

Town of Gypsum



Master Traffic Study January, 2008



FELSBURG
HOLT &
ULLEVIG

engineering paths to transportation solutions

TOWN OF GYPSUM
MASTER TRAFFIC STUDY

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I. INTRODUCTION

Located along the I-70 Mountain Corridor, the Town of Gypsum is centered within a region of high demand for housing and recreation. **Figure 1** illustrates the location of Gypsum relative to regional transportation facilities. With close proximity to the resort areas around Aspen and Vail, Gypsum has experienced an influx of new developments in recent years. Continuing pressures for growth have sparked concerns that the resultant increases in traffic volumes, and associated congestion and safety issues, could alter the quality of life in this mountain community.

To ensure the ability of Gypsum's transportation infrastructure to accommodate the growing demand, the Town has initiated this Master Traffic Study to evaluate current traffic conditions, estimate future traffic volumes and impacts, identify needed improvements, and estimate the associated planning level costs. Upon acceptance by the Town, the findings and recommendations of the Study will be incorporated into the Town's Comprehensive Plan. Specific analytic tasks of the Study include:

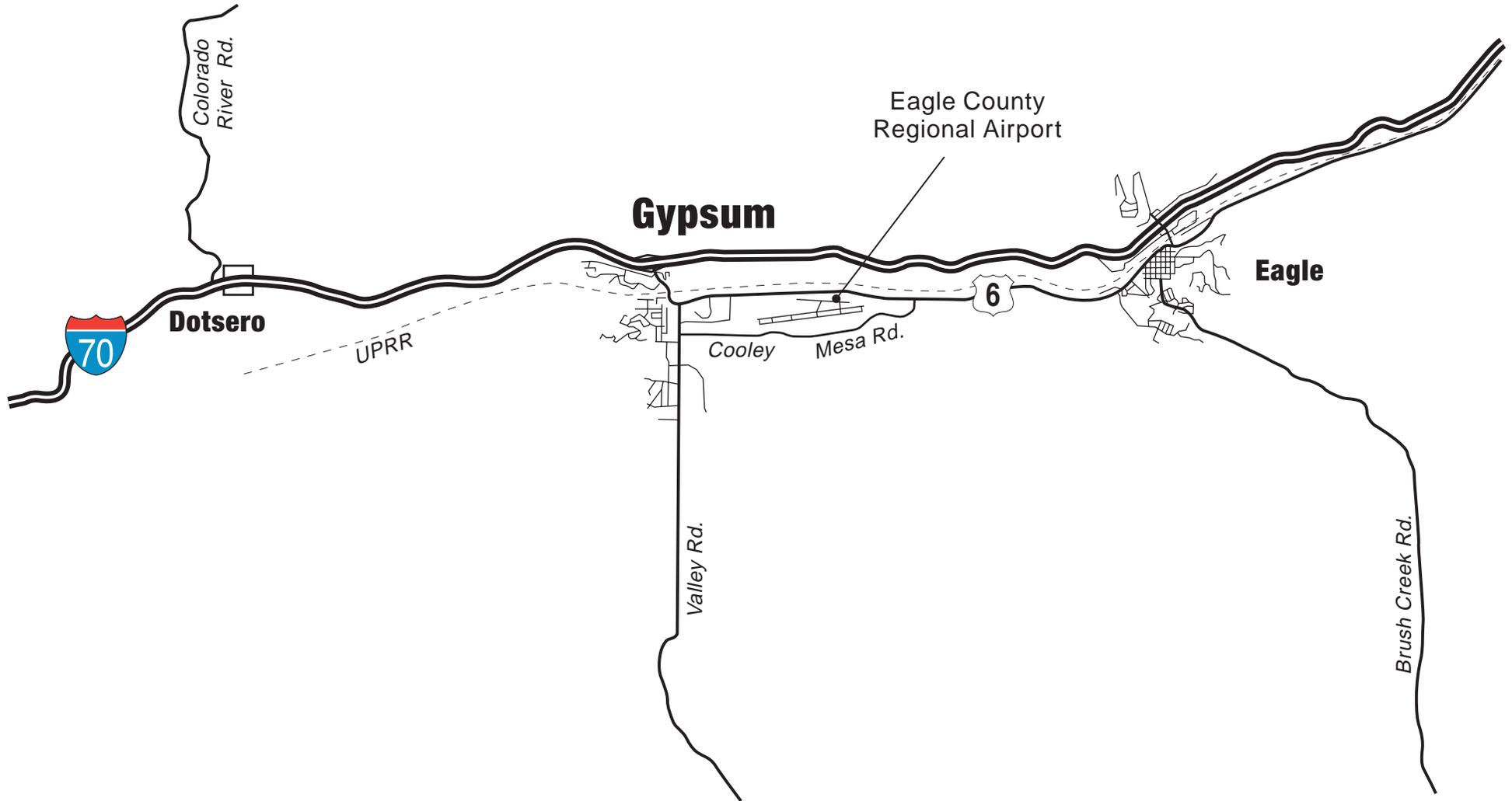
- ▶ A comprehensive roadway and traffic data collection effort.
- ▶ A trip generation analysis of future land use trends as defined by the Town, and development of a computer model to assign future traffic volumes to the roadway network.
- ▶ An analysis of the capacity requirements resulting from the traffic generated by ongoing phases of development and preliminary opinions of probable cost to implement the identified improvements.
- ▶ An assessment of existing and future pedestrian needs with recommendations for safety and connectivity enhancements.
- ▶ An evaluation of increased transit service requirements relative to bus schedules, additional bus stops, and parking facilities.

Based on the above data collection and traffic engineering analyses, the Study incorporates the following elements:

- ▶ A Five-Year Capital Improvement Plan and a prioritized Long Range Improvement Plan.
- ▶ A set of design guidelines for pedestrian facilities addressing walkway/trail widths, lighting, and crosswalk locations to be incorporated into the Town's standards.
- ▶ An updated Access Control Plan for US Highway 6 within the Town of Gypsum.

The following sections of this report describe in detail the development of this Master Traffic Study. Based on this study, a draft Traffic Impact Fee program will be developed to fairly distribute the roadway improvement costs to new development projects. Together, these documents will provide the Town of Gypsum with the planning tools to ensure a viable transportation system for many years to come.

Vicinity Map / Fig 1



North

II. EXISTING CONDITIONS

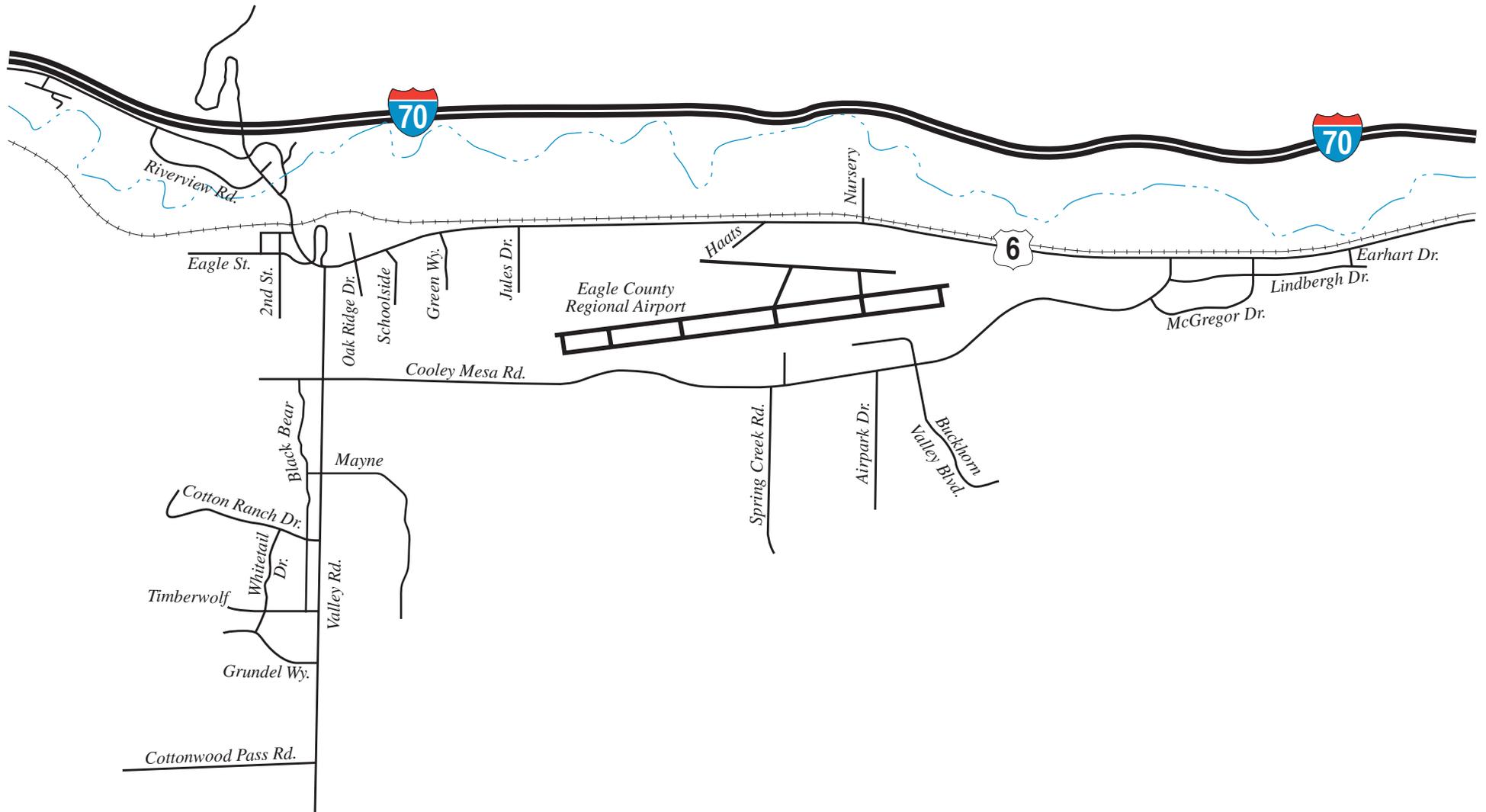
As an initial step in the development of the Master Traffic Study, an inventory of existing conditions was conducted. A field survey of the primary roadway system was conducted to determine roadway laneage, access conditions, intersection geometry, and traffic control. A traffic counting program was developed in consultation with Town staff to ensure coverage of key intersections and roadway sections. These existing data were then analyzed to identify any deficiencies or locations of concern.

A. Roadway Inventory

The existing roadway network in the Town of Gypsum is graphically depicted on **Figure 2**. The primary roadways include:

- ▶ **Interstate 70.** This four-lane freeway serves regional east-west travel needs for communities along its length through Colorado. I-70 connects the Town of Gypsum to Glenwood Springs on the west and the resorts at Avon and Vail to the east. There is an interchange providing freeway access at Gypsum; the next closest interchanges are at Eagle to the east and Dotsero to the west. The posted speed limit is 75 miles per hour (MPH) in the vicinity of Gypsum.
- ▶ **US Highway 6.** This regional arterial road runs parallel to I-70 between Gypsum and Dowd Junction. A roundabout has been constructed on US 6 immediately south of the Gypsum interchange. Within the Town of Gypsum, US 6 is a basic two-lane highway, with auxiliary turn lanes at major intersections and accesses. The posted speed limit on US 6 is 35 MPH through the developed part of Town, increasing to 55 MPH east of Jules Drive.
- ▶ **Valley Road.** Also known as Gypsum Creek Road, this basic two-lane arterial extends south from US 6 along the Gypsum Creek valley, providing access for primarily residential developments and agricultural lands along its length. The intersection of US 6/Valley Road is currently signalized. The speed limit is posted 30 MPH between US 6 and Cooley Mesa Road; to the south it varies between 35 and 40 MPH.
- ▶ **Cooley Mesa Road.** This arterial roadway provides access to the Eagle County Regional Airport as well as residential and industrial uses in the Spring Creek area and commercial uses in the Gateway area. The ECO Transit facility and Eagle County Road and Bridge maintenance facility are located along Cooley Mesa Road west of the airport. The ECO facility contributes significant bus traffic to roadway volumes. Cooley Mesa Road intersects Valley Road south of US 6, extending eastward past the Airport, then trending northward to intersect US 6 east of the Airport. The roadway is two-lanes, except through Gateway where it has been constructed as a four-lane divided road. The posted speed limit is 35 MPH.
- ▶ **Oak Ridge Drive.** This collector roadway intersects US 6 east of Valley Road. This roadway serves school uses on the south side of US 6 as well as a large commercial area on the north side. The intersection at US 6/Oak Ridge Drive is currently signalized. The posted speed limit is 25 MPH.

Primary Roadway System / Fig 2



North

- ▶ **Jules Drive.** This collector roadway extends south from US 6 along the west end of the Airport, serving commercial and residential uses. A planned extension of Jules Drive will connect to Cooley Mesa Road, providing an alternate route to Valley Road. The posted speed limit is 35 MPH.
- ▶ **Cottonwood Pass Road.** This two-lane, primarily unpaved, rural roadway extends west from Valley Road, trending south and west, providing connection to SH 82 in Garfield County. The speed limit on Cottonwood Pass Road on the paved section is posted 35 MPH, with 25 MPH on the unpaved section. This roadway is unmaintained during the winter months.

B. Traffic Counts

A comprehensive traffic counting program was conducted in May, 2006 on area roadways and at key intersections throughout the Town. The counts were conducted by All Traffic Data Services, Inc., and included 24-hour roadway data as well as AM and PM peak hour intersection turning movements. The counts were scheduled to ensure that school traffic was included in the data. The counts do not account for the peak of activity at the Eagle County Regional Airport; however, subsequent traffic projections do include peak season airport traffic. **Figure 3** summarizes the existing traffic volumes within Gypsum. As indicated, daily traffic volumes along US 6 are currently in the approximate range of 6,100 to 11,400 vehicles per day (VPD). Existing traffic volumes along Valley Road range from about 1,500 to 5,300 VPD. Cooley Mesa Road currently experiences approximately 2,400 to 2,800 VPD.

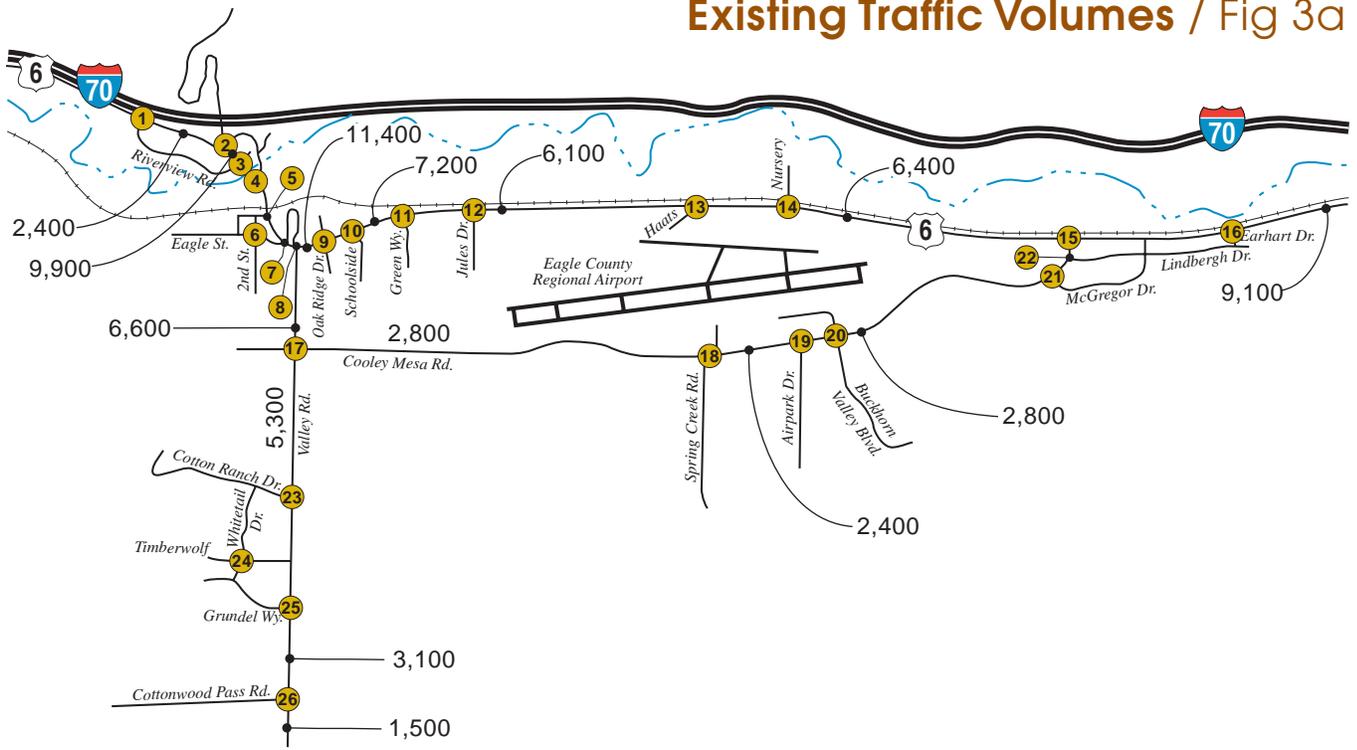
C. Level of Service Analysis

The existing AM and PM peak hour traffic volumes, intersection geometrics and traffic control were used as the basis for intersection Level of Service (LOS) analyses, the results of which are depicted on **Figure 4** (SYNCHRO LOS worksheets are included in the Appendix). LOS is a qualitative measure of traffic operational conditions, based on roadway capacity and motorist delay. The 2000 HIGHWAY CAPACITY MANUAL defines six levels of service, ranging from A to F, with LOS A representing the best possible operating conditions and LOS F representing over-capacity, or congested conditions. In Eagle County, LOS D is considered to be acceptable for peak hour intersection operations.

As shown, existing traffic operations in Gypsum are generally within the acceptable range. The roundabout just south of the Gypsum interchange currently operates at LOS A during both peak hours. Traffic operations at the two signalized intersections, US 6/Valley Road and US 6/Oakridge Drive are at LOS B during peak times.

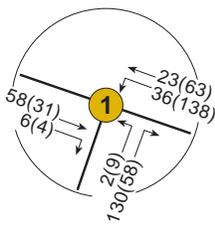
STOP sign controlled intersections throughout Town operate at LOS C or better, with the exception of the US 6/Eagle Street intersection, where side-street movements are at LOS F during the PM peak hour. This condition, which primarily affects left-turns, is due to the relatively heavy traffic volumes along US 6. Current traffic conditions at this intersection are insufficient to warrant a traffic signal, based on criteria contained in the MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FHWA, 2003 (MUTCD). The minimal spacing to the existing traffic signal at Valley Road, approximately 300 feet, would also preclude signalization of this intersection.

Existing Traffic Volumes / Fig 3a

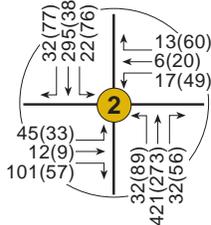


Intersections 1-16

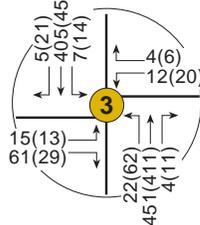
Roundabout



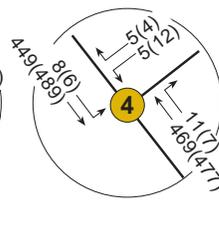
Riverview Rd./Frontage Rd.



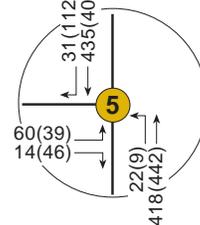
US 6/Frontage Rd.



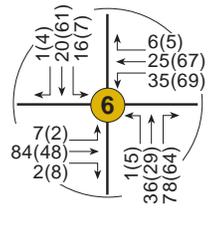
Riverview Rd./US 6



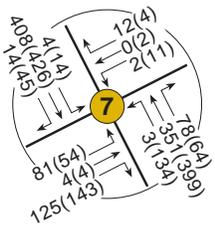
Trail Gulch Rd./US 6



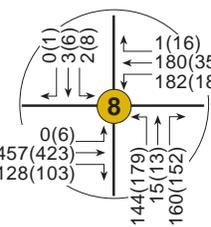
Railroad Ave./US 6



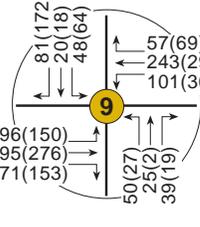
Eagle St./2nd St.



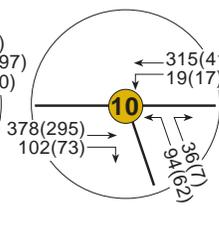
Eagle St./US 6



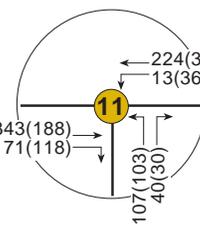
Valley Rd./US 6



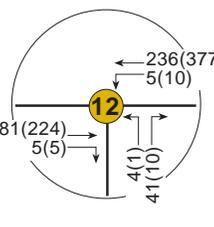
Oakridge Dr./US 6



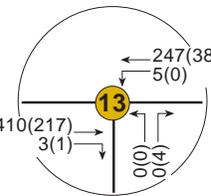
Schools Side/US 6



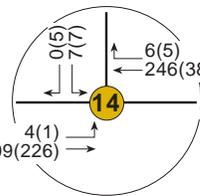
Green Wy./US 6



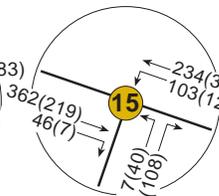
Jules Dr./US 6



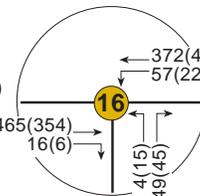
Haats/US 6



Nursery/US 6



US 6/Cooley Mesa Rd.



Earhart Dr./US 6

LEGEND

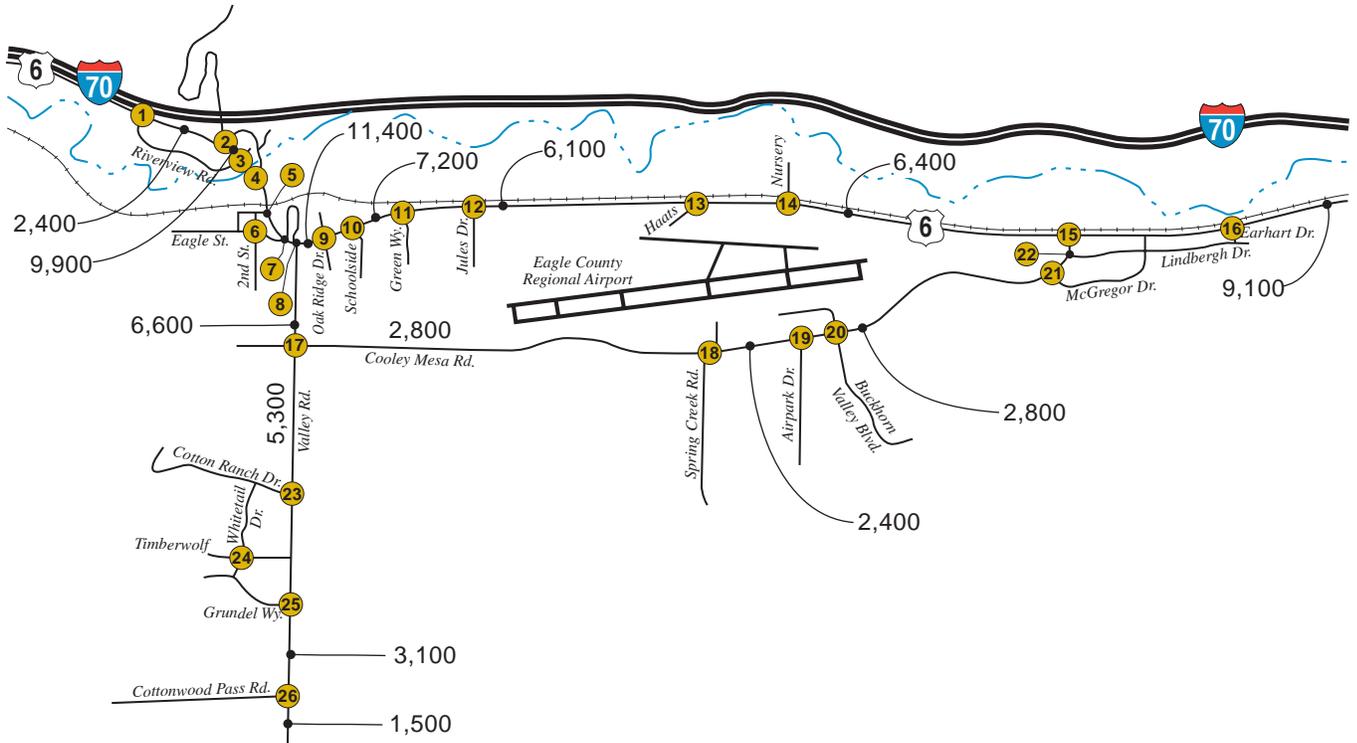
XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

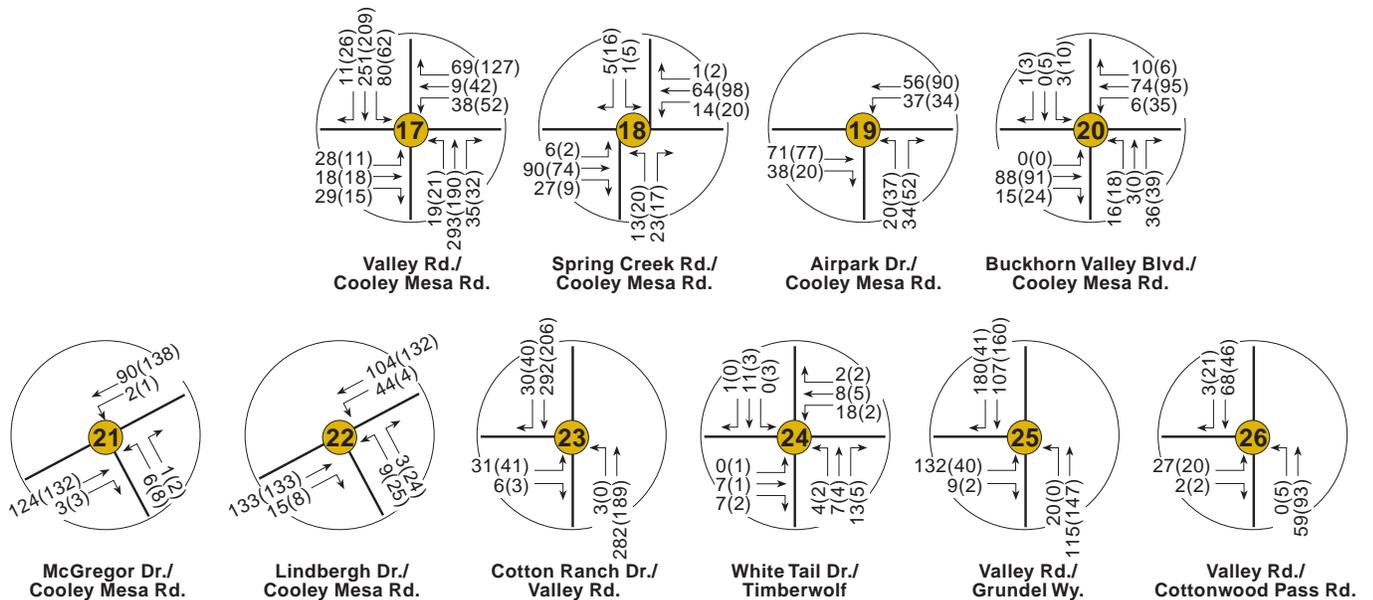


North

Existing Traffic Volumes / Fig 3b



Intersections 17-26



LEGEND

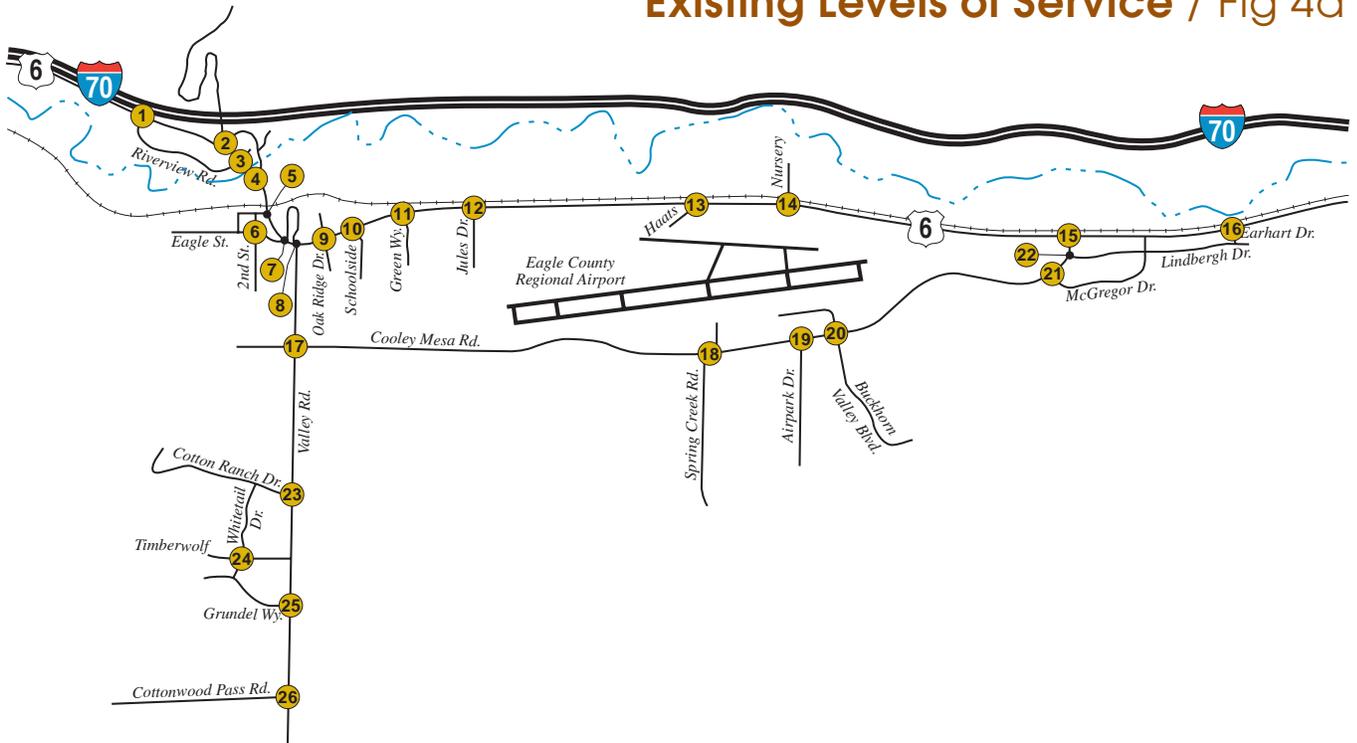
XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

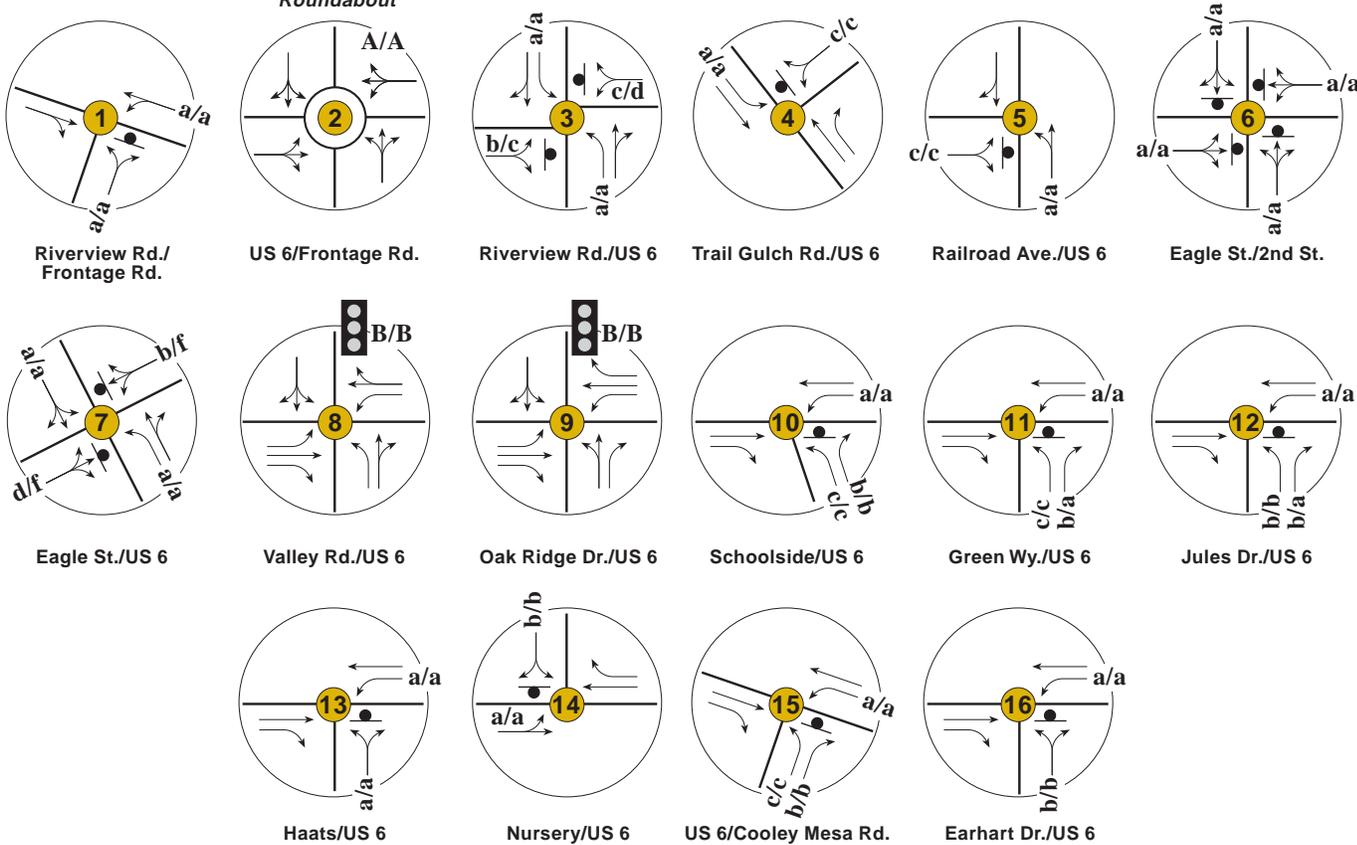


North

Existing Levels of Service / Fig 4a



Intersections 1-16



LEGEND

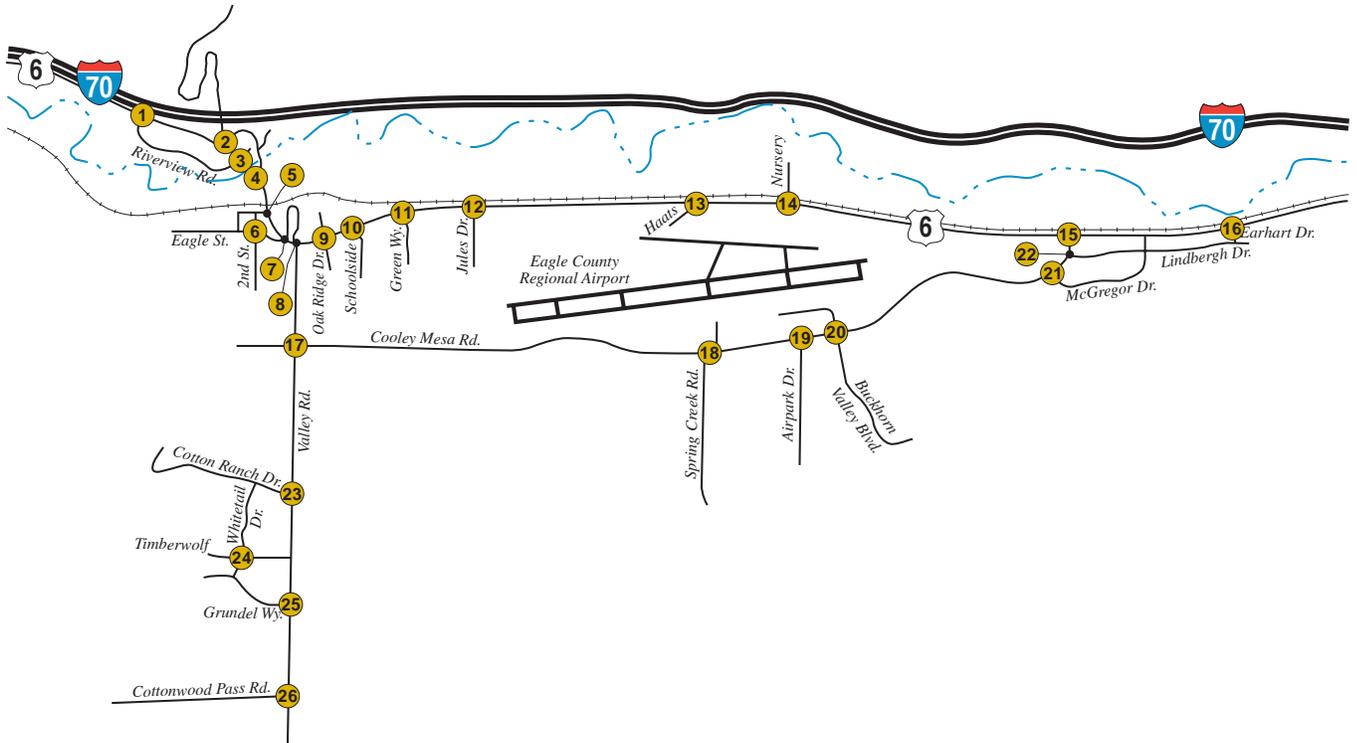
X/X = AM/PM Peak Hour Signalized Intersection Level Of Service
x/x = AM/PM Peak Hour Unsignalized Intersection Level Of Service

= Stop Sign
 = Traffic Signal

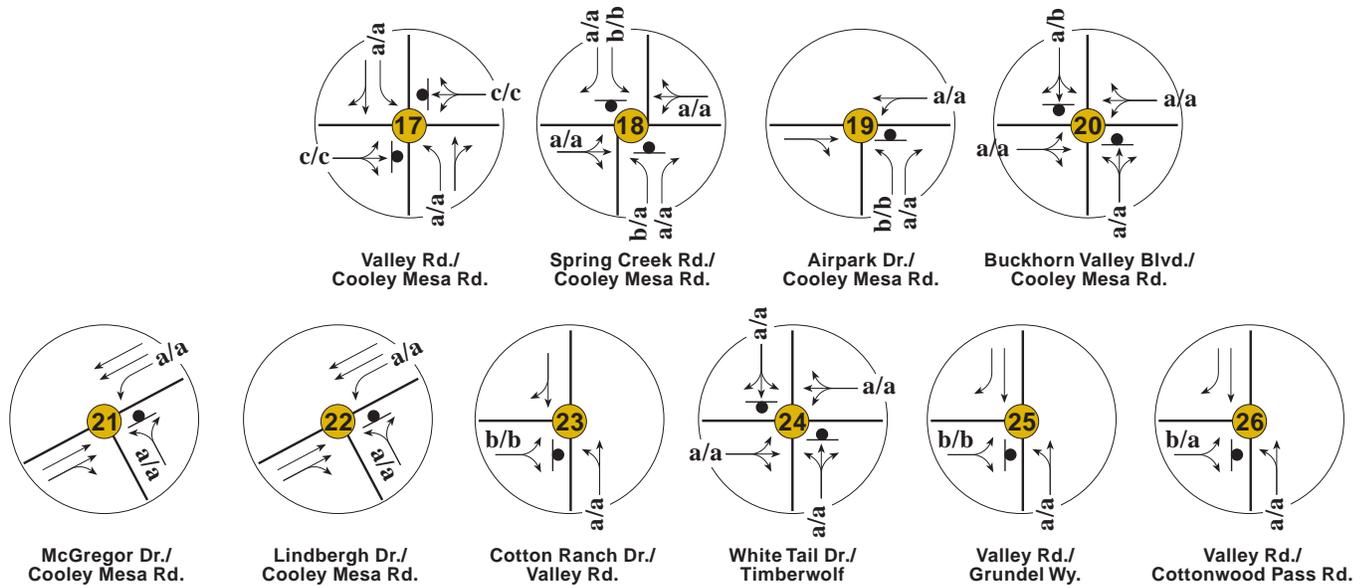


North

Existing Levels of Service / Fig 4b



Intersections 17-26



LEGEND

- X/X** = AM/PM Peak Hour Signalized Intersection Level Of Service
- x/x** = AM/PM Peak Hour Unsignalized Intersection Level Of Service

- = Stop Sign
- = Traffic Signal



North

III. FUTURE TRAFFIC VOLUME PROJECTIONS

A. *Land Use Projections*

Estimates of the future growth potential within the Gypsum area were developed through discussions with Town staff. The GYPSUM FOUNDATION PLAN, 1999, was referenced in this process, as were available traffic studies and development plans on file with the Town. The following land use estimates include developments already in process as well as potential future development anticipated by the year 2030:

- ▶ **Winding Creek Ranch.** The potential for approximately 248 single family residential units is currently envisioned for this development located along Valley Road south of Town.
- ▶ **Brightwater.** This development, currently under construction along Valley Road south of Town, is to consist of approximately 535 residential units, many of which will be recreational homes, and a golf course with related amenities.
- ▶ **One-Acre Residential.** Approximately 1,000 acres astride Valley Road between the Town and Brightwater could potentially develop at one single family residential unit to the acre.
- ▶ **Remington Ranch.** This development could potentially consist of about 220 single family homes along the east side of Valley Road.
- ▶ **Cotton Ranch.** At build-out, this existing development along the west side of Valley Road will include approximately 110 multi-family residential units, 450 single family homes, and an 18-hole golf course. Approximately 150 residential units and the golf course have been constructed to date.
- ▶ **Potential Recreation Site.** Previous planning efforts have identified an approximate 72 acre site on the west side of Valley Road for future recreational use. Most recently, the potential for a nine-hole golf course for handicapped children has been discussed.
- ▶ **Tower Center.** This proposed mixed-use development is to be located along US 6 east of Jules Drive. Estimated land uses include 140 single family homes, 190 multi-family homes, a 120-room hotel, about 71,400 square feet of office use, and about 446,500 square feet of retail use.
- ▶ **Airport.** The Eagle County Regional Airport, located along the north side of Cooley Mesa Road, provides flights to/from 14 major U.S. cities, serving mountain resort areas including Vail and Aspen. This facility has been expanded in the past to accommodate rapid increases in enplanements; currently, an additional expansion is under way, and airport growth is anticipated to continue in the future.
- ▶ **Spring Creek Area.** Ongoing development along the south side of Cooley Mesa Road is estimated to include approximately 115 single family residential units, 50 multi-family units. There is also the potential for about 2.2 million square feet of light industrial uses by the year 2030.

- ▶ **Buckhorn Valley.** This existing residential development along Buckhorn Valley Road will build-out at about 671 single family units and 228 multi-family units. Currently, Buckhorn Valley is estimated to be about 15 percent complete.
- ▶ **Saddle Ridge Golf Club.** This proposed resort development, located generally east of Buckhorn Valley, is planned to include about 300,000 square feet of commercial uses, an 18-hole golf course, a 100-room hotel, 132 lodging units, and 120 cabins.
- ▶ **Gateway.** The Gateway Center is located along US 6 and Cooley Mesa Road at the eastern end of Town. Ongoing development within this existing 232 acre commercial center has the potential to build-out at an estimated 884,300 square feet of retail uses, including the new Costco store, and about 884,300 square feet of light industrial uses. Gateway is currently about 30 percent built.

For traffic modeling purposes, the Gypsum area was divided into Traffic Analysis Zones (TAZ's) as depicted on **Figure 5**. In general, the TAZ's follow the basic descriptions of the developments listed above, with adjustments as described below:

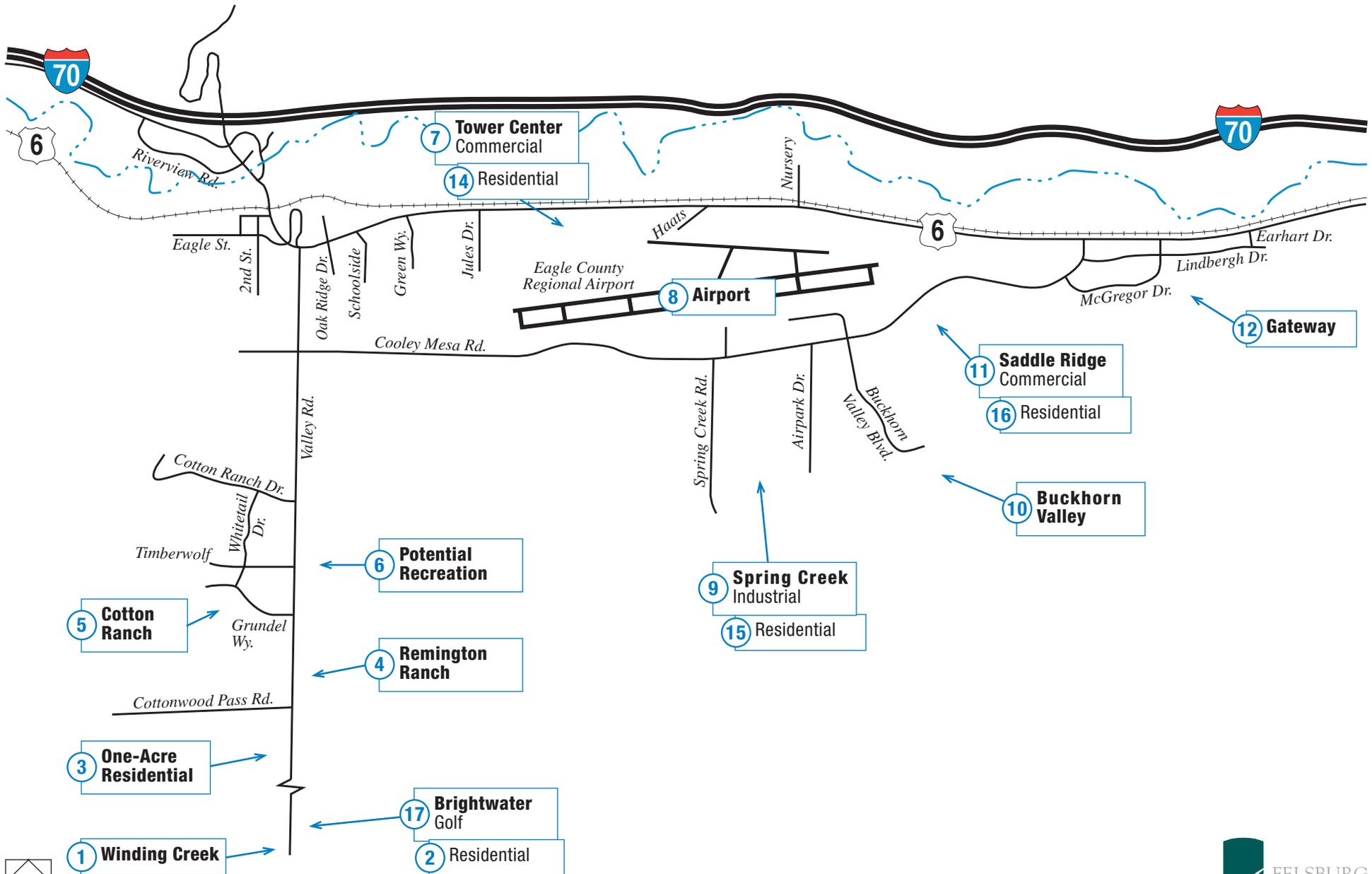
- ▶ A portion of the Saddle Ridge Golf Club (identified as Resort South) would access via Buckhorn Valley Road. Therefore, this component was included in the TAZ for Buckhorn Valley.
- ▶ To appropriately model the interaction between residential uses and non-residential uses, those developments with mixed land uses were assigned two TAZ's each (one for residential uses and one for commercial uses).

B. Year 2030 Trip Generation Analysis

To estimate the additional travel demand potential of anticipated development in Gypsum, a trip generation analysis by TAZ was conducted based on data contained in TRIP GENERATION, 7th Edition, Institute of Transportation Engineers, 2003. Traffic studies previously conducted for individual development proposals were incorporated, as available. These reports include:

- ▶ REVISED TRAFFIC IMPACT STUDY ADDENDUM, TOWER CENTER DEVELOPMENT, GYPSUM, COLORADO, Kimley-Horn and Associates, June 2006.
- ▶ SADDLE RIDGE GOLF CLUB TRAFFIC IMPACT ANALYSIS (DRAFT), Felsburg Holt & Ullevig, April 2006.
- ▶ EAGLE AIRPORT INTERCHANGE TRAFFIC IMPACT ANALYSIS UPDATE, Felsburg Holt & Ullevig, August 2003.
- ▶ BUCKHORN VALLEY TRAFFIC IMPACT ANALYSIS, LSC Inc., July 1999.
- ▶ GYPSUM CREEK TRAFFIC IMPACT ANALYSIS, Aldridge Transportation Consultants, LLC, 1999. Now known as Brightwater.

Traffic Analysis Zones / Fig 5



Other considerations included in the trip generation analysis are as follows:

- ▶ Year 2025 travel demand data for the Eagle County Regional Airport were extracted from the EAGLE AIRPORT INTERCHANGE TRAFFIC IMPACT ANALYSIS UPDATE. An estimated annual growth rate of 2 percent was applied to obtain year 2030 projections from the 2025 data.
- ▶ There will be interaction between land uses within the Gypsum area. This interaction will consist of trips between residential uses and commercial uses for shopping, employment, and recreational activities. For this Study, it was estimated that 65 percent of all residential trips would remain within the Gypsum area, with the remaining 35 percent of residential trips beginning or ending outside the area. Therefore, to avoid double counting, the commercial trips were reduced by an amount equal to 65 percent of the residential trips to be assigned to commercial zones.
- ▶ It was estimated that 30 percent of all trips within Gateway would remain internal to the TAZ. This reduction would account for multi-purpose trip making among the commercial uses and interaction between industrial and commercial uses.
- ▶ A 20 percent internal trip rate was estimated for the Spring Creek area to account for multi-purpose trips between industrial uses.
- ▶ Based on seasonal home data from the Northwest Council of Governments, the ITE single family residential trip generation rates were reduced by 10 percent. No reductions were made to the multi-family trip rates, as these residences would typically be occupied year-round.
- ▶ To account for growth in background traffic, TAZ 13 was added to the model to represent through-trips from Eagle which would use the I-70 interchange at Gypsum. Trips generated by this zone were developed through close coordination with LSC Transportation Consultants, the traffic consultant for the Town of Eagle.

Table 1 summarizes the results of the trip generation analysis by TAZ.

Table 1. Trip Generation Analysis

TAZ No.	Development Description	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			In	Out	Total	In	Out	Total
1.	Winding Creek	2,140	40	130	170	140	85	225
2.	Brightwater	2,320	75	65	140	95	105	200
3.	One-Acre Residential	8,610	170	510	680	575	335	910
4.	Remington Ranch	1,890	35	115	150	125	75	200
5.	Cotton Ranch	3,310	60	200	260	220	120	340
6.	Potential Recreation	320	15	5	20	10	15	25
7.	Tower Center (COM)	17,480	215	240	455	850	825	1,675
8.	Airport	6,850	190	165	355	210	165	375
9.	Spring Creek (COM)	10,730	1,245	170	1,415	180	1,325	1,605
10.	Buckhorn Valley	7,260	140	420	560	475	265	740
11.	Saddle Ridge (COM)	9,250	275	70	345	375	525	900
12.	Gateway	35,330	930	335	1,265	1,410	1,965	3,375
13.	Eagle Through-Traffic (1)							
14.	Tower Center (RES)	1,950	45	140	185	130	60	190
15.	Spring Creek (RES)	1,000	20	55	75	65	35	100
16.	Saddle Ridge (RES)	1,170	45	35	80	65	50	115
17.	Brightwater Golf	960	45	15	60	35	40	75
Total Trip Generation		110,570	3,545	2,670	6,215	4,960	5,990	10,950
Reduction for Interaction		-19,270	-410	-1,085	-1,495	-1,230	-735	-1,965
Total Adjusted Trips		91,300	3,135	1,585	4,720	3,730	5,255	8,985
1. TAZ 13 is used to represent through-trips generated by Eagle land uses and is not included in the above totals.								

As shown, planned and projected development within the Town of Gypsum is expected to generate a travel demand potential of approximately 91,300 vehicle trips per day in the year 2030. About 4,720 trips would occur in the AM peak hour and about 8,985 trips would occur in the PM peak hour. Subsequent phasing analyses for years prior to 2030 have been based on a proportionate share of the above total trip generation.

C. Trip Distribution

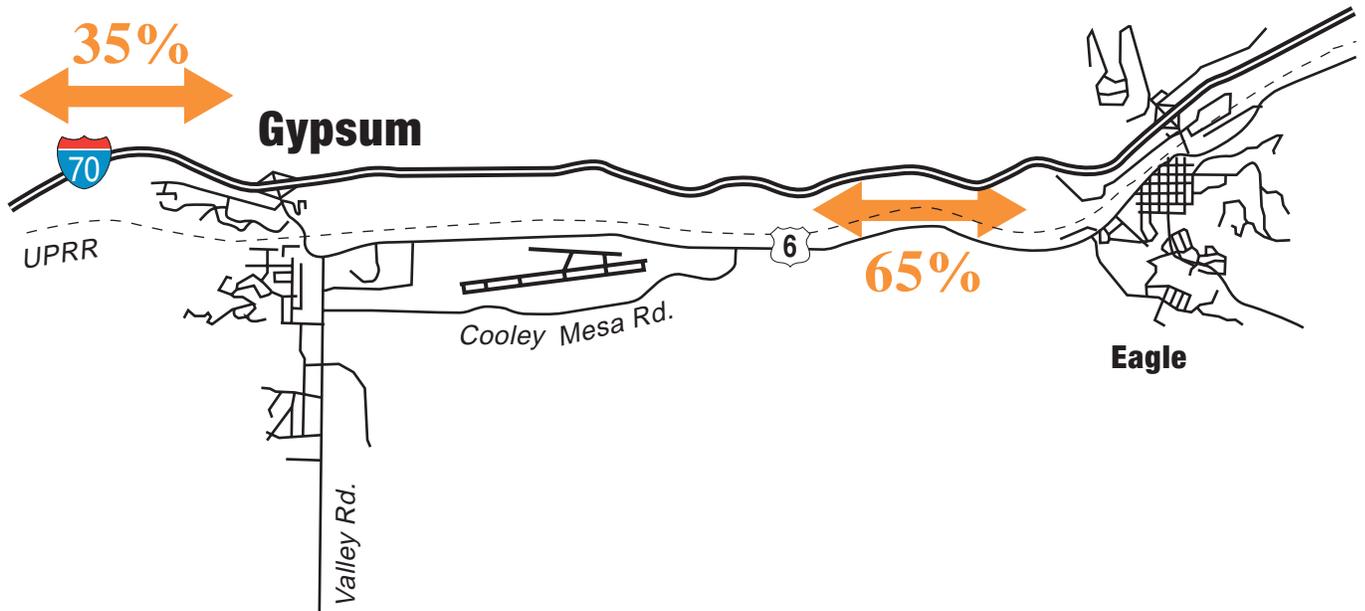
Figure 6 illustrates the trip distribution estimates used in this analysis, summarized as follows:

- ▶ **Non-Residential Trips.** Because of the internal trip reduction, all of the remaining non-residential trips are external to the Gypsum area. Approximately 35 percent of the commercial, industrial, and airport trips were distributed to/from I-70 west of Gypsum, with the remaining 65 percent distributed to/from US 6 and I-70 east of town.
- ▶ **Residential Trips.** An estimated 65 percent of the residential trips would remain internal to the Gypsum area, and were distributed proportionally to/from the commercial areas within Gypsum. The remaining 35 percent external trips include 7 percent to/from I-70 west of Gypsum, and 28 percent to/from US 6 and I-70 to the east.

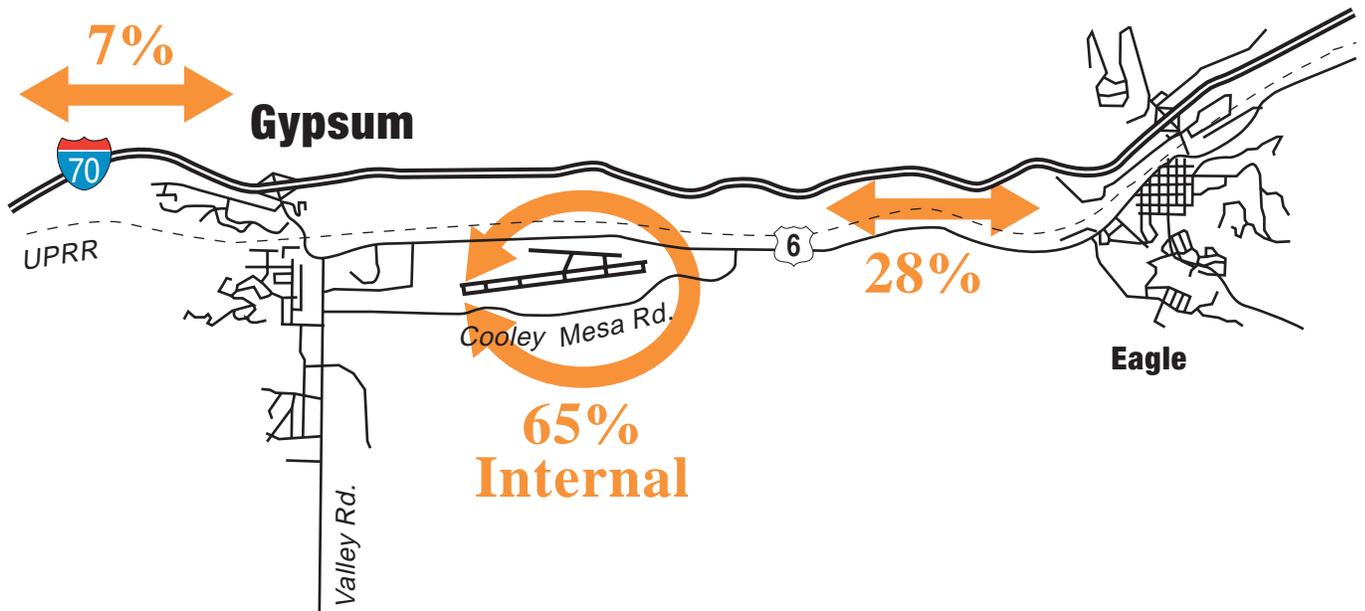
The above trip distribution estimates are based on existing travel patterns, previous traffic engineering analyses in the area, and on projected development trends along the I-70 corridor.

Trip Distribution / Fig 6

Non-Residential Trips



Residential Trips



D. Background Traffic

The trip generation estimates previously presented are representative of new development in Gypsum only. These new trips would be in addition to traffic volumes already on the roadway system which are generated by existing land uses within the surrounding area. Therefore, the background traffic for this analysis consists of the existing traffic volumes (previously presented on **Figure 3**) and any growth in regional trips passing through Gypsum between the Town of Eagle and I-70 west of Gypsum.

The pass-through component of background traffic volumes was developed in coordination with LSC Transportation Consultants, who are conducting similar traffic engineering efforts for the Town of Eagle. This component was assigned to the model via TAZ 13.

The total traffic volume projections used in this Study are the sum of the existing traffic counts, the pass-through component of background volumes, and the trip generation for new developments in Gypsum. A model of the Gypsum roadway network was constructed using the computer program TRAFFIX, and the total traffic volumes were assigned to the network.

E. Phasing Scenarios

The analyses described in previous sections of this report are based on anticipated levels of development by the year 2030. However, two additional future scenarios have been examined: year 2011 (five-year build) and year 2016 (ten-year build). These phasing scenarios were developed by applying factors to the TAZ trip generation estimates for 2030, as follows:

- ▶ 0.208 for the year 2011 analysis
- ▶ 0.417 for the year 2016 analysis

The above factor for 2011 represents a trip generation of about 19,000 new trips per day, which is approximately equivalent to build out at Cotton Ranch, Brightwater, and the new Costco, plus about one third of Tower Center. By the year 2016, about 42 percent of projected land uses within the area would be built.

F. Roadway Network Scenarios

Previous traffic engineering efforts identified the need for a new interchange to be located approximately midway between Gypsum and Eagle. This interchange would serve increasing traffic volumes related to the Eagle County Regional Airport as well as growth in area development. The report entitled I-70 / EAGLE AIRPORT INTERCHANGE CONCEPT STUDY, Felsburg Holt & Ullevig, January 1999 evaluated the feasibility of alternative locations and alignments for an interchange and connector road between I-70 and US 6.

Subsequent environmental and engineering studies identified a preferred alternative that would connect between I-70 and Cooley Mesa Road with a grade separated crossing of US 6. A preliminary design for the interchange and connector road was prepared; however, due to funding concerns, the timing of this new interchange is uncertain. Therefore, this analysis has included two primary roadway network scenarios:

- ▶ **Base Case Network.** This scenario assumes the Airport Interchange remains unbuilt. All area traffic destined to/from I-70 will use the existing interchanges at Gypsum and Eagle. All three phasing scenarios include the Base Case Network.
- ▶ **Alternative Network.** This network scenario includes the current concept for the Eagle Airport Interchange and connector road. Because funding for the interchange is long-range at best, only 2030 conditions are evaluated with the Alternative Network. This scenario also includes a reconfiguration of the Valley Road/Cooley Mesa Road intersection to focus more traffic onto Cooley Mesa Road.

G. Traffic Volume Assignments

Year 2011

The resultant total traffic volume assignment for the year 2011 is graphically depicted on **Figure 7**. As shown, US 6 within the study area is projected to experience daily traffic volumes in the approximate range of 11,700 to 18,400 VPD; these volumes are approaching the capacity of a two-lane highway. Valley Road would experience approximately 2,600 to 9,400 VPD in the year 2011, and Cooley Mesa Road would carry between about 5,400 and 7,900 VPD.

Also depicted on the figure are peak hour turning movements at key intersections within Gypsum. Based on current development plans the following new intersections were included:

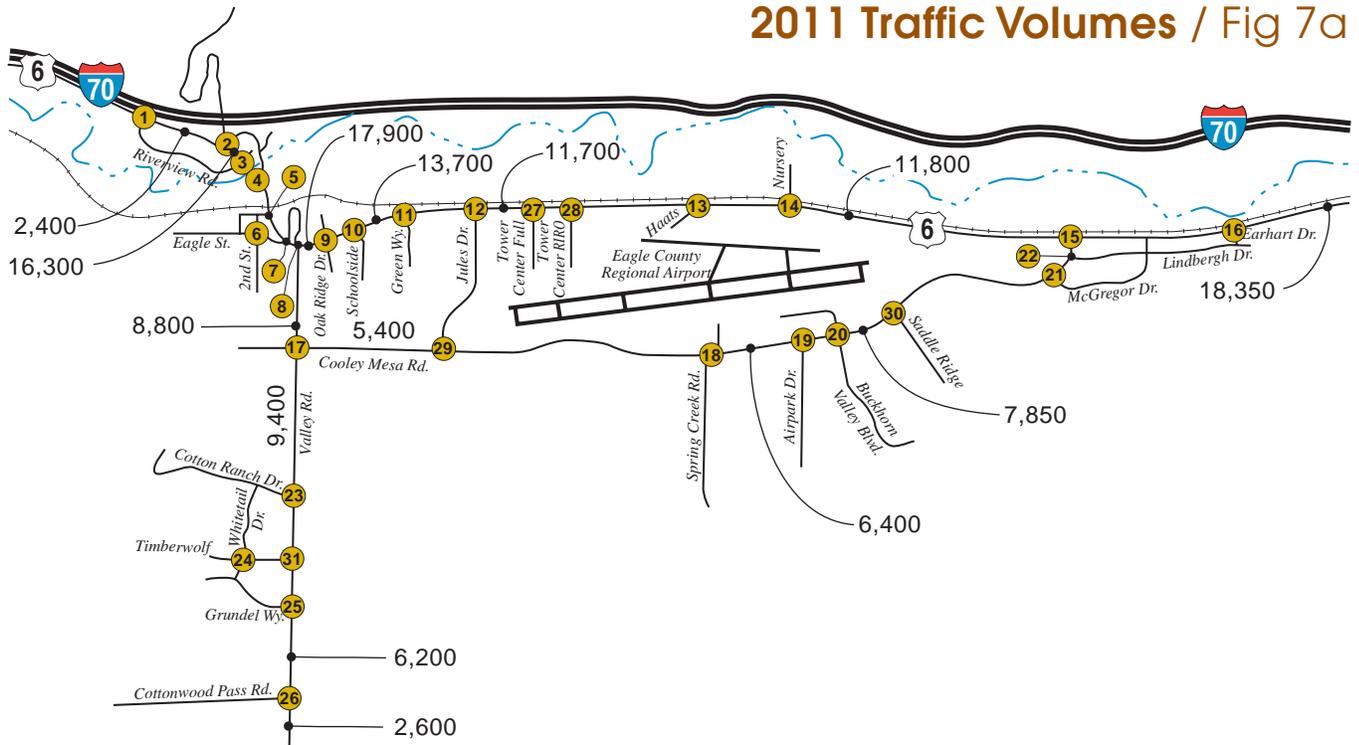
- ▶ US 6/Tower Center full-movement access
- ▶ US 6/Tower Center right-in/right-out (RIRO) access
- ▶ Cooley Mesa Road/Jules Drive
- ▶ Cooley Mesa Road/Saddle Ridge Golf Club access

The peak hour volumes were used as the basis for SYNCHRO capacity analyses documented in subsequent sections of this report.

Year 2016

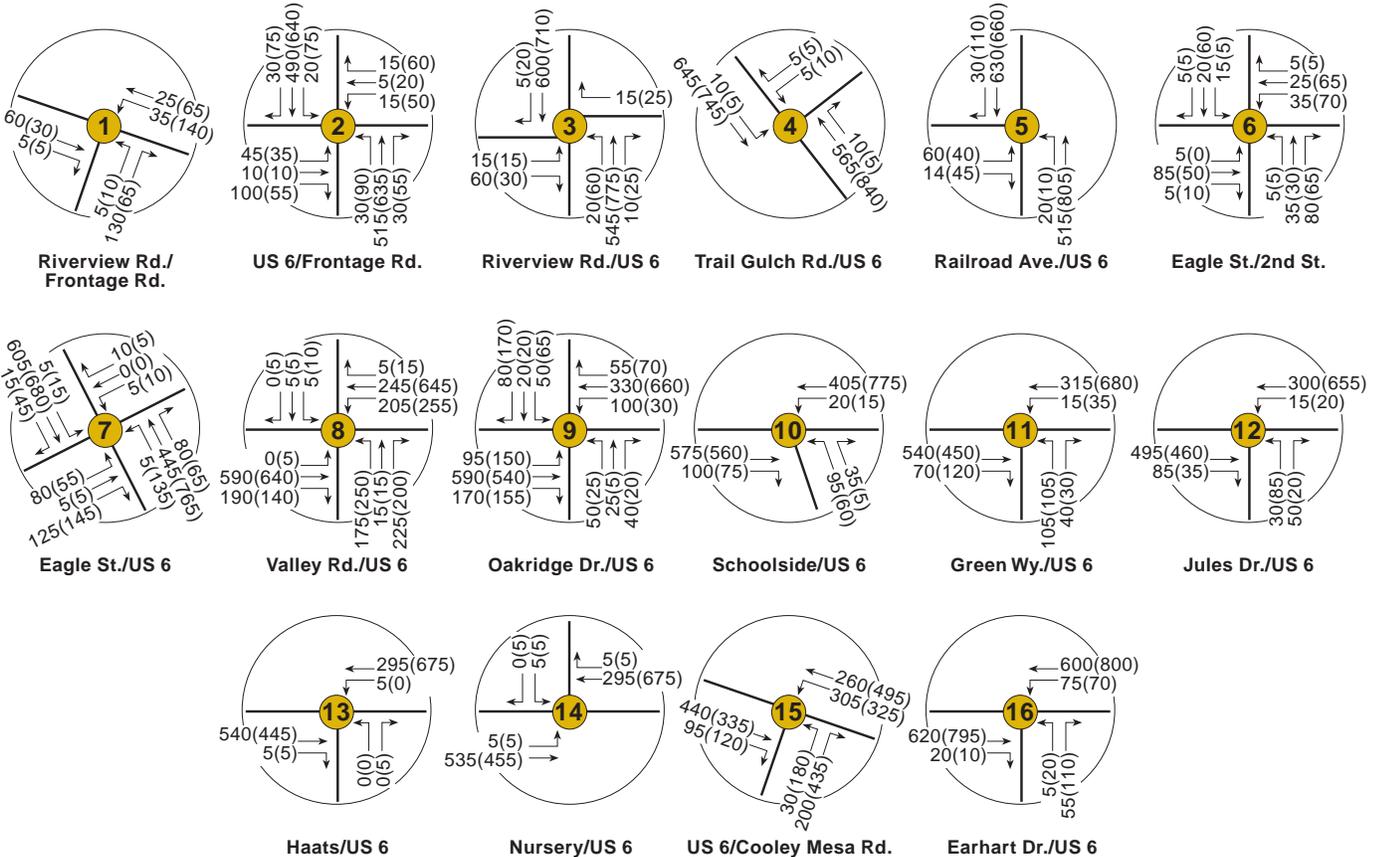
Figure 8 shows the traffic volume projections for the year 2016. As shown, US 6 is projected to carry daily traffic volumes of approximately 22,500 VPD between I-70 and Valley Road. At the eastern Town boundary, traffic volumes on US 6 would be about 27,600 VPD. Valley Road would experience approximately 3,800 to 13,500 VPD, and Cooley Mesa Road would carry between about 8,100 and 13,000 VPD. Also depicted on the figure are the projected AM and PM peak hour turning movements at key intersections and accesses.

2011 Traffic Volumes / Fig 7a



Intersections 1-16

Roundabout



LEGEND

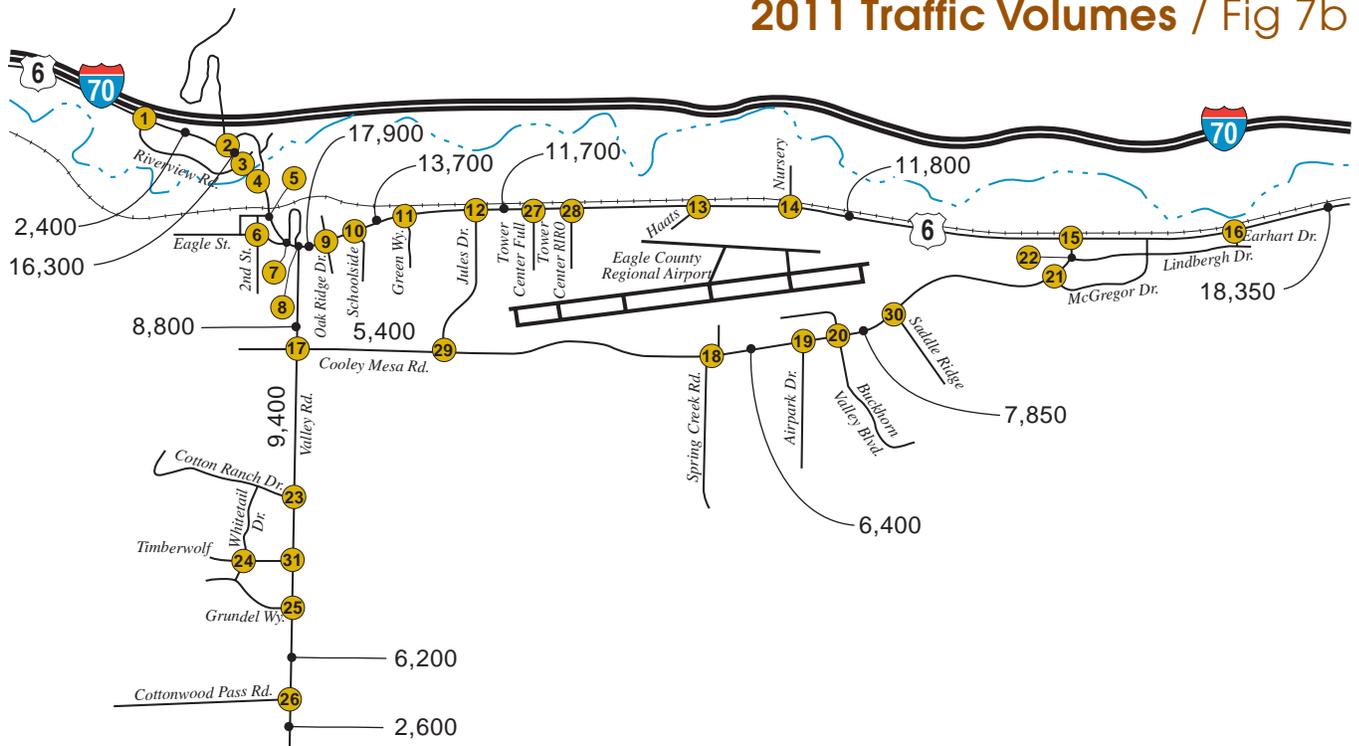
XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

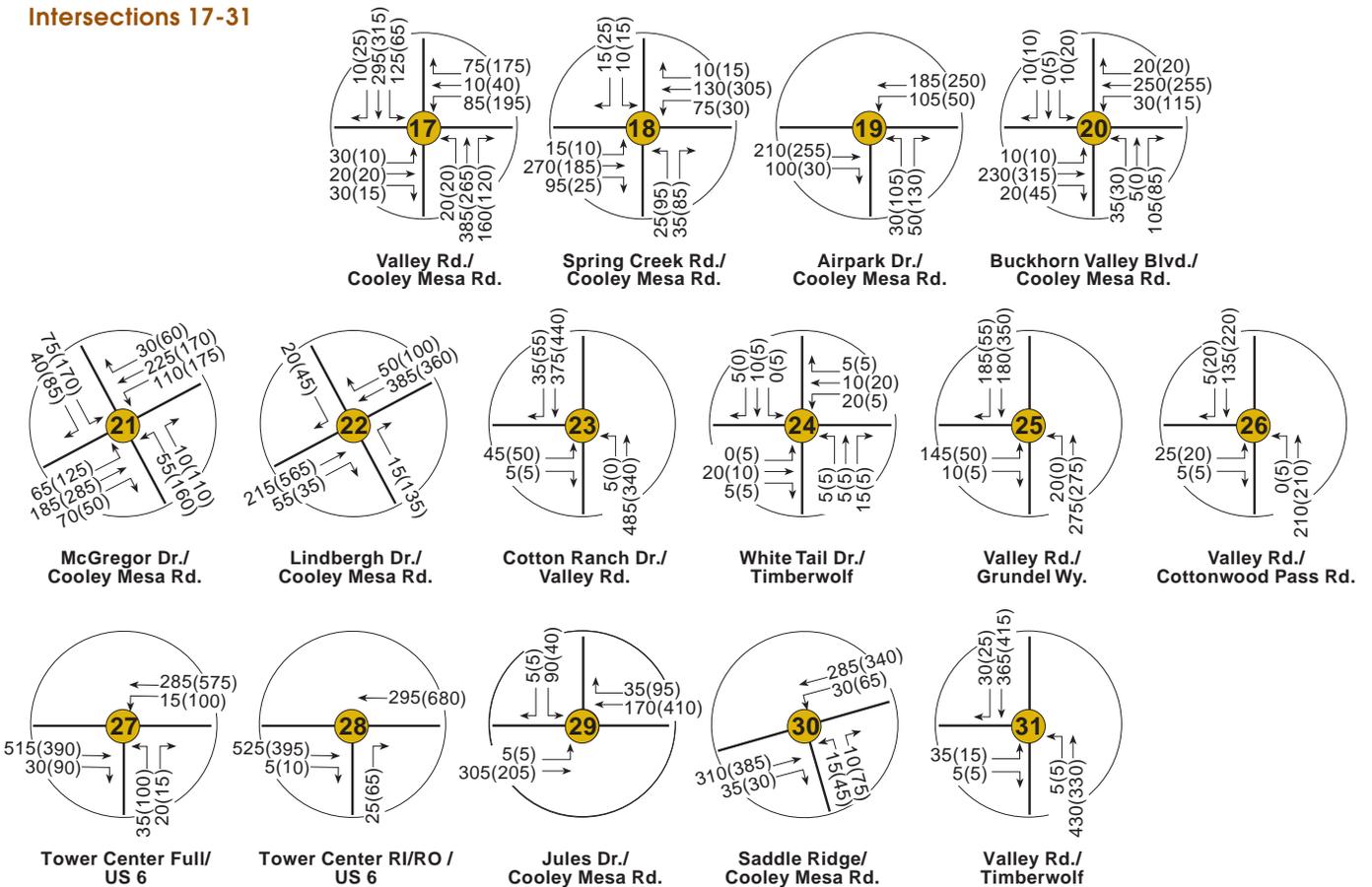


North

2011 Traffic Volumes / Fig 7b



Intersections 17-31



LEGEND

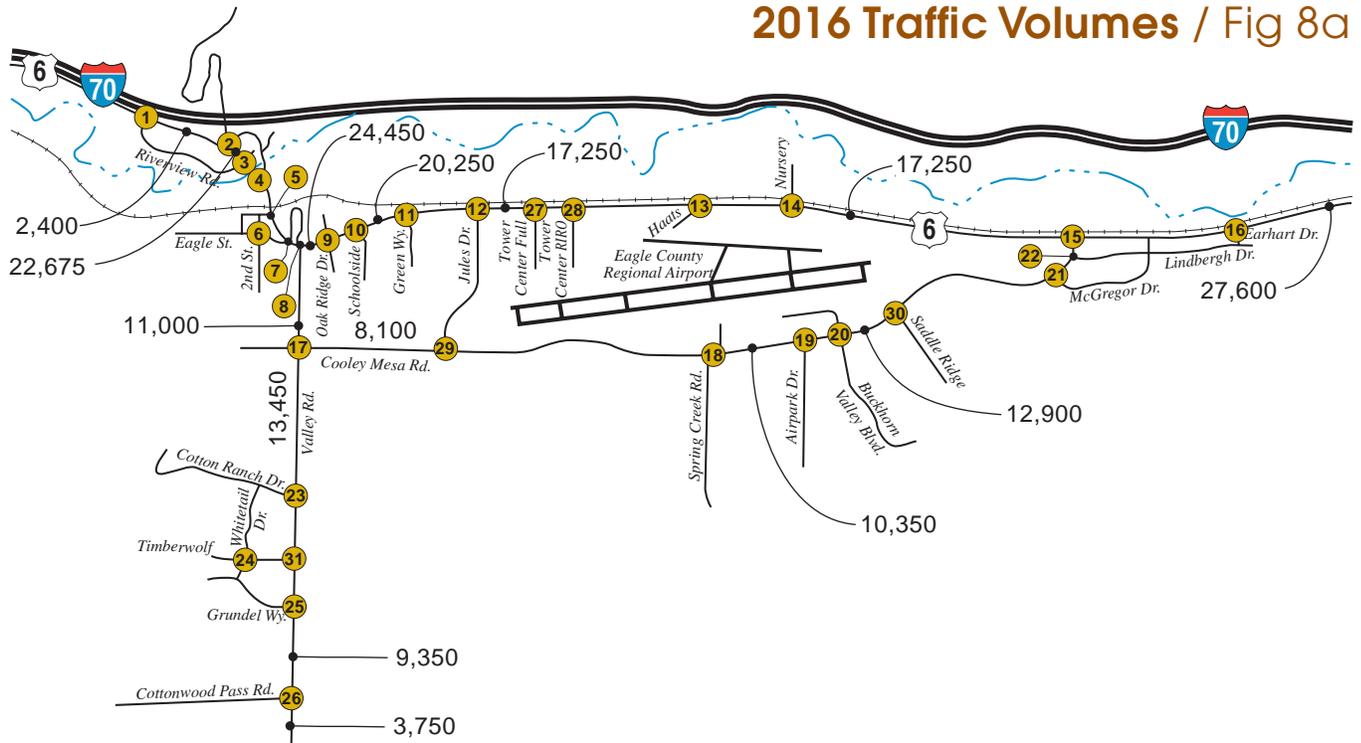
XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

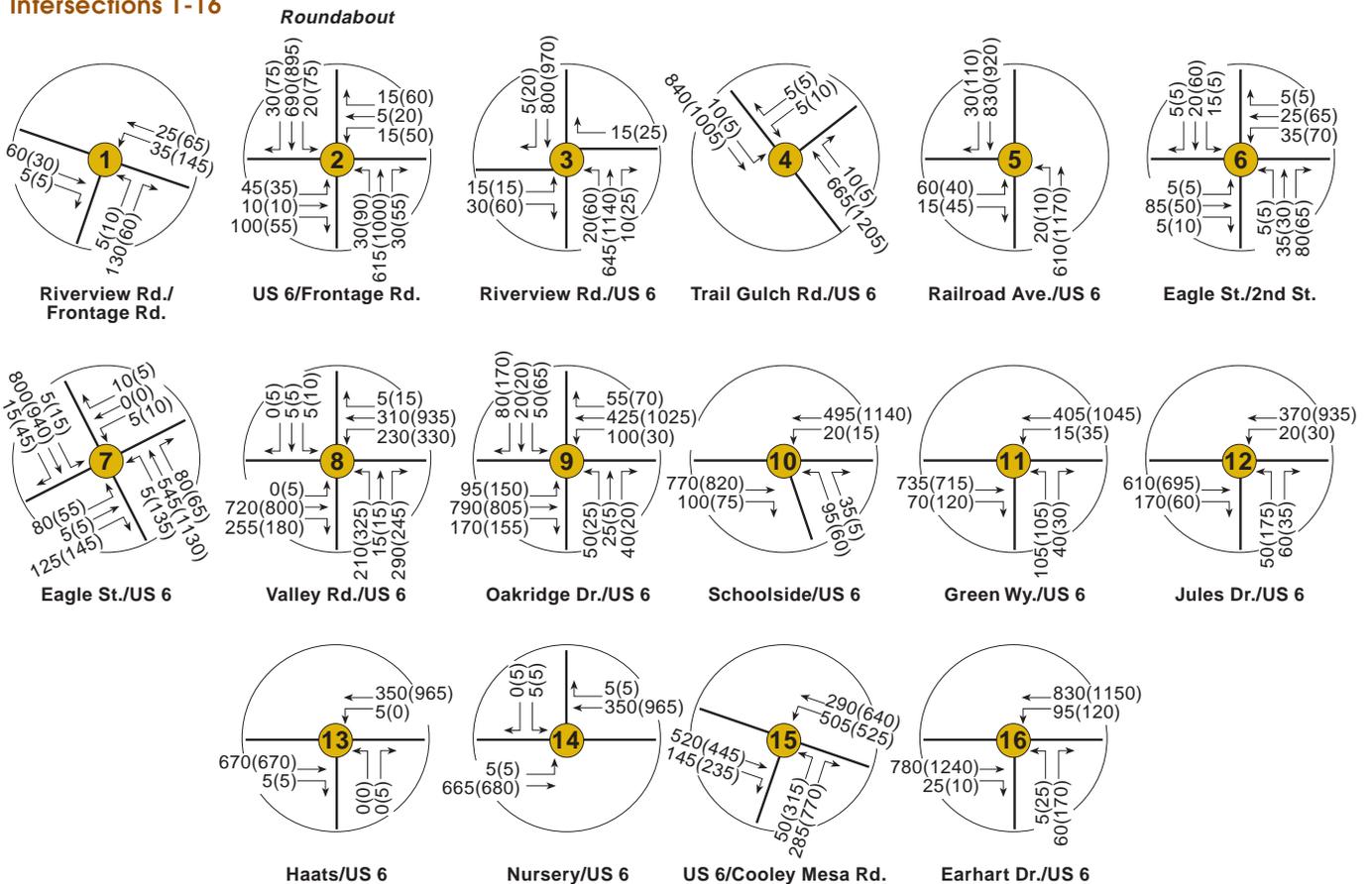


North

2016 Traffic Volumes / Fig 8a



Intersections 1-16



LEGEND

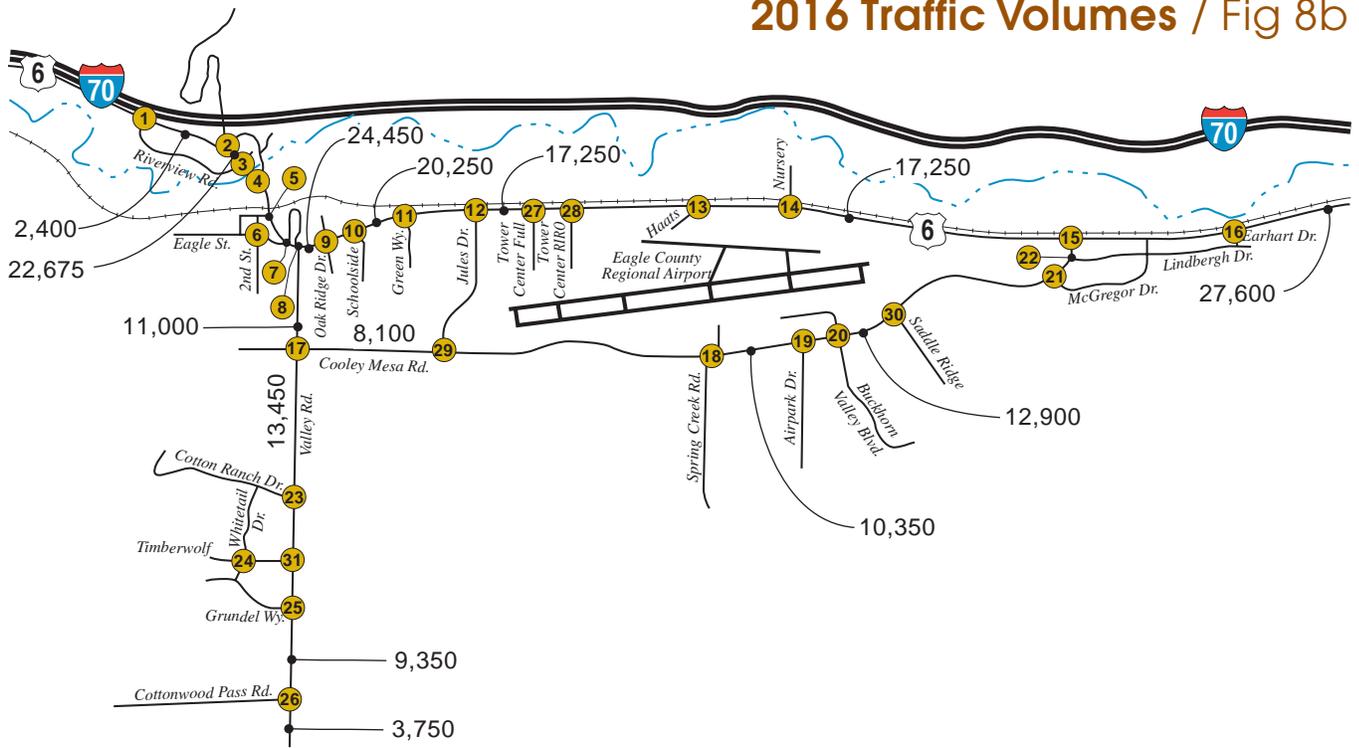
XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

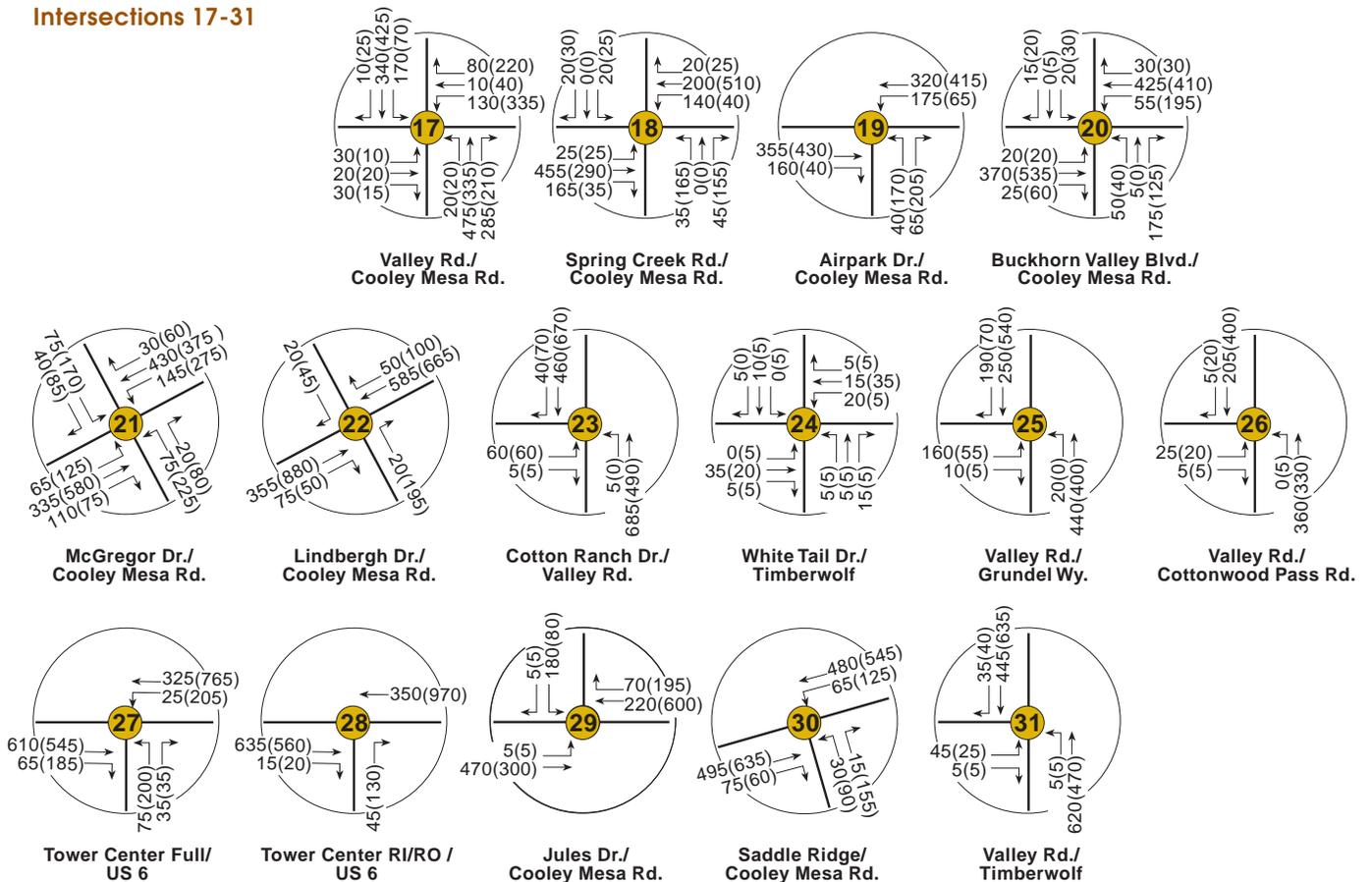


North

2016 Traffic Volumes / Fig 8b



Intersections 17-31



LEGEND

XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes



North

Year 2030 Base

The Base Case Network is projected to experience year 2030 traffic volumes as shown on **Figure 9**. Without the Airport interchange, US 6 is projected to carry daily traffic volumes of approximately 40,600 VPD between I-70 and Valley Road. At the eastern Town boundary, traffic volumes on US 6 would be about 53,500 VPD. Valley Road would experience approximately 6,900 to 24,900 VPD south of Cooley Mesa Road. Although not shown on the figure, Valley Road between Cooley Mesa Road and US 6 would carry about 17,200 VPD, indicating the potential need for roadway widening. Cooley Mesa Road would carry between about 15,400 and 27,100 VPD.

Year 2030 Alternative

Figure 10 shows the traffic volume projections for the year 2030 with the I-70/Airport interchange and connector roadway in place. In this scenario, US 6 is projected to carry daily traffic volumes of approximately 37,300 VPD between I-70 and Valley Road. At the eastern Town boundary, traffic volumes on US 6 would be about 25,100 VPD, showing a significant reduction from the Base scenario. The Airport connector road would experience about 31,700 VPD.

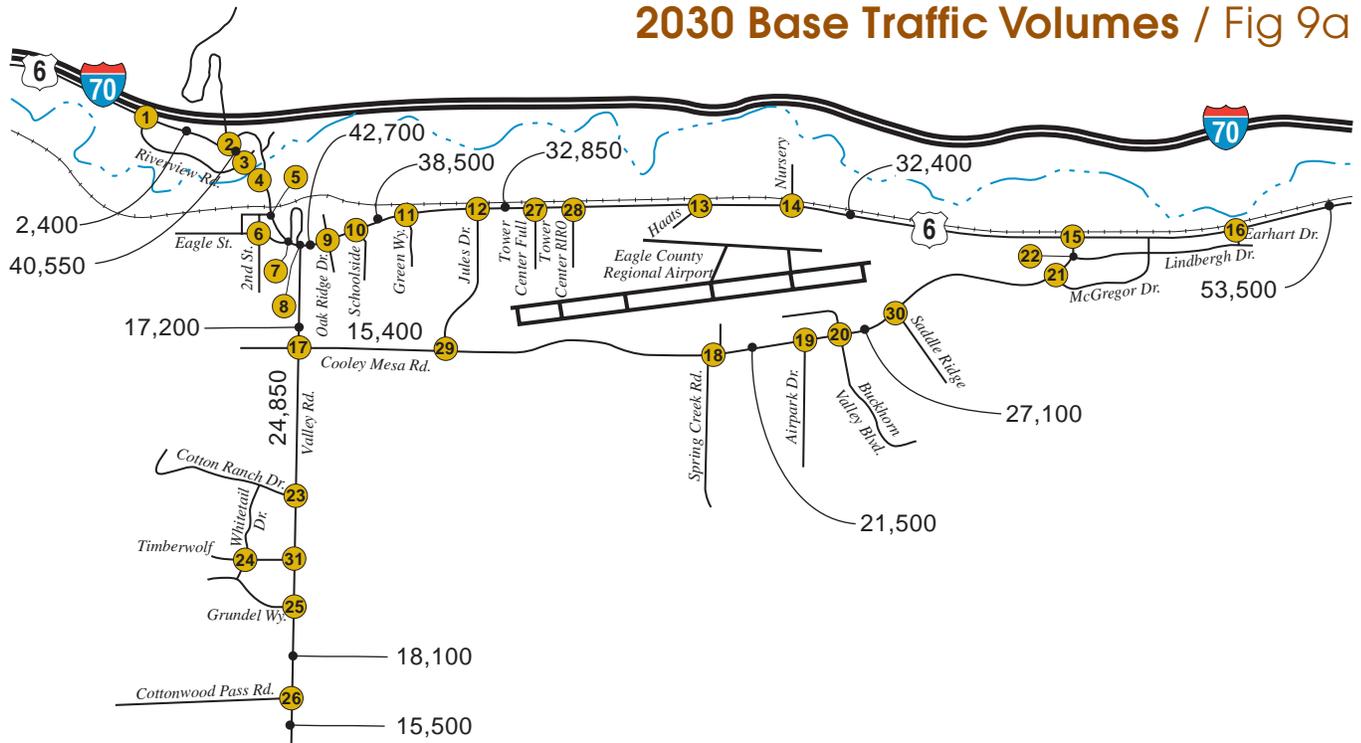
Valley Road would experience approximately 15,200 to 24,900 VPD south of Cooley Mesa Road. Between Cooley Mesa Road and US 6, this roadway would experience approximately 10,400 VPD, representing a significant reduction from the Base scenario. Cooley Mesa Road would carry between about 21,100 and 28,700 VPD.

Table 2 provides a comparison between existing traffic volumes and future forecasts for key roadway links in Gypsum.

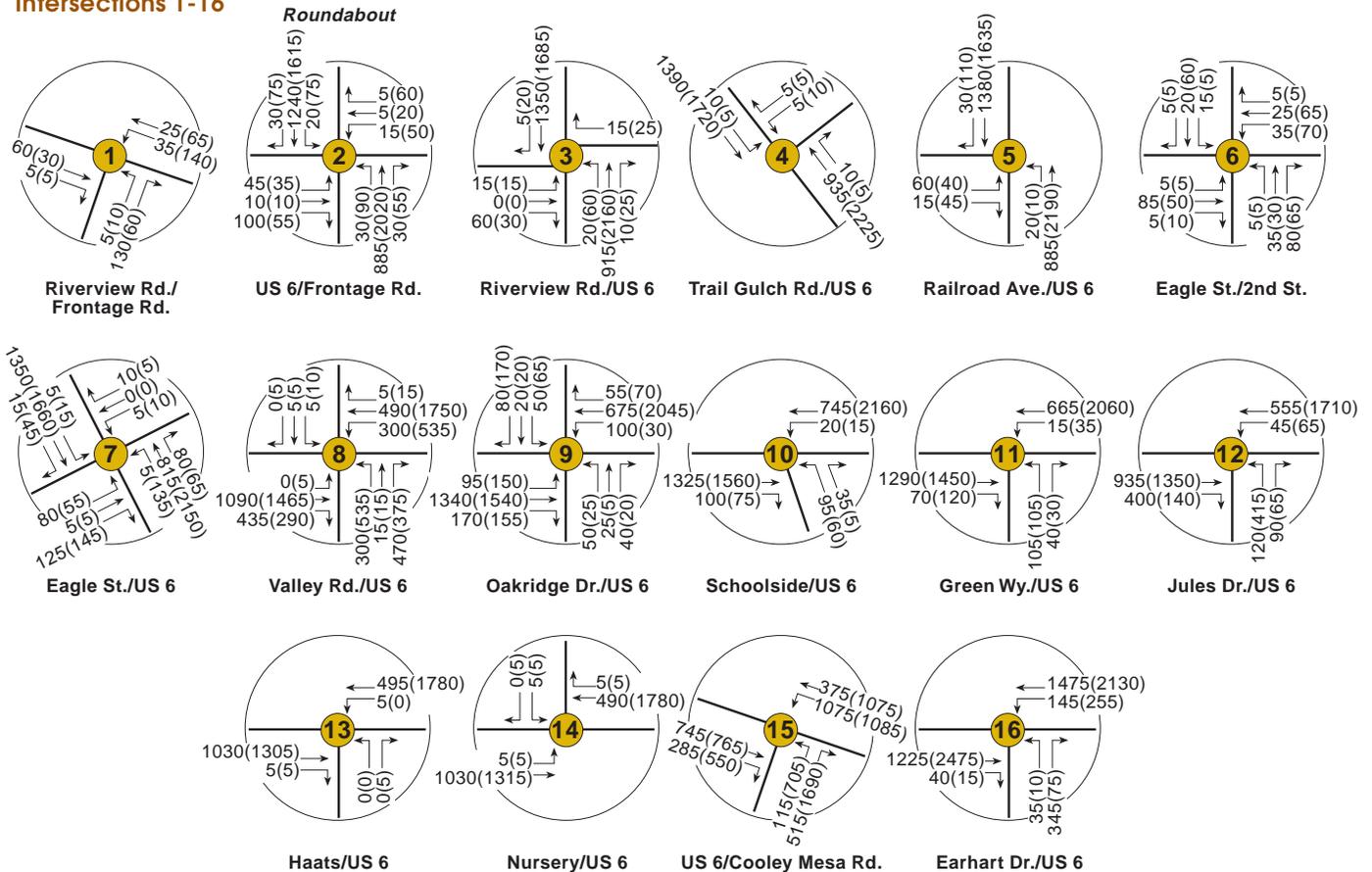
Table 2. Daily Traffic Volume Comparison

Roadway/Segment	Existing Counts	Year 2011	Year 2016	Year 2030 Base	Year 2030 Alternative
US 6					
I-70 to Valley Rd	9,900	16,275	22,675	40,550	37,300
West of Cooley Mesa	6,400	11,800	17,250	32,400	30,950
East of Cooley Mesa	9,100	18,350	27,600	53,500	25,075
Cooley Mesa Road					
Valley to Spring Creek	2,800	5,425	8,075	15,425	21,125
East of Spring Creek	2,800	7,850	12,925	27,100	28,650
Valley Road					
South of Cottonwood	1,500	2,625	3,750	15,525	15,525
South of Cooley Mesa	5,300	9,375	13,450	24,850	24,850
Cooley Mesa to Valley	6,600	8,800	11,000	17,200	10,400

2030 Base Traffic Volumes / Fig 9a



Intersections 1-16



LEGEND

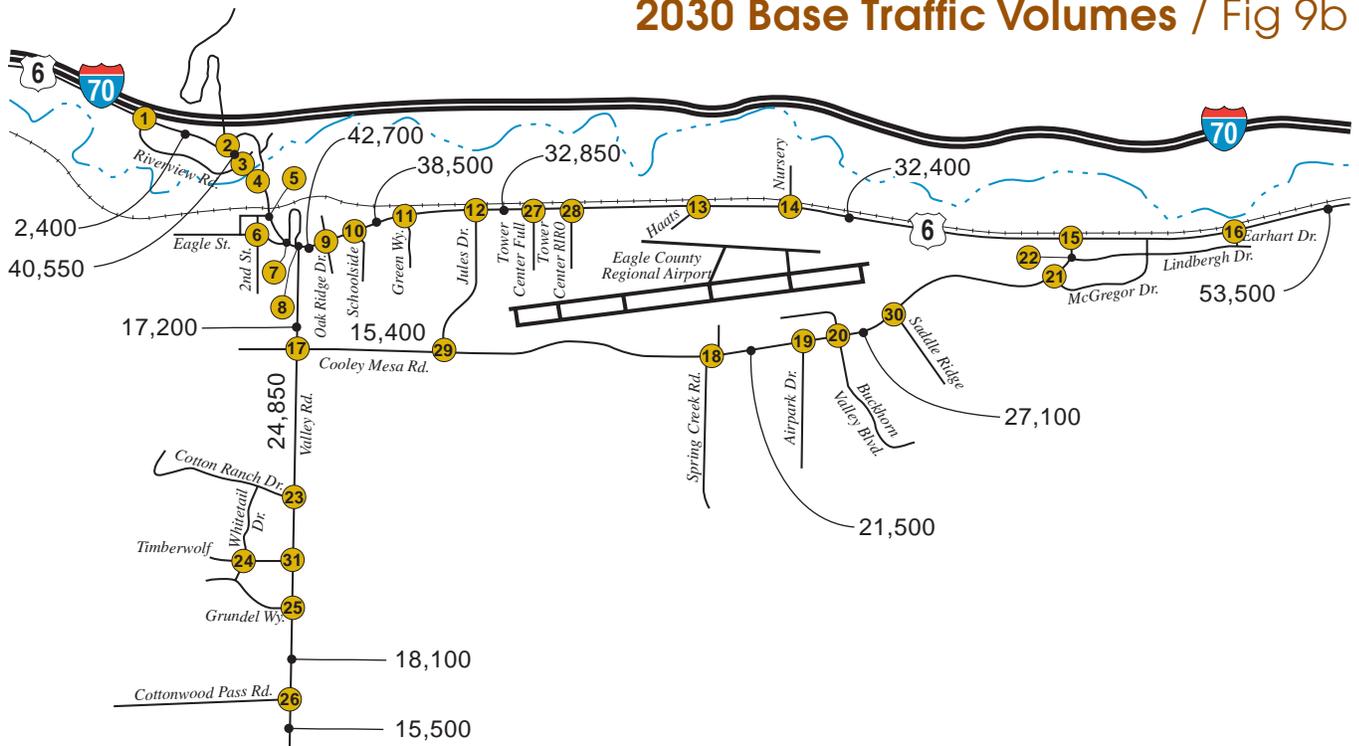
XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

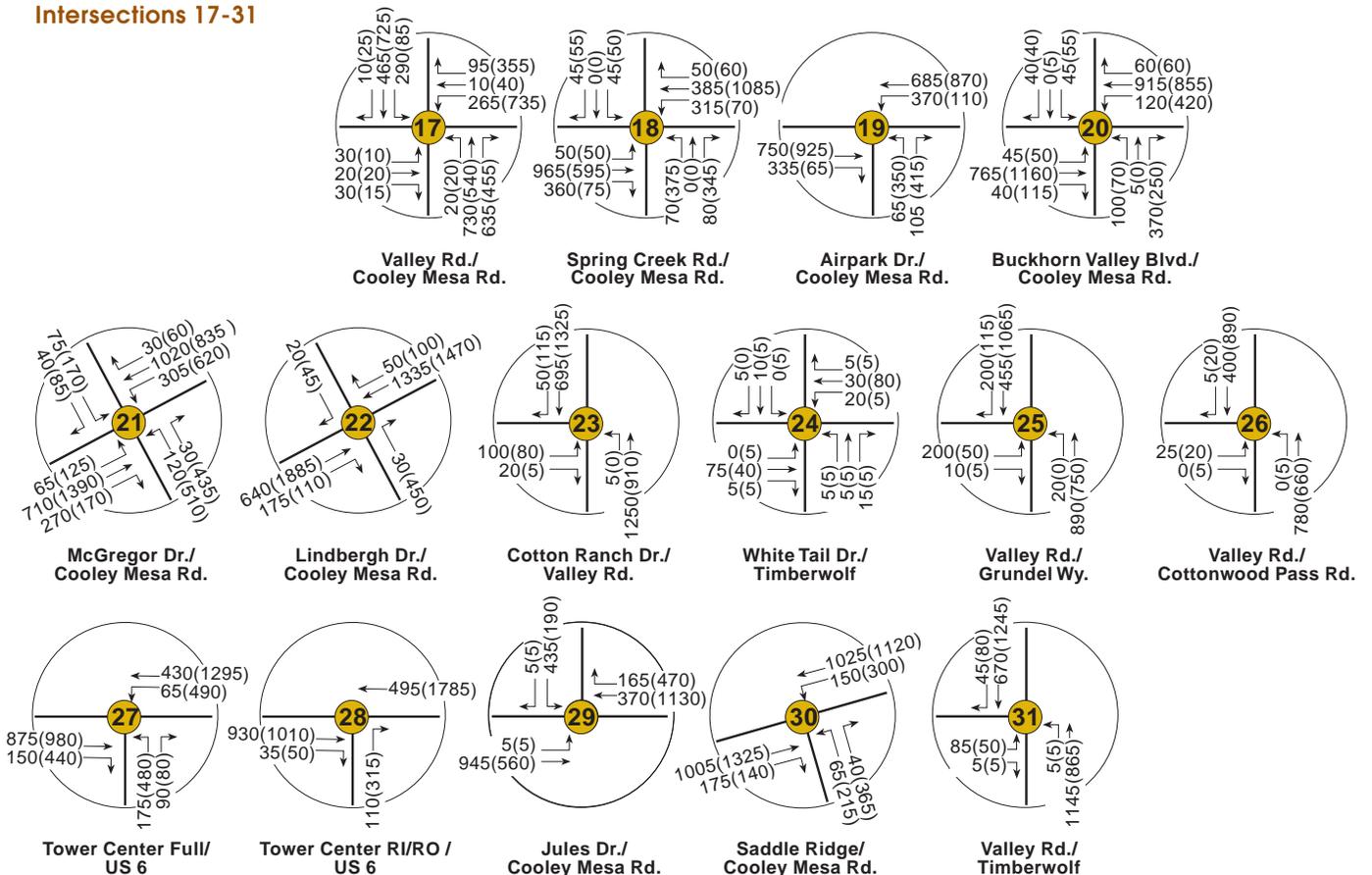


North

2030 Base Traffic Volumes / Fig 9b



Intersections 17-31



LEGEND

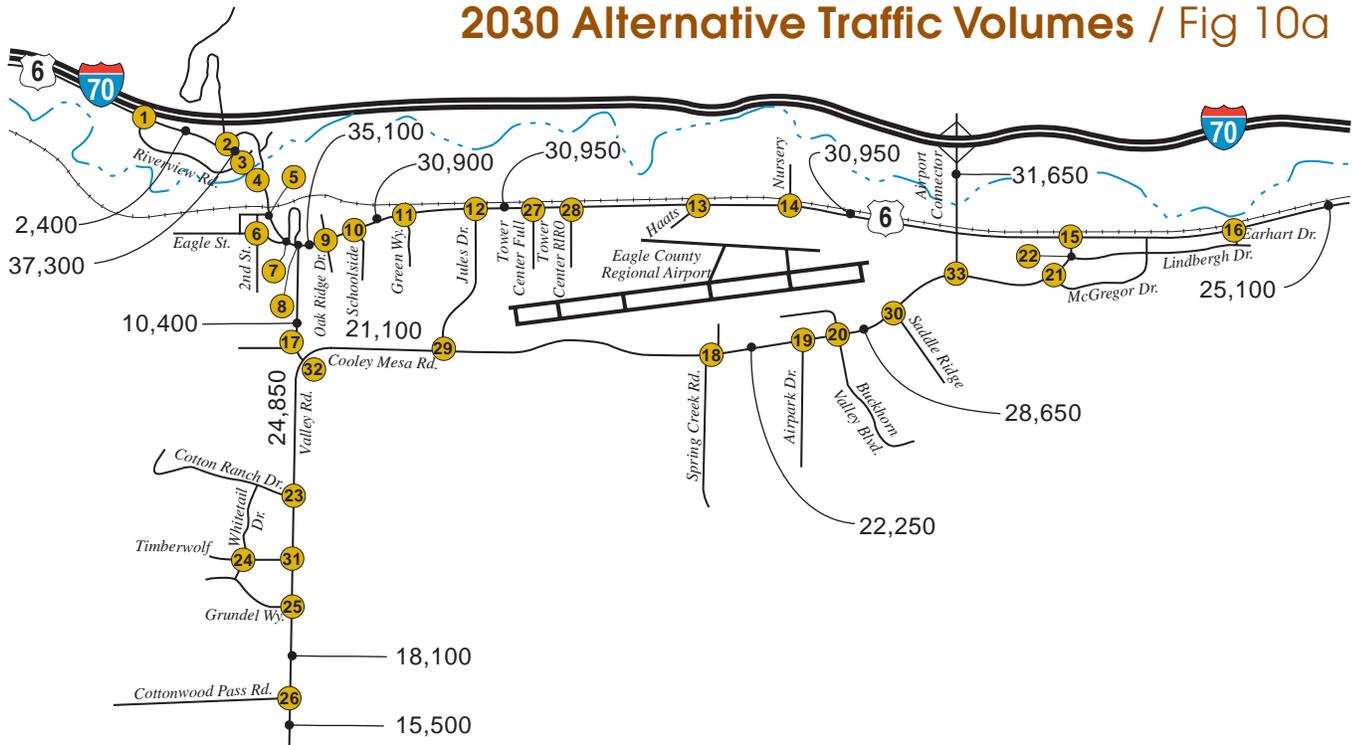
XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

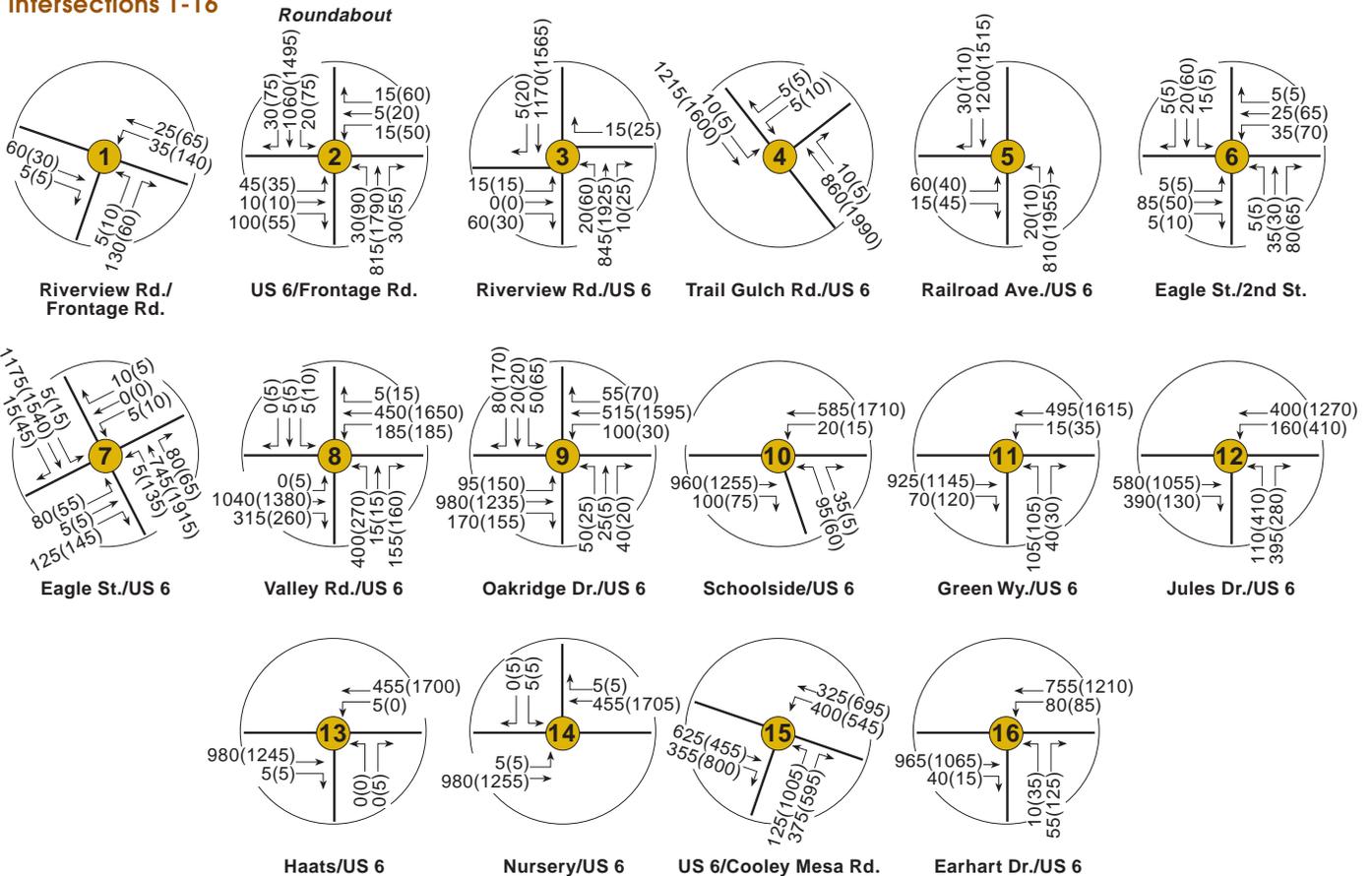


North

2030 Alternative Traffic Volumes / Fig 10a



Intersections 1-16



LEGEND

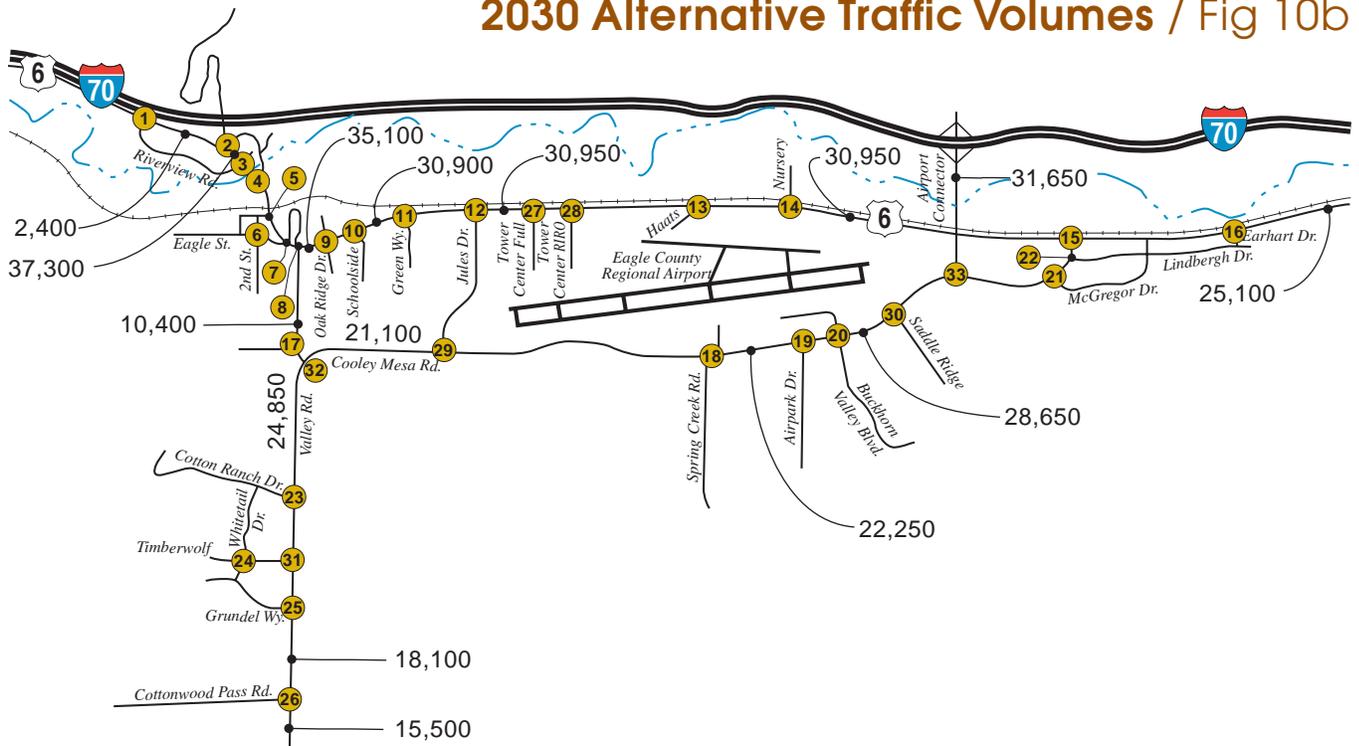
XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

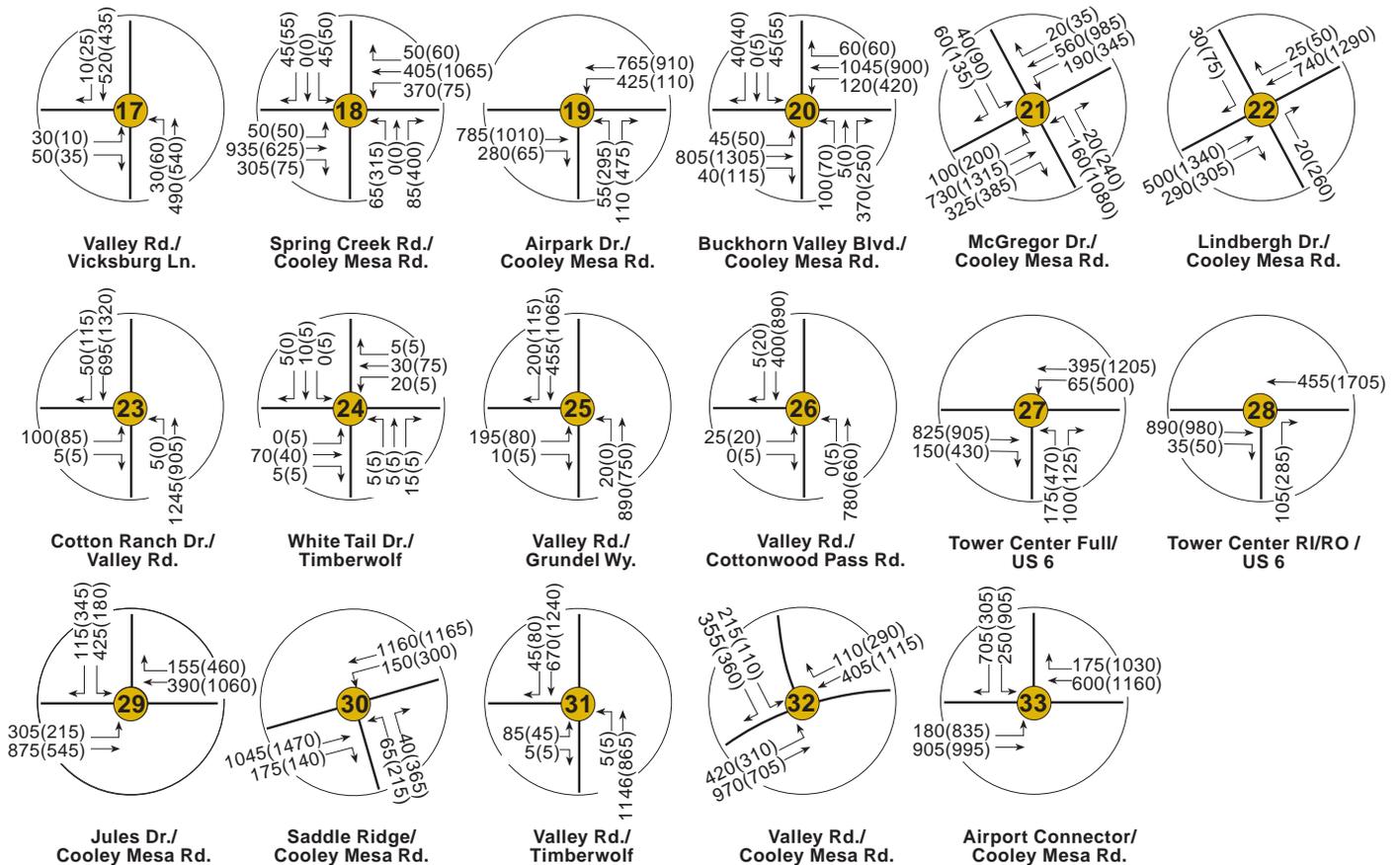


North

2030 Alternative Traffic Volumes / Fig 10b



Intersections 17-33



LEGEND

XXX(XXX) = AM/PM Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes



North

IV. FUTURE IMPROVEMENT REQUIREMENTS

A. Year 2011

The peak hour volumes previously depicted on **Figure 7** were used as the basis for intersection LOS analyses, the results of which are summarized on **Figure 11**. At the five-year horizon, traffic operations would be generally acceptable within the study area. The existing roundabout just south of the Gypsum interchange would operate at LOS A during peak times. The intersection of US 6/Valley Road would operate at LOS C during peak times under the current signalized traffic control. The US 6/Oak Ridge Drive intersection, also currently signalized, would operate at LOS B. During the morning peak, however, left-turns into the high school can form queues which extend beyond the current storage capacity of the left-turn lane. This condition impacts the westbound through-movement on US 6; therefore, the left-turn lane should be extended about 100 feet to provide additional storage.

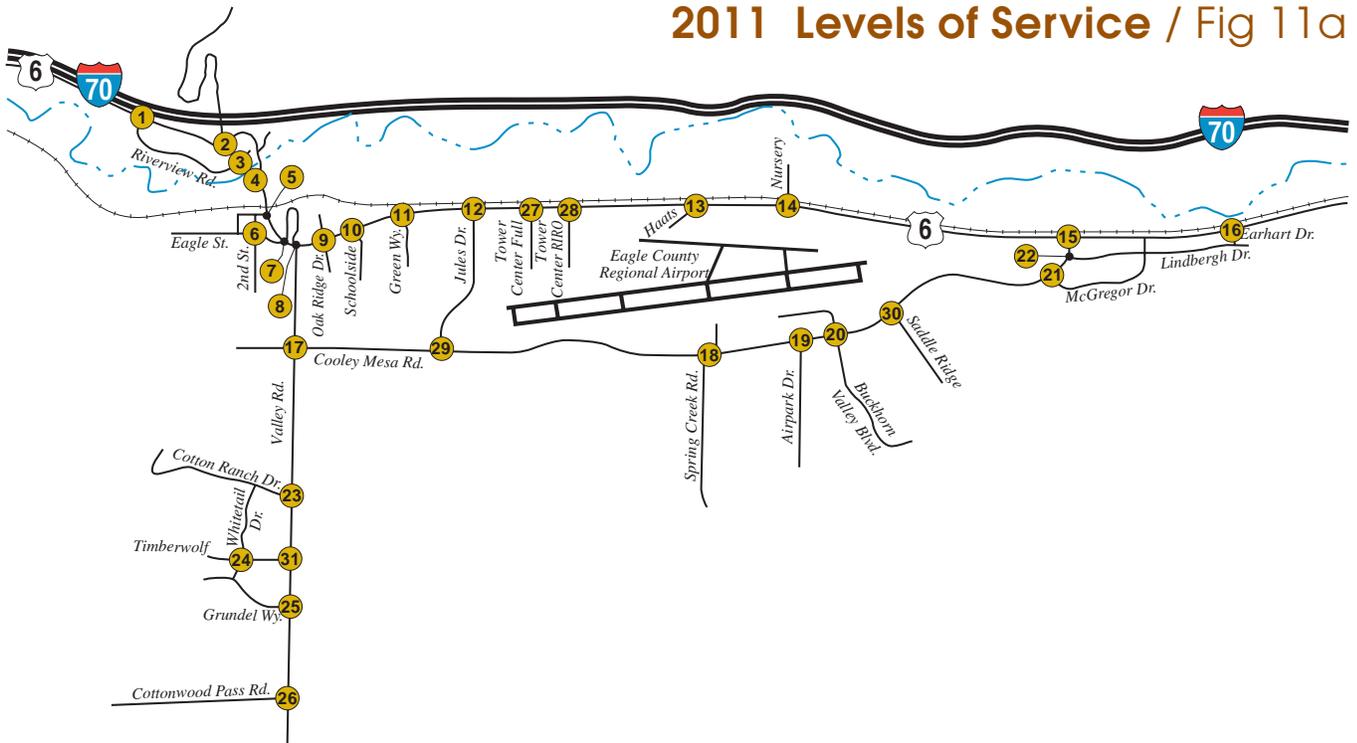
STOP sign controlled operations along US 6 would include long delays for side-street movements. This condition is typical of unsignalized operations along busy roadways, and is due to the relatively high through-volumes projected along US 6. The projected congestion would affect primarily the left-turn movements onto US 6. At many of the intersections and accesses along US 6, the projected traffic volumes would be insufficient to warrant signalization, based on peak hour criteria contained in the MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), FHWA, 2003 Edition. At the US 6/Tower Center access (at milepost 143.95), the forecasted traffic conditions would be sufficient to warrant signalization. If signalized, this intersection would operate at LOS A during peak times. The US 6/Cooley Mesa Road intersection is scheduled to be signalized by fall of 2006.

Projected traffic volumes at the US 6/Green Way intersection would also be sufficient to warrant a traffic signal per MUTCD criteria. The spacing of this intersection from the existing traffic signal at Oak Ridge Drive (approximately one-quarter mile), however, does not meet CDOT requirements. Furthermore, signal progression analyses conducted for the Access Control Plan (documented in a subsequent section of this report) indicate that the location of the Green Way intersection would have a negative impact on progression along US 6. As land uses served by Green Way have an alternative means of access at Jules Drive, it is recommended that this intersection remain unsignalized.

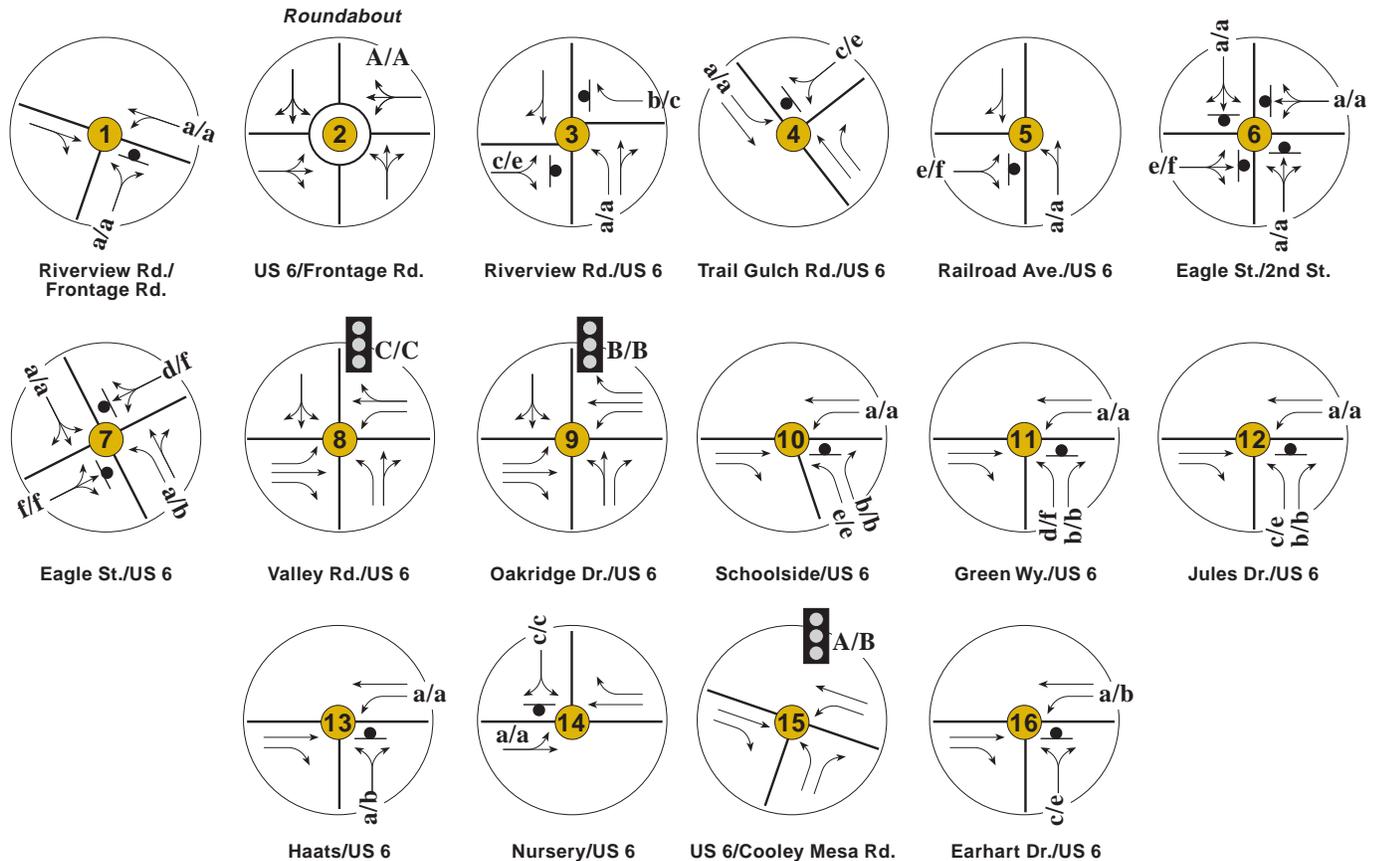
The intersection of Cooley Mesa Road/Valley Road is projected to meet signal warrants by the year 2011. In addition, the westbound approach to this intersection should be widened to include an exclusive left-turn lane. With these improvements, the intersection is projected to operate at LOS B during peak times.

The intersection of Cooley Mesa Road/McGregor Drive is projected to meet signal warrants in the near term future. Under signalized traffic control, this intersection would operate at LOS B or C. At the Cooley Mesa Road/Lindbergh Drive intersection, unsignalized operations would be at congested levels. Due to the proximity of this intersection to US 6 (approximately 500 feet), side street movements should be restricted to right-turns only.

2011 Levels of Service / Fig 11a



Intersections 1-16



LEGEND

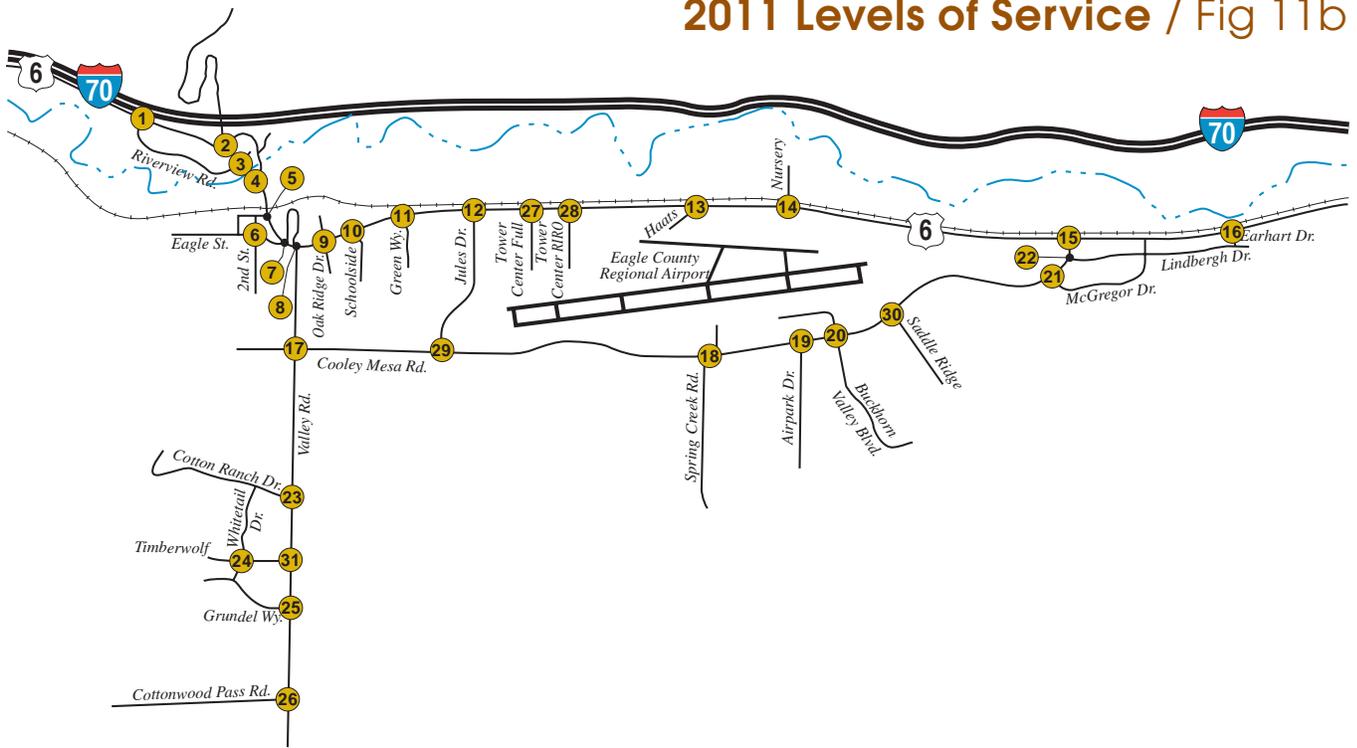
- X/X** = AM/PM Peak Hour Signalized Intersection Level Of Service
- x/x** = AM/PM Peak Hour Unsignalized Intersection Level Of Service

- = Stop Sign
- = Traffic Signal

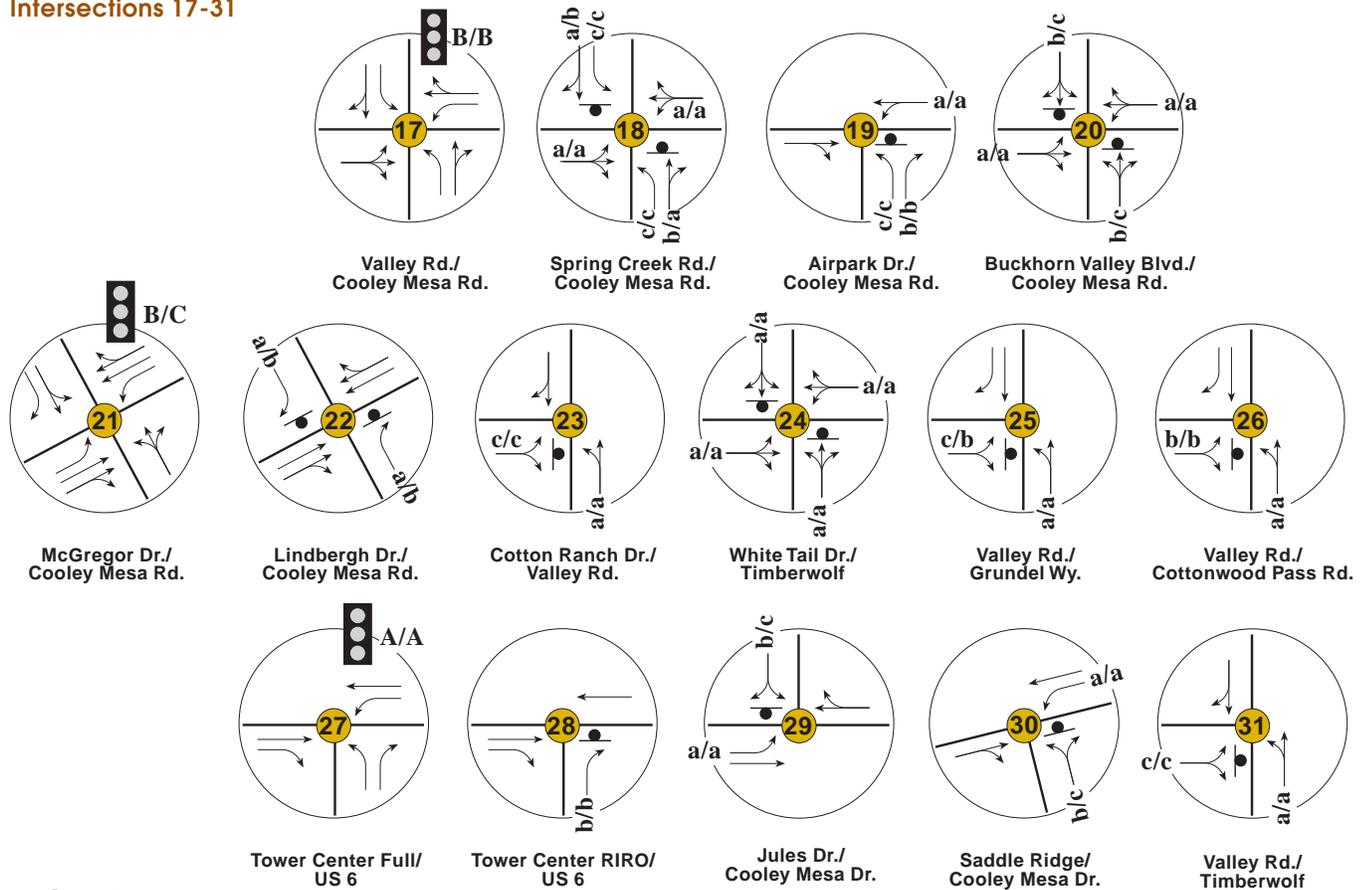


North

2011 Levels of Service / Fig 11b



Intersections 17-31



LEGEND

- X/X** = AM/PM Peak Hour Signalized Intersection Level Of Service
- x/x** = AM/PM Peak Hour Unsignalized Intersection Level Of Service

- = Stop Sign
- = Traffic Signal



North

The projected year 2011 improvements are summarized as follows:

- ▶ Extend the existing westbound left-turn lane at US 6/Oak Ridge Drive.
- ▶ Provide a westbound left-turn lane on Cooley Mesa Road at Valley Road.
- ▶ Signalize the Cooley Mesa Road/Valley Road intersection, when warranted.
- ▶ Construct Jules Drive south to Cooley Mesa Road.
- ▶ Signalize the US 6/Tower Center access (MP 143.95), when warranted.
- ▶ Signalize the Cooley Mesa Road/McGregor Drive intersection, when warranted.
- ▶ Restrict side street movements to right-turn only at the Cooley Mesa Road/Lindbergh Drive intersection.

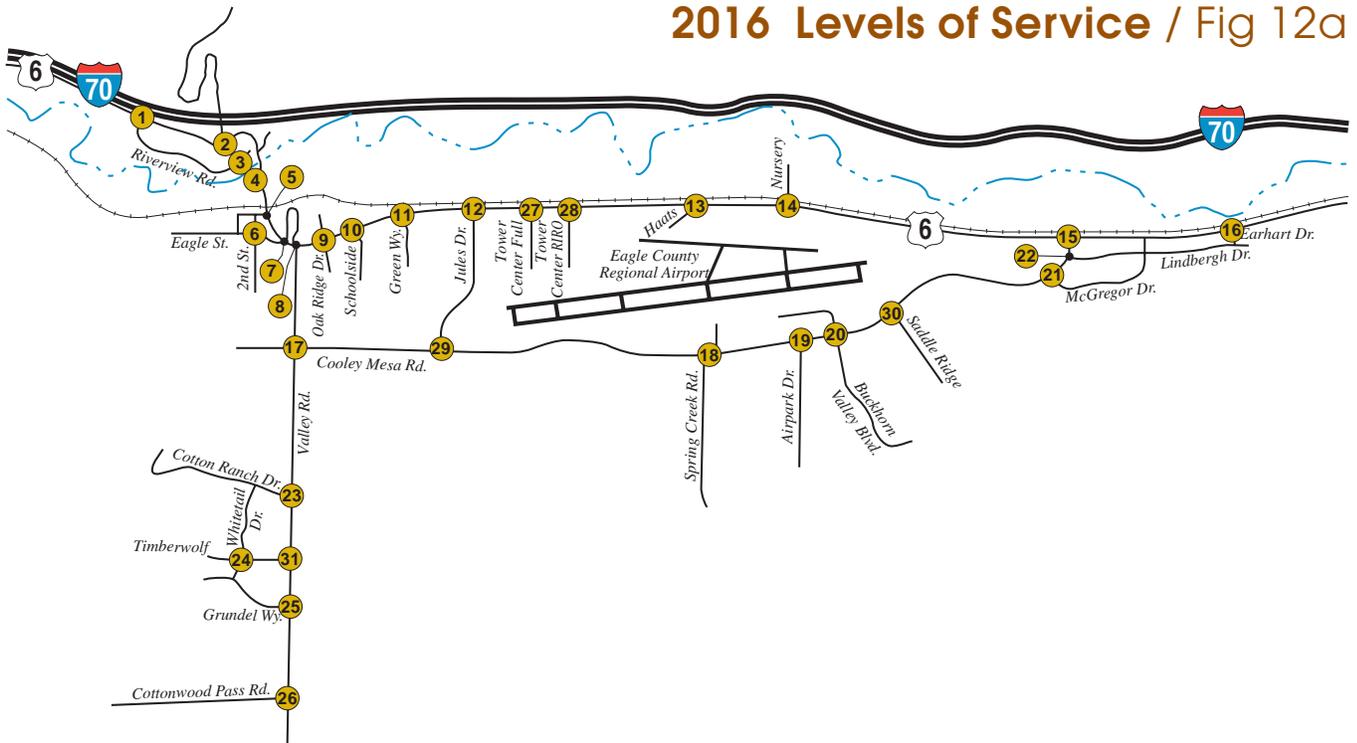
B. Year 2016

By the year 2016, traffic volumes along US 6 between I-70 and Valley Road are projected to exceed the capacity of the existing two-lane facility. This segment of US 6 would require widening to four through-lanes, necessitating the replacement of the existing Union Pacific Railroad bridge over US 6 and Gypsum Creek. This bridge currently precludes the ability to widen the roadway, and creates sight distance issues along US 6. The existing roundabout located just south of the intersection would require two circulating lanes to accommodate the roadway widening.

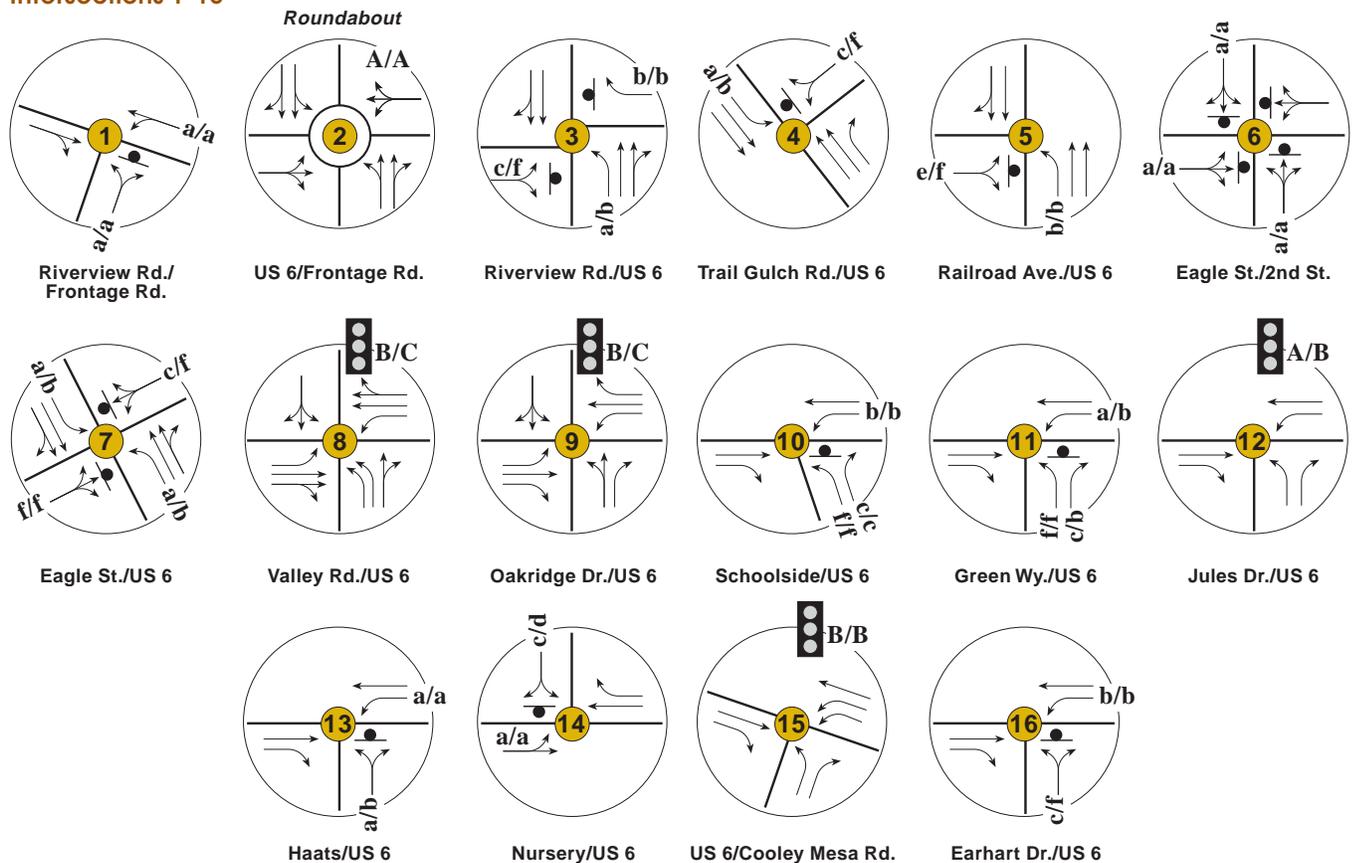
Intersection LOS analyses for the ten-year horizon are summarized on **Figure 12**. In the year 2016, traffic operations in Gypsum would remain generally acceptable within the study area. Signalized intersections along US 6 would operate acceptably; however, STOP sign controlled movements would continue to experience congestion and delays. As previously discussed, this condition is typical of unsignalized operations along arterials, and primarily affects the side-street left-turn movements. By the year 2016, an additional traffic signal is projected at the US 6/Jules Drive intersection. This intersection would operate at LOS A or B.

Traffic signals are also projected to be warranted along Cooley Mesa Road at Spring Creek Road, Airpark Drive, and the Saddle Ridge Golf Club access. These signals would operate at LOS A or B during the peak hours. Additional auxiliary laneage and geometric improvements at key intersections will also be required. The following highlights summarize the projected year 2016 improvements, additive to the improvements identified for 2011:

2016 Levels of Service / Fig 12a



Intersections 1-16



LEGEND

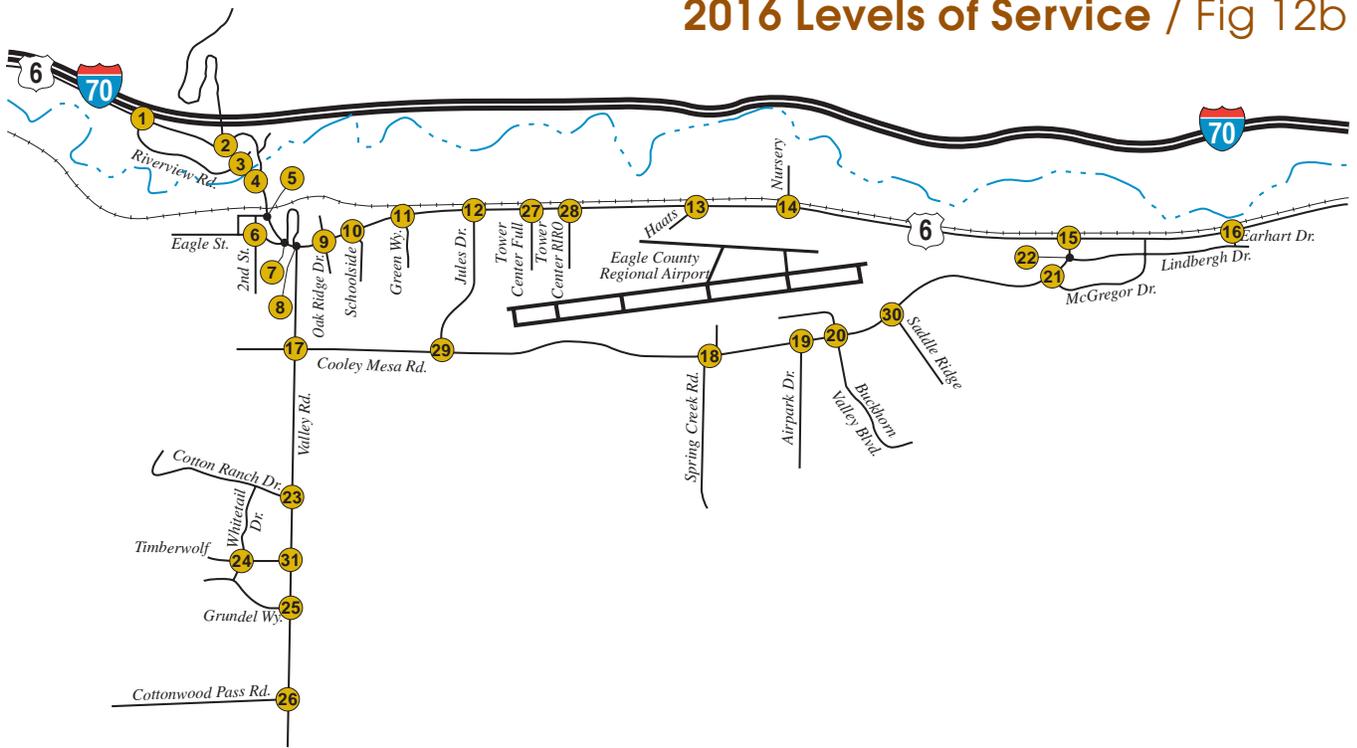
- X/X** = AM/PM Peak Hour Signalized Intersection Level Of Service
- x/x** = AM/PM Peak Hour Unsignalized Intersection Level Of Service

- = Stop Sign
- = Traffic Signal

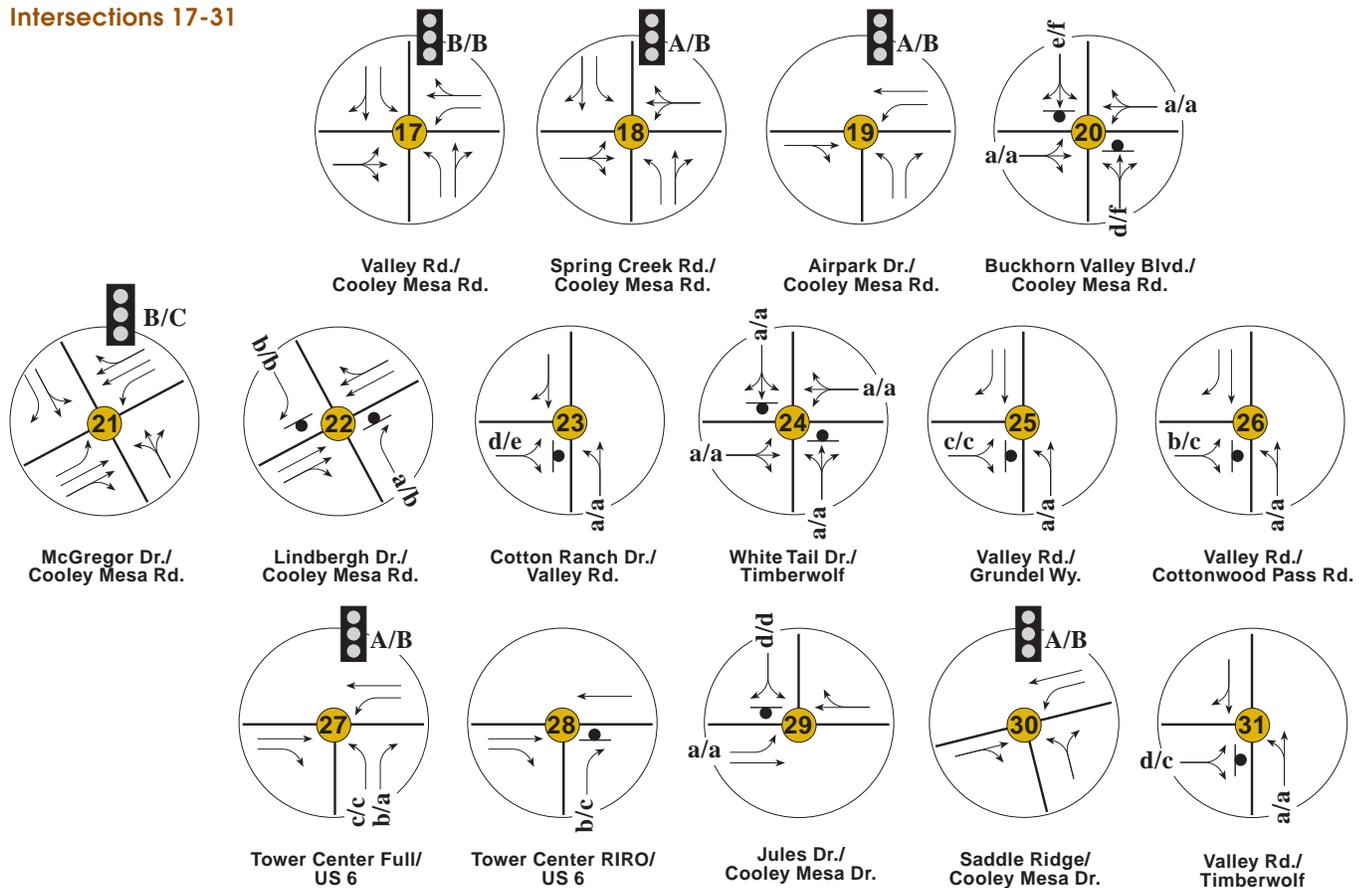


North

2016 Levels of Service / Fig 12b



Intersections 17-31



LEGEND

- X/X** = AM/PM Peak Hour Signalized Intersection Level Of Service
- x/x** = AM/PM Peak Hour Unsignalized Intersection Level Of Service

- = Stop Sign
- = Traffic Signal



North

- ▶ Replace the UP railroad bridge over US 6.
- ▶ Widen US 6 to four through-lanes plus left-turn lanes at intersections from I-70 through the Valley Road intersection.
- ▶ Provide two circulating lanes within the roundabout.
- ▶ Provide dual left-turn lanes on westbound US 6 at Cooley Mesa Road.
- ▶ Signalize the US 6/Jules Drive intersection, when warranted.
- ▶ Provide dual left-turn lanes on northbound Valley Road at US 6.
- ▶ Provide a left-turn lane on westbound Cooley Mesa Road at Airpark Drive.
- ▶ Signalize the Cooley Mesa Road/Spring Creek Road intersection, when warranted.
- ▶ Signalize the Cooley Mesa Road/Airpark Drive intersection, when warranted.
- ▶ Signalize the Cooley Mesa Road/Saddle Ridge Golf Club access, when warranted.

C. *Year 2030 Base*

Intersection LOS analyses for year 2030 Base network (no new Airport interchange) are summarized on **Figure 13**. In this scenario, the widening of US 6 from two to four through-lanes would be extended from Valley Road through the Town of Gypsum. The projected traffic volumes on US 6 east of Cooley Mesa Road would be at the capacity of a four-lane highway.

Cooley Mesa Road would also require widening to four through-lanes plus left-turn lanes at major accesses between Spring Creek Road and the existing four-lane section in Gateway. Valley Road between Cottonwood Pass Road and US 6 would need to be widened to four through-lanes in this scenario.

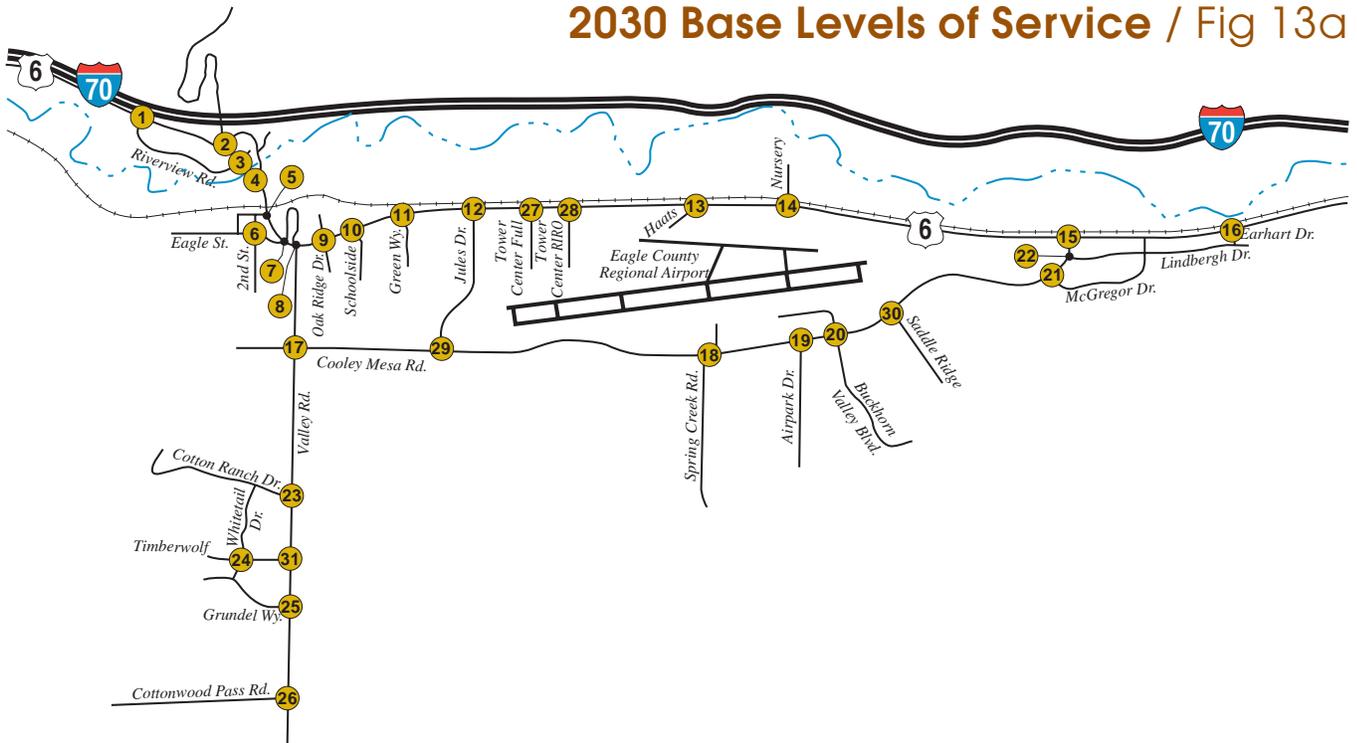
The projected volumes at US 6/Earhart Drive would warrant a traffic signal by the year 2030. Signalized traffic operations along US 6 would remain acceptable within the study area, with the exception of the US 6/Earhart Drive intersection, which would be at LOS E during the PM peak hour.

By the year 2030, additional traffic signals would be required at Cooley Mesa Road/Buckhorn Valley Boulevard, Cooley Mesa Road/Jules Drive, and Valley Road/Cotton Ranch Drive intersections. These intersections would operate at LOS C or better during peak times.

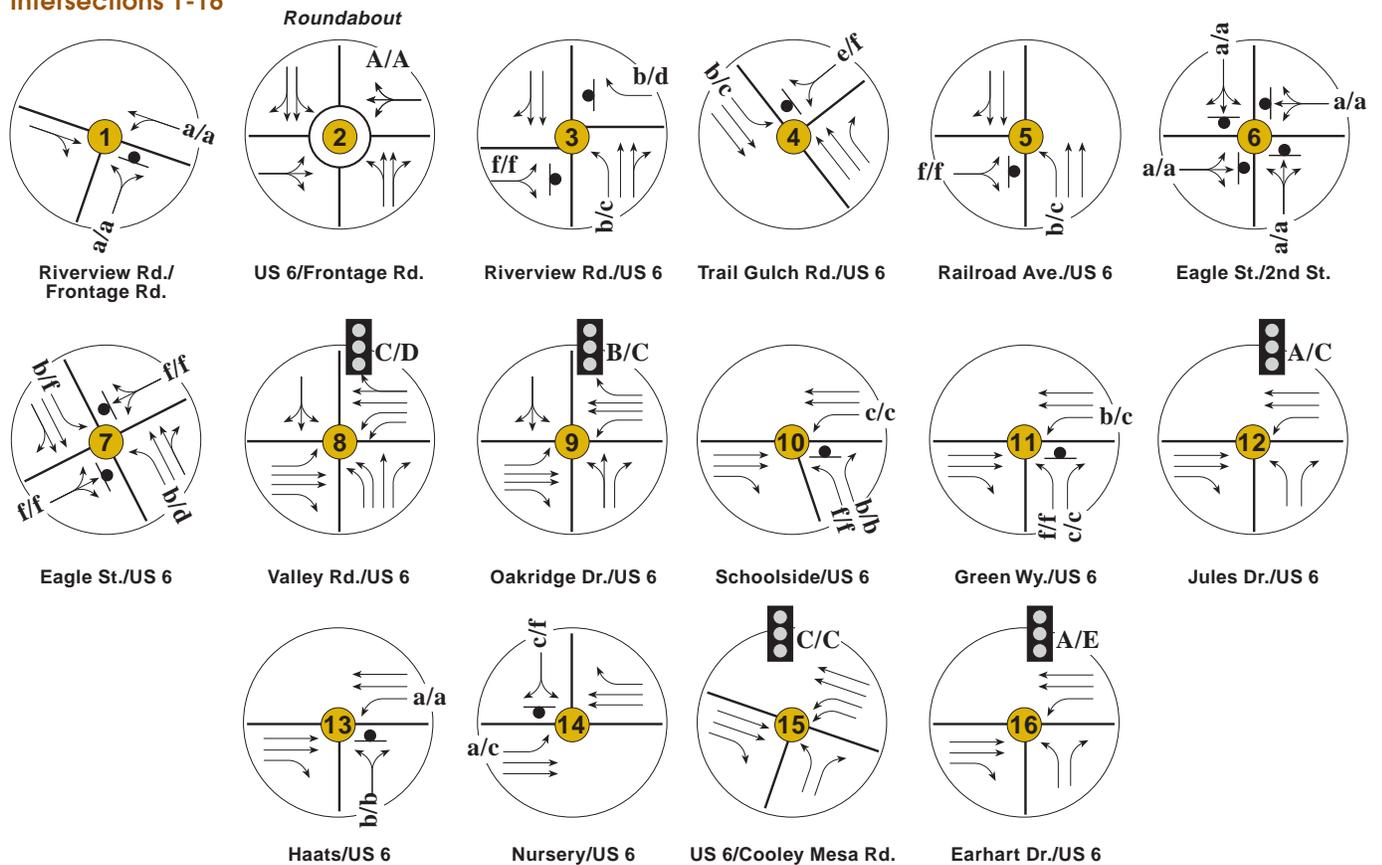
It is estimated that, if approved by CDOT, an additional full-movement access on US 6 at Tower Center would meet MUTCD criteria for signalization. This location would also serve the property on the north side of US 6, as discussed in the Access Control Plan section of this report.

Additional geometric improvements at area intersections will be required. As documented in the 2030 INTERMOUNTAIN REGIONAL TRANSPORTATION PLAN, the existing I-70 interchange at Gypsum will also require improvements within this time frame. The projected year 2030 Base improvements (additive to the 2011 and 2016 improvements) are as follows:

2030 Base Levels of Service / Fig 13a



Intersections 1-16



LEGEND

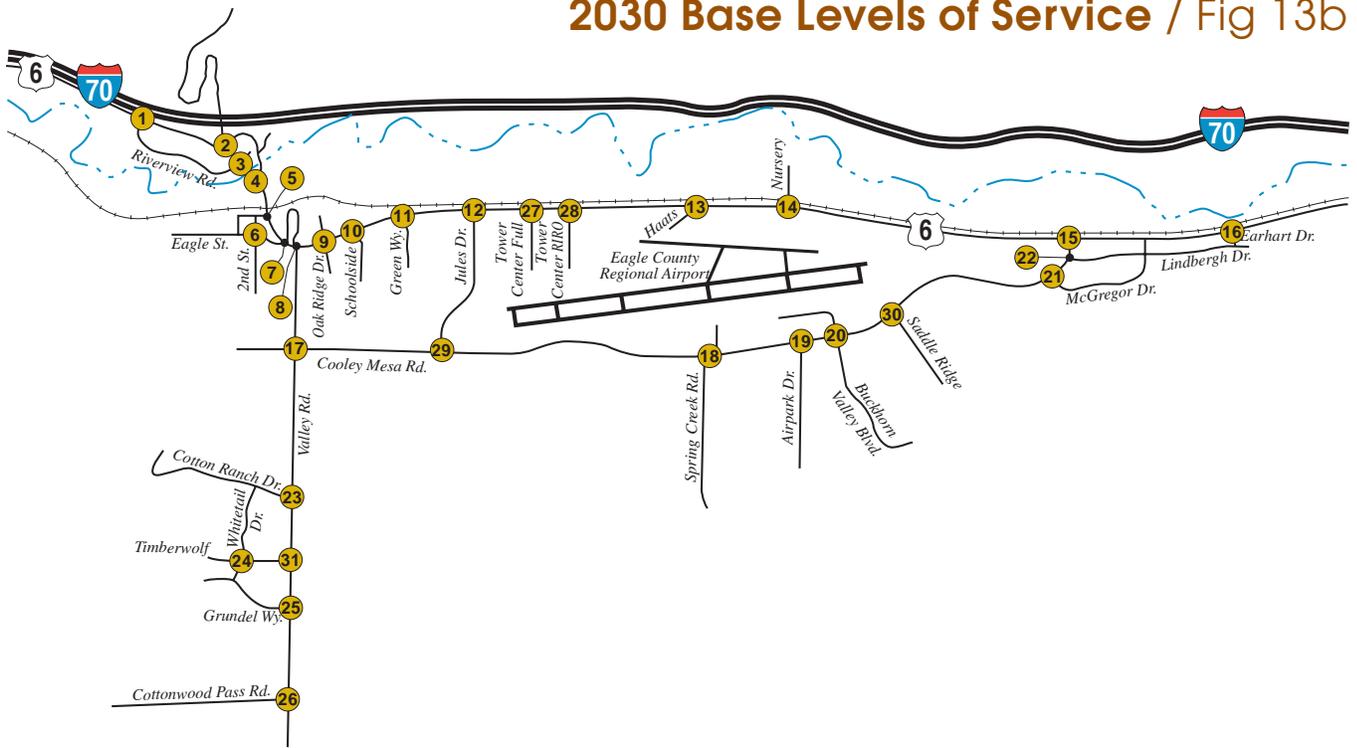
X/X = AM/PM Peak Hour Signalized Intersection Level Of Service
x/x = AM/PM Peak Hour Unsignalized Intersection Level Of Service

= Stop Sign
 = Traffic Signal

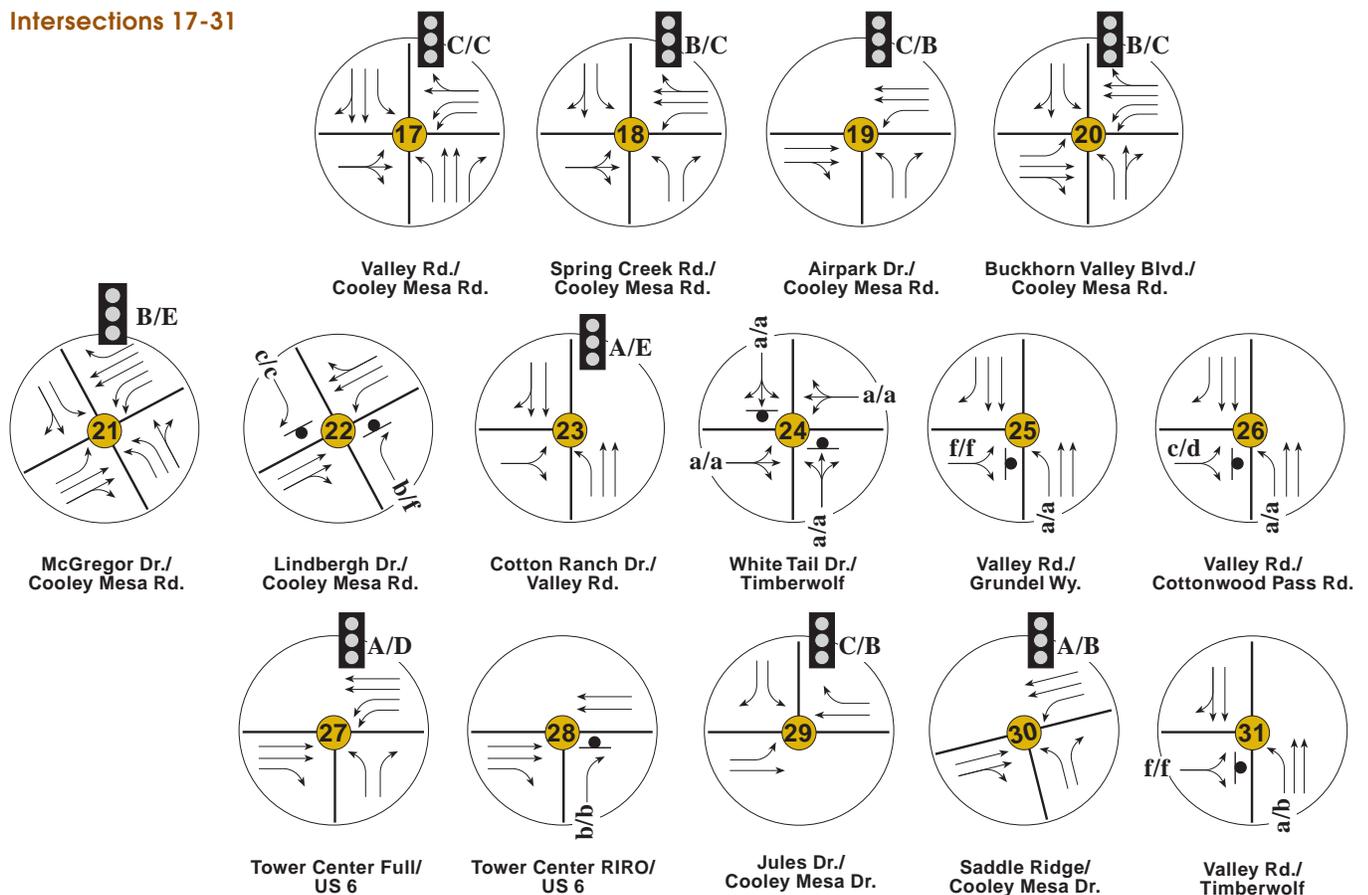


North

2030 Base Levels of Service / Fig 13b



Intersections 17-31



LEGEND

- X/X** = AM/PM Peak Hour Signalized Intersection Level Of Service
- x/x** = AM/PM Peak Hour Unsignalized Intersection Level Of Service

- = Stop Sign
- = Traffic Signal



North

- ▶ Provide interchange improvements at I-70/Gypsum exit.
- ▶ Widen US 6 to four through-lanes plus left-turn lanes at intersections from the Valley Road intersection east to the Town limits.
- ▶ Widen Cooley Mesa Road to four through-lanes plus left-turn lanes at intersections from Spring Creek Road to the Gateway area.
- ▶ Widen Valley Road to four through-lanes plus left-turn lanes at major intersections from Cottonwood Pass Road to US 6.
- ▶ Signalize the Cooley Mesa Road/Jules Dive intersection, when warranted.
- ▶ Provide dual left-turn lanes on the westbound and southbound approaches at Cooley Mesa Road/McGregor Drive. Provide an exclusive right-turn lane on the southbound approach at this intersection.
- ▶ Signalize the Cooley Mesa Road/Buckhorn Valley Boulevard intersection, when warranted.
- ▶ Signalize the Valley Road/Cotton Ranch Drive intersection, when warranted.
- ▶ Provide dual left-turn lanes on westbound US 6 at Valley Road. Provide an exclusive right-turn lane on northbound Valley Road and on eastbound US 6 at this intersection.
- ▶ Provide dual left-turn lanes on westbound Cooley Mesa Road at Buckhorn Valley Boulevard.
- ▶ Signalize the US 6/Earhart Drive intersection, when warranted.
- ▶ Provide an exclusive northbound left-turn lane at US 6/Earhart Drive.

D. Year 2030 Alternative

In this scenario, the planned Eagle Airport Interchange and connector roadway is a part of the roadway network improvements in Gypsum. The current concept for this improvement consists of a new interchange on I-70 about midway between the existing interchanges at Gypsum and Eagle. A connector roadway would bridge over the Eagle River valley, the Union Pacific Railroad, and US 6, connecting to Cooley Mesa Road east of the Airport. The projected daily traffic volumes on US 6 east of Cooley Mesa Road would remain well within the capacity of a four-lane facility.

The 2030 Alternative network also considers a reconfiguration of the Valley Road/Cooley Mesa Road intersection to focus more traffic onto Cooley Mesa Road. Valley Road south of the current intersection would be curved to the east in a large radius, creating a continuous connection with Cooley Mesa Road. Valley Road north of the current intersection would then tee into the reconfigured roadway at a new unsignalized intersection. Vicksburg lane would continue to intersect Valley Road at the current location. The reconfigured intersection would focus more traffic from Valley Road onto Cooley Mesa Road towards Jules Drive and the Airport Interchange. This configuration would require Cooley Mesa Road to be widened to four through-lanes from Valley Road to the Gateway area. The traffic volume assignments for this scenario indicate that Valley Road between Cooley Mesa Road and US 6 would then remain a two-lane facility.

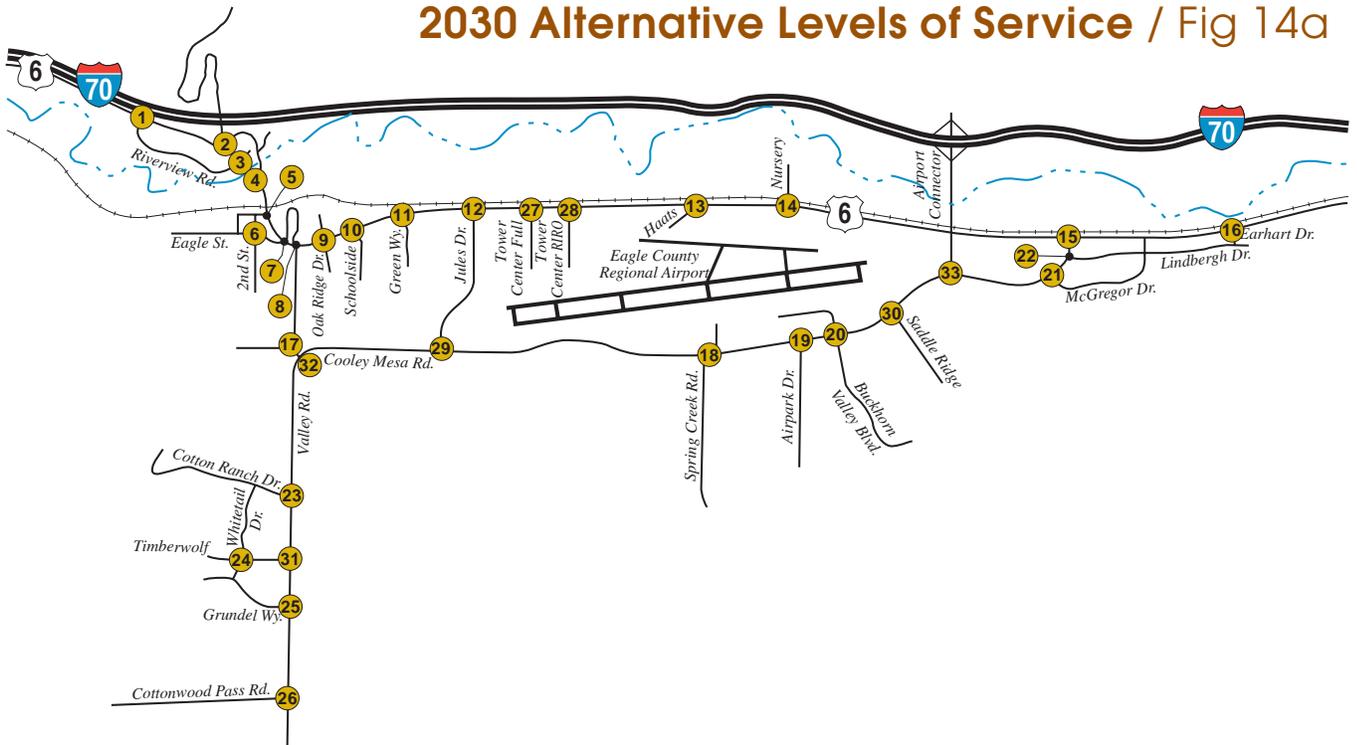
Figure 14 illustrates the LOS analysis results. The improvements for the Year 2030 Alternative scenario are summarized as follows; these improvements are in addition to those identified for 2011 and 2016, but are in lieu of the 2030 Base scenario improvements:

- ▶ Provide interchange improvements at I-70/Gypsum exit.
- ▶ Construct the planned Eagle Airport Interchange and Connector Road.
- ▶ Reconfigure the Valley Road/Cooley Mesa Road intersection to emphasize the south-to-east/east-to south movement.
- ▶ Widen US 6 to four through-lanes plus left-turn lanes at intersections from the Valley Road intersection east to the Town limits.
- ▶ Widen Cooley Mesa Road to four through-lanes plus left-turn lanes at intersections from Valley Road to the Gateway area.
- ▶ Widen Valley Road to four through-lanes plus left-turn lanes at major intersections from Cottonwood Pass Road to Cooley Mesa Road.
- ▶ Signalize the Cooley Mesa Road/Jules Dive intersection, when warranted.
- ▶ Provide dual left-turn lanes on the westbound and southbound approaches at Cooley Mesa Road/McGregor Drive. Provide an exclusive right-turn lane on the southbound approach at this intersection.
- ▶ Signalize the Valley Road/Cotton Ranch Drive intersection, when warranted.
- ▶ Signalize the Cooley Mesa Road/Buckhorn Valley Boulevard intersection, when warranted.
- ▶ Provide dual left-turn lanes on westbound Cooley Mesa Road at Buckhorn Valley Boulevard. Also provide exclusive left-turn lanes on the northbound and southbound approaches to this intersection.
- ▶ Provide dual left-turn lanes on westbound US 6 at the primary access to Tower Center.
- ▶ Provide an exclusive northbound left-turn lane at US 6/Earhart Drive.

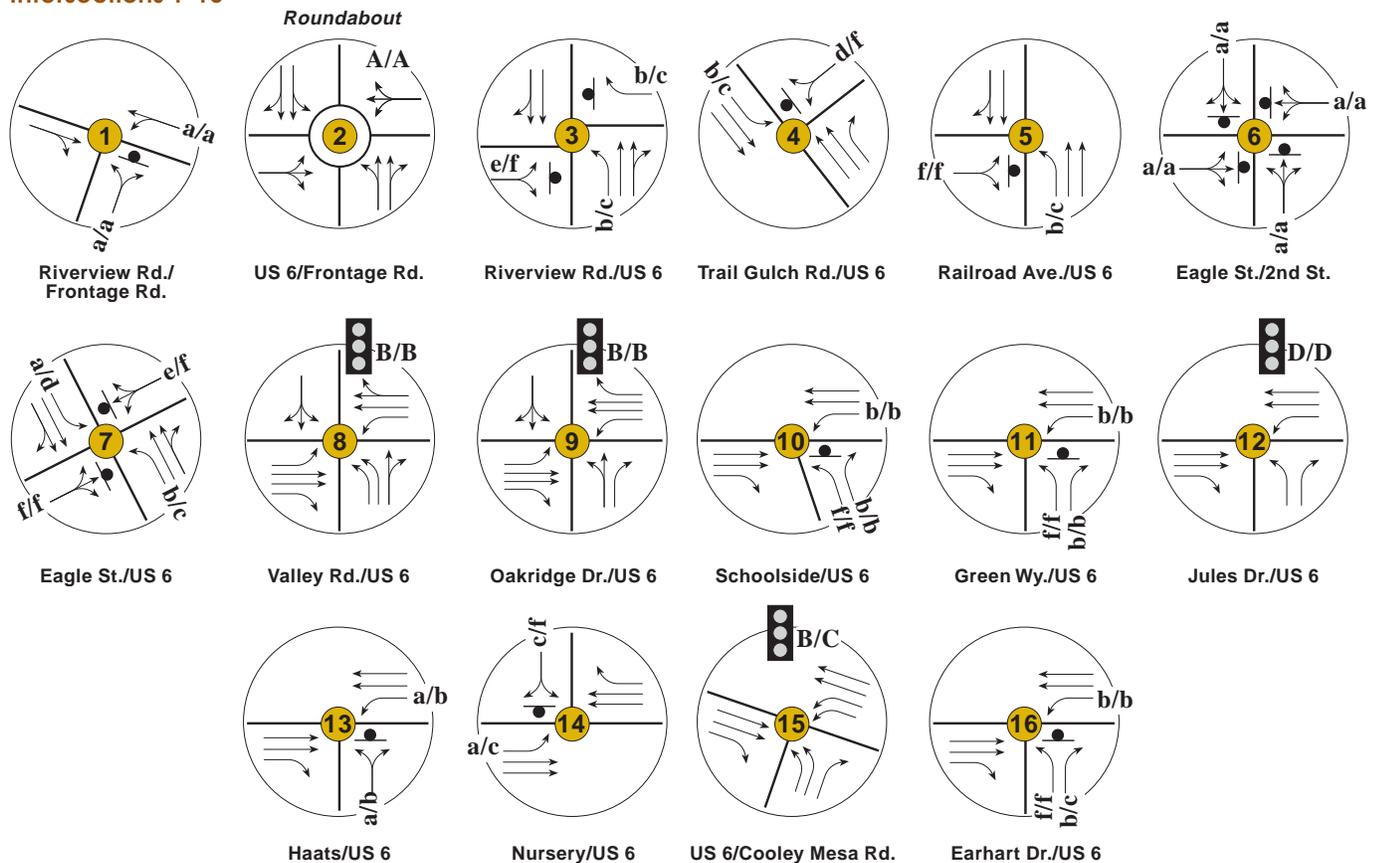
E. Capital Projects Plan

Preliminary opinions of probable costs associated with the improvement projects previously identified were developed based on previous engineering efforts in the area and current CDOT cost data for highway projects in Colorado. All costs are in current year dollars. The projects were prioritized into the Five Year Plan (year 2011), the Ten Year Plan (year 2016) and the Long Range Preferred Plan (year 2030 Alternative Scenario). **Table 3** summarizes the resultant Capital Projects Plan.

2030 Alternative Levels of Service / Fig 14a



Intersections 1-16



LEGEND

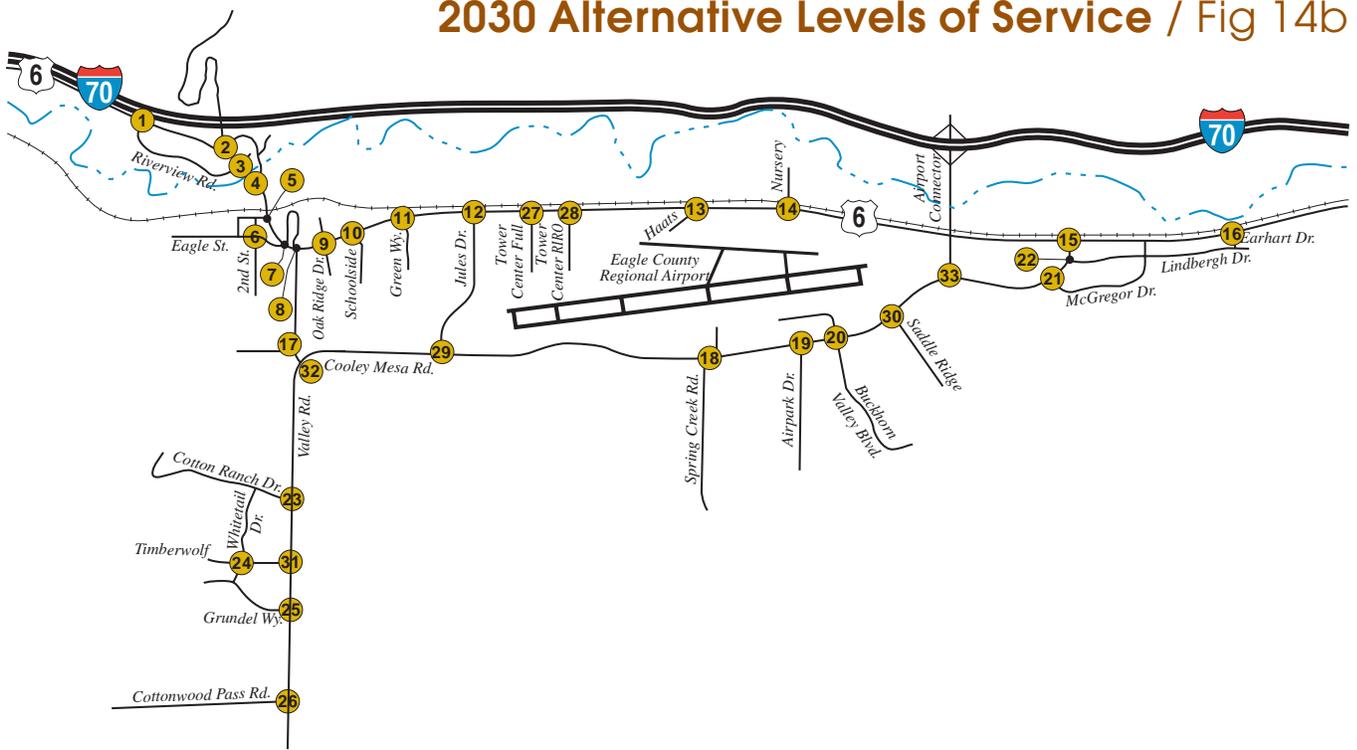
X/X = AM/PM Peak Hour Signalized Intersection Level Of Service
x/x = AM/PM Peak Hour Unsignalized Intersection Level Of Service

= Stop Sign
 = Traffic Signal

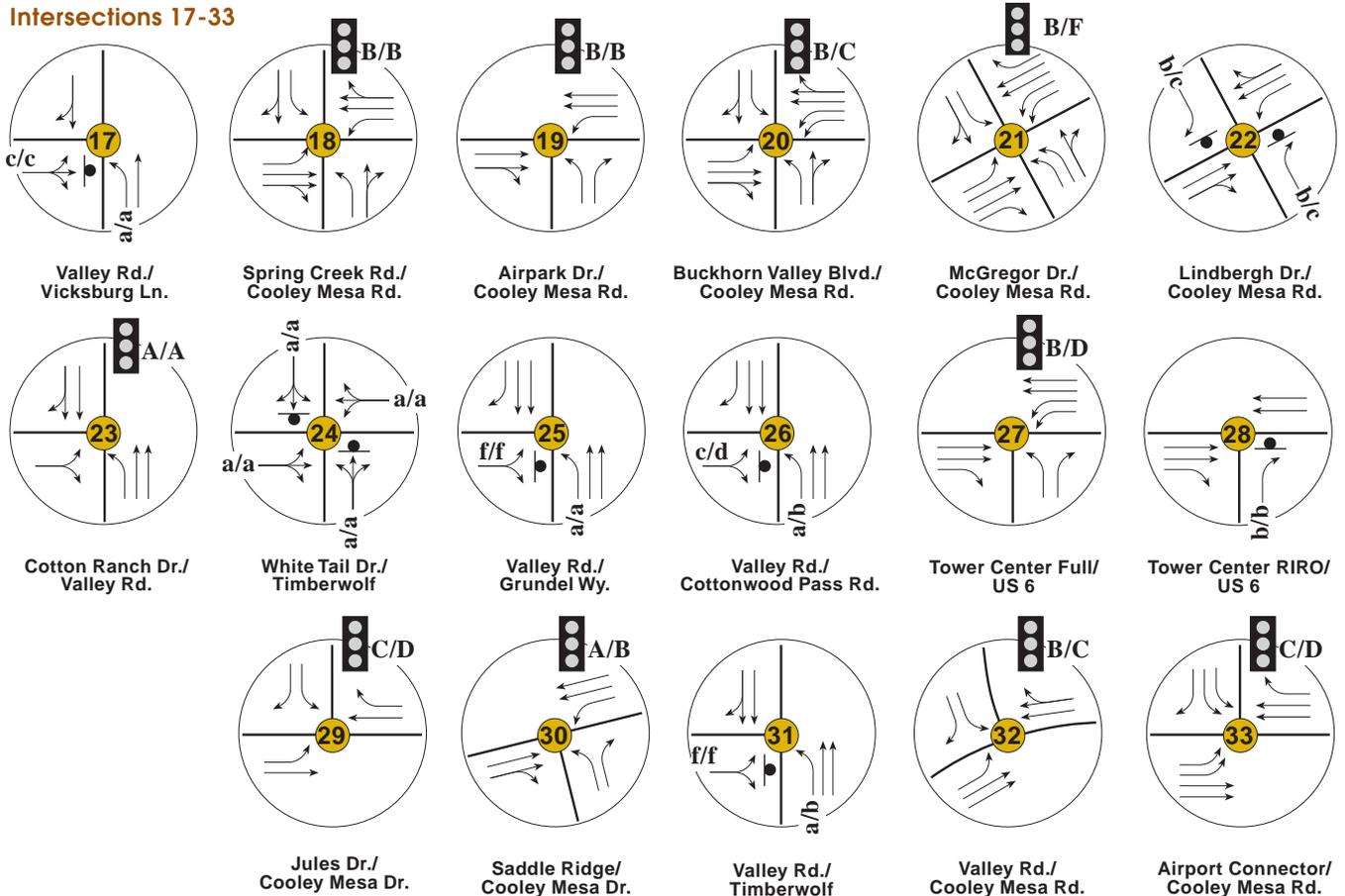


North

2030 Alternative Levels of Service / Fig 14b



Intersections 17-33



LEGEND

X/X = AM/PM Peak Hour Signalized Intersection Level Of Service
x/x = AM/PM Peak Hour Unsignalized Intersection Level Of Service

= Stop Sign
 = Traffic Signal



North

Table 3. Capital Projects Plan

Priority No.	Project Description	Project Cost
Five Year Capital Projects Plan		
1.	Westbound left-turn lane, US 6/Oak Ridge Drive	\$100,000
2.	Westbound left-turn lane, Cooley Mesa Road/Valley Road	\$64,000
3.	Traffic signal, Cooley Mesa Road/Valley Road	\$175,000
4.	Construct Jules Drive to Cooley Mesa Road	\$1,161,000
5.	Traffic signal, US 6/Tower Center (MP 143.95)	\$225,000
6.	Traffic signal, Cooley Mesa Road/McGregor Drive	\$175,000
7.	Intersection improvements, Cooley Mesa Road/Lindbergh Drive	\$47,000
Five Year Capital Projects Plan Total		\$1,945,000
Ten Year Capital Projects Plan		
8.	U.P. Railroad bridge replacement	\$11,000,000
9.	Roundabout improvements	\$150,000
10.	Widen US 6 to 4-lanes, I-70 to Valley Road	\$5,914,000
11.	Dual left-turn lanes, westbound US 6 at Cooley Mesa Road	\$88,000
12.	Traffic signal, US 6/Jules Drive	\$225,000
13.	Intersection improvements, US 6/Valley Road	\$2,000,000
14.	Left-turn lane, westbound Cooley Mesa Road at Airpark Dr.	\$46,000
15.	Traffic signal, Cooley Mesa Road/Spring Creek Road	\$175,000
16.	Traffic signal, Cooley Mesa Road/Airpark Drive	\$175,000
17.	Traffic signal, Cooley Mesa Road/Saddle Ridge Golf Club	\$175,000
Ten Year Capital Projects Plan Total		\$19,948,000
Long Range Capital Projects Plan		
18.	Interchange improvements, I-70/Gypsum exit.	\$2,000,000
19.	Construct Eagle Airport Interchange and Connector Road	\$60,000,000
20.	Valley Road/Cooley Mesa Road intersection reconstruction	\$3,069,000
21.	Widen US 6 to 4-lanes, Valley Road to Town Limits	\$8,350,000
22.	Widen Cooley Mesa Road, Valley Road to Spring Creek Road	\$3,550,000
23.	Widen Cooley Mesa Road, Spring Creek Road to Navajo Road	\$1,440,000
24.	Widen Cooley Mesa Road, Navajo Road to Gateway area	\$1,180,000
25.	Widen Valley Road, Cottonwood Pass to Cooley Mesa Road	\$3,200,000
26.	Traffic signal at Cooley Mesa Road/Jules Drive	\$175,000
27.	Intersection improvements, Cooley Mesa Road/McGregor Dr.	\$150,000
28.	Traffic signal at Valley Road/Cotton Ranch Drive	\$175,000
29.	Traffic signal at Cooley Mesa Road/Buckhorn Valley Boulevard	\$175,000
30.	Intersection improvements, Cooley Mesa Rd/Buckhorn Valley	\$85,000
31.	Dual left-turn lanes, WB US 6 at Tower Center access	\$83,000
32.	Left-turn lane, NB Earhart Drive at US 6	\$30,000
Long Range Capital Projects Plan Total		\$83,662,000
Grand Total Capital Projects Plan		\$105,555,000

Previous engineering efforts have considered improvements to Cottonwood Pass to provide an alternative route to I-70 during closures of Glenwood Canyon. The 2030 INTERMOUNTAIN REGIONAL TRANSPORTATION PLAN identifies the Cottonwood Pass/I-70 Bypass project in the preferred plan. This I-70 bypass is dependant on the proposed Eagle Airport Interchange and Connector Road, as Valley Road between US 6 and Cooley Mesa Road is deemed unsuitable for interstate traffic. While not included in the Long Range Capital Projects Plan, the Cottonwood Bypass should be considered in planning decisions so that future development does not preclude the ability to provide the connection.

Other potential future connections that were not analyzed as part of the Capital Projects Plan include an extension of Lundgren Drive west to Second Street, and a connection from Valley Road east to Jules Drive approximately midway between US 6 and Cooley Mesa Road (an existing trail currently follows an alignment south of the High School for a portion of the distance). These connections, although not addressed in the analyses, should be considered in future planning efforts to maintain the ability to provide them when feasible.

It can be seen that the projects included in the Five Year Plan have a preliminary opinion of probable cost of approximately \$1.9 million. The corresponding costs for the Ten Year Plan are approximately \$20.0 million, and the Long Range Plan costs are approximately \$83.7 million. The grand total for all identified improvements in the Town of Gypsum is approximately \$105.6 million.

In addition to item quantity costs, the above cost opinions include 28.5 percent of quantity costs for percentage items such as clearing/grubbing, signing/stripping, drainage, construction signing and traffic control, surveying, and mobilization. An additional 30 percent of quantity and percentage items was added for contingencies and miscellaneous items. Engineering costs of 18 percent of the total were added. The above preliminary opinions of probable cost do not include potential right-of-way acquisitions.

V. ACCESS CONTROL PLAN

Access control is a compilation of strategies that help minimize the number and complexity of conflicts along an arterial roadway. These strategies include consolidation of access, appropriate spacing of access, turning movement restrictions (such as right-turn-only access), and traffic control spacing. To help enhance both the safety and capacity of US 6 through the Town of Gypsum, an updated Access Control Plan was prepared based on prior engineering efforts documented in the ACCESS CONTROL PLAN, STATE HIGHWAY 6, EAGLE TO GYPSUM AND STATE HIGHWAY I-70 F (EAGLE SPUR ROAD), Felsburg Holt & Ullevig, August 1999. Subsequent access decisions and recent roadway improvements have been incorporated, as well as plans for impending development.

Because US 6 is a Colorado State Highway, access to it is regulated by CDOT. Per the STATE HIGHWAY ACCESS CATEGORY ASSIGNMENT SCHEDULE, CDOT, March 30, 2003, US 6 has an access category assignment of NRB - Non-Rural Arterial between I-70 and Valley Road. East of Valley Road, the access category assignment is RA – Regional Highway. These assignments identify the functional characteristics of the roadway and establish the criteria under which access may be granted.

NRB facilities have the capacity for moderate travel speeds and moderate to high traffic volumes, typically providing intercommunity travel needs over relatively short distances. RA facilities, however, have generally higher speeds and higher traffic volumes, and provide regional connection over greater distances. As such, the criteria for granting access is more restrictive than for NRB facilities.

The STATE HIGHWAY ACCESS CODE, CDOT, 1998 defines the conditions under which an access may be permitted to a State Highway. The Code also specifies criteria for the design and location of accesses, including auxiliary lane requirements, minimum spacing between accesses, turn-lane dimensions, and other access design standards. The Access Control Plan developed for US 6 within the Town of Gypsum conforms to the requirements of the Code to the extent feasible given both existing conditions and planned future development.

Table 4 summarizes the resultant Access Control Plan concept for the five-mile section of US 6 between I-70 (Milepost 142) and the eastern Town boundary (Milepost 147).

Table 4. Access Control Plan, US 6, MP 142 to MP 147

No.	Mile Post	Access Description
1.	142.09	Existing intersection, roundabout, Frontage Road (west side), Trail Gulch Road (east side).
2.	142.12	Existing residential access (west side). Currently restricted to right-in/right-out.
3.	142.15	Existing commercial access (east side). To be restricted to right-in/right-out on redevelopment of site.
4.	142.16	Existing intersection, Riverview Road (west side).
5.	142.27	Existing intersection, Trail Gulch Road (east side).
6.	142.28	Existing private access, residential/agricultural (west side).
7.	142.30	Existing private access, wallboard plant (east side).
8.	142.42	Existing intersection, Railroad Avenue (west side).

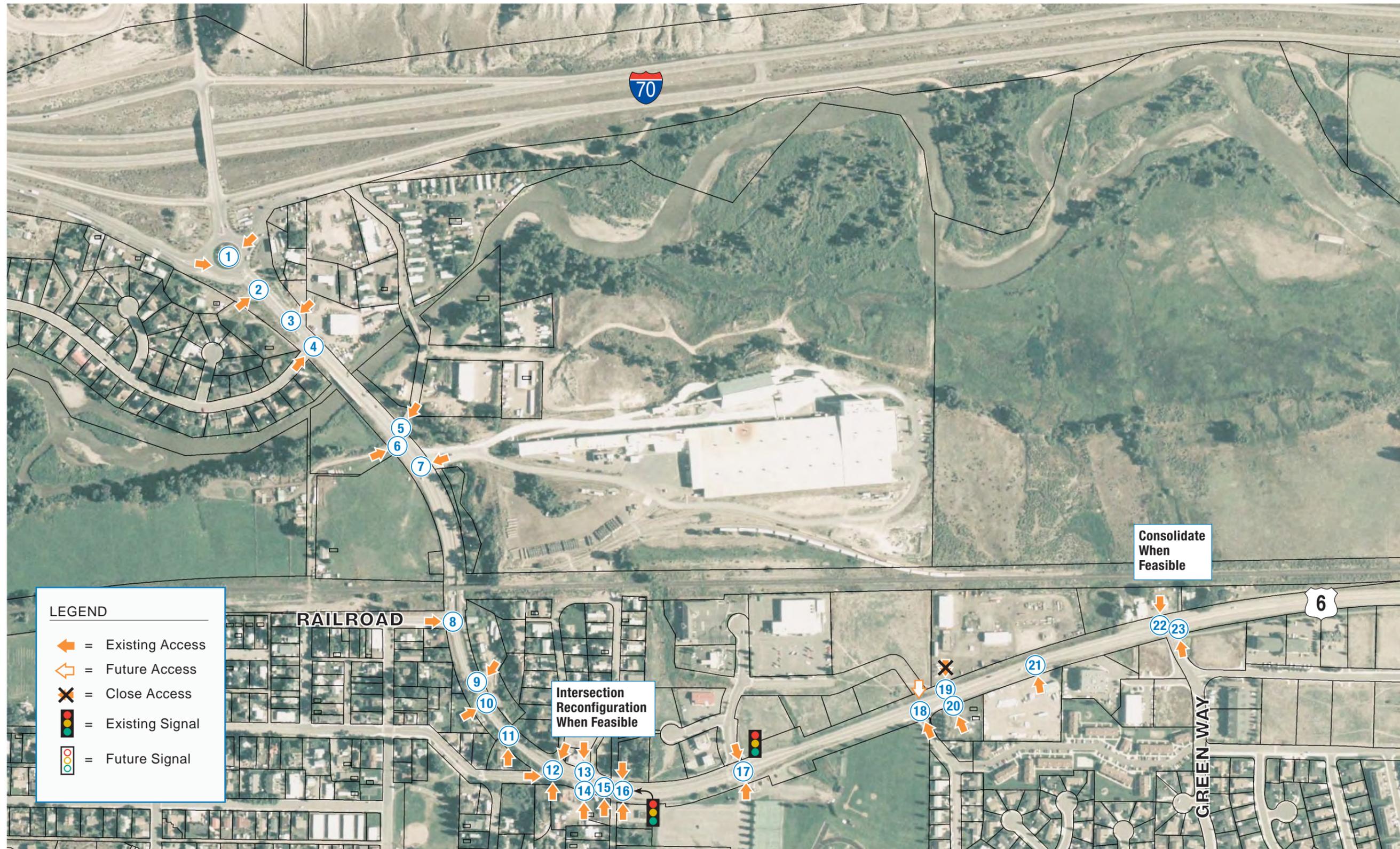
No.	Mile Post	Access Description
9.	142.48	Existing private access, residential (east side).
10.	142.50	Existing private access, residential (west side).
11.	142.54	Existing private access, residential (west side).
12.	142.57	Existing intersection, Eagle Street (south side), private access, residential (south side), Estes Lane (north side). This intersection is to be reconfigured on redevelopment of existing commercial properties along the north side of US 6.
13.	142.59	Existing commercial access, feed store (north side). To be closed pending future redevelopment.
14.	142.59	Existing private access, residential (south side).
15.	142.60	Existing commercial access, restaurant (south side).
16.	142.61	Existing signalized intersection, Valley Road (south side), Estes Lane (north side).
17.	142.73	Existing signalized intersection, High School access (south side), Oak Ridge Drive (north side).
18.	142.87	Existing intersection, Schoolside Street (south side).
19.	142.91	Existing private access, CDOT maintenance facility (north side). To be closed and replaced with a new access opposite Schoolside Street in future.
20.	142.91	Existing private access, residential (south side).
22.	142.98	Existing commercial access, Amergas (south side).
22.	143.06 to 143.11	Existing continuous access to residential, restaurant, and other commercial uses (north side). To be consolidated when feasible.
23.	143.10	Existing intersection, Green Way (south side).
24.	143.33	Existing field access (north side).
25.	143.41	Existing intersection, Jules Drive (south side). Future traffic signal location.
26.	143.41	Existing commercial access (south side). To be closed.
27.	143.42	Existing commercial access (south side). To be closed pending redevelopment.
28.	143.47	Existing commercial access (south side).
29.	143.57	Existing commercial access (south side).
30.	143.57	Existing field access (south side). To be closed.
31.	143.65	Existing private access, gravel mine (north side). With railroad grade crossing, flashers and gates. Potential future commercial access, Tower Center (south side). Potential future traffic signal location.
32.	143.95	Existing private access, gravel mine (north side). With railroad grade crossing, flashers and gates. Future commercial access, Tower Center (south side). Potential future traffic signal location.
33.	144.15	Future commercial access, Tower Center (south side). Restricted to right-turns only.
34.	144.37	Existing intersection, Haats Road (Army National Guard access), south side.
35.	145.11	Existing commercial access, Eagle-Gypsum Garden Center (north side), existing commercial access, landscape materials (south side).
36.	145.44	Existing closed access, old Cooley Mesa Road (south side). Potential future access location.
37.	145.99	Existing intersection, Cooley Mesa Road (south side). Existing signal location.
38.	146.30	Existing intersection, McGregor Drive (south side).
39.	146.53	Existing private access, Eagle River Ranches (residential/agricultural) (north side).
40.	146.68	Existing intersection, Earhart Drive (south side). Potential future traffic signal location.
41.	146.81	Existing commercial access, Ferrell Gas (south side).
42.	146.83	Existing commercial access, Ferrell Gas (south side). To be consolidated when feasible.
43.	146.92	Existing private access, Eagle Baptist Church (south side).

Figure 15 graphically depicts the accesses described in the above table. As noted on the figure, a number of accesses are identified for relocation, reconfiguration, or consolidation, at such time as conditions allow. Access No. 19, which currently serves the CDOT maintenance facility, would be replaced in the future with an access aligned opposite Schoolside Drive. The Town of Gypsum has plans to provide the right-of-way to achieve this goal. Access No.s 12 and 13 (Eagle Street/residential access and Estes Lane) would be reconfigured upon future redevelopment of adjacent properties on the north side of US 6. Preliminary planning efforts have identified a potential reconfiguration concept for this area that would move this intersection to the west to provide more separation from the signalized intersection at Valley Road. Access No. 22 is a continuous area of access along the north side of US 6 serving existing residential and commercial uses. The continuous access would be consolidated into one formal access, aligned opposite Green Way, upon future redevelopment of this site. Access No.s 41 and 42 currently provide a circular driveway for the Ferrell Gas facility; these accesses would be consolidated into one access pending future redevelopment of the site.

As shown on **Figure 15**, there are up to five additional traffic signals identified in the Plan. Two of these signals would occur at existing intersections: Jules Drive and Earhart Drive. These locations are projected to meet signal warrants by the year 2030. Two potential new signals would occur at existing accesses: at MP 143.65 and at MP 143.95. These existing accesses currently serve gravel mining operations along the north side of US 6. In the future, it is proposed that development along the south side of US 6 (Tower Center) would access opposite these accesses.

Justification for these proposed traffic signals is as follows:

- ▶ **Jules Drive.** This existing full-movement "T" intersection provides access for existing and planned residential and commercial uses along the south side of US 6. With the planned extension south to connect to Cooley Mesa Road, Jules Drive will form an alternative route to Valley Road. The peak hour traffic volumes at this intersection are projected to meet signal warrants by the year 2016.
- ▶ **MP 143.65.** This existing full-movement "T" intersection currently provides access for gravel mining operations along the north side of US 6. This access has a grade crossing of the UP Railroad. In the future, a potential full-movement access to serve the Tower Center development has been proposed on the south side of US 6 at this location. Traffic volume projections for the Tower Center indicate that a signal would be warranted at this access; traffic operations at the proposed Tower Center access farther to the east (MP 143.95) would also be improved. The signal would also provide for future development along the north side of US 6, currently projected to be beyond the year 2030.
- ▶ **MP 143.95.** This existing full-movement "T" intersection also provides access for gravel mining operations along the north side of US 6, and has a grade crossing of the UP Railroad. The primary full-movement site access to Tower Center is proposed on the south side of US 6 at this location. Peak hour traffic volume projections for the Tower Center indicate that a signal would be warranted at this access.



North

Access Control Plan / Fig 15b



Access Control Plan / Fig 15c



North

Access Control Plan / Fig 15d



North

Access Control Plan / Fig 15e



North

- ▶ **Earhardt Drive.** This existing full-movement intersection serves development within the Gateway commercial area along the south side of US 6. The peak hour traffic volumes at this intersection are projected to meet signal warrants by the year 2030.

The future signal locations occur along the segment of US 6 classified as R-A. Per Code, this functional classification requires one-half mile spacing between signalized intersections. Exceptions to this standard are not permitted unless there are no other reasonable alternatives to one-half mile intervals. Where it is not feasible to meet this requirement, full-movement access may be considered if a progression analysis indicates good progression (35 percent efficiency or better).

Table 5 summarizes the signal spacing documented in the Plan.

Table 5. US 6 Signal Spacing

Signal Location/Description	Spacing	
	Miles	Feet
Valley Road (public roadway) existing signal		
	0.12	630
Oak Ridge Drive (public roadway/school access) existing signal		
	0.68	3,590
Jules Drive (public roadway) potential future signal		
	0.24	1,270
MP 143.65 (private access) potential future signal		
	0.30	1,580
MP 143.95 (private access) potential future signal		
	2.04	10,770
Cooley Mesa Road (public roadway) existing signal		
	0.69	3,640
Earhart Drive (public roadway) potential future signal		

It can be seen that the one-half mile interval requirement is generally not met along the corridor, due to existing conditions. Intervals of less than one-half mile would occur between three of the potential signal locations, due to the signal location identified at MP 143.65. This future potential signal is included in the plan, however, to preserve full-movement access capability for the property along the north side of US 6. Although redevelopment of this parcel is not foreseen within the time frame of this report, the existing gravel operation access is full-movement, with a grade crossing of the railroad protected by automatic gates and flashers.

To determine the impacts of the future signals to signal progression along US 6, time-space diagrams were prepared using the SYNCHRO LOS analyses documented earlier and are included in the appendix to this report. The following scenarios were evaluated:

- ▶ Year 2011. New signal at MP 143.95.
- ▶ Year 2016. Add new signal at Jules Drive to the above.
- ▶ Year 2030 Base Case. Add new signals at MP 143.65 and Earhart Drive to the above.

The ability to travel along a signalized corridor without stopping for red signal indications is called progressive movement. Roadways with high levels of progression experience reduced delays and fewer stops. Signal progression is a function of signal spacing, signal timing, and travel speed. A key measure of progression is efficiency, the percent of the system cycle length available for progressive movement. Efficiency is the average of the directional arterial green-band widths divided by the system cycle length. As previously mentioned, for R-A facilities such as US 6, the minimum progression efficiency is 35 percent.

Per the Code, the progression analysis was based on the following parameters:

- ▶ 55 MPH speed limit on US 6 (existing speed over most of the corridor).
- ▶ Leading left-turn phasing only (no lagging left-turn arrow).
- ▶ Minimum side street phasing based on pedestrian crossing times.

For the purposes of this analysis, only the Base Roadway Network (no new Airport interchange) was considered. The following table summarizes the results of the progression analysis.

Table 6. US 6 Progression Analysis Results

Scenario	System Cycle Length	Arterial Bandwidth		Progression Efficiency
		Eastbound	Westbound	
Year 2011 AM	90	48	50	54.4 %
PM	90	49	48	53.9 %
Year 2016 AM	90	38	46	46.7 %
PM	90	35	44	43.9 %
Year 2030 AM	100	39	39	39.0 %
PM	100	36	35	35.5 %

It can be seen that US 6 through Gypsum would have the potential for progression at or above the minimum efficiency standard of 35 percent. As identified in our earlier improvement recommendations, traffic conditions at these intersections should be monitored over time as development occurs, and traffic signal control should be installed, when warranted.

VI. PEDESTRIAN ENHANCEMENTS

Along with growth and the resultant increases in traffic volumes, the Town of Gypsum is experiencing an increased demand for pedestrian and bicycle facilities. To serve this demand, the 1999 GYP SUM FOUNDATION PLAN envisions a system of sidewalks, trails, and pathways interconnecting major activity centers and residential areas within Gypsum. As pedestrian facilities are best considered in the early stages of development planning to avoid potentially costly or inconvenient retrofits, current Town design standards require developers to provide appropriate pedestrian facilities based on roadway classification.

The 2001 EAGLE VALLEY REGIONAL TRAILS PLAN, developed by ECO Trails, establishes an overall framework for regional trail connectivity along the Eagle River Valley between Dotsero and Minturn. The Plan identifies design standards, based on both CDOT and American Association of State Highway and Transportation Officials (AASHTO) guidelines, for the construction of regional trails.

As part of the Master Traffic Study, the existing and proposed trail systems have been reviewed relative to current land use planning and recent development decisions. In addition, Town design standards for pedestrian facilities have been examined for compliance with current industry standards. This section discusses these issues and provides recommendations for bicycle/pedestrian connectivity and design criteria.

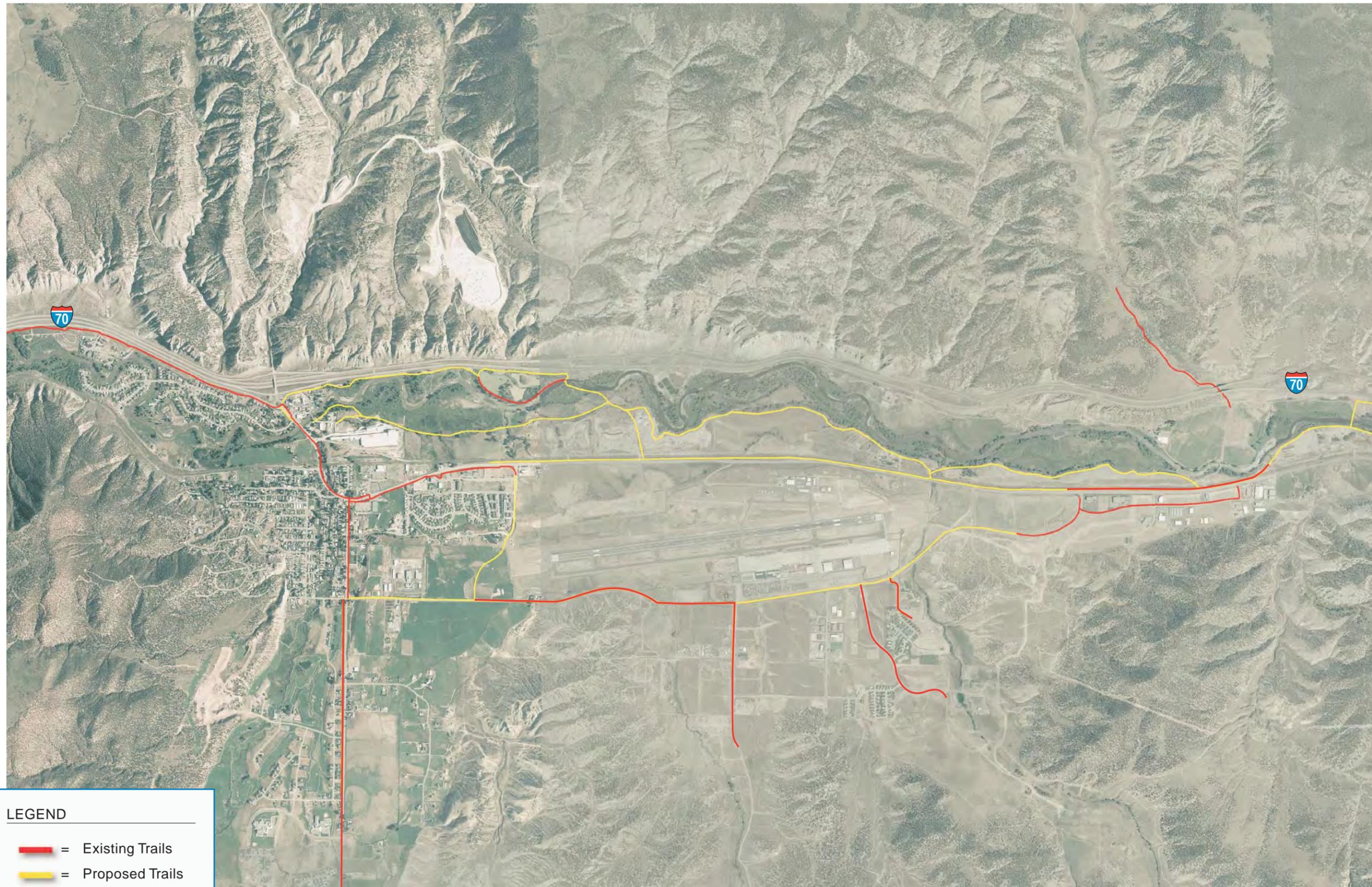
A. *Regional Trail System*

Figure 16 illustrates the Gypsum component of the Eagle County Regional Trails Plan; both existing and planned links are depicted. As shown, an existing core trail extends along the south side of the I-70 frontage road from the western Town boundary to the roundabout at US 6. The existing core trail then follows US 6 south and east to Jules Drive, where it currently terminates. A planned extension would then continue either along the north or south side of US 6 until it connects to the existing trail located east of the intersection of Cooley Mesa Road and US 6, which extends to the eastern Town Boundary.

Existing link trails are provided along Valley Road between US 6 and Cooley Mesa Road, and along Cooley Mesa Road and Lindbergh Drive in the Gateway area. Future trail links are planned along Valley Road (Cottonwood Pass to Brightwater), Jules Drive (US 6 to Cooley Mesa Road), Cooley Mesa Road (Valley Road to the Gateway area), and Buckhorn Valley Road as the Buckhorn subdivision develops. A series of trail links are also planned to serve future needs between I-70 and US 6. As defined in the Foundation Plan, the Town will coordinate with ECO Trails on the design criteria for future regional system components.

In addition to the trail connections identified in the Regional Trails Plan, the following connections should be considered in the Town of Gypsum's planning efforts:

Eagle County Regional Trails System / Fig 16



LEGEND

-  = Existing Trails
-  = Proposed Trails



- ▶ Valley Road, Cottonwood Pass to Brightwater. As residential development continues to the south along the Gypsum Creek Valley, a bicycle/pedestrian connection to the regional system will be needed.
- ▶ Airpark Road. Planned future land uses located between Spring Creek Road and Buckhorn Valley Road will need a connection to the planned regional trail link along Cooley Mesa Road.
- ▶ Saddle Ridge Golf Club. This proposed resort development will also need a connection to the planned regional trail link along Cooley Mesa Road.

B. Sidewalk Standards

The Town's Street and Roadway Classification and Design Standards are documented in the Public Works Manual. These standards identify sidewalk dimensional criteria for the different classifications of roadways in Gypsum. In general, detached sidewalks, or pedestrian/bicycle paths, are required on both sides of new roadways; the exceptions are as follows:

- ▶ Where development can only occur on one side of the roadway. The pedestrian facility is to be constructed on the side of the roadway adjacent to development.
- ▶ Where no development can occur on either side of the roadway. A pedestrian facility is required on only one side, the location is dependant on topography, safety, and pedestrian convenience considerations.

Table 7 summarizes width requirements contained in the Town standards for pedestrian facilities in new developments. Also included are minimum separation between the sidewalk and the roadway.

Table 7. Gypsum Pedestrian Facility Width Requirements

Roadway Classification	Ped/Bike Path or Sidewalk Width	Landscaped Separation to Roadway (Minimum)
Major Collector	8 feet	5 feet
Minor Collector	6 feet	5 feet
Local Commercial	5 feet	5 feet
Local Residential	4 feet	5 feet

These standards generally correspond well with guidelines proposed in DESIGN AND SAFETY OF PEDESTRIAN FACILITIES, Institute of Transportation Engineers, 1998. For local residential streets serving densities greater than 4 dwelling units per acre, however, a minimum width of 5 feet is recommended (4 foot widths are adequate for lower density residential developments). It is recommended that the Town's standards be adjusted to reflect this distinction. The above landscaped separations are greater than the minimum 2 feet suggested by ITE; however, where space allows, wider separations are desirable for pedestrian comfort, landscaping opportunities, and snow storage in winter.

The current Town standards are directed at primarily new development. Where existing development has occurred without provision for pedestrians, retrofitting of sidewalks should be undertaken when feasible. To provide some flexibility for existing conditions, it is recommended that the Town adopt additional standards to address this condition, as follows:

- ▶ Minimum sidewalk width of 5 feet.
- ▶ Minimum landscaped separation of 2 feet. On existing local, low volume streets with limited right-of-way, an attached sidewalk may be considered.

The design, construction, upgrade, and repair of pedestrian facilities in Gypsum must also comply with the Americans with Disabilities Act of 1990 (ADA). A requirement to meet current ADA guidelines should be included in the Town standards.

C. Pedestrian Safety

Pedestrian safety is directly related to proper planning and design of sidewalks and trails. Sidewalks separate pedestrians from vehicular traffic and help reduce pedestrian collisions and injuries. Through appropriate developer requirements and design standards, the Town of Gypsum has ensured that adequate pedestrian facilities will be provided in new developments. In areas of existing development where sidewalks or trails may not be present, every effort should be made to add missing sidewalks and complete trail links when feasible.

Safety at pedestrian crossings has been identified as a concern, particularly for children walking to the schools along US 6 at Oak Ridge Drive and School Side Drive. Currently, a school crossing of US 6 is established at Oak Ridge Drive, with crosswalk pavement marking and pedestrian actuated traffic signal protection. In addition, school zone warning signs with flashing yellow beacons are provided along US 6 approaching the crossing.

For students living in neighborhoods west of US 6 and north of Railroad Avenue, there is a need for an additional school crossing from the west side of US 6 to the existing trail located along the east side of US 6. The crossing should occur prior to the Union Pacific Railroad Bridge, so that pedestrians are not walking along the roadway within this tightly constrained area. Currently, CDOT is investigating the appropriate location crosswalk pavement marking, as well as the potential to provide school zone warning signage and flashing beacons.

As development along the south side of US 6 continues, there will be a need for additional marked crosswalks to access the regional bicycle/pedestrian trail, planned along the north side of US 6. These crosswalks should occur at signalized intersections, where pedestrian actuated signal protection can be provided. Potential future crosswalk locations on US 6 include Jules Drive, Tower Center, and Cooley Mesa Road.

Other potential crosswalk locations include Valley Road at Cooley Mesa Road (future signalized intersection), and Valley Road at Lundgren Boulevard (unsignalized intersection). At Valley Road/Lundgren Boulevard, additional pedestrian protection treatments may be considered, such as advance warning signs and a raised crosswalk.

In A REVIEW OF PEDESTRIAN SAFETY RESEARCH IN THE UNITED STATES AND ABROAD, USDOT/FHWA, 2004, studies of the effects of crosswalk illumination on pedestrian safety are summarized. These studies indicate significant reductions in nighttime pedestrian/vehicle crashes at illuminated crossings. It is, therefore, recommended that the Town consider street lighting (one on each side of the roadway, on either side of the crosswalk) at key pedestrian crossing locations, particularly at existing and future crosswalks on US 6. Such street lighting could also provide safety benefits at Valley Road/Cooley Mesa Road and Valley Road/Lundgren Boulevard.

VII. TRANSIT AND PARKING

Pressures for growth in Gypsum, and the accompanying increases in travel demand, emphasize the need to provide alternative modes of transportation. Bicycle/pedestrian trail facilities, as discussed in the previous section of this report, can encourage residents and visitors to walk or bike to various destinations. Transit, or bus service, can also help satisfy travel demand, particularly regional trip needs. Intermodal facilities, such as Park-N-Rides, allow users to transfer from one mode to another to complete their journey.

A. *Transit*

The Eagle County Regional Transportation Authority (ECO Transit) is currently the sole provider of bus service in Gypsum. ECO Transit provides connection along the I-70 corridor between Dotsero and Vail, as well as service to Minturn, Red Cliff, and Leadville via US 24. Bus service is available year-round, with increased frequency during the winter months.

The current transit route, which follows US 6 and Cooley Mesa Road within Gypsum, includes bus stops at the Gypsum Plant, the Mountain Glen Apartments, Eagle Valley High School, Town Hall, the ECO maintenance facility, and Eagle County Regional Airport. In the future, as development within the Town continues, there will be a potential need for additional bus stops at the following locations:

- ▶ US 6/Cooley Mesa Road (Gateway Area)
- ▶ US 6/Tower Center
- ▶ Cooley Mesa Road/Jules Drive
- ▶ Cooley Mesa Road/Buckhorn Valley Road
- ▶ Cooley Mesa Road/Saddle Ridge Golf Club

As the need for additional bus stops becomes evident, the Town should work with ECO Transit on the design and locations of each new stop. Where new developments are occurring, the Town can explore potential transit improvements as a part of developer contributions. Such improvements might include bus shelters, signal preemption equipment, or queue-jumping lanes; again, coordination with ECO Transit will be essential to identify specific needs.

The above potential additional bus stops are all located along the existing ECO Transit route through Gypsum. Future planned development along Valley Road will likely generate some demand for transit, particularly for employees of these developments. To serve this potential need, it is suggested that a shuttle van service be considered. This type of service could be provided through a cooperative effort by the developments along Gypsum Creek.

As development within Gypsum nears build out, the Town may wish to consider providing a local circulator bus. This type of service could be coordinated with the ECO Transit service to enhance accessibility and travel options for residents and area employees.

B. *Park-N-Rides*

Park-N-Rides offer transit users a means to access the bus system from a remote location, such as a subdivision well off the established bus route. Users can drive (or walk/bike) to the Park-N-Ride facility, then ride the bus to an ultimate destination. Currently, an informal Park-N-Ride operates at the Eagle Valley High School. Some parking spaces are also provided for Park-N-Ride use at the ECO facility on Cooley Mesa Road. To help alleviate projected future traffic volumes, it is recommended that the Town investigate the potential to acquire additional properties for the development of additional Park-N-Ride facilities within the Town of Gypsum.

Appropriate Park-N-Ride sites include vacant properties and properties currently used for parking that are close to an existing or planned bus stop. Shopping centers, churches, and other private properties with excess weekday parking can be used for this purpose under some type of lease agreement. However, due to liability and maintenance issues, sites that can be acquired by the Town should be given first consideration. The 1992 AASHTO GUIDE FOR THE DESIGN OF PARK-AND-RIDE FACILITIES lists the following preferred site characteristics:

- ▶ The site is proximate to existing informal Park-N-Ride activities (but not in competition with existing or planned transportation facilities).
- ▶ The site is proximate to a primary roadway serving the transit corridor.
- ▶ The site is in an area where theft and vandalism can be minimized.
- ▶ The site is located between residential areas and major activity areas.
- ▶ The site supports a design for easy accessibility by transit operators.

Site selection in Gypsum should also consider proximity to bicycle/pedestrian facilities. Bicycle storage should be incorporated in the design. Based on existing and planned development patterns, the following general locations should be investigated for potential Park-N-Ride sites:

- ▶ Cooley Mesa Road/Valley Road (would require an additional new bus stop)
- ▶ Cooley Mesa Road/Jules Drive (alternative to Valley Road site)
- ▶ Cooley Mesa Road/Spring Creek Road
- ▶ Cooley Mesa Road/US 6 (Gateway Area)

As new development occurs, opportunities for acquisition of other sites may arise; therefore, the potential to include a Park-N-Ride facility with larger development proposals should be examined.

C. Other Parking Considerations

Gypsum Town standards prohibit the parking of vehicles on all city roads and streets. This facilitates the Town's trash collection, maintenance, and snow removal operations. All parking occurs on private property, and new developments are required to provide sufficient parking on-site based on the land uses envisioned.

For public uses, such as parks and trail access, it would be advantageous for the Town to provide off-street parking, when and where feasible. In undeveloped areas, public parking options should be evaluated with new development proposals. In areas of existing development, locations where a need for parking is observed should be identified, and opportunities to acquire land for off-street parking should be explored.



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