rendering of this upgraded roadway section is shown at **Figure 71.**

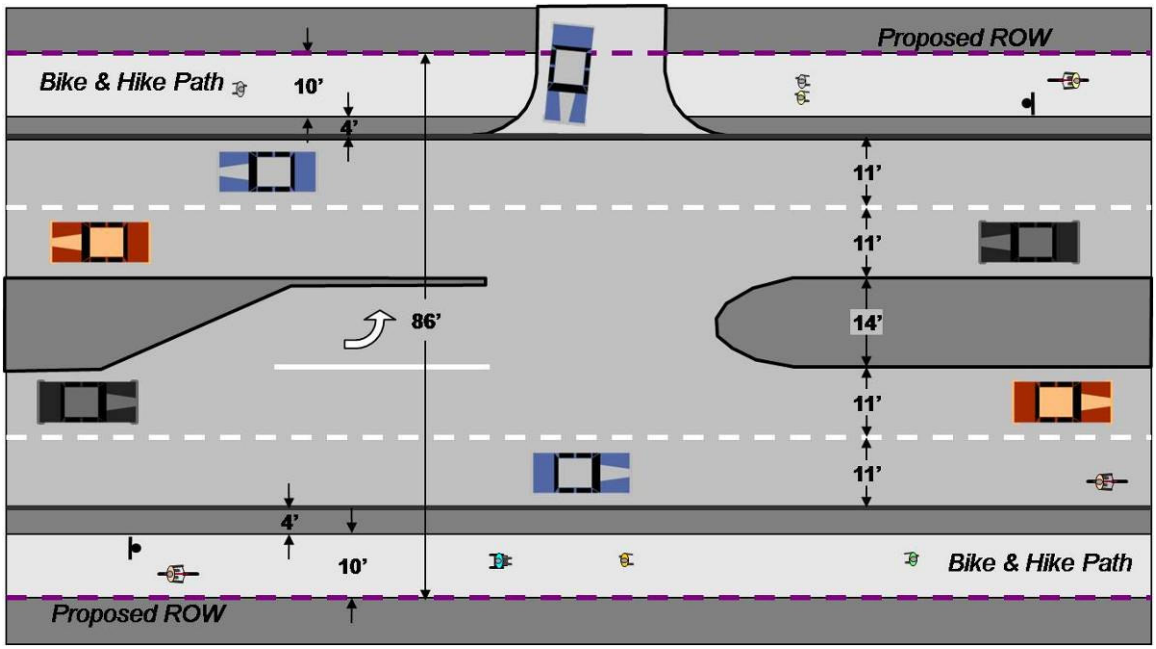


Figure 71: Conceptual Rendering of a Five Lane Roadway along the Gomez/Redd Road Corridor

This improvement can occur without relocating the existing bike and hike paths. The continuous left turn lane can be converted to a raised median with left turn bays at strategic locations. Although the shared use lanes are eliminated, bicyclists with advanced riding skills would still be anticipated to travel along the roadway. The buffer strip is narrowed to four feet, which minimizes landscaping options but still provides for signing and other traffic control devices.

A cursory review of extending Gomez westward to the intersection of McNutt and Airport was conducted. Modeling by *TransCAD* revealed the improvement would shift little traffic from Country Club; rather the effect was a notable amount of traffic shifted from Artcraft to the Gomez/Redd corridor. In keeping with the concepts of CSS, causing such a shift in traffic would not be considered appropriate for the communities adjacent to the Gomez/Redd corridor. Instead, improvements to the Artcraft corridor were viewed as being more appropriate.

Additional Lanes or Reassignment of Existing Lanes

The introduction of additional lanes or the reassignment of existing lanes is recommended at the following intersections:

- Borderland at Upper Valley
- Borderland at Strahan
- Borderland at Doniphan
- Doniphan at Montoya
- Doniphan at Redd
- Lindbergh at Montoya
- Country Club at Memory
- Emory at Sunland Park

Borderland at Upper Valley – It is recommended that a 120 foot left turn bay be provided for the northbound approach to the intersection of Upper Valley at Borderland. Heavy left turns will result in queue spillback into the northbound through travel lanes. The project would require a minor widening of Upper Valley at the northbound approach in order to provide one left turn lane and one shared through/right lane. (See **Figure 72**)

Borderland at Strahan – Traffic volumes along Borderland coupled with improvements to Borderland at Doniphan (described below) necessitate the construction of additional lanes for the roundabout to provide two lanes for eastbound and westbound traffic. The concept for the roundabout recommended for 2017 anticipated the need for additional lanes in the future, thus implementation of the improvement can occur relatively easily with minimal disruption to traffic. (See **Figure 73)**.

Borderland at Doniphan – Several improvements are recommended. The first is to provide left turn lanes on Borderland for the east and west approach to the intersection. The second improvement is to provide a southbound right turn lane on Doniphan at Borderland. This will reduce the speed differential that occurs between turning vehicles and through vehicles. The last recommended improvement is to provide a right turn lane for the eastbound approach to the intersection on Borderland at Doniphan. The right turn lane will improve the intersections capacity by separating the

right turns from through movements. The project would require the widening of Borderland at the approach, improvements to the railroad crossing and possible gate relocation. A portion of railroad right-of-way will be needed to accommodate these improvements. (See **Figure 74**)

Borderland from Strahan to Doniphan – The previously described improvements for the intersections at either end of this segment necessitate the widening of Borderland to provide an additional eastbound lane. The bridge across the Rio Grande is approximately 40 feet wide and can be restriped to provide one lane westbound and two lanes eastbound; adding a second lane westbound would require widening the bridge.

Doniphan at Montoya – Currently there is one lane of travel in the eastbound and westbound approach of Montoya at Doniphan. It is recommended that a 120 foot right turn lane be provided for the eastbound approach to separate right turns from left/through movements. For the westbound approach, it is recommended that a 120 foot left turn lane be provided. These improvements will add additional roadway capacity. The westbound approach improvements can be constructed within existing right-of-way; however the eastbound approach improvements will require additional right-of-way and relocation of the railroad gates at the crossing. (See **Figure 75**)

Doniphan at Redd – Several improvements are recommended. The first is to provide an additional lane on Doniphan in order to provide exclusive dual left turn lanes on the southbound approach, and the northbound approach. The heavy southbound and northbound left turn movements cause long queues on both approaches, particularly during peak hours. The project would require that the northbound and southbound left turn signals be changed to protected only operation and that the intersection be striped to provided a total of six lanes. The second improvement would be to provide a 120 foot right turn lane for the northbound approach to separate heavy right turns from the through movements and increase capacity at the intersection. It is recommended that a 200 foot westbound right turn lane be provided and that the existing mandatory westbound right turn lane be used as a westbound through lane for the westbound approach to the intersection at Redd at Doniphan. These improvements will require minor widening of Doniphan and Redd to provide the additional lanes. Improvements to the railroad crossing and relocation of the gates will be required. (See **Figure 76**)

Montoya at Lindbergh – The westbound movement on Lindbergh is a one lane approach T-intersection. We recommend that a 120 foot westbound right turn bay be provided on Lindbergh to provide additional road capacity at the intersection. This project would require the minor widening of Lindbergh at the approach. (See **Figure 77**)

Country Club at Memory- The southbound movement on Memory is a one lane approach at Country Club. We recommend a 120 foot southbound right turn bay to provide additional capacity at the intersection. (See **Figure 78**)

Artcraft at Desert – In addition to the direct connectors recommended at this intersection as seen in **Figure 84**, it is recommended that a northbound right turn lane be provided on Desert North at Artcraft. (See **Figure 79**)

Emory at Sunland Park – The implementation of grade separation of Sunland Park over Doniphan will include one way frontage roads along the overpass that provide access between Doniphan and Sunland Park. Due to the elevation differential between the frontage roads and the overpass, Emory would no longer have through movements, but will instead tee into the frontage roads. Traffic movements to and from Emory would be limited to right turns. (See **Figure 80**)

A summary of all improvements by design year can be seen in **Table 6** at the end of this section.

Figure 72: Borderland at Upper Valley Improvements

Figure 73: Borderland at Strahan Improvements

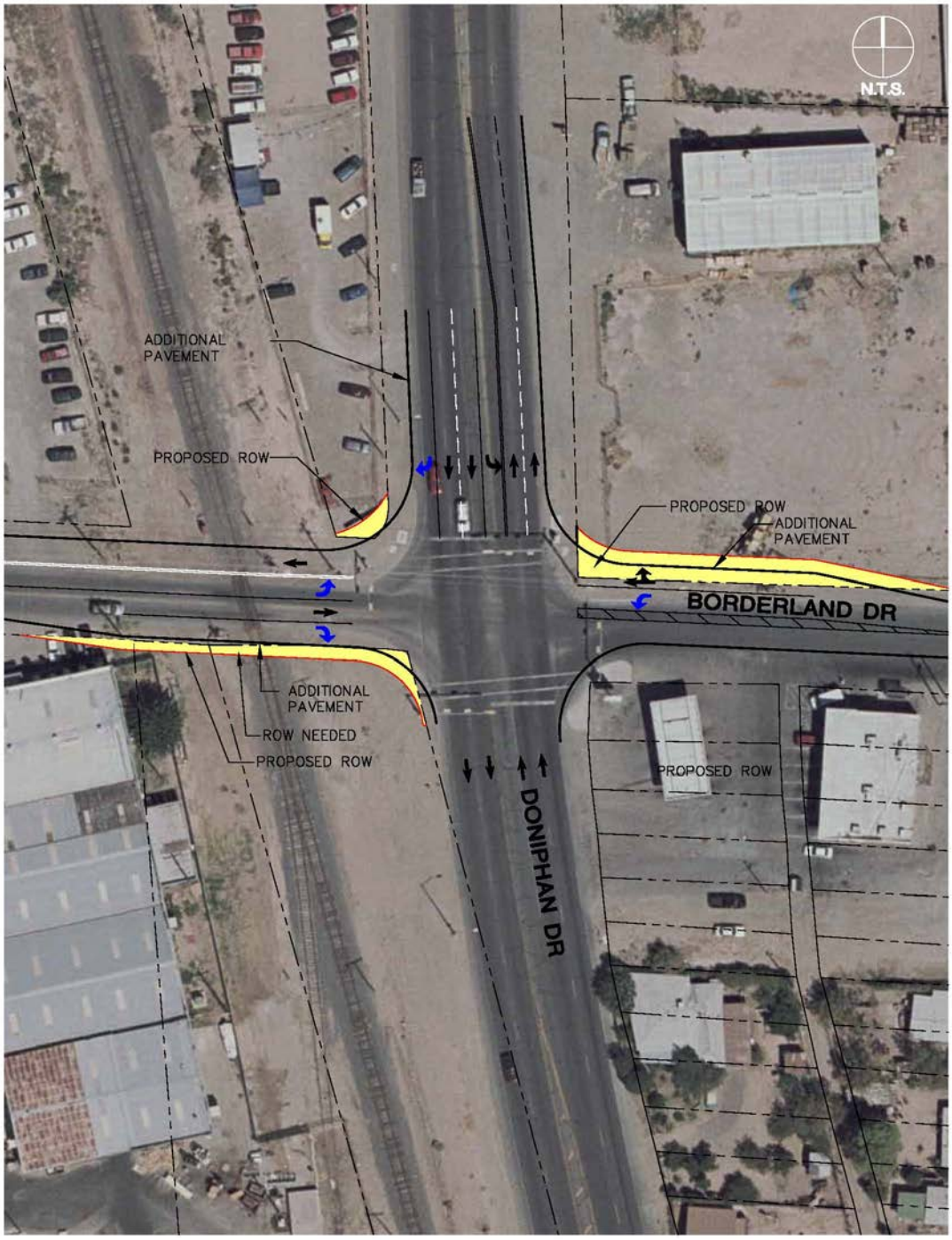


Figure 74: Borderland at Doniphan Improvements

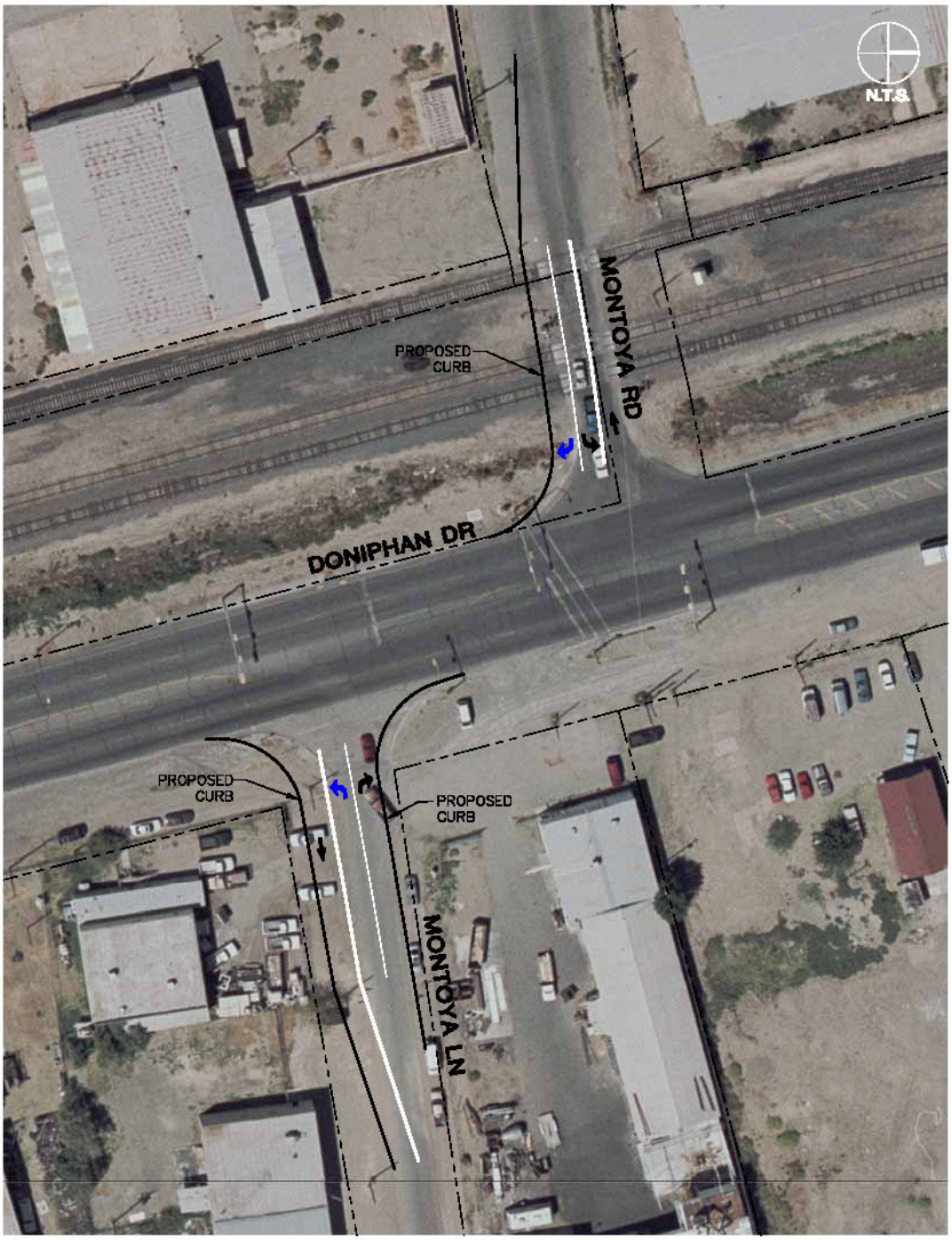


Figure 75: Doniphan at Montoya Improvements

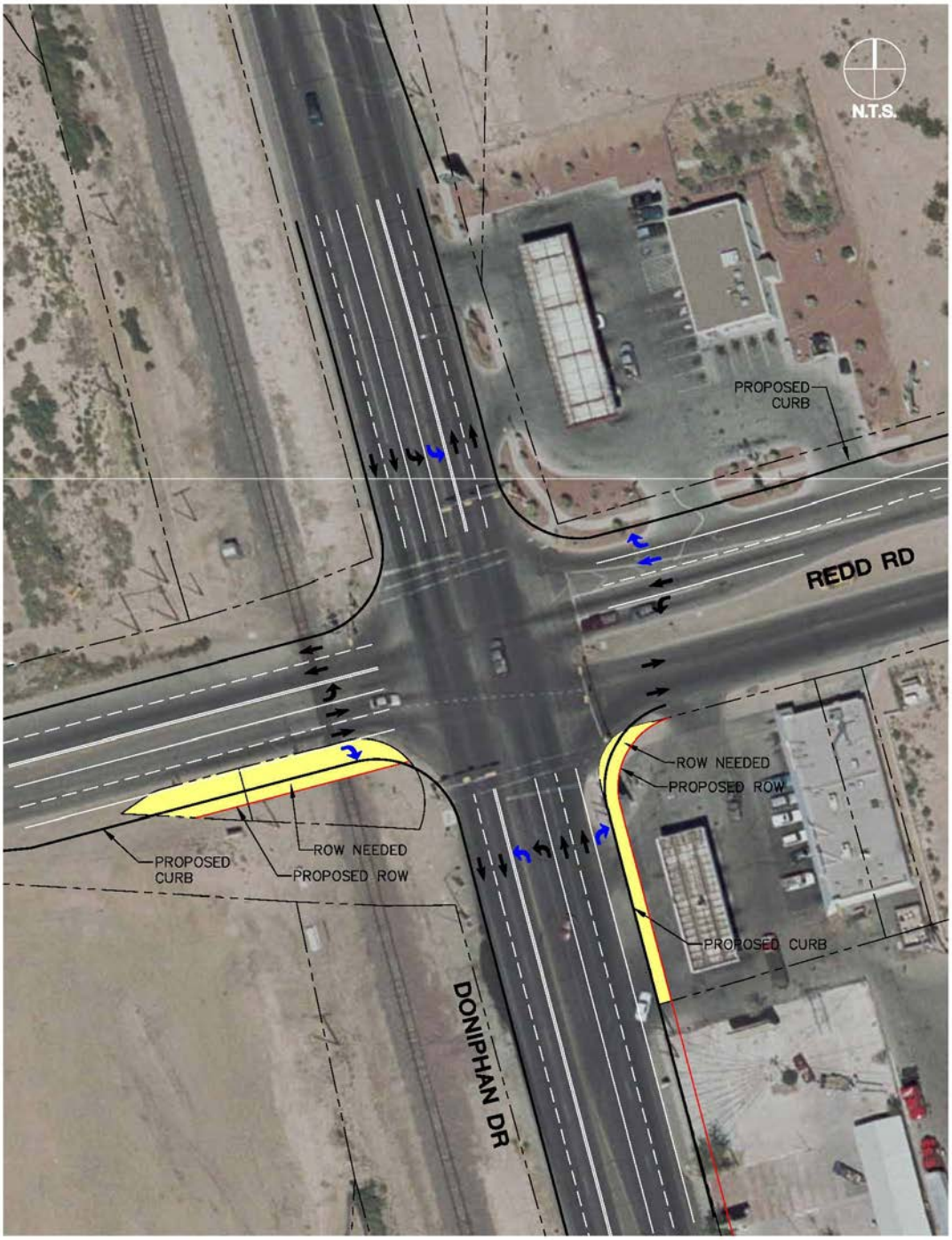


Figure 76: Doniphan at Redd Improvements

Figure 77: Montoya at Lindbergh Improvements

Figure 78: Country Club at Memory Improvements

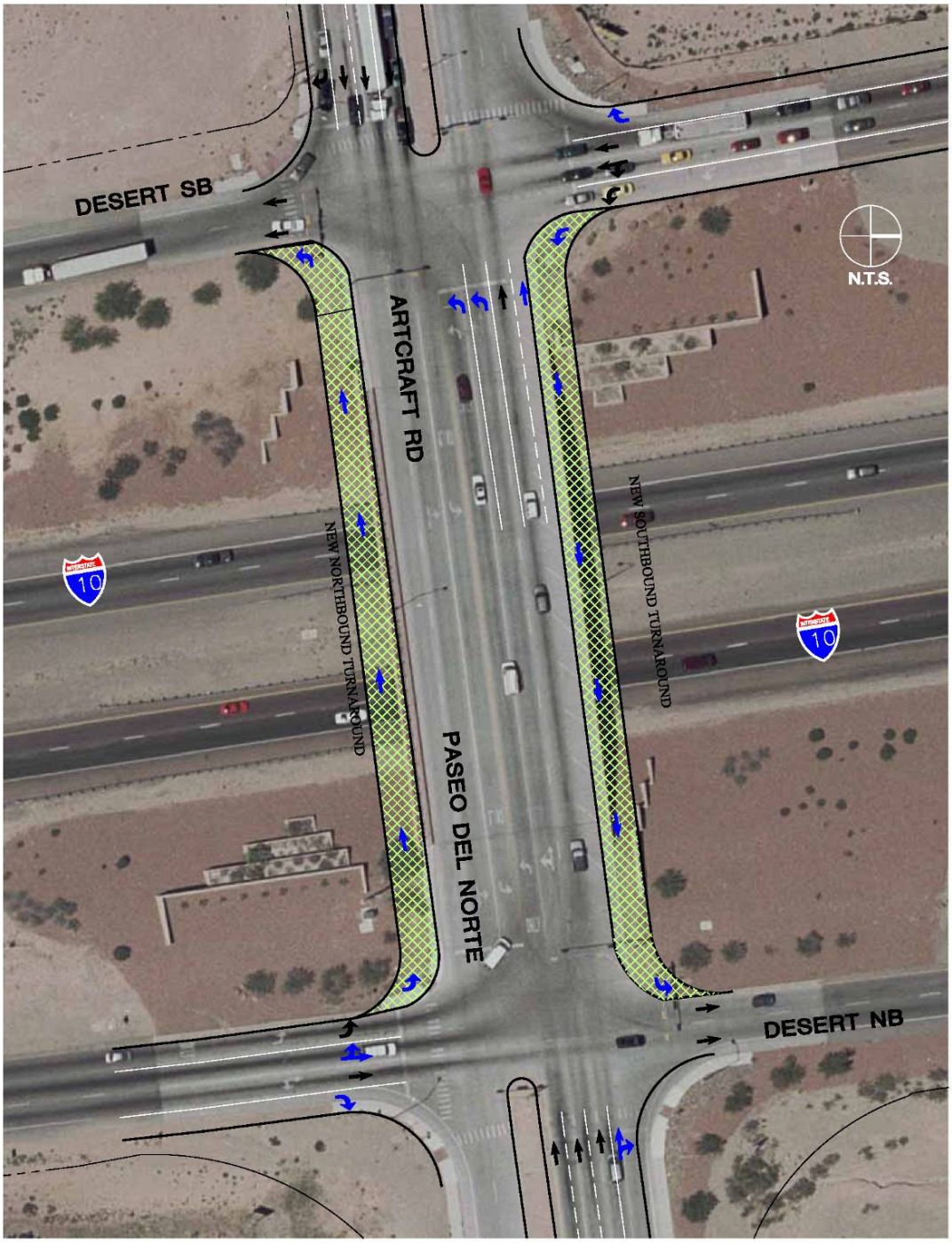


Figure 79: Artcraft at Desert Improvements

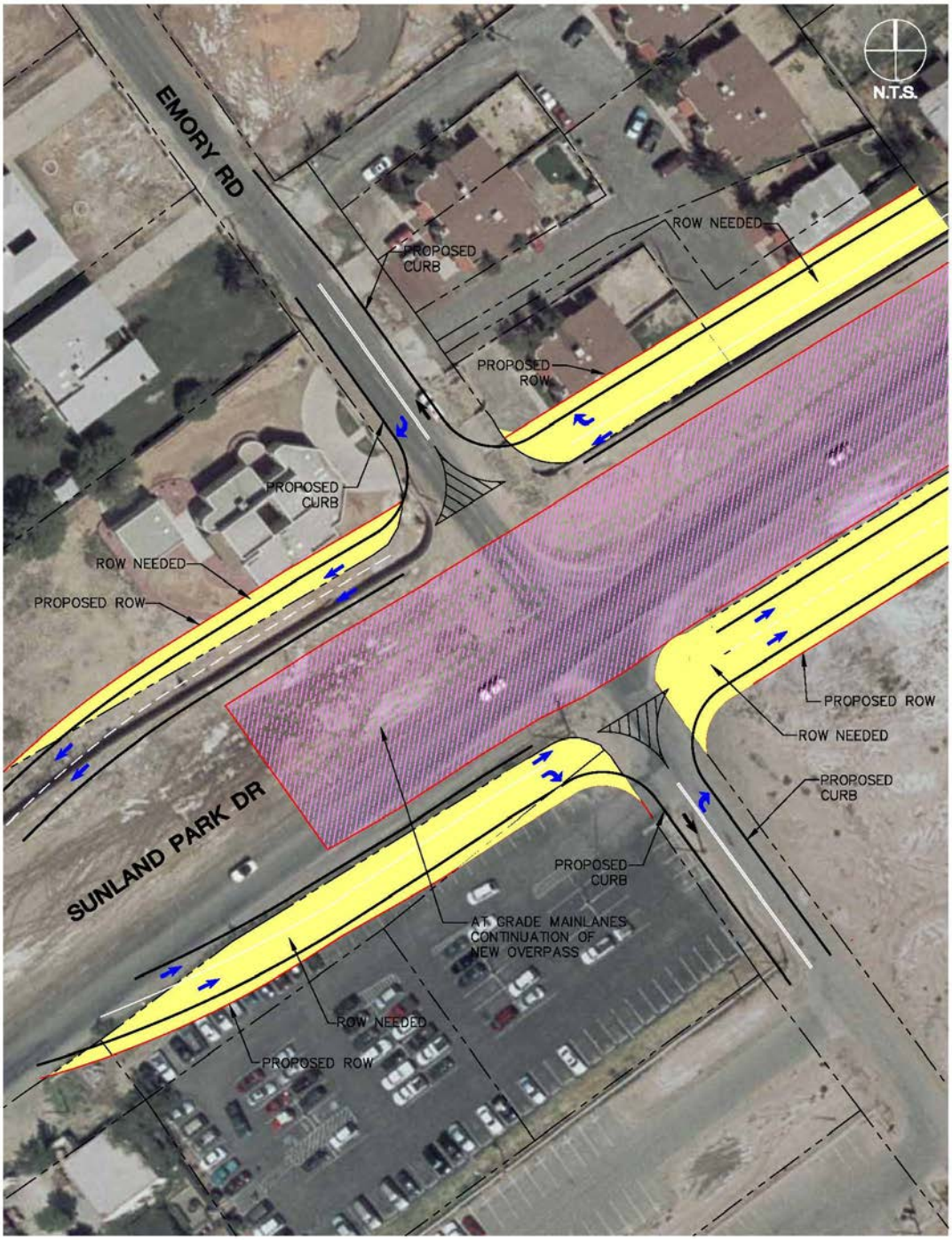


Figure 80: Emory at Sunland Park Improvements

Grade Separation of Intersections

The construction of overpasses to provide grade separation is recommended at the following intersections:

- Doniphan at Sunland Park (grade separate Sunland Park)
- Artcraft at Westside (grade separate Artcraft)
- Artcraft at Upper Valley (grade separate Artcraft)
- Artcraft at Desert South (direct connectors/flyovers)

Doniphan at Sunland Park – The implementation of grade separation of Sunland Park over Doniphan and the BNSF track will include one way frontage roads along the overpass that provide access between Doniphan and Sunland Park. (See **Figure 81**) Grade separation of this intersection also provides a second emergency services travel route for the study area that would not be impacted by train traffic.

Artcraft at Westside – The implementation of grade separation of Artcraft over Westside improves throughput and safety. Entrance and exit ramps provide access between Artcraft and Westside at signalized intersections. The existing bike paths would be realigned to access the signalized intersections, maintaining the same level and method of control as currently exists. (See **Figure 82**)

Artcraft at Upper Valley – The implementation of grade separation of Artcraft over Upper Valley improves throughput and safety. Entrance and exit ramps provide access between Artcraft and Upper Valley at signalized intersections. The existing bike paths would be realigned to access the signalized intersections, maintaining the same level and method of control as currently exists. (See **Figure 83**)

Artcraft at Desert South – Flyover direct connector ramps are proposed between IH 10 and Artcraft west of IH 10. These overpasses would remove a significant amount of traffic from the signalized intersections of Desert North/South and Artcraft, improving efficiency of those intersections by reducing demand and delay while providing improved connectivity between the freeways. To minimize impacts to adjacent property, the overpasses would "land" in the centers of Artcraft and IH 10. (See **Figure 84**)

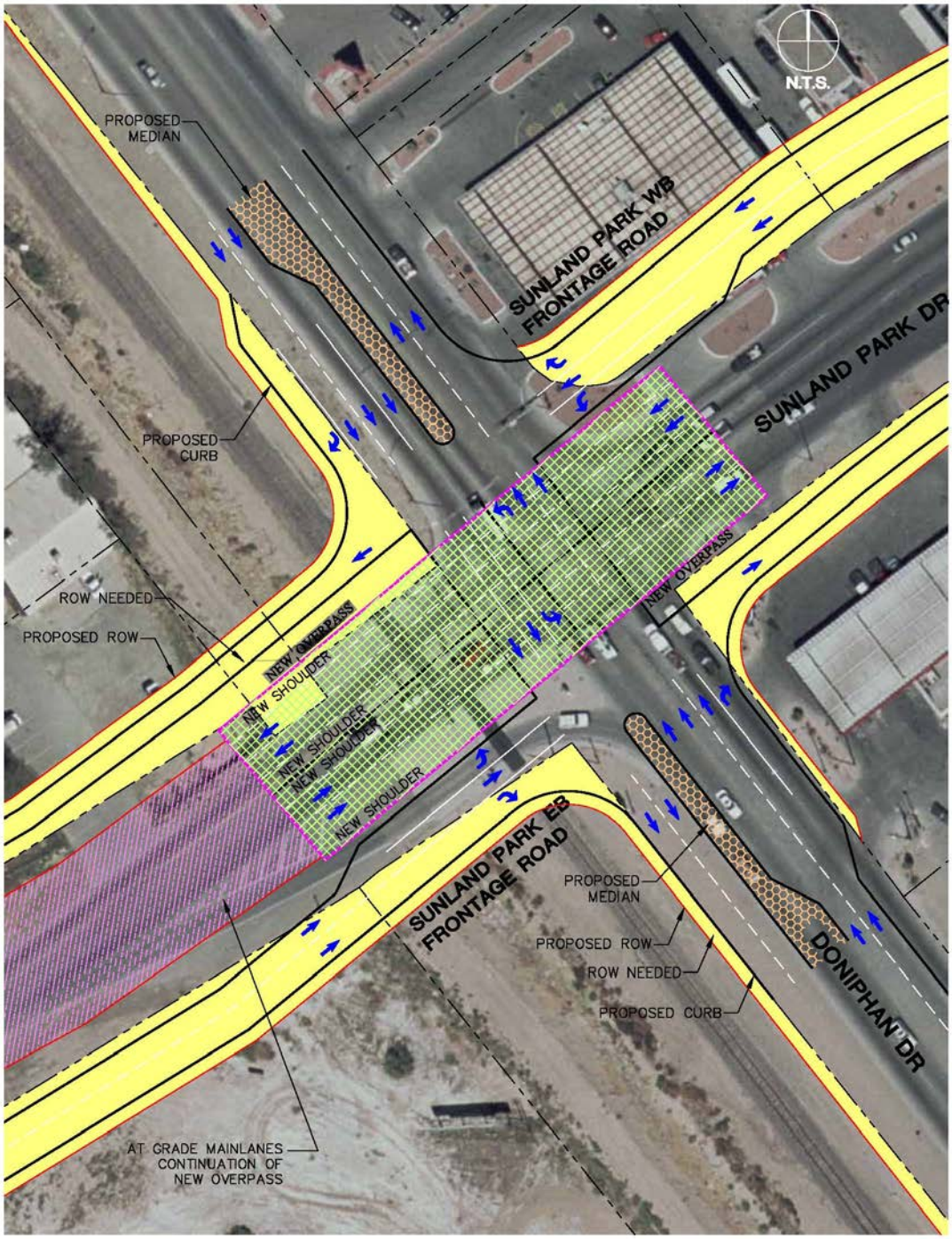


Figure 81: Doniphan at Sunland Park Improvements

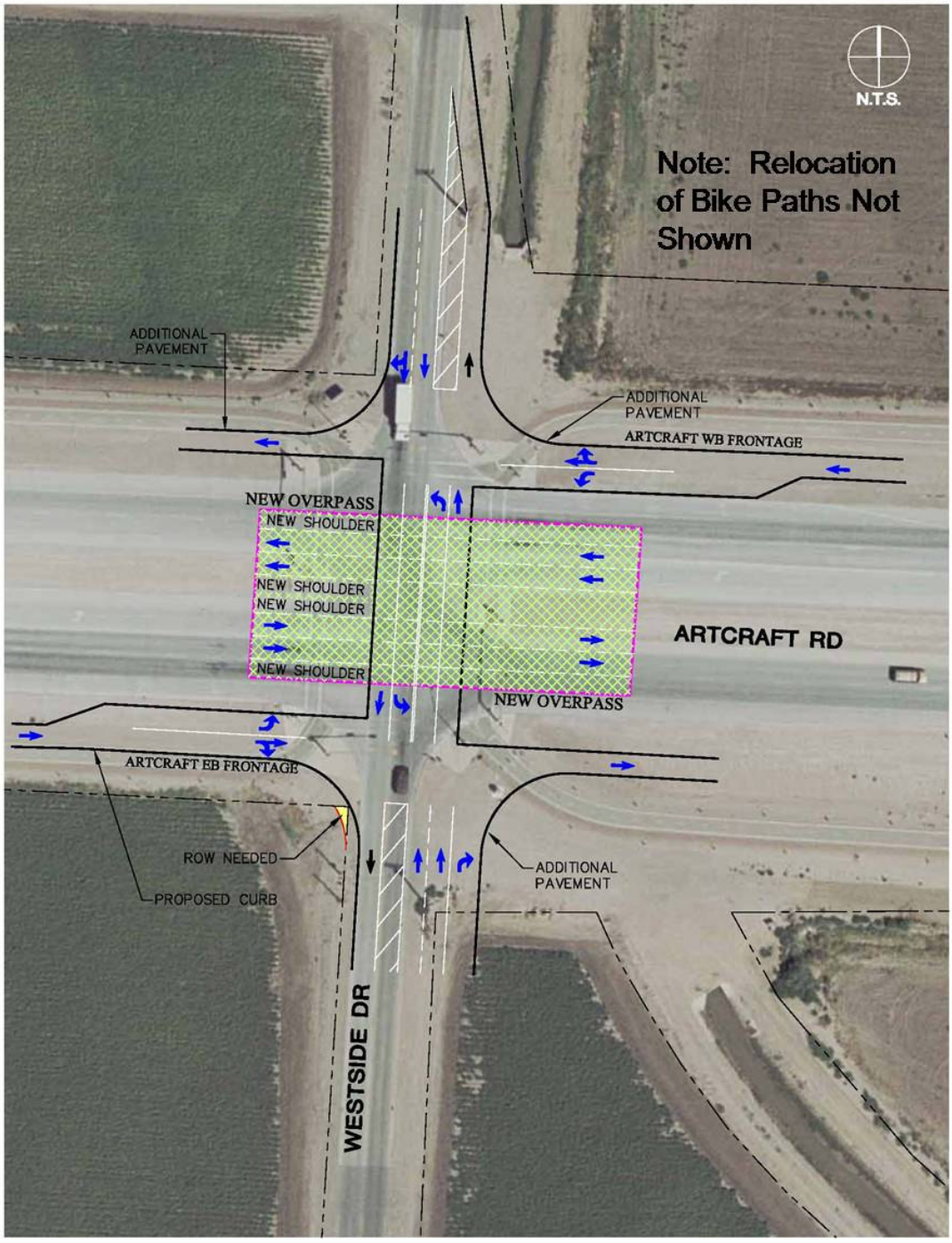


Figure 82: Artcraft at Westside Improvements

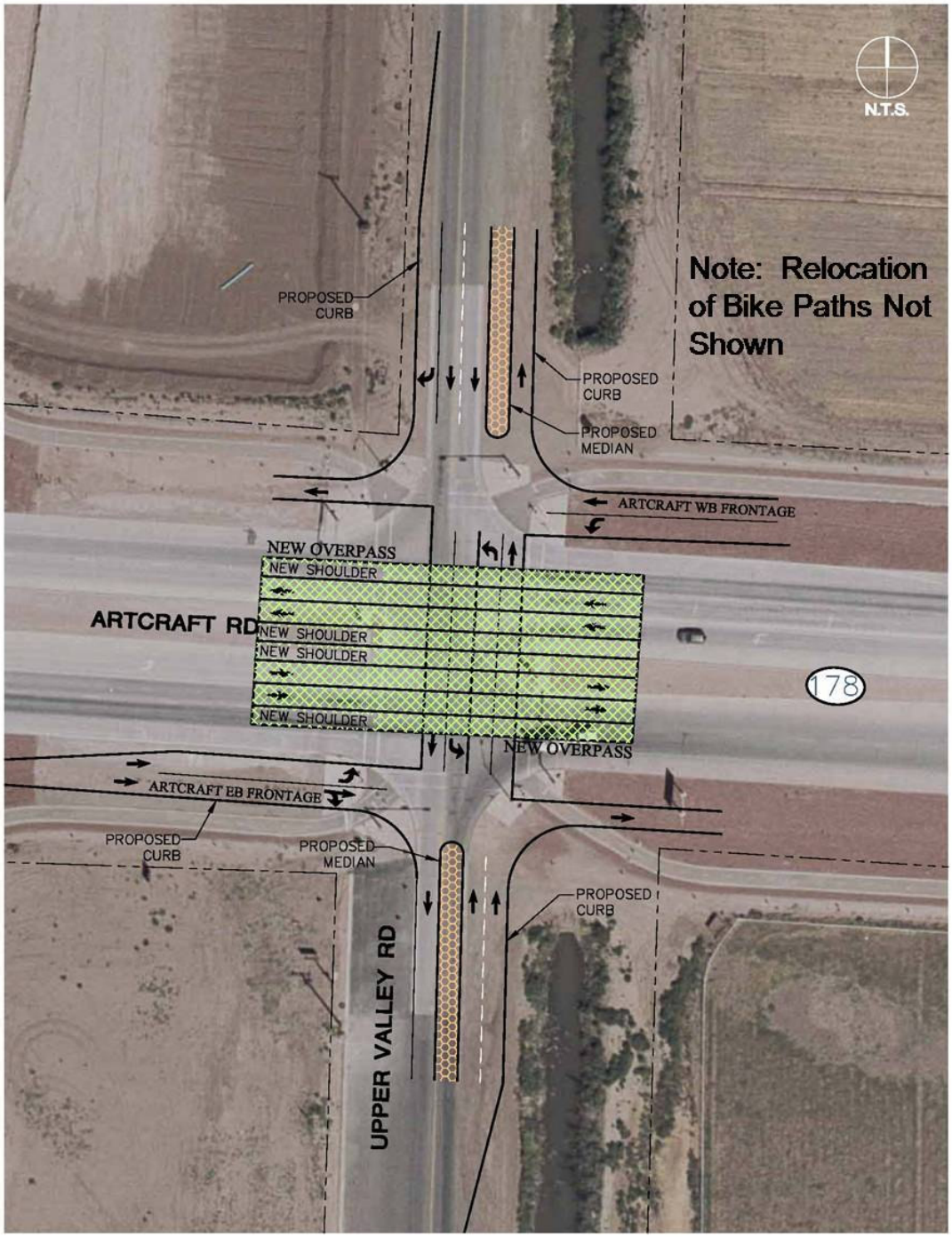


Figure 83: Artcraft at Upper Valley Improvements

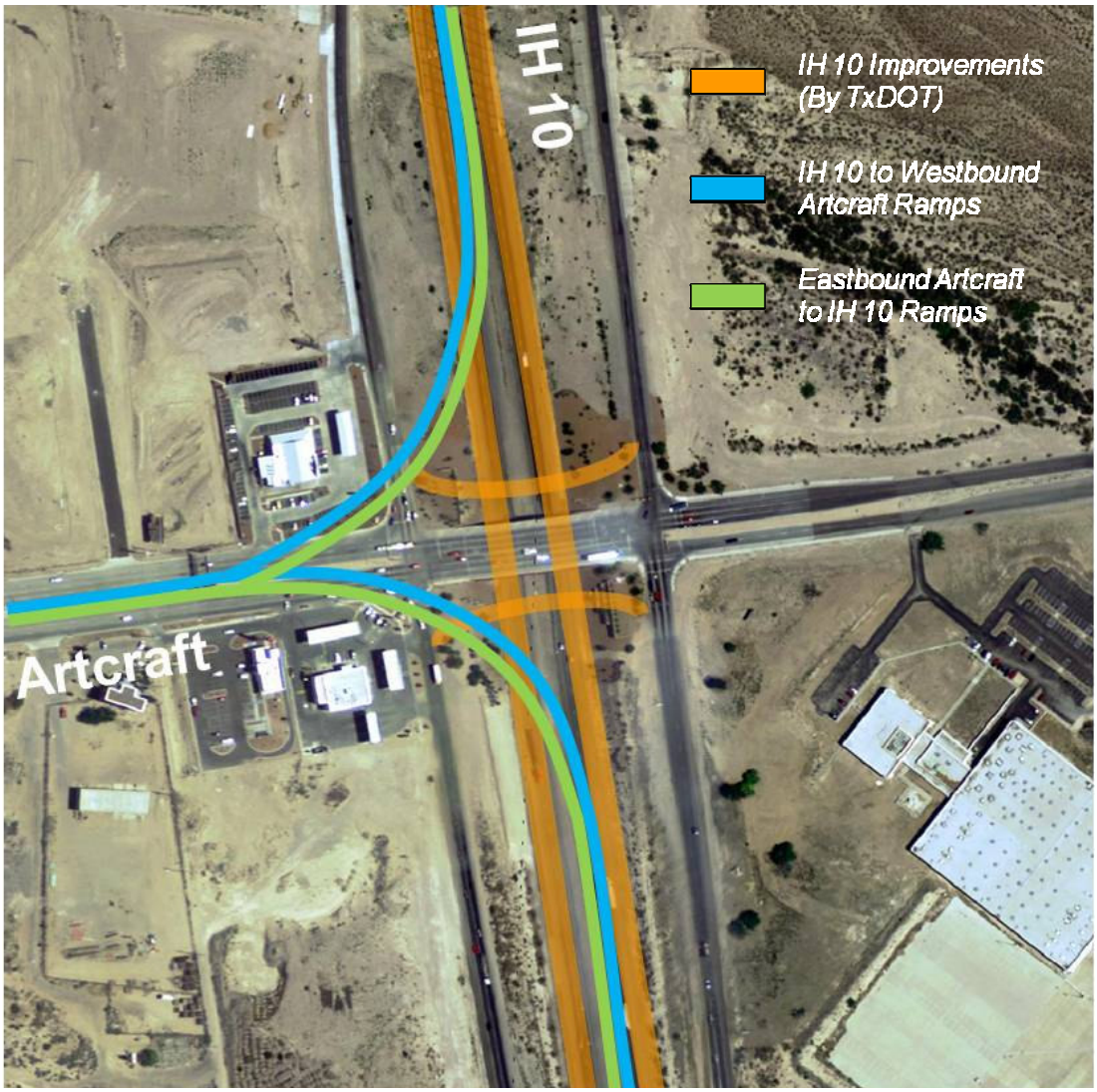


Figure 84: Artcraft at Desert Improvements

Conversion of Existing Intersections to Modern Roundabouts

The following intersections were recommended for conversion to modern roundabouts:

- Gomez at Westside
- Gomez at Upper Valley
- Montoya at Redd
- Emory at Sunset
- Bird at Emory

Given the discussion of the advantages of modern roundabouts over traditional intersection control, these locations were viewed as being appropriate candidates for consideration. The number of lanes for the roundabout was determined by analyzing the anticipated traffic volumes using the methodology outlined in Reference 9. The result of this analysis is included in **Tab Eight**.

Figure 85 shows a conceptual rendering for a multi-lane roundabout at Gomez and Westside. The concept provides two lanes to accommodate anticipated heavy westbound to northbound left turn volumes and heavy southbound to eastbound left turn volumes, which facilitates the use of Artcraft as an alternate route. Single lanes are provided for the remaining movements initially; the concept anticipates the potential for adding lanes to the roundabout in the future.

Figure 86 depicts a conceptual rendering for a two lane roundabout at Gomez and Upper Valley and Montoya at Redd. All three roundabouts are configured to accommodate fire pumper trucks, garbage trucks, school buses, passenger vehicles, and occasional larger vehicles such as fire ladder trucks and moving vans. These three roundabouts are implemented to complement the proposed extension of Redd across the Rio Grande to Gomez.

A conceptual rendering of a single lane roundabout for Emory and Sunset appears at **Figure 87.** This concept does not anticipate widening in the future; rather efforts are made to minimize impacts to adjacent property. The concept is intended to accommodate fire pumper trucks, garbage trucks, school buses, and passenger vehicles; accommodation of relatively rare larger vehicles such as fire ladder trucks or moving vans would be accomplished by "hardening" areas which would likely be run over by the wheels of those vehicles.

Shown at **Figure 88** is a conceptual rendering for a single lane roundabout at Bird and Emory. Presently the intersection has five legs, the fifth leg being formed by Hermosa Lane. To accommodate all five legs would require the roundabout to have a relatively large diameter, which would adversely impact all properties at the intersection. A smaller "footprint" can be achieved if the roundabout only has four legs. Hermosa lane would be eliminated from the intersection by terminating it with a small cul-de-sac just outside of the roundabout.

A summary of all improvements by design year can be seen in **Table 6** at the end of this section.

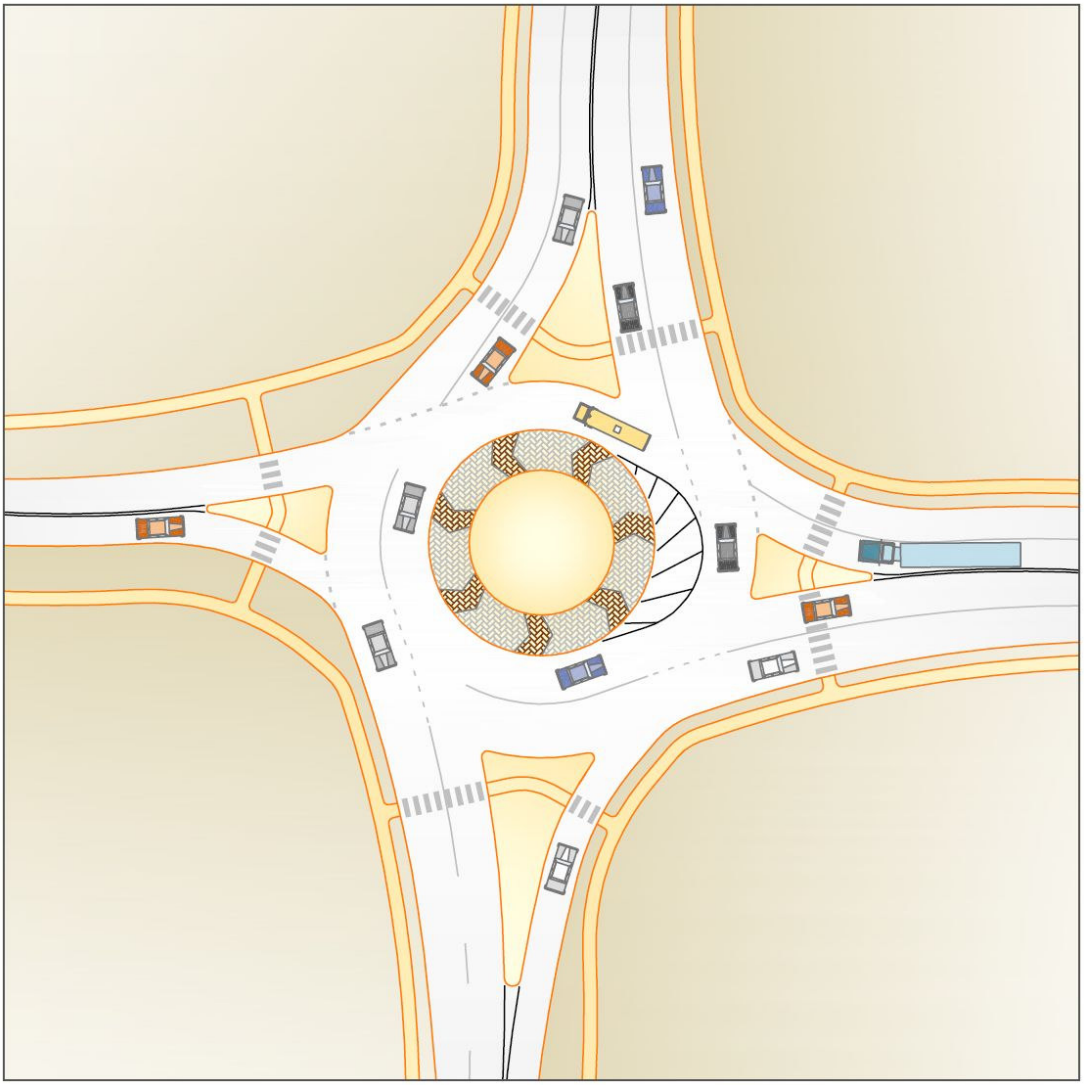


Figure 85: Multi-Lane Roundabout at Gomez and Westside

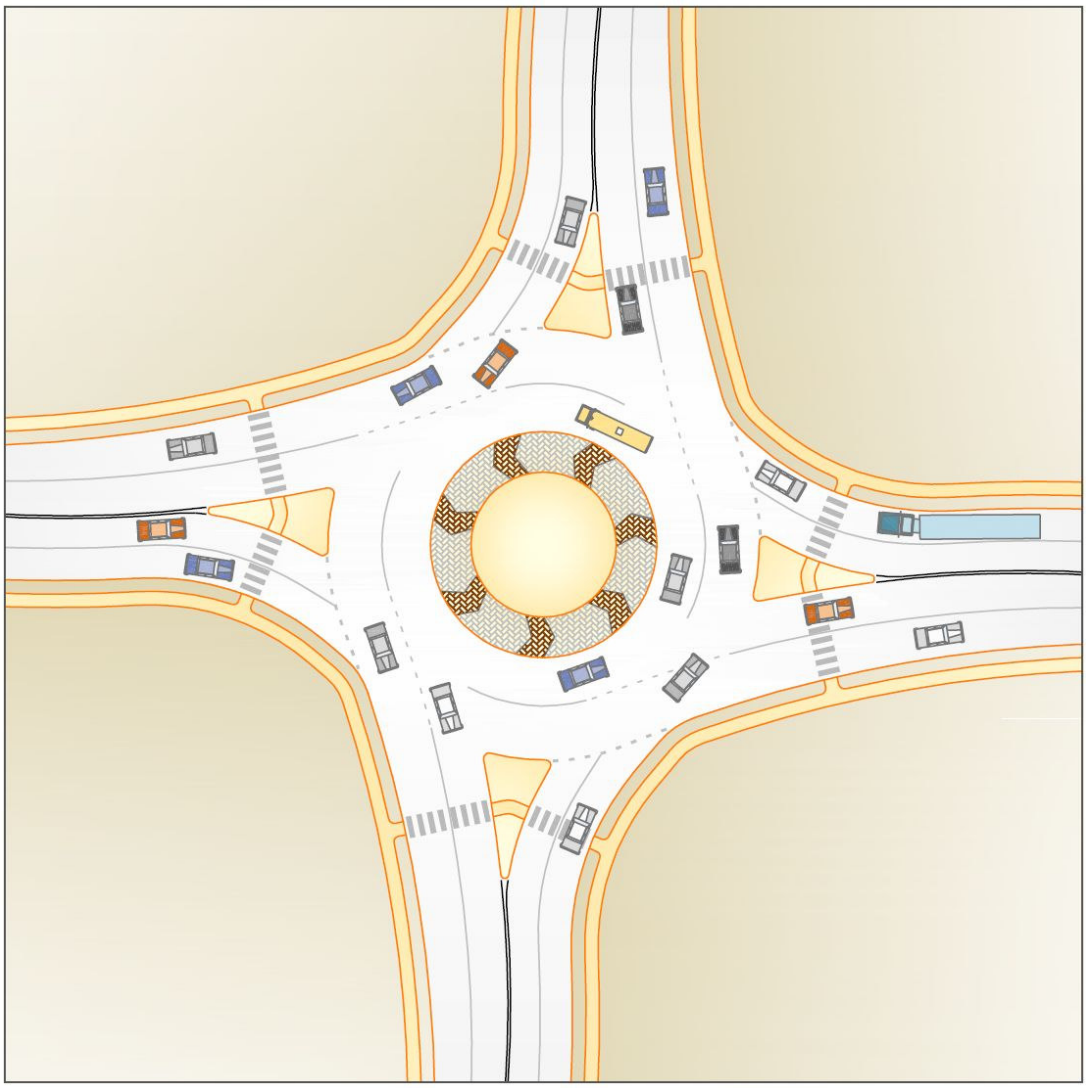


Figure 86: Two Lane Roundabout

Figure 87: Conceptual Rendering of a Single Lane Roundabout at Emory and Sunset

Figure 88: Bird at Emory Improvements

2035 Roadway Improvements

Futurity Drive Corridor

Included in the 2035 TransCAD model provided by the MPO was the extension of Futurity Drive from Sunland Park west across the Rio Grande, eventually intersecting with McNutt. The model also included the widening of the existing portion of Futurity Drive from Sunland Park to Racetrack. This improvement is shown as a forecasted condition in Figure 98.

2035 Intersection Improvements

Providing Additional Lanes or Reassignment of Existing Lanes

The introduction of additional lanes or the reassignment of existing lanes is recommended at the following intersections:

- Borderland at Westside
- Artcraft at Upper Valley
- Artcraft at Doniphan WB
- Sunland Park at Gibson Veck
- Doniphan at Sunland Park
- Doniphan at Racetrack
- Country Club at Montoya

Borderland at Westside – Traffic volumes along Westside necessitate the construction of additional lanes for the roundabout to provide two lanes for northbound and southbound traffic. The concept for the roundabout recommended for 2017 anticipated the need for additional lanes in the future, thus implementation of the improvement can occur relatively easily with minimal disruption to traffic. (See **Figure 89)**.

Artcraft at Upper Valley – It is recommended that right turn lanes be provided for the northbound and westbound approach to the intersection of Artcraft at Upper Valley. The right turn lanes would separate right turn movements from through traffic and increase intersection capacity. This project would require a minor widening of Artcraft and Upper Valley at the approach to provide the

additional lanes. The existing bike paths would be realigned to access the signalized intersections, maintaining the same level and method of control as currently exists. (See **Figure 90**)

Artcraft at Doniphan WB – Two improvements are recommended. Currently there is a dedicated left lane and two through lanes. It is recommended that the northbound left most through lane on Doniphan be used as a combined left/through lane. This configuration would require a split phase operation of the signal at this intersection. The heavy northbound left turn movement cause long queues on the northbound approach, particularly during the afternoon peak. It is also recommended that the striping for westbound Artcraft at the approach provide a mandatory left, combined through/right, and a right turn. (See **Figure 91**)

Sunland Park at Gibson Veck – Heavy right turning movements on the eastbound and southbound approach at the intersection will require right turn lanes to relieve congestion, and separate right turns from the through movements particularly during peak hours. This project can be constructed within existing right-of-way. (See **Figure 92**)

Doniphan at Sunland Park – The eastbound approach on Sunland Park at Doniphan will require additional capacity for the right turn movement. We recommend that the rightmost through lane be reconfigured as an optional through and right turn lane to provide additional capacity for the right turn movement.

Doniphan at Racetrack – It is recommended that a 120 foot southbound right turn lane be provided on Doniphan at Racetrack to separate heavy right turns from the through movements and increase capacity at the intersection. This project would require a minor widening of Doniphan on the south approach in order to provide the right turn lane. (See **Figure 93**)

Country Club at Montoya – Currently this intersection requires a split phasing operation of the signal due to the intersection being offset, which is less efficient. It is recommended that this intersection be realigned to increase the level of service. (See **Figure 94**)

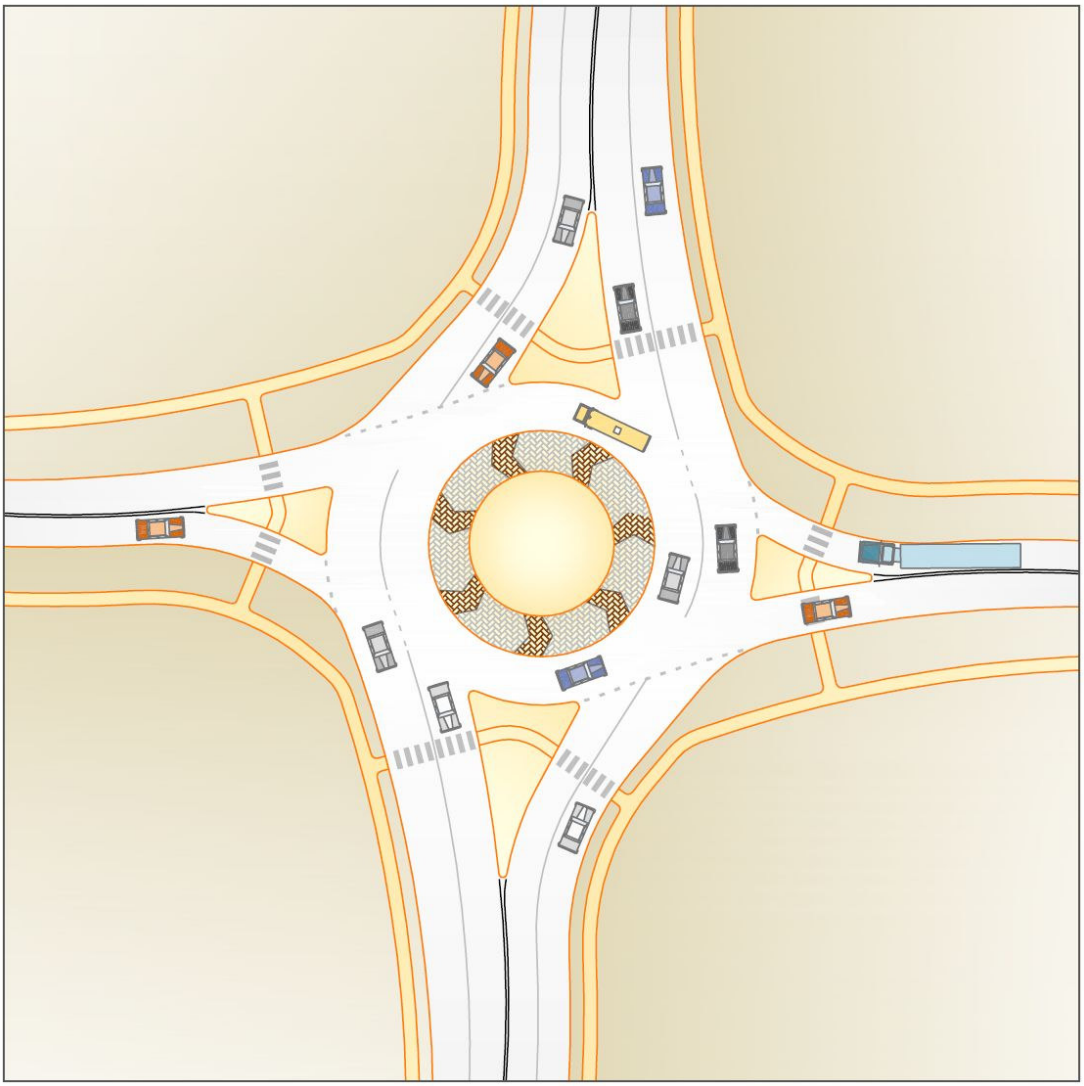


Figure 89: Borderland at Westside Improvements

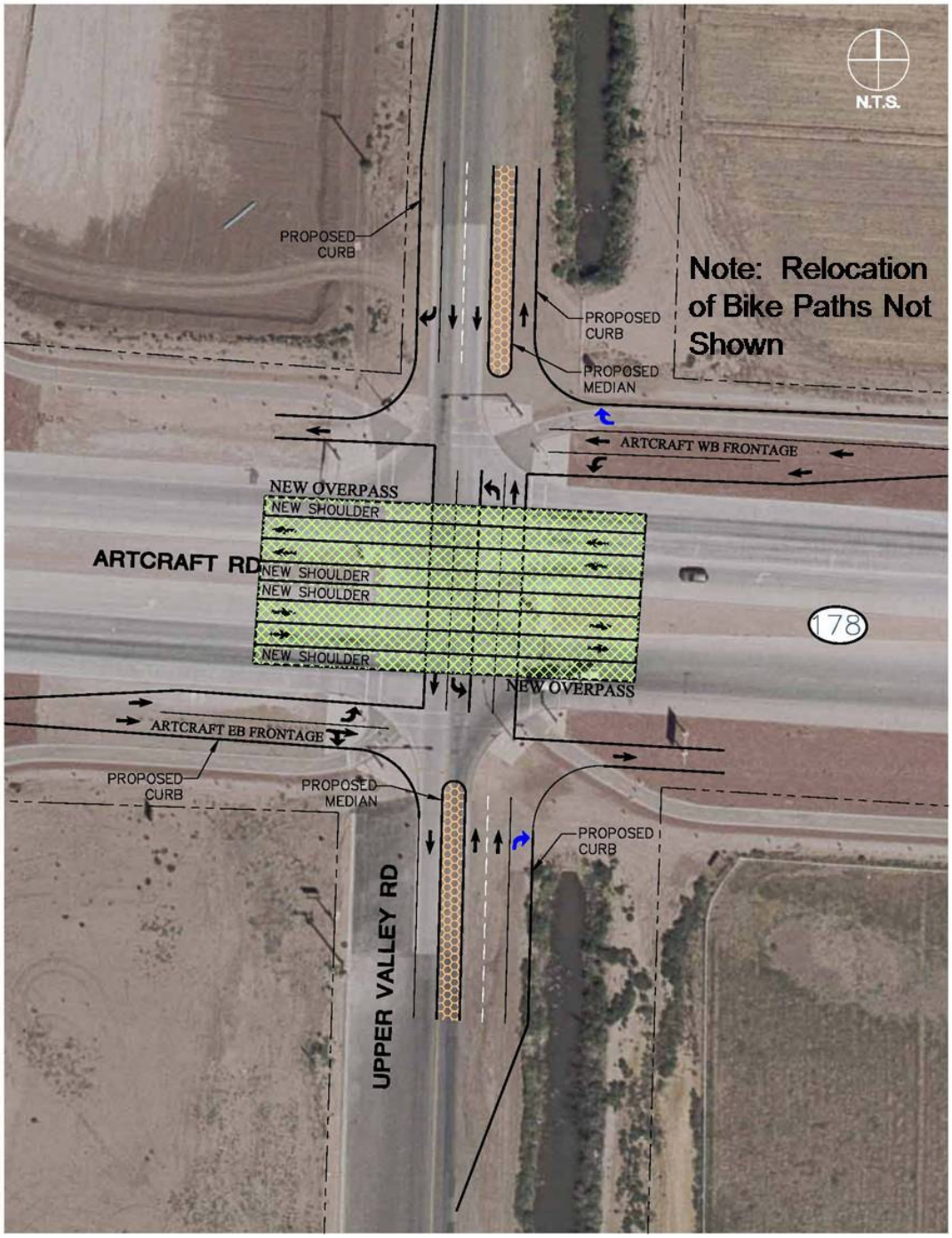


Figure 90: Artcraft at Upper Valley Improvements

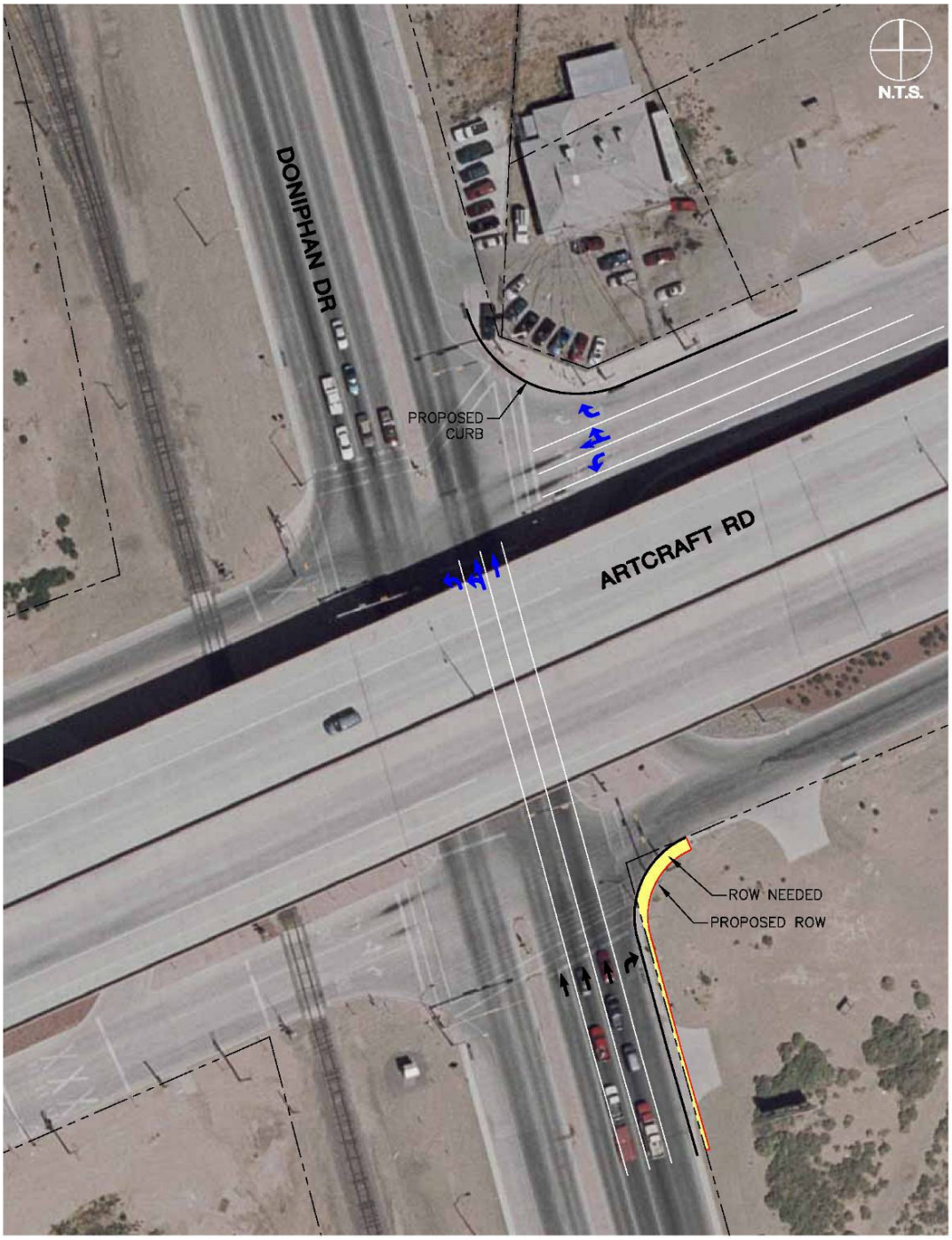


Figure 91: Artcraft at Doniphan Improvements

Figure 92: Sunland Park at Gibson Veck Improvements

Figure 93: Doniphan at Racetrack Improvements

Figure 94: Country Club at Montoya Improvements

Conversion of Existing Intersections to Modern Roundabouts

The following intersection is recommended for conversion to a modern roundabout:

- Borderland at Upper Valley

Given the discussion of the advantages of modern roundabouts over traditional intersection control, and the presence of roundabouts east and west of this intersection, this location was viewed as being an appropriate candidate for consideration. The number of lanes for the roundabout was determined by analyzing the anticipated traffic volumes using the methodology outlined in Reference 9. The result of this analysis is included in **Tab Ten**.

Figure 95 shows a conceptual rendering for a single lane roundabout at Borderland and Upper Valley. The concept anticipates the potential for adding lanes to the roundabout in the future, and is configured to accommodate fire pumper trucks, garbage trucks, school buses, passenger vehicles, and occasional larger vehicles such as fire ladder trucks and moving vans.

Figure 95: Conceptual Rendering of a Single Lane Roundabout at Borderland and Upper Valley

OPINION OF COST

The construction costs in this report are on an order of magnitude developed using standard estimating practices and local unit price databases. The opinions of construction costs were developed for the 2017, 2025 and 2035 design years and do not reflect a detailed cost opinion for the proposed recommended improvements. The cost totals for each analysis year were prepared based on 2008 dollars and were projected using a 5% per year compound interest.

A detailed cost opinion of construction for the selected improvements should be developed during the design phase of the project. A breakdown of the cost estimates (rounded to the nearest $1,000) for the proposed improvements for each analysis year are included in **Table 6** for 2017, **Table 7** for 2025, and **Table 8** for 2035. Details of the cost estimate are located under **Tab Eleven** in the Appendix.

Table 6: 2017 Opinion of Probable Cost (rounded to nearest $1,000)							
Location	Proposed Improvements	Engineering	Right-of-way	Construction	Contingency	Total Cost (2007 Dollars)	Total Cost (2017 Dollars)
Borderland at Westside	Single lane roundabout	$211,000	$120,000	$1,174,000	$376,000	$1,881,000	$2,918,000
Borderland at Strahan	Single lane roundabout	$211,000	$120,000	$1,174,000	$376,000	$1,881,000	$2,918,000
Artcraft at Upper Valley	Add second westbound left turn lane (approximately 250’ long) and widen southbound receiving lanes south of Artcraft	$112,000	---	$623,000	$199,000	$935,000	$1,450,000
	Reconfigure eastbound approach to provide an additional eastbound thru lane beginning approximately 250' in advance of Upper Valley	$29,000	---	$162,000	$52,000	$243,000	$377,000
	Widen Artcraft immediately after Upper Valley to provide three thru lanes	$33,000	---	$185,000	$59,000	$278,000	$431,000
Artcraft at Desert SB	Reconfigure lanes on the bridge to provide a second westbound thru lane	---	---	$1,000	---	$2,000	$2,000
	Reconfigure westbound approach as two left turn and two through lanes	---	---	$1,000	---	$2,000	$2,000
	Add 220' southbound right turn bay	$27,000	---	$148,000	$47,000	$222,000	$344,000
Artcraft at Desert NB	Reconfigure existing westbound right turn lane as shared thru-right lane	---	---	$1,000	---	$2,000	$2,000
Country Club at Westside	Add 200' eastbound left turn bay	$44,000	---	$242,000	$78,000	$363,000	$564,000
Country Club at Montoya	Add 120' northbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$237,000
	Add 120' southbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$237,000
Country Club at Doniphan	Add 150' eastbound right turn bay	$58,000	---	$323,000	$103,000	$484,000	$751,000
	Add second southbound left turn lane (approximately 200’ long)	$25,000	---	$139,000	$44,000	$208,000	$323,000
Bird at Doniphan	Traffic signal	$37,000	---	$207,000	$66,000	$311,000	$482,000
	Add 120' eastbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$237,000
Frontera at Emory	Single lane roundabout	$135,000	$120,000	$750,000	$240,000	$1,244,000	$1,930,000
Frontera at Doniphan	Add 120' eastbound right turn bay	$56,000	---	$309,000	$99,000	$463,000	$718,000
Gibson Veck at Sunland Park	Traffic signal	$37,000	---	$207,000	$66,000	$311,000	$482,000
Doniphan at Sunland Park	Add 120' eastbound left turn bay	$56,000	---	$309,000	$99,000	$463,000	$718,000
	Add 120' northbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$237,000
	Add second southbound left turn bay (approximately 280' long)	$32,000	---	$176,000	$56,000	$264,000	$409,000

Table 7: 2025 Opinion of Probable Cost (rounded to nearest $1,000)							
Location	Proposed Improvements	Engineering	Right-of-way	Construction	Contingency	Total Cost (2007 Dollars)	Total Cost (2025 Dollars)
Borderland at Upper Valley	Add 120' northbound left turn bay	$43,000	$5,000	$241,000	$77,000	$366,000	$838,000
Borderland at Strahan	Add second lane serving Borderland to roundabout	$125,000	$60,000	$692,000	$222,000	$1,098,000	$2,518,000
Borderland at Doniphan	Construct second eastbound lane between Strahan and Doniphan	$214,000	$5,000	$1,188,000	$380,000	$1,786,000	$4,094,000
	Add 120' eastbound right turn bay	$18,000	$5,000	$102,000	$33,000	$157,000	$361,000
	Add 120' westbound left turn bay	$18,000	$5,000	$102,000	$33,000	$157,000	$361,000
	Add 120' southbound right turn bay	$18,000	$5,000	$102,000	$33,000	$157,000	$361,000
Artcraft at Westside	Construct Artcraft as a four lane overpass with ramps connecting to Westside	$1,224,000	---	$6,802,000	$2,177,000	$10,203,000	$23,386,000
Artcraft at Upper Valley	Construct Artcraft as a four lane overpass with ramps connecting to Upper Valley	$1,224,000	---	$6,802,000	$2,177,000	$10,203,000	$23,386,000
Artcraft at IH 10	Construct direct connection ramps between IH 10 and the portion of Artcraft west of IH 10.	$3,956,000	---	$21,975,000	$7,032,000	$32,963,000	$75,552,000
Artcraft at Desert NB	Reconfigure the eastbound approach to provide a left turn and two thru lanes	---	---	$1,000	---	$2,000	$3,000
	Add 250' northbound right turn bay	$29,000	---	$162,000	$52,000	$243,000	$557,000
Doniphan at Montoya Rd	Add 120' eastbound right turn bay	$56,000	---	$309,000	$99,000	$463,000	$1,062,000
Doniphan at Montoya Ln	Add 120' westbound left turn bay	$18,000	---	$102,000	$33,000	$153,000	$350,000
Gomez at Westside	Multi-lane roundabout	$472,000	$120,000	$2,620,000	$838,000	$4,049,000	$9,281,000
Gomez/Redd from Upper Valley to Montoya	Construct three lane roadway with shared use lanes and continuous left turn lane; construct bridge over Rio Grande	$3,645,000	$1,488,000	$20,249,000	$6,480,000	$31,861,000	$73,026,000
Gomez at Upper Valley	Two lane roundabout	$526,000	$120,000	$2,922,000	$935,000	$4,504,000	$10,323,000
Montoya at Redd	Two lane roundabout	$526,000	$120,000	$2,922,000	$935,000	$4,504,000	$10,323,000
Doniphan at Redd	Add second northbound left turn lane (approximately 290' long)	$43,000	---	$237,000	$76,000	$355,000	$814,000
	Add 120' northbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$350,000
	Add additional southbound left turn lane (approximately 265' long)	$30,000	---	$169,000	$54,000	$253,000	$580,000
	Add 200' westbound right turn bay	$25,000	---	$139,000	$44,000	$208,000	$477,000
	Reconfigure existing westbound right turn lane to thru lane	$2,000	---	$10,000	$3,000	$15,000	$34,000
	Add 150' eastbound right turn bay	$21,000	---	$116,000	$37,000	$173,000	$398,000
Lindbergh at Montoya	Add 120' westbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$350,000
Country Club at Memory	Add 120' southbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$350,000
Emory at Sunset	Single lane roundabout	$110,000	---	$611,000	$196,000	$917,000	$2,101,000
Bird at Emory	Single lane roundabout	$110,000	$120,000	$611,000	$196,000	$1,037,000	$2,376,000
Emory at Sunland Park	Construct as T-intersections connecting to Doniphan overpass frontage roads	$50,000	---	$277,000	$89,000	$415,000	$952,000
Doniphan at Sunland Park	Construct Sunland Park as a four lane overpass with frontage roads connecting to Doniphan.	$1,967,000	$720,000	$10,927,000	$3,497,000	$17,111,000	$39,218,000

Table 8: 2035 Opinion of Probable Cost (rounded to nearest $1,000)							
Location	Proposed Improvements	Engineering	Right-of-way	Construction	Contingency	Total Cost (2007 Dollars)	Total Cost (2035 Dollars)
Borderland at Westside	Add second lane serving Westside to roundabout	$348,000	$120,000	$1,933,000	$619,000	$3,020,000	$11,273,000
Borderland at Upper Valley	Single lane roundabout	$211,000	$120,000	$1,174,000	$376,000	$1,881,000	$7,022,000
Artcraft at Upper Valley	Add 120' westbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$570,000
	Add 120' northbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$570,000
Artcraft at Doniphan	Reconfigure northbound approach to provide left turn, shared left-thru and thru lanes	---	---	$1,000	---	$2,000	$6,000
	Reconfigure westbound approach to provide left turn, shared thru-right and right turn lanes	---	---	$1,000	---	$2,000	$6,000
Country Club at Montoya	Realign Montoya to eliminate intersection offset	$266,000	$360,000	$1,475,000	$472,000	$2,573,000	$9,605,000
Gibson Veck at Sunland Park	Add 120' westbound right turn bay	$28,000	---	$154,000	$49,000	$230,000	$860,000
	Add 120' southbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$570,000
Doniphan at Sunland Park	Reconfigure eastbound thru lane as shared thru-right lane	---	---	$1,000	---	$2,000	$6,000
Doniphan at Racetrack	Add 120' southbound right turn bay	$18,000	---	$102,000	$33,000	$153,000	$570,000

CONCLUSIONS AND RECOMMENDATIONS

The Upper Valley Traffic Study has provided a comprehensive review of forecasted growth in the study area and impacts to traffic for the 2017, 2025 and 2035 analysis years. Various measures have been recommended to address impacts as well as the necessary short and long term improvements to meet the future travel demand. High traffic future volumes on major roadways in the Upper Valley are directly associated with adjacent residential and commercial land uses. The rate of growth and development patterns in the study area and surrounding communities will continue to produce transportation challenges.

Analysis of the results considered the following areas of mobility improvements:

- Intersection improvements through auxiliary lanes
- Signalized Intersections
- Modern roundabouts
- Grade-separated intersections
- Corridor development using context sensitive solutions
- Facilitation of public transportation
- Development of bicycle and pedestrian facilities

The study considered three alternatives for the design of Country Club and recommends a three lane roadway with shared use lanes, a continuous left turn lane and sidewalks where the existing right-of-way is 60 feet wide; where the existing right-of-way is at least 70 feet wide; bike and hike paths are recommended in lieu of the sidewalks. The study also considers two alternatives for the design of bus stops and recommends curbside stops where the existing right-of-way is less than 70 feet wide and pull-out bus stops where the existing right-of-way is 70 feet wide or greater.

SUMMARY OF IMPROVEMENTS

A summary of all transportation improvements considered for the study area appears at **Table 9**. This table includes improvements currently programmed for implementation and improvements recommended in this report. Following the tables are **Figures 96 through 98**, which depicts graphically the types and locations of improvements for 2017, 2025 and 2035 for the entire study area.

Table 9: Summary of Transportation Improvements			
Location	**Proposed 2017 Improvements**	**Proposed 2025 Improvements**	**Proposed 2035 Improvements**
Borderland at Westside	Single lane roundabout	No changes	Add second lane serving Westside to roundabout
Borderland at Upper Valley	No changes	Add 120' northbound left turn bay	Single Lane roundabout
Borderland at Strahan	Single lane roundabout	Add second lane serving Borderland to roundabout	No changes
Borderland from Strahan to Doniphan	No changes	Construct additional eastbound lane	No changes
Borderland at Doniphan	No changes	Add 300' eastbound left turn bay	No changes
		Add 120' eastbound right turn bay	
		Add 120' westbound left turn bay	
		Add 120' southbound right turn bay	
Artcraft at Westside	Add 150' northbound left turn bay (City of El Paso planned improvement)	Construct Artcraft as a four lane overpass with ramps connecting to Westside.	No changes
	Add 150' southbound left turn bay (City of El Paso planned improvement)		
Artcraft at Upper Valley	120' northbound left turn bay (City of El Paso planned improvement)	Construct Artcraft as a four lane overpass with ramps connecting to Upper Valley.	Add 120' westbound right turn bay
	120' northbound right turn bay (City of El Paso planned improvement)		Add 120' northbound right turn bay
	120' southbound left turn bay (City of El Paso planned improvement)		
	120' southbound right turn bay (City of El Paso planned improvement)		
	Add second westbound left turn lane (approximately 250’ long)		
	Add 550' long southbound receiving lane south of Artcraft to accommodate second westbound left turn lane		
	Reconfigure eastbound approach to provide an additional eastbound thru lane beginning approximately 250' in advance of Upper Valley		
	Widen Artcraft immediately after Upper Valley to provide three thru lanes		
Artcraft at Doniphan	No changes	No changes	Reconfigure northbound approach to provide left turn, shared left-thru and thru lanes
			Reconfigure westbound approach to provide left turn, shared thru-right and right turn lanes
IH 10 from south of study area to north of study area	No changes	Widen IH 10 to six lanes (TxDOT planned improvement)	No changes
Artcraft at Desert SB	Reconfigure lanes on the bridge to provide a second westbound thru lane	Construct U-turn lanes (TxDOT planned improvement)	No changes
	Reconfigure westbound approach as two left turn and two through lanes	Construct direct connection ramps between IH 10 and the portion of Artcraft west of IH 10	
	Add 220' southbound right turn bay		
Artcraft at Desert NB	Reconfigure existing westbound right turn lane as shared thru-right lane	Reconfigure the eastbound approach to provide a left turn and two thru lanes	No changes
		Add a 250' northbound right turn bay	
Doniphan at Montoya Rd	No changes	Add 120' eastbound right turn bay	No changes
Doniphan at Montoya Ln	No changes	Add 120' westbound left turn bay	No changes
Gomez at Westside	No changes	Multi-lane roundabout	No changes
Gomez at Upper Valley	No changes	Two lane roundabout	No changes
Gomez/Redd from Upper Valley to Montoya	No changes	Construct three lane roadway with shared use lanes and continuous left turn lane; construct bridge over Rio Grande	No changes
Montoya at Redd	No changes	Two lane roundabout	No changes
Redd from Doniphan to Fernwood Circle	Reconstruct Redd to five lanes (City of El Paso planned improvement)	No changes	No changes

Table 9: Summary of Transportation Improvements (continued)			
Location	**Proposed 2017 Improvements**	**Proposed 2025 Improvements**	**Proposed 2035 Improvements**
Doniphan at Redd	Reconstruct Redd to five lanes (City of El Paso planned improvement)	Add second northbound left turn bay (approximately 290' long) Add 120' northbound right turn bay Add additional southbound left turn lane (approximately 265’ long) Add 200' westbound right turn bay Reconfigure existing westbound right turn lane to thru lane Add 150' eastbound right turn bay	No changes
Montoya at Mulberry	No changes	No changes	No changes
Doniphan at Mulberry	No changes	No changes	No changes
Lindbergh at Montoya	No changes	Add 120' westbound right turn bay	No changes
Doniphan at Thorn	No changes	No changes	No changes
Doniphan at Lindberg	No changes	No changes	No changes
McNutt from Peter Domenici to Rio Grande bridge	Widen McNutt to four lanes (NMDOT planned improvement)	No changes	No changes
Country Club at McNutt	Additional main lanes and auxiliary lanes (NMDOT planned improvement)	No changes	No changes
Country Club at Westside	Add 200' eastbound left turn bay	No changes	No changes
Country Club at Upper Valley/ River Run	Construct roundabout (City of El Paso planned improvement)	No changes	No changes
Country Club from River Run to Doniphan	Construct three lane roadway with shared use lanes and continuous left turn lane (City of El Paso planned improvement)	No changes	No changes
Country Club at Montoya	Add 120' northbound right turn bay Add 120' southbound right turn bay	No changes	Realign Montoya to eliminate intersection offset
Country Club at Memory	No changes	Add 120' southbound right turn bay	No changes
Country Club at Doniphan	Add 150' eastbound right turn bay Add second southbound left turn lane (approximately 200’ long)	No changes	No changes
Sunset at Riverbend	No changes	No changes	No changes
Emory at Sunset	No changes	Single lane roundabout	No changes
Doniphan at Sunset	No changes	No changes	No changes
Bird at Riverbend	No changes	No changes	No changes
Bird at Emory	No changes	Single lane roundabout	No changes
Bird at Doniphan	Traffic signal Add 120' eastbound right turn bay	No changes	No changes
Frontera at Riverbend	No changes	No changes	No changes
Frontera at Emory	Single lane roundabout	No changes	No changes
Frontera at Doniphan	Add 120' eastbound right turn bay	No changes	No changes
Columbus Road east of McNutt	No changes	Construct roadway (Planned improvement per MPO)	No changes
Gibson Veck at Sunland Park	Traffic signal	No changes	Add 120' westbound right turn bay Add 120' southbound right turn bay
Emory at Sunland Park	No changes	Construct as T-intersections connecting to Doniphan overpass frontage roads	No changes
Doniphan at Sunland Park	Add 120' eastbound left turn bay Add 120' northbound right turn bay Add second southbound left turn bay (approximately 280' long)	Construct Sunland Park as a four lane overpass with frontage roads connecting to Doniphan	Reconfigure eastbound thru lane as shared thru-right lane
Futurity from Racetrack to McNutt	No changes	No changes	Construct roadway (Planned improvement per MPO)
Doniphan at Racetrack	No changes	No changes	Add 120' southbound right turn bay
Doniphan at Racetrack Ramp	No changes	Traffic signal (TxDOT planned improvement - US 375 extension)	No changes
US 375 at Racetrack Ramps	No changes	Traffic signal (TxDOT planned improvement - US 375 extension)	No changes

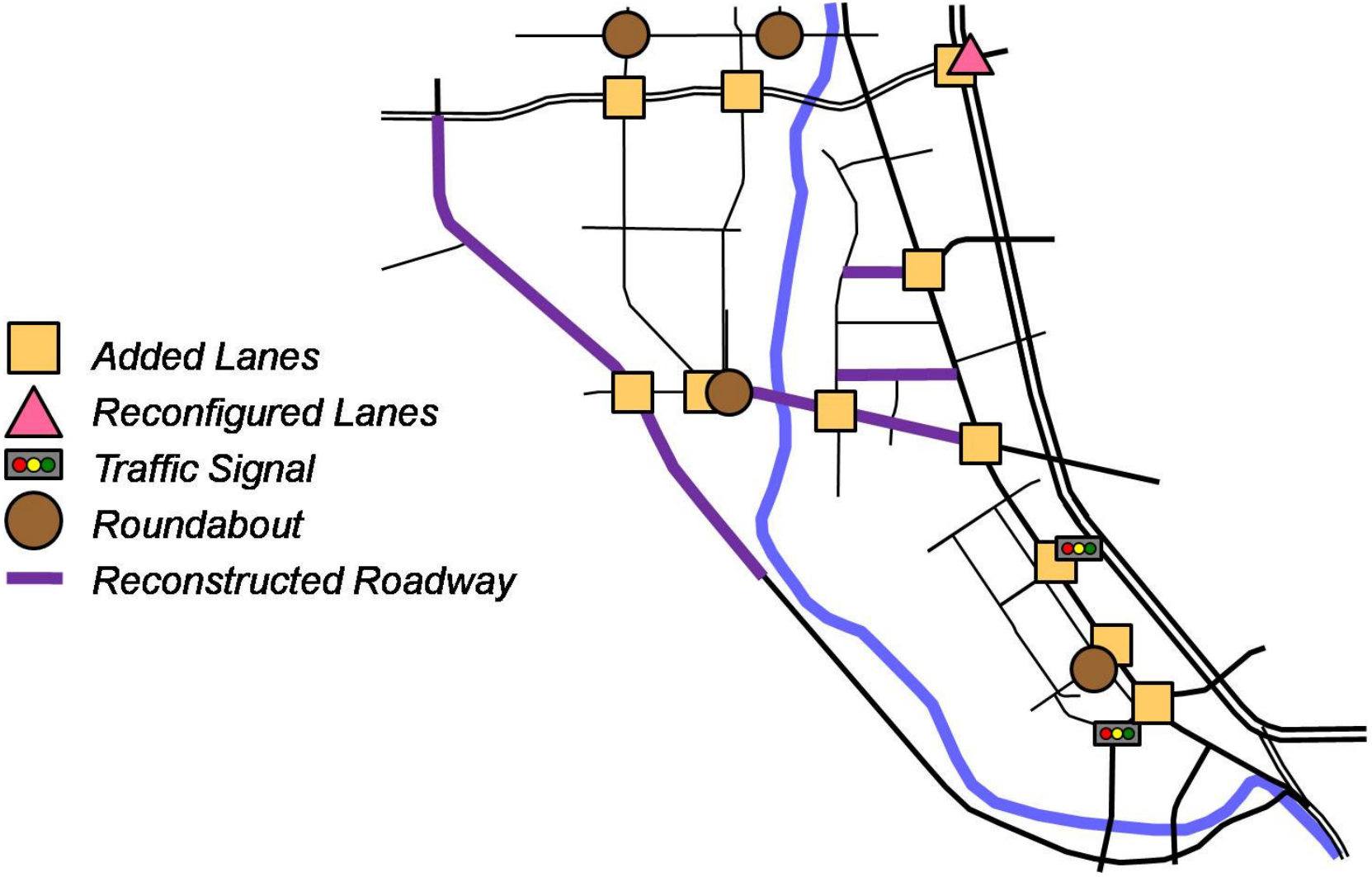


Figure 96: 2017 Transportation Improvements

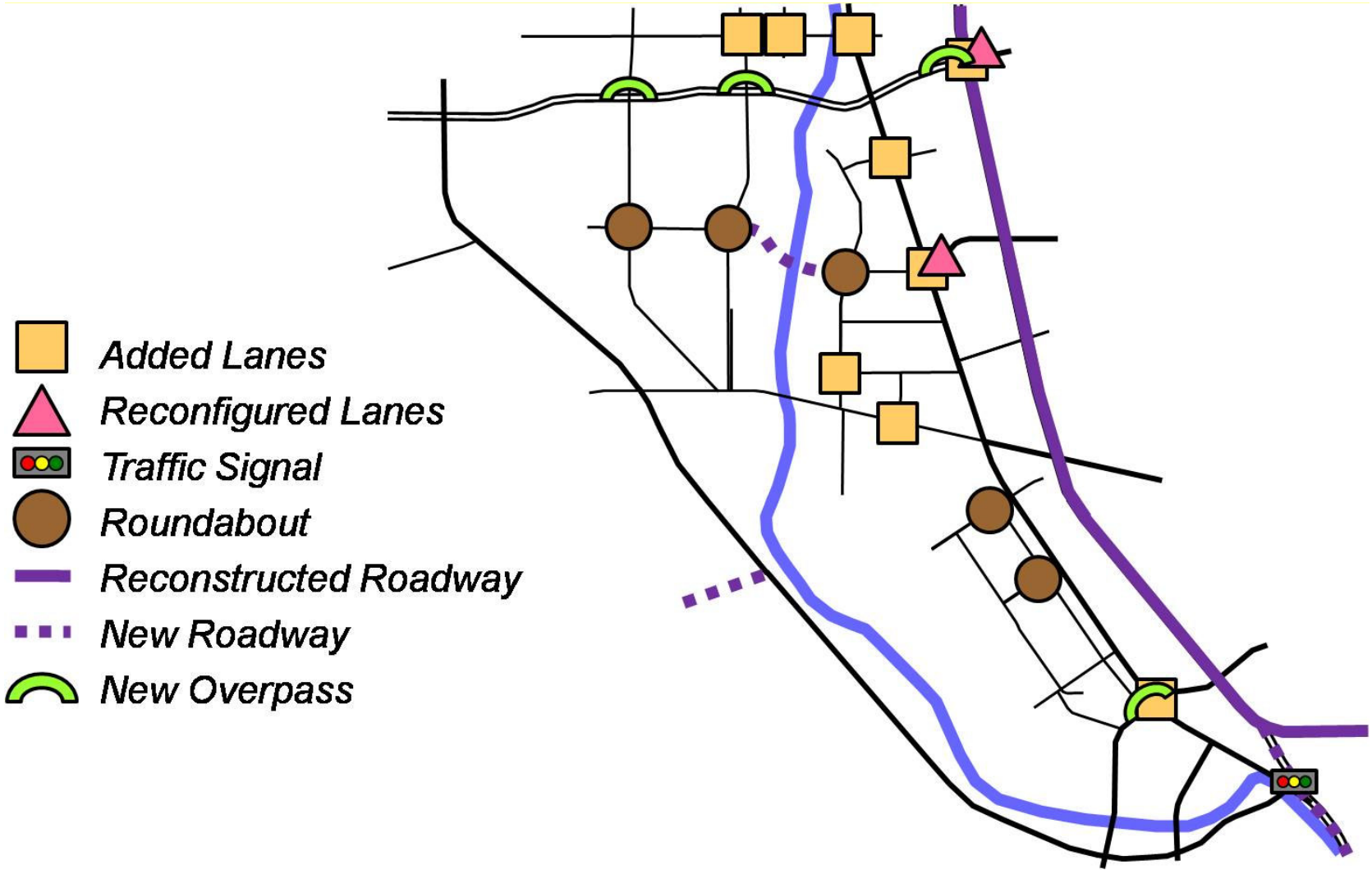


Figure 97: 2025 Transportation Improvements

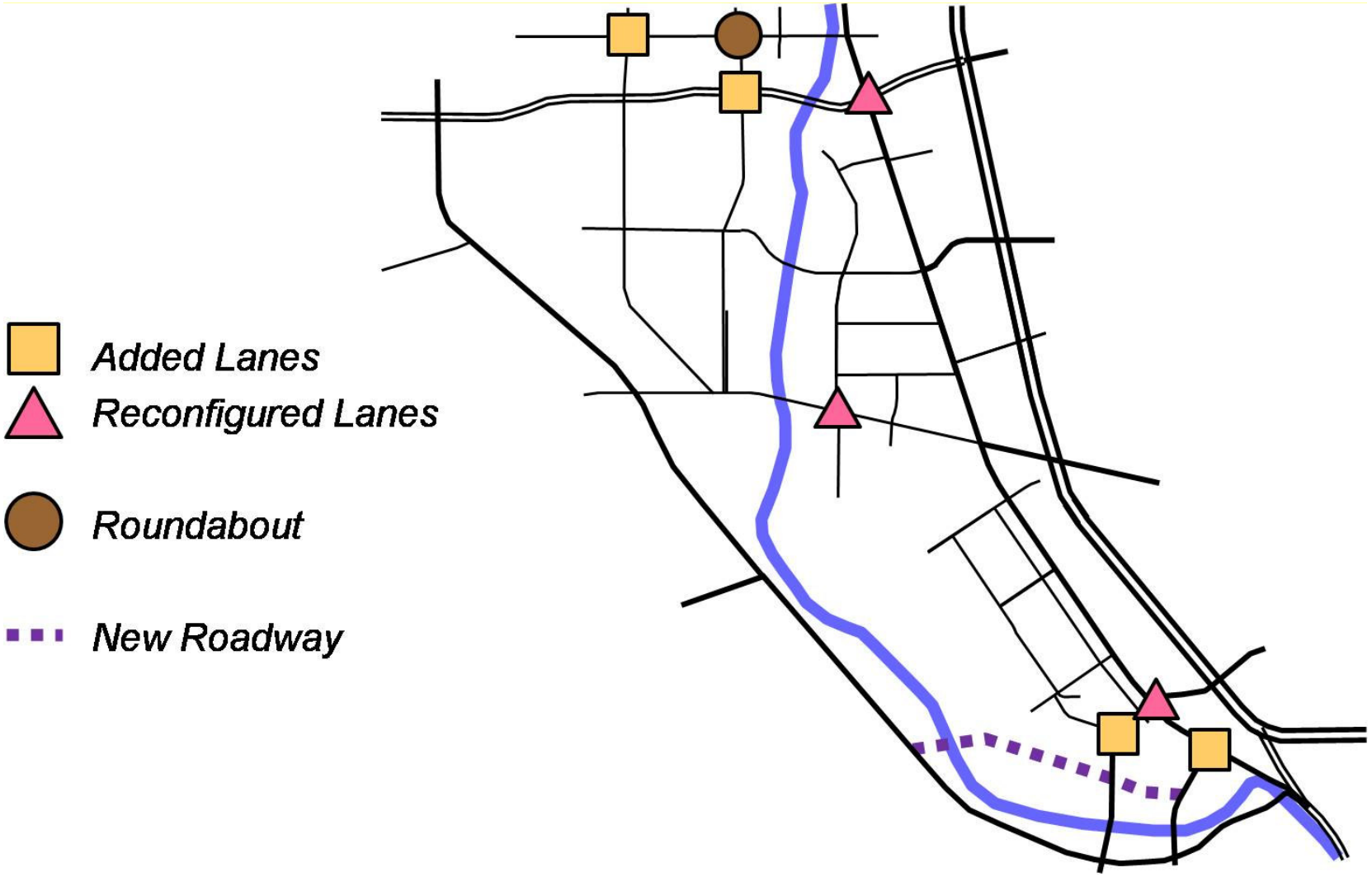


Figure 98: 2035 Transportation Improvements

The summaries of the recommended improvements for 2017, 2025 and 2035 with an opinion of probable cost appear in **Table 10 through Table 12**. The values are adjusted for time assuming a cost escalation factor of 5% per year and rounded to the nearest $1,000.

Table 10: 2017 Summarized List of Improvements		
Location	**Proposed Improvements**	**Opinion of Probable Cost**
Borderland at Westside	Single lane roundabout	$2,918,000
Borderland at Strahan	Single lane roundabout	$2,918,000
Artcraft at Upper Valley	Add second westbound left turn lane (approximately 250’ long)	$1,450,000
	Add 550' long southbound receiving lane south of Artcraft to accommodate second westbound left turn lane	$377,000
	Reconfigure eastbound approach to provide an additional eastbound thru lane beginning approximately 250' in advance of Upper Valley	$431,000
	Widen Artcraft immediately after Upper Valley to provide three thru lanes	$2,000
Artcraft at Desert SB	Reconfigure lanes on the bridge to provide a second westbound thru lane	$2,000
	Reconfigure westbound approach as two left turn and two through lanes	$344,000
	Add 220' southbound right turn bay	$2,000
Artcraft at Desert NB	Reconfigure existing westbound right turn lane as shared thru-right lane	$564,000
Country Club at Westside	Add 200' eastbound left turn bay	$237,000
Country Club at Montoya	Add 120' northbound right turn bay	$237,000
	Add 120' southbound right turn bay	$751,000
Country Club at Doniphan	Add 150' eastbound right turn bay	$323,000
	Add second southbound left turn lane (approximately 200’ long)	$482,000
Bird at Doniphan	Traffic signal	$237,000
	Add 120' eastbound right turn bay	$1,930,000
Frontera at Emory	Single lane roundabout	$718,000
Frontera at Doniphan	Add 120' eastbound right turn bay	$482,000
Gibson Veck at Sunland Park	Traffic signal	$718,000
Doniphan at Sunland Park	Add 120' eastbound left turn bay	$237,000
	Add 120' northbound right turn bay	$409,000
	Add second southbound left turn bay (approximately 280' long)	$2,918,000

Table 11: 2025 Summarized List of Improvements		
Location	Proposed Improvements	Opinion of Probable Cost
Borderland at Upper Valley	Add 120' northbound left turn bay	$838,000
Borderland at Strahan	Add second lane serving Borderland to roundabout	$2,518,000
Borderland from Strahan to Doniphan	Construct additional eastbound lane	$4,094,000
Borderland at Doniphan	Add 120' eastbound right turn bay	$361,000
	Add 120' westbound left turn bay	$361,000
	Add 120' southbound right turn bay	$361,000
Artcraft at Westside	Construct Artcraft as a four lane overpass with ramps connecting to Westside	$23,386,000
Artcraft at Upper Valley	Construct Artcraft as a four lane overpass with ramps connecting to Upper Valley	$23,386,000
Artcraft at IH 10	Construct direct connection ramps between IH 10 and the portion of Artcraft west of IH 10.	$75,552,000
Artcraft at Desert NB	Reconfigure the eastbound approach to provide a left turn and two thru lanes	$3,000
	Add 250' northbound right turn bay	$557,000
Doniphan at Montoya Rd	Add 120' eastbound right turn bay	$1,062,000
Doniphan at Montoya Ln	Add 120' westbound left turn bay	$350,000
Gomez at Westside	Multi-lane roundabout	$9,281,000
Gomez/Redd from Upper Valley to Montoya	Construct three lane roadway with shared use lanes and continuous left turn lane; construct bridge over Rio Grande	$73,026,000
Gomez at Upper Valley	Two lane roundabout	$10,323,000
Montoya at Redd	Two lane roundabout	$10,323,000
Doniphan at Redd	Add second northbound left turn lane (approximately 290' long)	$814,000
	Add 120' northbound right turn bay	$350,000
	Add additional southbound left turn lane (approximately 265' long)	$580,000
	Add 200' westbound right turn bay	$477,000
	Reconfigure existing westbound right turn lane to thru lane	$34,000
	Add 150' eastbound right turn bay	$398,000
Lindbergh at Montoya	Add 120' westbound right turn bay	$350,000
Country Club at Memory	Add 120' southbound right turn bay	$350,000
Emory at Sunset	Single lane roundabout	$2,101,000
Bird at Emory	Single lane roundabout	$2,376,000
Emory at Sunland Park	Construct as T-intersections connecting to Doniphan overpass frontage roads	$952,000
Doniphan at Sunland Park	Construct Sunland Park as a four lane overpass with frontage roads connecting to Doniphan	$39,218,000

Table 12: 2035 Summarized List of Improvements		
Location	Proposed Improvements	Opinion of Probable Cost
Borderland at Westside	Add second lane serving Westside to roundabout	$11,273,000
Borderland at Upper Valley	Single lane roundabout	$7,022,000
Artcraft at Upper Valley	Add 120' westbound right turn bay	$570,000
	Add 120' northbound right turn bay	$570,000
Artcraft at Doniphan	Reconfigure northbound approach to provide left turn, shared left-thru and thru lanes	$6,000
	Reconfigure westbound approach to provide left turn, shared thru-right and right turn lanes	$6,000
Country Club at Montoya	Realign Montoya to eliminate intersection offset	$9,605,000
Gibson Veck at Sunland Park	Add 120' westbound right turn bay	$860,000
	Add 120' southbound right turn bay	$570,000
Doniphan at Sunland Park	Reconfigure eastbound thru lane as shared thru-right lane	$6,000
Doniphan at Racetrack	Add 120' southbound right turn bay	$570,000

OTHER RECOMMENDATIONS

Timing and Funding of Improvements

The improvements identified and recommended for 2017 should be funded and implemented prior to that horizon year. Many of the recommended improvements are intended to mitigate congestion and delay, thus they would be considered appropriate candidates for Congestion Mitigation and Air quality (CMAQ) funding through the MPO and TxDOT. Therefore it is recommended that the findings of this study be presented to these agencies for consideration of including the recommended improvements in the Transportation Improvement Plan (TIP) as soon as possible and that local matching funds be identified and budgeted to match the schedule defined by the TIP.

Public Transportation

In order to improve safety and efficiency along the service routes in the Upper Valley, especially along Country Club, a review of the existing bus stops should be conducted. It may be possible to relocate or consolidate some of the stops minimizing conflicts along the roadway between stopped buses and moving traffic, yet remain relatively convenient to patrons. To facilitate transit service along the Country Club corridor, especially BRT vehicles, intelligent transportation systems (ITS) should be considered for implementation. Interconnecting the traffic signals, installing bus detection

hardware and implementing transit prioritization timing and phasing plans can reduce delays and improve service efficiencies. These in turn can lead to improved levels of ridership.

Pedestrian Safety

Where possible, consideration should be given to implementing wider sidewalks and bike and hike paths along the more utilized roadways. Additionally, existing roadway and trail intersections should be reviewed for possibly installing additional signing and pavement markings to alert roadway users to the intersection. Alternative geometric designs such as raised crosswalks, bulb outs or splitter islands with pedestrian refuges could be considered for select locations. Widening of existing bridges or the installation of new bridges to provide pedestrian facilities could better separate pedestrians from vehicular traffic.

Bicycle Safety

There are a significant number of cyclists who use the Upper Valley roadways and trails. As a minimum, the design of either new roadways or reconstruction of existing roadways should include wider outside lanes for shared use by bicyclists and motorists. Creating or enhancing walkability within a community also benefits bicyclists. The introduction of bike and hike paths better serves children riding bicycles and older cyclists who may not be comfortable riding in shared use lanes.

Roadway Safety

Where possible, locations with fixed objects or unprotected irrigation canals relatively close to roadways should be reviewed for potential improvements to reduce the risks associated with run-off-the-road crashes. As a minimum, street lighting should be considered for installation at all intersections, especially those along the more utilized roadways. All roundabouts should be adequately illuminated and the street lights installed as part of their construction.

Utilities

Although, the horizontal and vertical alignments are not being established by this study, impacts to existing utilities should be avoided or minimized during design. Any relocation of utilities located within TxDOT right-of-way should follow standards set forth in the TxDOT Utility Manual. Also, relocation of utilities should follow criteria of pertinent local government agencies and regulations by the utility owner.

Additional Studies

As with all transportation planning studies, another study of equivalent scope should be repeated in eight to ten years to validate the assumptions and recommendations for the 2025 and 2035 improvements and identify potential improvements for 2045. Additionally it may be appropriate to consider complementary studies of McNutt Road and IH 10 that integrate this study.

Community Outreach

Roadway users tend to not be concerned with jurisdictional boundaries; it is their expectation that their travel route will be safe and efficient no matter how many boundaries it crosses. Thus projects of mutual benefit that cross jurisdictions should be considered holistically and pursued through partnering. As the recommendations of this study are reviewed and move forward to potential implementation, the community should be encouraged to remain actively involved. Future design contracts should include scope and funding for stakeholder outreach and provide for community input into the design and construction process.

REFERENCES

1. *Americans with Disabilities Act - Architectural Barriers Act Accessibility Guidelines for Buildings and Facilities,* US Department of Justice, Washington, D.C. 2005.
2. *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities; An ITE Proposed Recommended Practice,* Institute of Transportation Engineers, Washington, D.C. 2006.
3. *Design and Safety of Pedestrian Facilities; An ITE Proposed Recommended Practice,* Institute of Transportation Engineers, Washington, D.C. 1998.
4. *A Guide for Achieving Flexibility in Highway Design,* American Association of State Highway and Transportation Officials, Washington, D.C. 2004.
5. *Guide for the Development of Bicycle Facilities,* American Association of State Highway and Transportation Officials, Washington, D.C. 1999.
6. *Guide for the Planning, Design, and Operation of Pedestrian Facilities,* American Association of State Highway and Transportation Officials, Washington, D.C. 2004.
7. *A Policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials, Washington, D.C. 2004.
8. *Manual on Uniform Traffic Control Devices,* Federal Highway Administration, Washington, D.C. 2003.
9. *Roundabouts: An Informational Guide,* Federal Highway Administration, Washington, D.C. 2000.
10. *Sun Metro Comprehensive Service Plan*, City of El Paso, El Paso, TX. 2008.
11. *Texas Accessibility Standards of the Architectural Barriers Act,* Texas Department of Licensing and Regulation, Austin, TX. 1994.
12. *Texas Manual on Uniform Traffic Control Devices,* Texas Department of Transportation, Austin, TX. 2006.
13. *Traffic Calming: State of the Practice,* Institute of Transportation Engineers, Washington, D.C. 1999.
14. *TransBorder 2035 Mobility Transportation Plan,* El Paso Metropolitan Planning Organization, El Paso, TX. 2007.

Upper Valley Traffic Study
El Paso, Texas

Summary Presentation

May 19, 2009

Purpose of Study

- **Determine existing traffic conditions**
- **Determine future traffic conditions**
  - **2017**
  - **2025**
  - **2035**
- **Determine improvement options to**
  - **Maintain acceptable levels of mobility**
  - **Provide context-sensitive solutions**

UVTS Meetings/Presentations

- **Initial Walter P. Moore Upper Valley Traffic Study presentation and LRC meeting was held January 14, 2009 with over 200 people attending**
- **167 questions/comments were collected**
- **UVTS summary presentation, given by Engineering at LRC meeting, was held March 25, 2009 with 63 attendees**
- **45 questions/comments were collected**
- **UVTS presentation given at CPC meeting held April 23, 2009**
- **Meetings and questions/comments were posted on the City website at:**

  http://www.elpasotexas.gov/engineering/upper_valley_traffic_study.asp

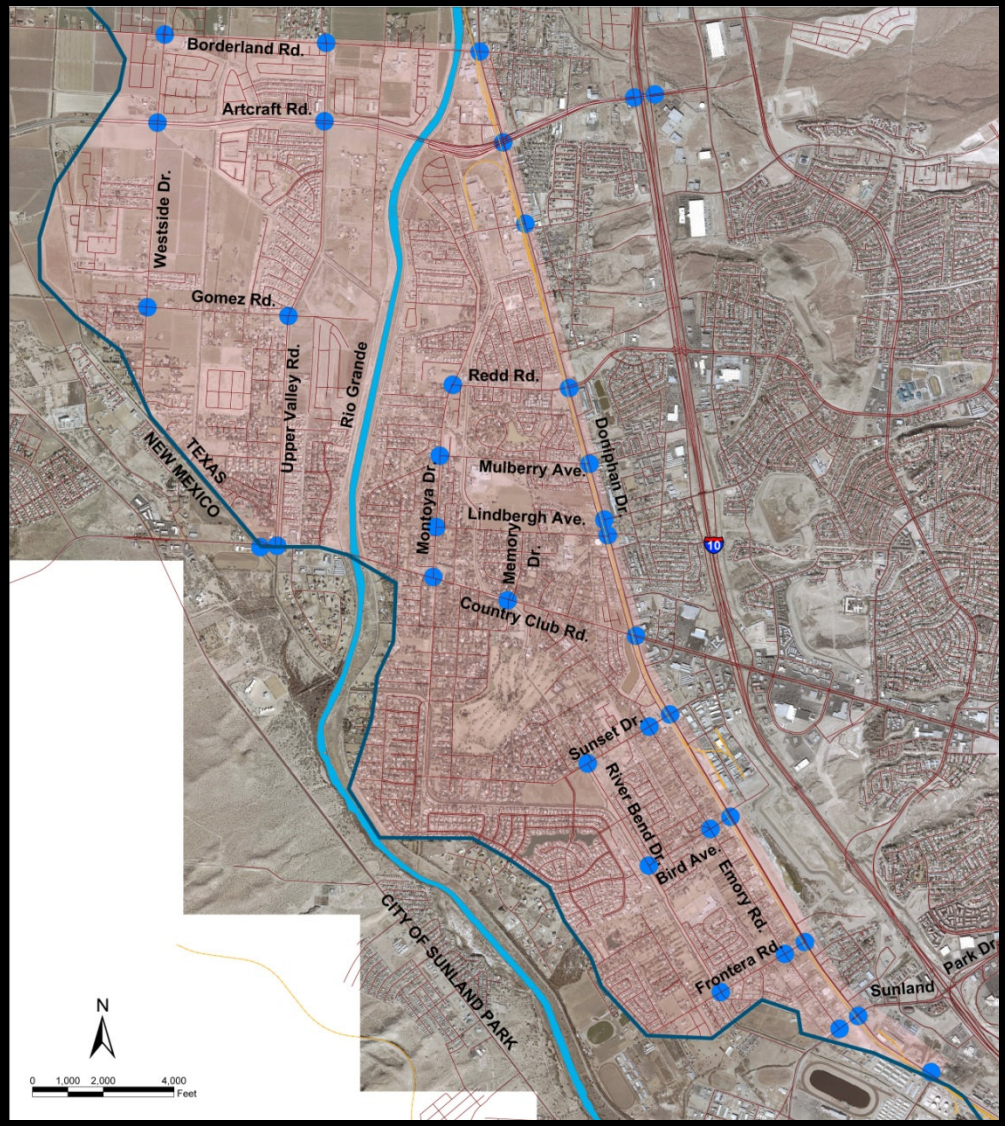
Outreach for Public Meetings

- **Walter P. Moore contacted Upper Valley Neighborhood Associations**
- **City Engineering sent out media advisories including LRC and CPC agendas**
- **Agendas posted on City website**

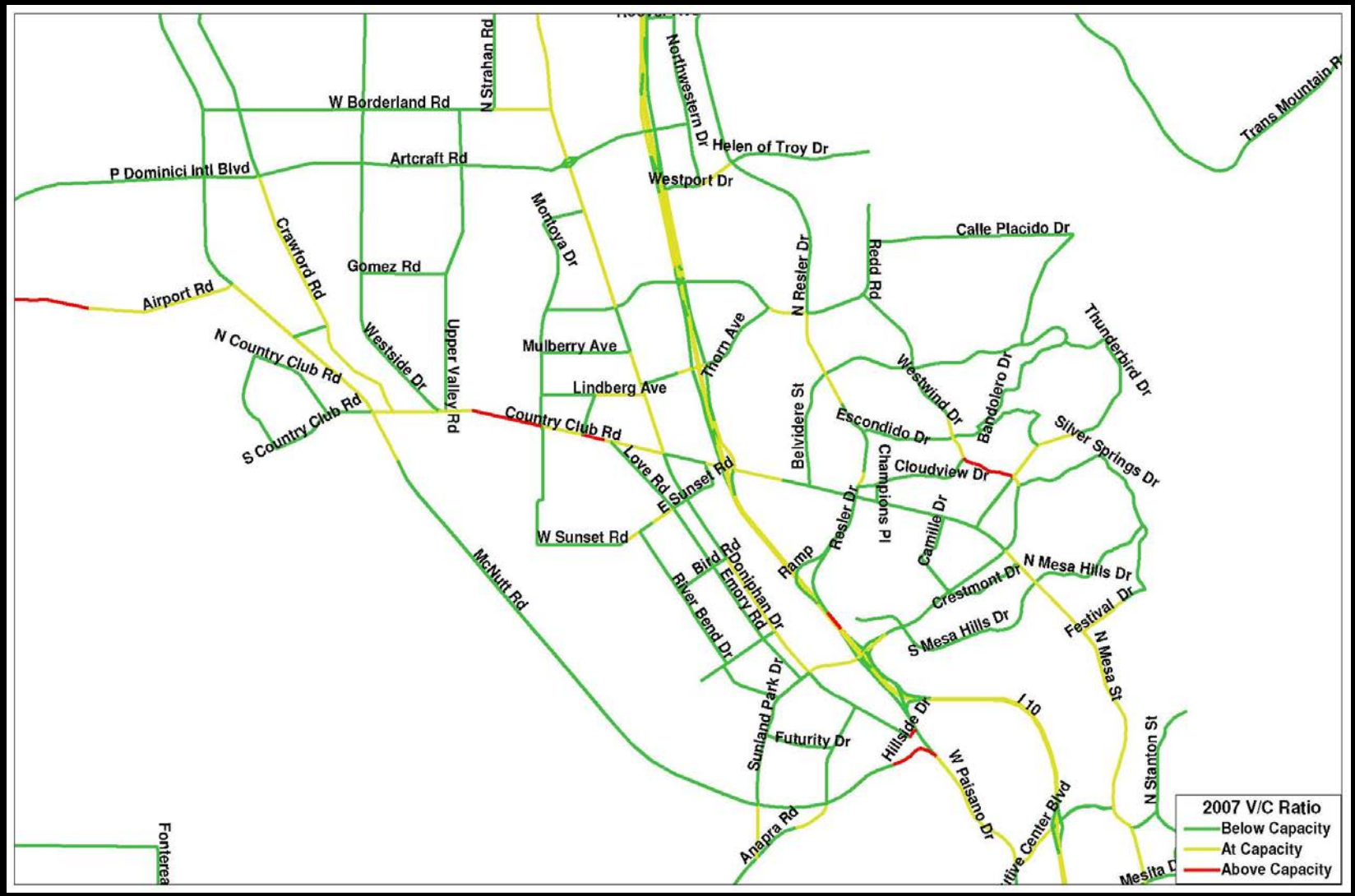
Study Area

- **General Boundaries**
  - **Borderland**
  - **Doniphan**
  - **Westside Drive**
  - **Racetrack**

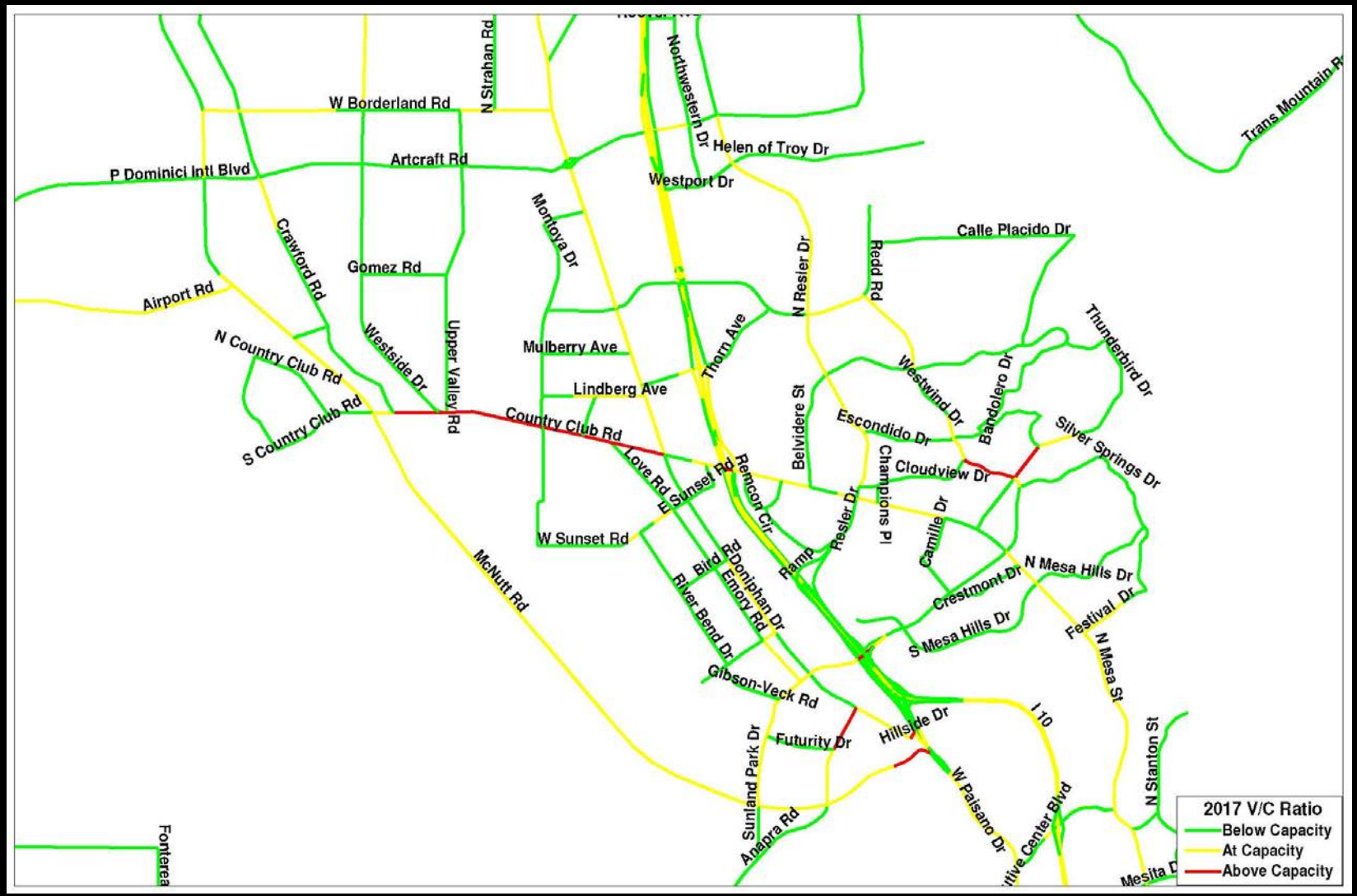
● ***Analyzed Intersection***



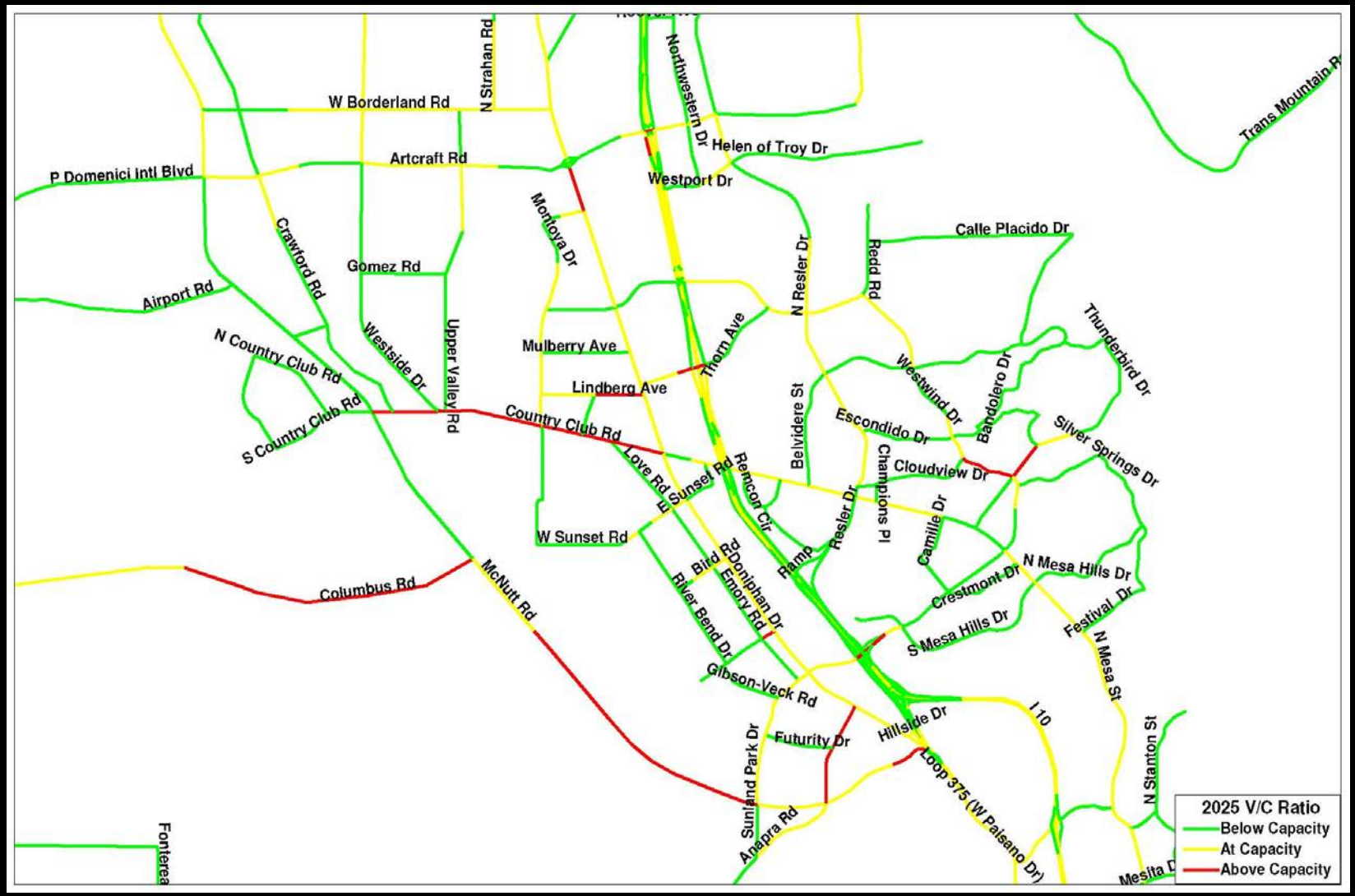
Upper Valley Region
2007 Traffic Estimates



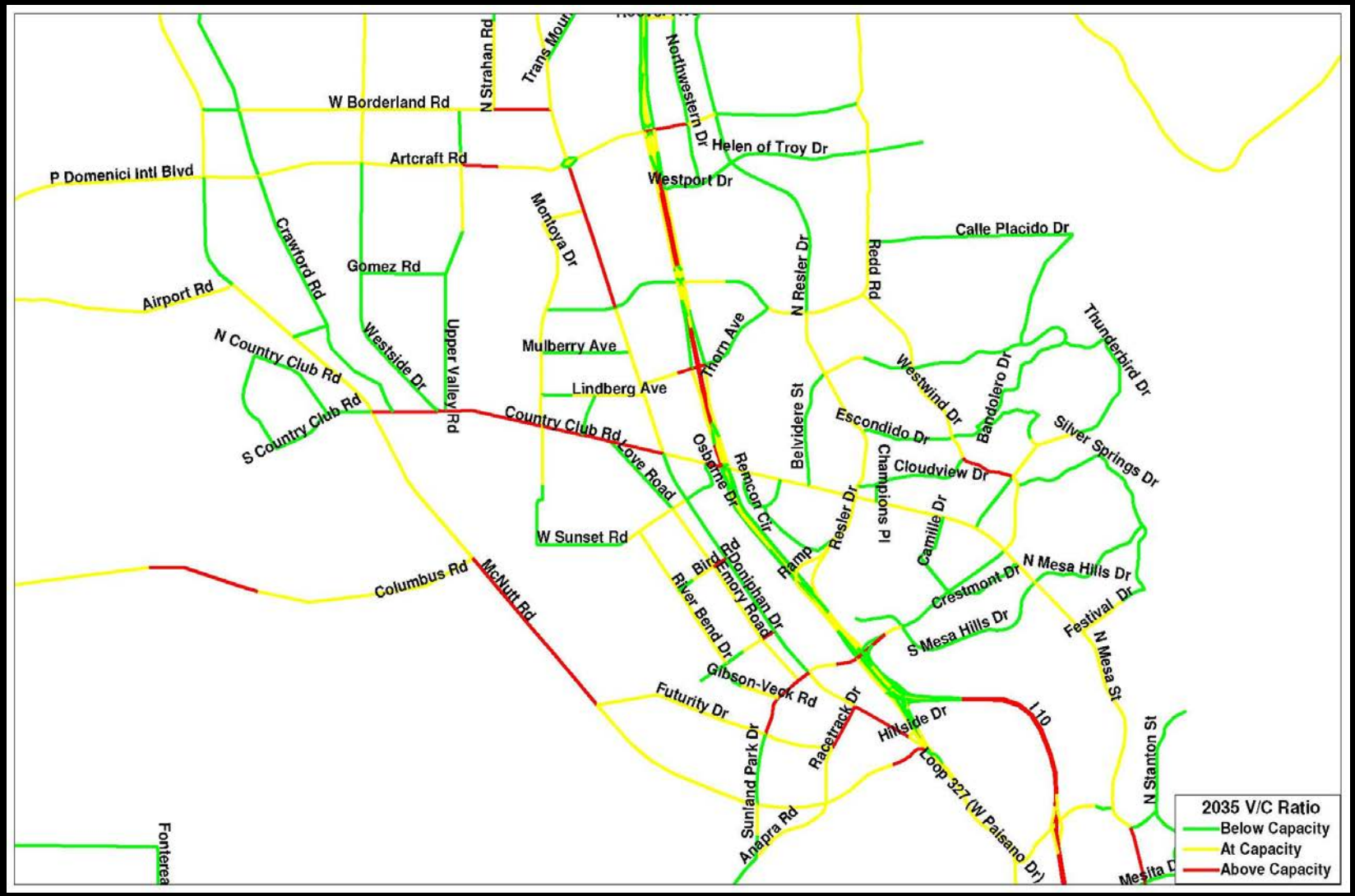
Upper Valley Region
2017 Traffic Estimates



Upper Valley Region
2025 Traffic Estimates



Upper Valley Region
2035 Traffic Estimates



Summary

- **Complete list of recommended Transportation Improvements are in Table 9 of the report.**
- **Recommended improvements for 2017, 2025 and 2035 with an opinion of probable cost appear in Table 10 – Table 12 of the report.**

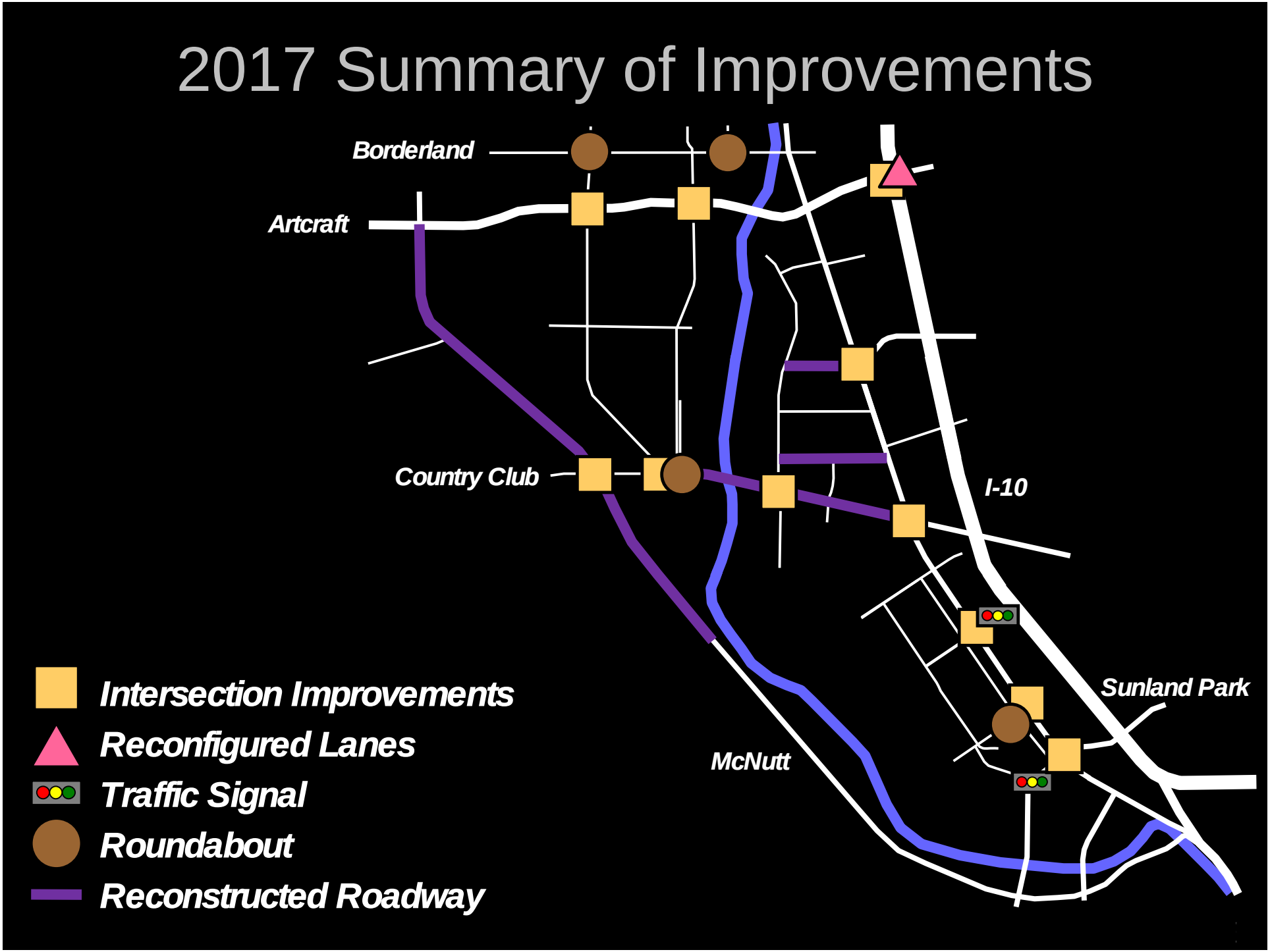
Overview of Recommended Improvements

- **Intersection Improvements through Additional Lanes**
- **Signalized Intersections**
- **Modern Roundabouts**
- **Grade-separated Intersections**
- **Corridor development using Context Sensitive Solutions**
- **Facilitation of Public Transportation**
- **Development of Bicycle and Pedestrian Facilities**

Priority of Projects

- **Overall, projects are scheduled to meet the demands of anticipated traffic by the design year. Most projects are scheduled for completion by 2017 and 2025.**
- **The City will advance projects from future design years if funding becomes available for planning, design, or construction**
- **Within the design year, projects will be prioritized in terms of cost, impact and construction timeline**
  - **Low cost, low impact, easily constructible**
  - **Medium cost items such as roundabouts and signals**
  - **Big-ticket items such as overpasses or new roadways**

2017 Summary of Improvements



Recommended Prioritization for 2017

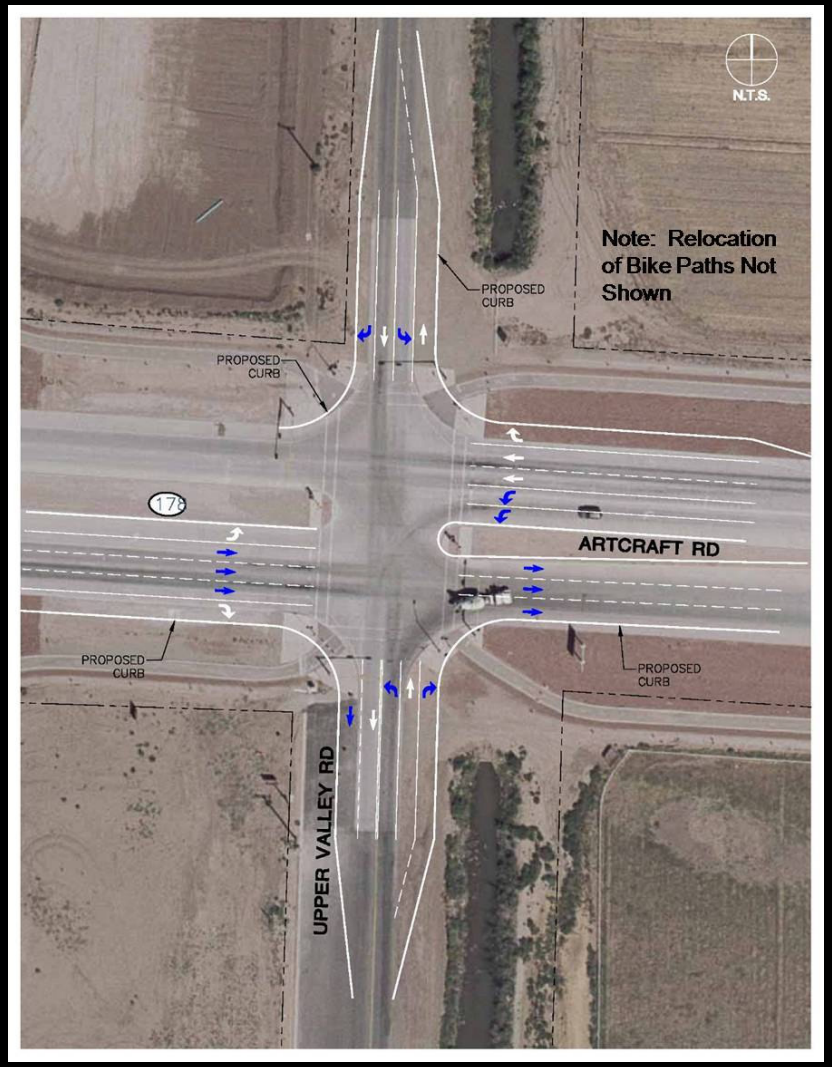
- **Lane reconfiguration at**
  - **Artcraft & Upper Valley, Desert South, Desert North**
- **Additional lanes at intersections for left turn and/or right turn bays at**
  - **Artcraft & Westside, Upper Valley, Desert South**
  - **Country Club & Westside, Montoya, Doniphan**
  - **Doniphan & Bird, Frontera, Sunland Park**
- **Signalized intersections at**
  - **Doniphan & Bird, Sunland Park & Gibson Veck**

Recommended Prioritization for 2017

- **Modern roundabouts at**
  - **Borland & Westside, Borderland & Strahan, Country Club & Upper Valley/River run**
- **Reconstruction for additional lanes at**
  - **Artcraft eastbound from Upper Valley to Desert South**
  - **Redd from Doniphan to Fernwood Circle**
  - **Country Club from River Run to Doniphan**

Conceptual Design for Adding Lanes at Lindbergh and Montoya

Conceptual Design for Adding Lanes at Artcraft and Upper Valley



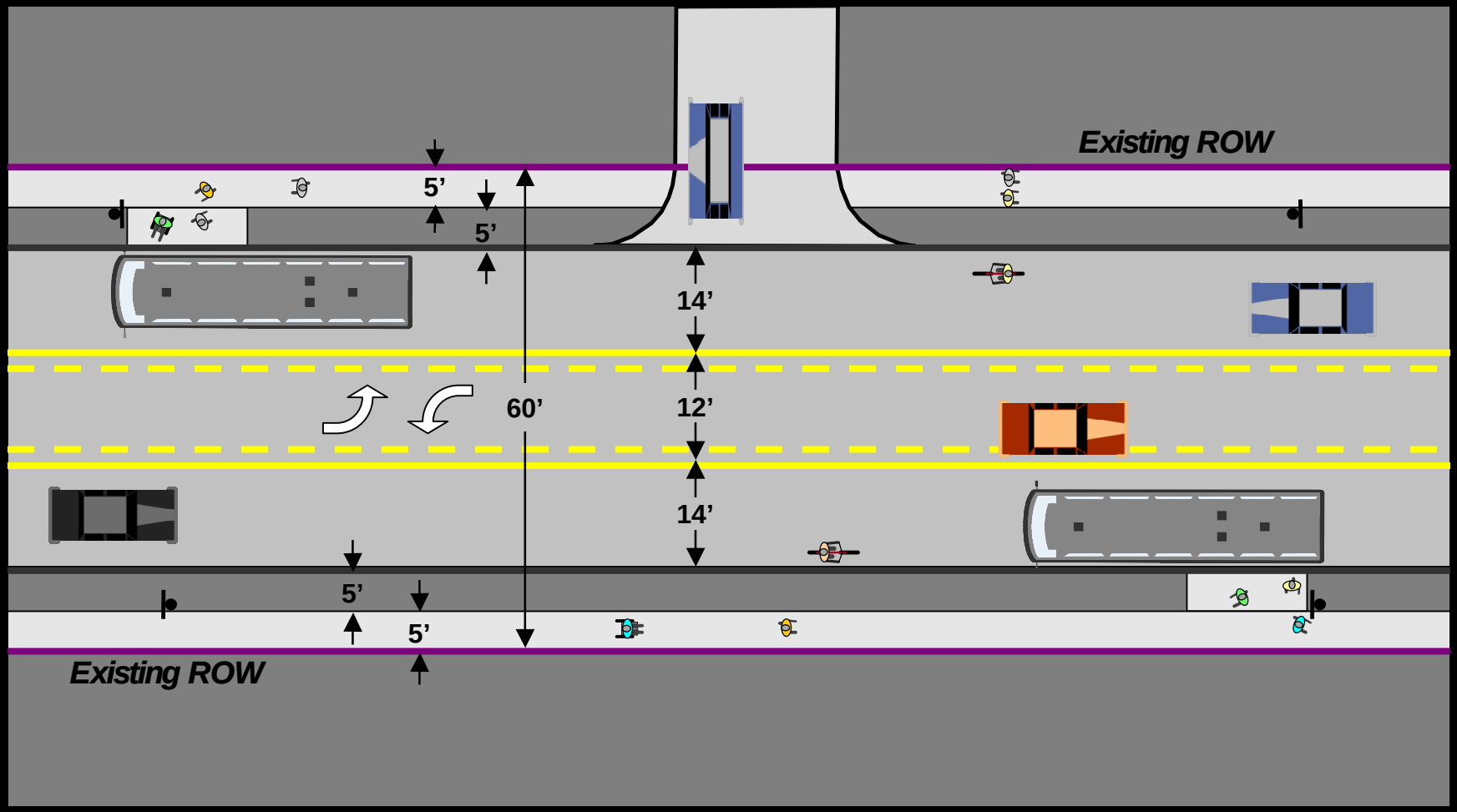
Conceptual Design for a Single Lane Roundabout Along Borderland

Design Of Country Club

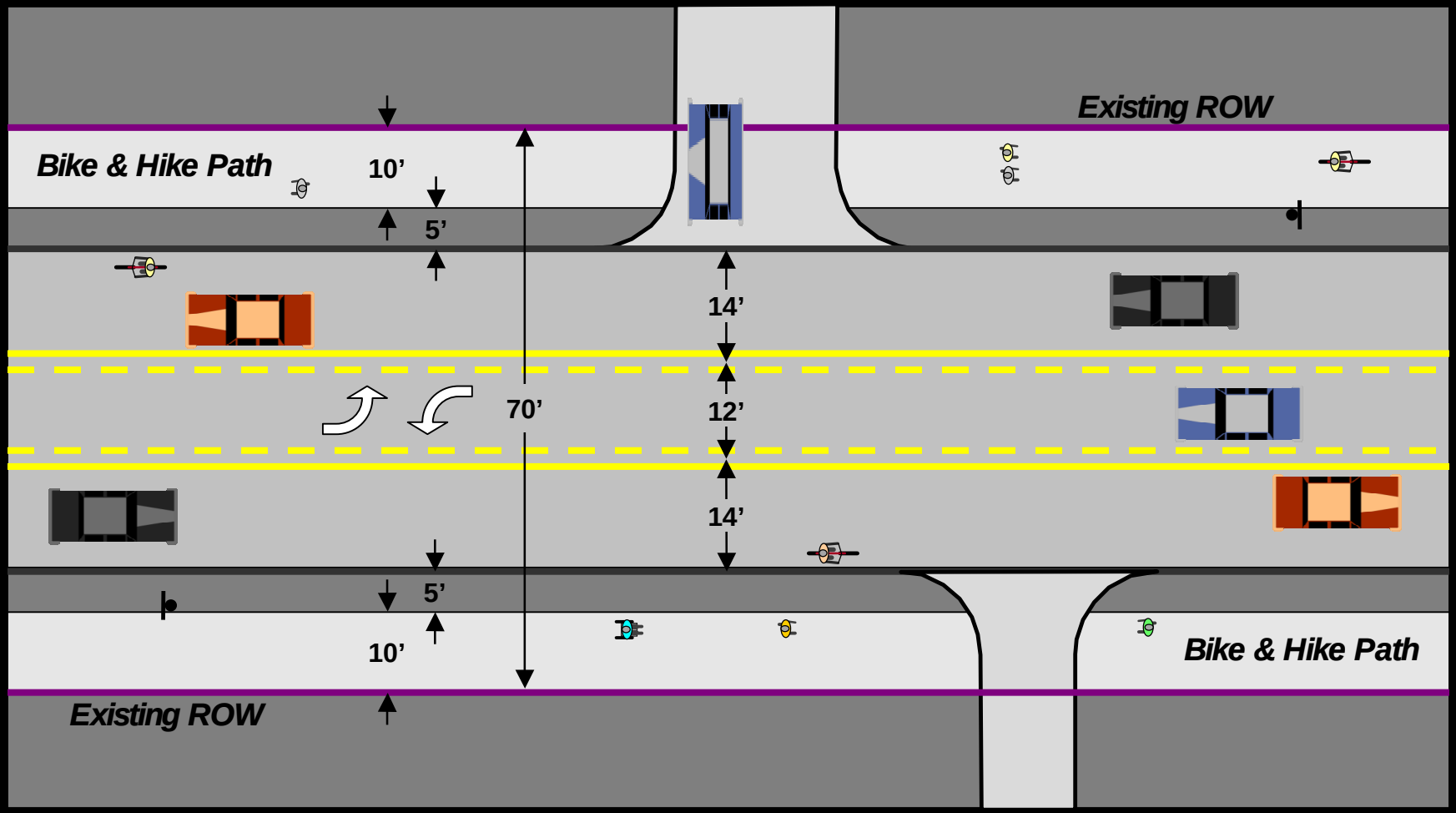
- **Study considered three alternatives for the design of Country Club**
  - **For areas of 60’ ROW – 3 lane roadway with a continuous left turn lane, sidewalks and curbside bus stops**
  - **For areas of 70’ ROW – 3 lane roadway with a continuous left turn lane, bike and hike paths in lieu of the sidewalks and curbside bus stops**
  - **For areas of 80’ ROW - 3 lane roadway with a continuous left turn lane, bike and hike paths and pull-out bus stops**

Country Club Right-of-Way

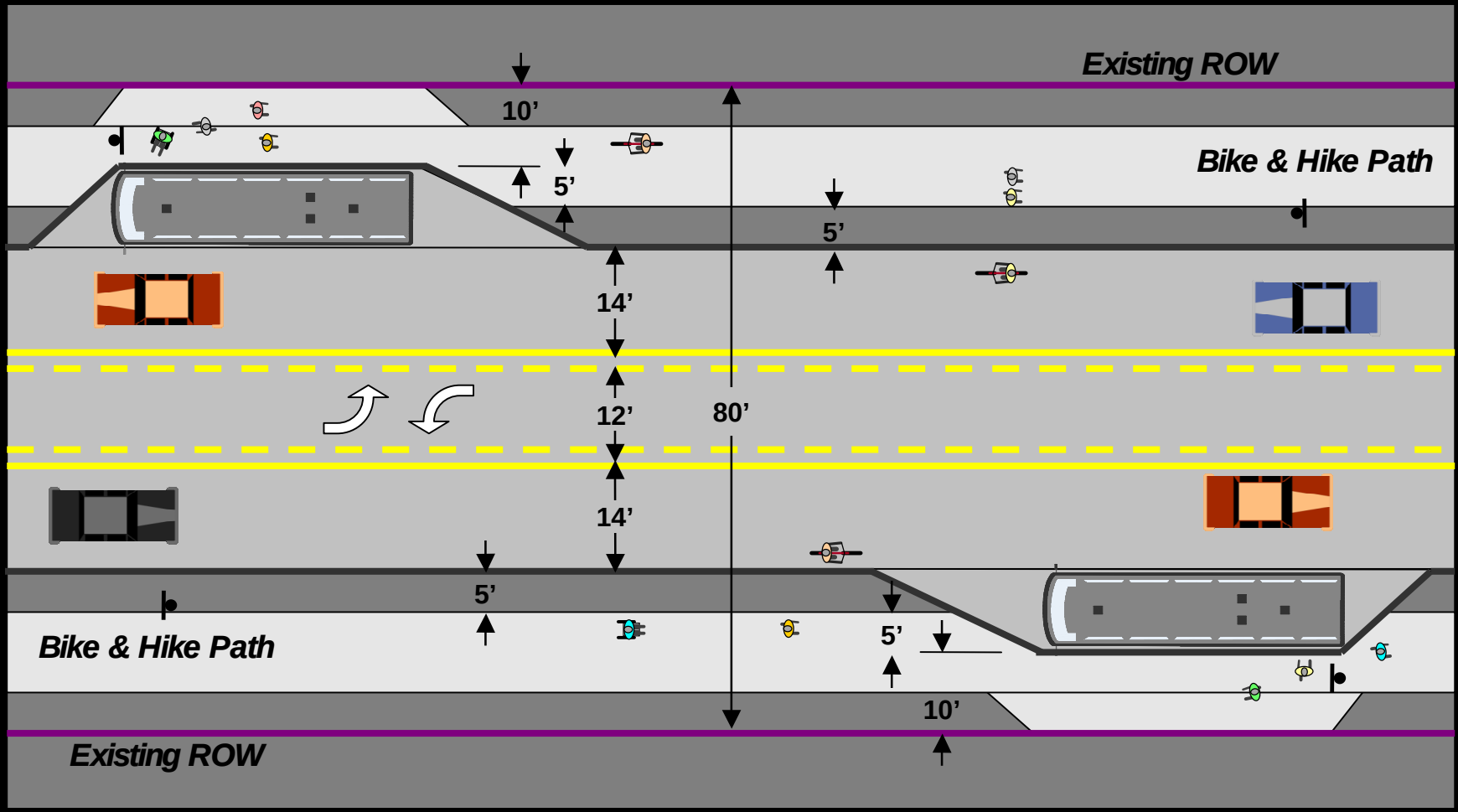
Recommended Option Within 60’ ROW Shared-Use Lanes, Sidewalks, Bus Stops at Country Club



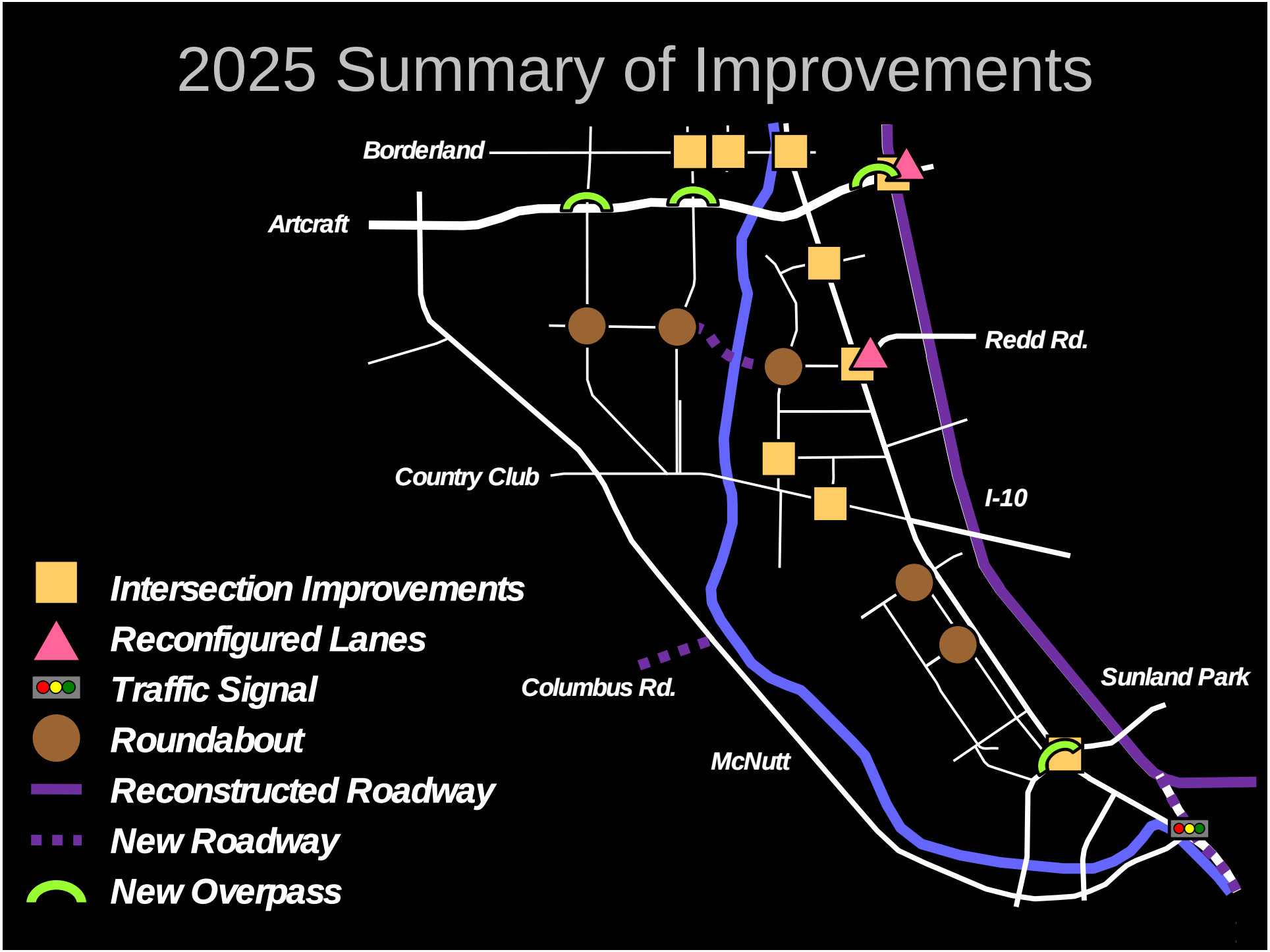
Recommended Option Within 70’ ROW Shared-Use Lanes and Bike & Hike Paths at Country Club



Recommended Option within 80’ ROW Shared-Use Lanes, Bike & Hike, Bus Stops at Country Club



2025 Summary of Improvements



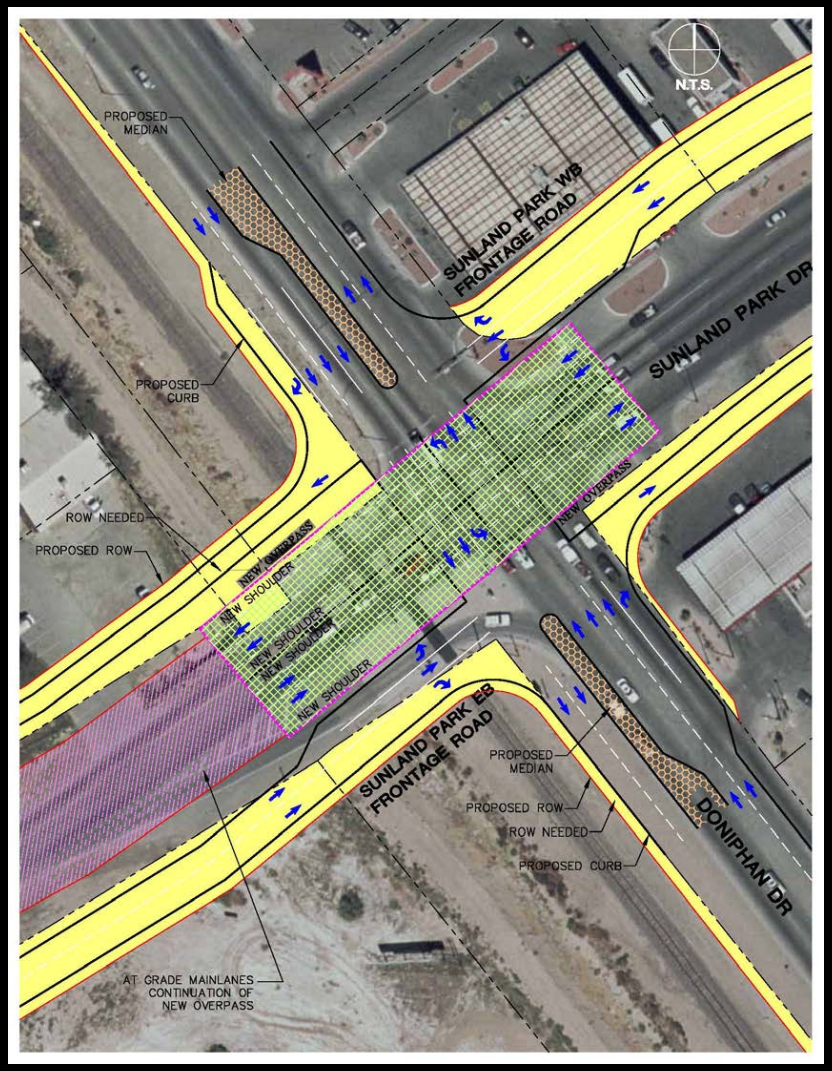
Recommended Prioritization for 2025

- **Lane reconfiguration at**
  - **Artcraft & Desert North, Doniphan & Redd**
- **Additional lanes at intersections for left turn and/or right turn bays at**
  - **Borderland & Upper Valley, Doniphan**
  - **Doniphan & Montoya, Redd, Thorn, Country Club**
  - **Artcraft & Desert North**
- **Modern roundabouts at**
  - **Gomez & Westside, Gomez & Upper Valley, Montoya & Redd, Emory & Sunset, Bird & Emory**

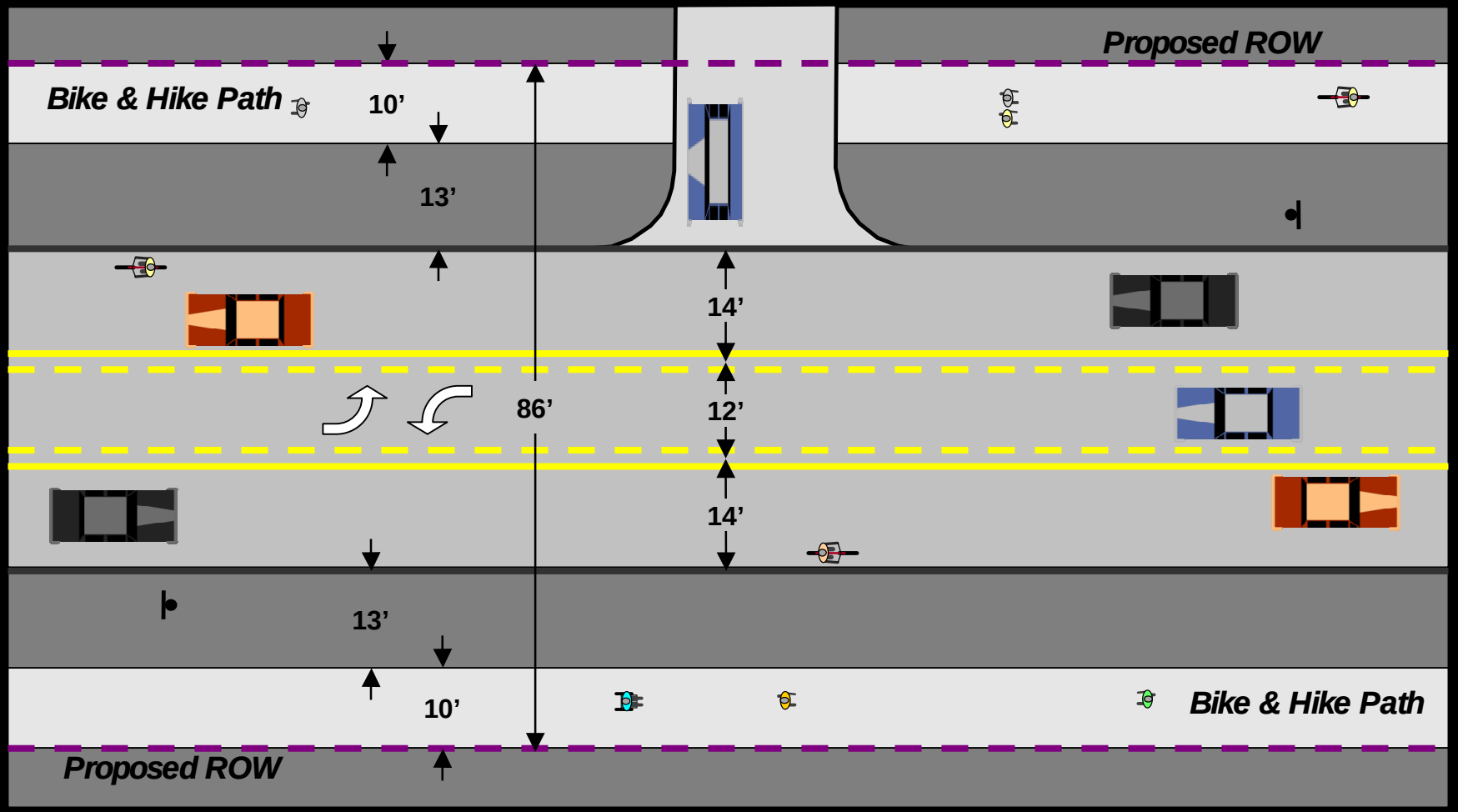
Recommended Prioritization for 2025

- **Reconstruction for additional lanes at**
  - **Gomez/Redd from Upper Valley to Montoya**
- **Overpasses at**
  - **Artcraft & Westside, Artcraft & Upper Valley, Artcraft & Desert South, Doniphan & Sunland Park**

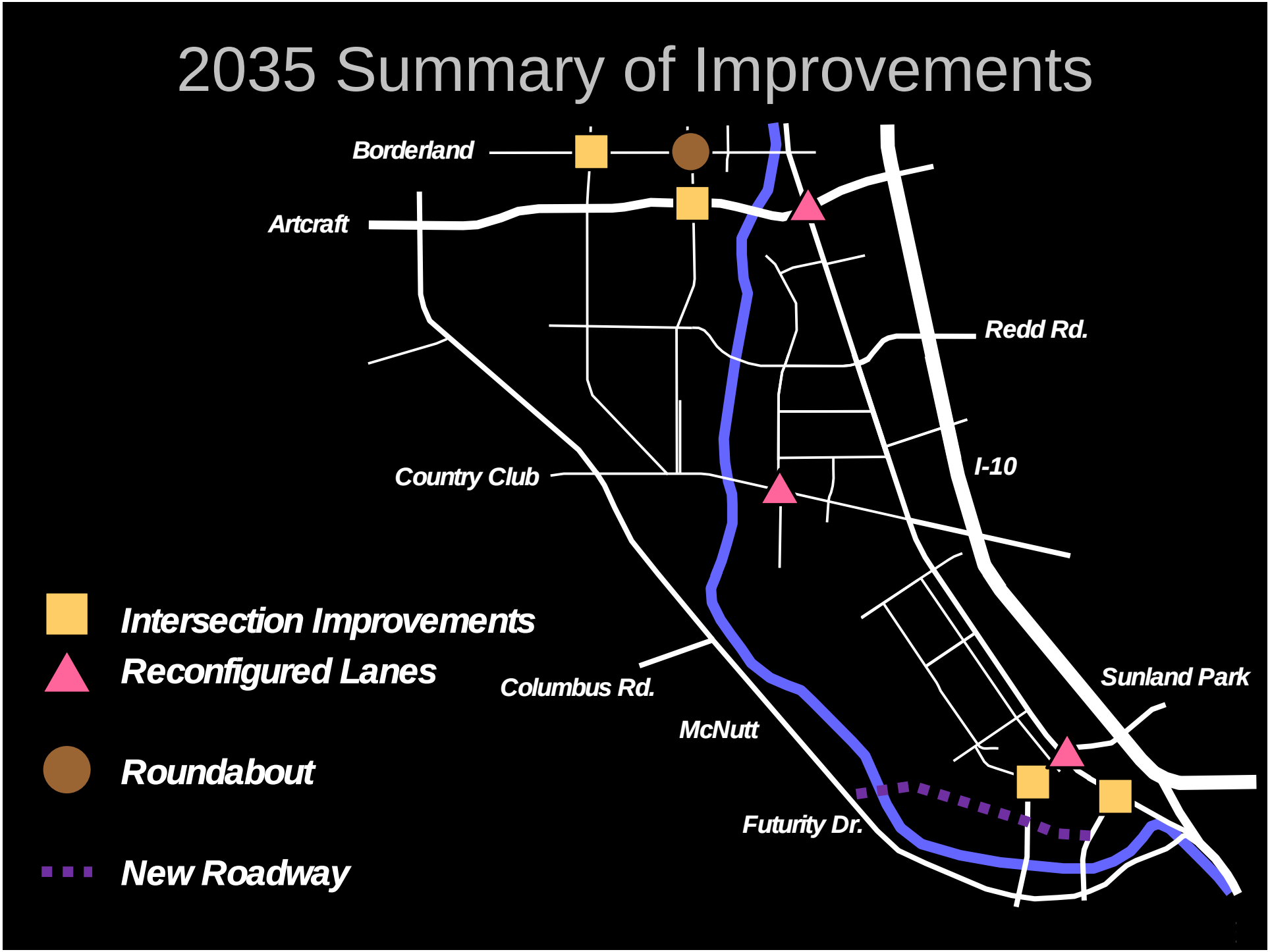
Conceptual Design for an Overpass at Doniphan and Sunland Park



Recommended Option for Redd Road Three Lanes with Shared-Use Lane



2035 Summary of Improvements



Recommended Prioritization for 2035

- **Lane reconfiguration at**
  - **Artcraft & Doniphan, Doniphan & Sunland Park**
- **Additional lanes at intersections for left turn and/or right turn bays at**
  - **Artcraft & Upper Valley, Gibson Veck & Sunland Park, Doniphan & Racetrack**
- **Additional lanes for roundabouts at**
  - **Borderland & Westside**
- **Realignment of Montoya at Country Club**
- **Modern roundabout at Borderland & Upper Valley**

Conceptual Design for Realigning Montoya at Country Club

Transit Analysis

- BRT is anticipated along Mesa with circulator service along Country Club and the Upper Valley area
- Sun Metro provided transit ridership for this area and it was included in the TransCAD model provided by MPO
- Proposed roadway improvements that can can lead to increased levels of ridership include
  - bike and hike paths
  - Relocating/consolidating existing bus stops to minimize conflicts and increase efficiency
  - implementing ITS features such as bus priority detection and traffic signal interconnect to reduce delays and improve efficiency
- Projected house density and ridership does not require dedicated bus lanes at this time nor reduce the number of roadway lanes or roadway connections

Conclusions

- **The study achieved the objective of safety, mobility and future growth by using context sensitive solutions**
  - **The needs of all roadway users; bicyclists, pedestrians, motorists, and transit; were considered**
  - **Design options which require minimal or no additional right-of-way were explored**
  - **Improvement strategies that are in context with the corridors and intersections where they are proposed were developed**
- **An Upper Valley roadway network plan designed to maintain an acceptable level of service has been provided**

Public Question Overview

- **Country Club Rd. concerns involved right of way issues, eminent domain, trees, tolling and success of proposed cross section**
  - **The proposed cross section of Country Club remains wholly within its current right of way.**
  - **Eminent domain is not contemplated for this project**
  - **Designs presented are intended to offer options that minimize impacts to existing trees such as meandering of sidewalks. Landscaping design will be part of the project**
  - **Country Club will operate at acceptable levels of service provided proposed improvements are made**
  - **Tolling would encourage more traffic to use residential streets and is not being considered**

Public Question Overview

- **Why expand Redd Rd.?**
  - **Providing Redd Rd. as an alternate route to Country Club and Artcraft will better distribute traffic in the area and provide an additional east/west connection**
- **Why is New Mexico not doing anything?**
  - **New Mexico plans to widen McNutt to four lanes from just south of Country Club to Peter Domenici International Highway. Improvements are also planned at Country Club & McNutt. New Mexico project listing can be accessed at:**

http://www.elpasotexas.gov/engineering/upper_valley_traffic_study.asp

Staff Recommendations

- **Plan follow up study, with stakeholder inclusion, in 8-10 years to validate future recommendations**
- **Approve the list of projects by program year and program improvements for funding**

- **Approval and adoption of this study as the Traffic Improvement Plan for the Upper Valley by City Council.**

Board/Commission Recommendations

- **At the first presentation, LRC members recommended a 2nd LRC meeting to be held due to the number of questions that needed to be answered by the consultant and engineering**
- **At the 2nd presentation, LRC members approved and recommended study to the CPC**
- **At the 3rd presentation, CPC members approved and recommended the study to City Council with the following modification: "that the traffic study include recommendations to alter our long range plan for the Upper Valley in order to address, through planning and zoning, changes that would mitigate the traffic currently included in the plan for the longer term".**

Table 9: Summary of Transportation Improvements			
Location	**Proposed 2017 Improvements**	**Proposed 2025 Improvements**	**Proposed 2035 Improvements**
Borderland at Westside	Single lane roundabout	No changes	Add second lane serving Westside to roundabout
Borderland at Upper Valley	No changes	Add 120' northbound left turn bay	Single Lane roundabout
Borderland at Strahan	Single lane roundabout	Add second lane serving Borderland to roundabout	No changes
Borderland from Strahan to Doniphan	No changes	Construct additional eastbound lane	No changes
Borderland at Doniphan	No changes	Add 300' eastbound left turn bay	No changes
		Add 120' eastbound right turn bay	
		Add 120' westbound left turn bay	
		Add 120' southbound right turn bay	
Artcraft at Westside	Add 160' northbound left turn bay (City of El Paso planned improvement)	Construct Artcraft as a four lane overpass with ramps connecting to Westside.	No changes
	Add 160' southbound left turn bay (City of El Paso planned improvement)		
Artcraft at Upper Valley	120' northbound left turn bay (City of El Paso planned improvement)	Construct Artcraft as a four lane overpass with ramps connecting to Upper Valley.	Add 120' westbound right turn bay
	120' northbound right turn bay (City of El Paso planned improvement)		Add 120' northbound right turn bay
	120' southbound left turn bay (City of El Paso planned improvement)		
	120' southbound right turn bay (City of El Paso planned improvement)		
	Add second westbound left turn lane (approximately 250' long)		
	Add 660' long southbound receiving lane south of Artcraft to accommodate second westbound left turn lane		
	Reconfigure eastbound approach to provide an additional eastbound thru lane beginning approximately 260' in advance of Upper Valley		
	Widen Artcraft immediately after Upper Valley to provide three thru lanes		
Artcraft at Doniphan	No changes	No changes	Reconfigure northbound approach to provide left turn, shared left-thru and thru lanes
			Reconfigure westbound approach to provide left turn, shared thru-right and right turn lanes
IH 10 from south of study area to north of study area	No changes	Widen IH 10 to six lanes (TxDOT planned improvement)	No changes
Artcraft at Desert SB	Reconfigure lanes on the bridge to provide a second westbound thru lane	Construct U-turn lanes (TxDOT planned improvement)	No changes
	Reconfigure westbound approach as two left turn and two through lanes	Construct direct connection ramps between IH 10 and the portion of Artcraft west of IH 10	
	Add 220' southbound right turn bay		
Artcraft at Desert NB	Reconfigure existing westbound right turn lane as shared thru-right lane	Reconfigure the eastbound approach to provide a left turn and two thru lanes	No changes
		Add a 260' northbound right turn bay	
Doniphan at Montoya Rd	No changes	Add 120' eastbound right turn bay	No changes
Doniphan at Montoya Ln	No changes	Add 120' westbound left turn bay	No changes
Gomez at Westside	No changes	Multi-lane roundabout	No changes
Gomez at Upper Valley	No changes	Two lane roundabout	No changes
Gomez/Redd from Upper Valley to Montoya	No changes	Construct three lane roadway with shared use lanes and continuous left turn lane; construct bridge over Rio Grande	No changes
Montoya at Redd	No changes	Two lane roundabout	No changes
Redd from Doniphan to Fernwood Circle	Reconstruct Redd to five lanes (City of El Paso planned improvement)	No changes	No changes

Table 9: Summary of Transportation Improvements (continued)			
Location	Proposed 2017 Improvements	Proposed 2026 Improvements	Proposed 2036 Improvements
Doniphan at Redd	Reconstruct Redd to five lanes (City of El Paso planned improvement)	Add second northbound left turn bay (approximately 290' long) Add 120' northbound right turn bay Add additional southbound left turn lane (approximately 285' long) Add 200' westbound right turn bay Reconfigure existing westbound right turn lane to thru lane Add 150' eastbound right turn bay	No changes
Montoya at Mulberry	No changes	No changes	No changes
Doniphan at Mulberry	No changes	No changes	No changes
Lindbergh at Montoya	No changes	Add 120' westbound right turn bay	No changes
Doniphan at Thorn	No changes	No changes	No changes
Doniphan at Lindberg	No changes	No changes	No changes
McNutt from Peter Domenici to Rio Grande bridge	Widen McNutt to four lanes (NMDOT planned improvement)	No changes	No changes
Country Club at McNutt	Additional main lanes and auxiliary lanes (NMDOT planned improvement)	No changes	No changes
Country Club at Westside	Add 200' eastbound left turn bay	No changes	No changes
Country Club at Upper Valley/ River Run	Construct roundabout (City of El Paso planned improvement)	No changes	No changes
Country Club from River Run to Doniphan	Construct three lane roadway with shared use lanes and continuous left turn lane (City of El Paso planned improvement)	No changes	No changes
Country Club at Montoya	Add 120' northbound right turn bay Add 120' southbound right turn bay	No changes	Realign Montoya to eliminate intersection offset
Country Club at Memory	No changes	Add 120' southbound right turn bay	No changes
Country Club at Doniphan	Add 150' eastbound right turn bay Add second southbound left turn lane (approximately 200' long)	No changes	No changes
Sunset at Riverbend	No changes	No changes	No changes
Emory at Sunset	No changes	Single lane roundabout	No changes
Doniphan at Sunset	No changes	No changes	No changes
Bird at Riverbend	No changes	No changes	No changes
Bird at Emory	No changes	Single lane roundabout	No changes
Bird at Doniphan	Traffic signal Add 120' eastbound right turn bay	No changes	No changes
Frontera at Riverbend	No changes	No changes	No changes
Frontera at Emory	Single lane roundabout	No changes	No changes
Frontera at Doniphan	Add 120' eastbound right turn bay	No changes	No changes
Columbus Road east of McNutt	No changes	Construct roadway (Planned improvement per MPO)	No changes
Gibson Veck at Sunland Park	Traffic signal	No changes	Add 120' westbound right turn bay Add 120' southbound right turn bay
Emory at Sunland Park	No changes	Construct as T-intersections connecting to Doniphan overpass frontage roads	No changes
Doniphan at Sunland Park	Add 120' eastbound left turn bay Add 120' northbound right turn bay Add second southbound left turn bay (approximately 280' long)	Construct Sunland Park as a four lane overpass with frontage roads connecting to Doniphan	Reconfigure eastbound thru lane as shared thru-right lane
Futurity from Racetrack to McNutt	No changes	No changes	Construct roadway (Planned improvement per MPO)
Doniphan at Racetrack	No changes	No changes	Add 120' southbound right turn bay
Doniphan at Racetrack Ramp	No changes	Traffic signal (TxDOT planned improvement - US 375 extension)	No changes
US 375 at Racetrack Ramps	No changes	Traffic signal (TxDOT planned improvement - US 375 extension)	No changes