

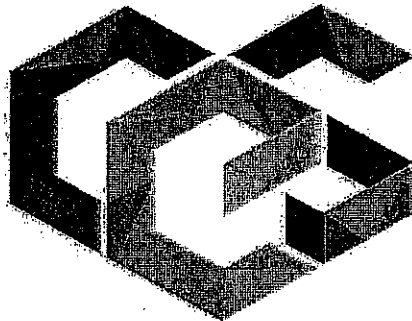
Falcon Ridge Development
Estes Park, Colorado
Traffic Impact Study

April 2014

Prepared for:

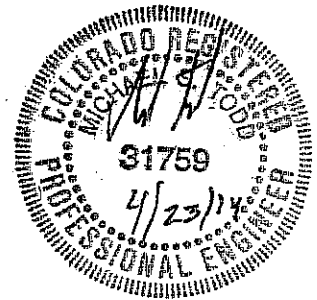
Estes Park Housing Authority
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Prepared by:



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1. Introduction

Project Overview

This traffic study addresses the capacity, geometric, and control requirements associated with the proposed Falcon Ridge Development, located on Lot 4, Good Samaritan Addition to the Town of Estes Park, Estes Park, Colorado. The Vicinity Map (Figure 1) shows the location of the Falcon Ridge Development relative to the major roadways in the immediate area.

Study Area Boundaries

The traffic impact analysis study area examines property access to proposed Falcon Ridge Development off Red Tail Hawk Drive, and the intersection of Red Tail Hawk Drive and Dry Gulch Road. The Study Area Map (Figure 2) shows the traffic generated by the existing developments.

Within the study area, Dry Gulch Road is a major collector which will allow traffic to Red Tail Hawk Drive.

Description of the Site

Lot 4 Good Samaritan Subdivision is zoned R-M Multi Family and currently undeveloped. The proposed development will consist multi unit apartment buildings with 66 dwelling units.

Access to the site is proposed via two full-movement accesses off Red Tail Hawk Drive.

The site plan is shown in Figure 2

Existing Transportation Network

Red Tail Hawk Drive is a local street that primarily services residential apartments. Red Tail Hawk Drive consists of one lane in each direction and is stop signed controlled at each end. Red Tail Hawk Drive ties in to Dry Gulch Road to the east and Ptarmigan Trail to the north. Falcon Ridge will access directly onto Red Tail Hawk Drive. Salud Medical clinic accesses Red Tail Hawk Drive approximately 150 feet west of the Dry Gulch intersection.

Dry Gulch Road is a north/south major collector street north off U.S. 34A. Dry Gulch Road is used to access local residences and residential side streets surrounding the Good Samaritan Subdivision. Dry Gulch Road becomes County Road 63E approximately 0.3 miles north of Red Tail Hawk Drive and provides access to Devils Gulch Road (County Road 43). Dry Gulch Road is one lane in each direction and is stop sign controlled at both ends. The posted speed along Devils Gulch Road is 40 mph.

Dry Gulch Road feeds into U.S. Highway 34A at approximate highway mile post 64.4. Highway 34A is 0.67 mile from Red Tail Hawk and 0.9 miles from the Falcon Ridge development. With Highway 34A being outside the ¼ mile radius of the proposed development, impact to Highway 34A and Dry Gulch intersection was not evaluated.

Current Levels of Service

Map 5-2 (Estes Valley Comprehensive Plan, 1996) shows the current levels of service of roadways in the Estes Valley. The Level of Service for Dry Gulch Road is depicted as level "A". The AASHTO manual "A Policy on Geometric Design of Highways and Streets" defines Levels of Service in Exhibit 2-31 as follows:

Exhibit 2-31¹

<u>Level of Service</u>	<u>General Operating Conditions</u>
A	Free flow
B	Reasonably free flow
C	Stable flow
D	Approaching unstable flow
E	Unstable flow
F	Forced or breakdown flow

This is further defined based upon combinations of area and terrain in Exhibit 2-32:

Exhibit 2-32²

Appropriate level of service for specified combinations of area and terrain type:

Function Class	Rural level	Rural rolling	Rural mountainous	Urban and suburban
Freeway	B	B	C	C
Arterial	B	B	C	C
Collector	C	C	D	D
Local	D	D	D	D

Desired level of service for a rural collector roadway is "C". This level is currently being met at the intersection of Red Tail Hawk Drive and Dry Gulch Road.

Accident History

Accident information obtained from Larimer County Traffic Engineering, Estes Park Public Works Department and the Estes Park Police Department showed no accidents for the last three years along Devils Gulch Road.

Existing Traffic Levels

¹ A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, 444 North Capitol Street, N.W., Suite 249, Washington D.C. 20001, p. 84

² A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, 444 North Capitol Street, N.W., Suite 249, Washington D.C. 20001, p. 85

<u>Description</u>	<u>Projected ADT (66 units)</u>	<u>Entering</u>	<u>Exiting</u>
Weekday ADT	438	219	219
AM Peak	37	10	27
PM Peak	44	27	17
Saturday ADT	422	211	211
Peak Hour	34		
Sunday ADT	387	194	194
Peak Hour	34		

The greatest projected peak hour traffic would be for weekday AM exiting and PM entering. The traffic movement is estimated as 28% of the vehicles entering and 72% exiting during the AM peak hour and 61% entering and 39% exiting during the PM peak hour.

With the assumption that 99% of the traffic from the Falcon Ridge development will turn right out of the development using the Red Tail Hawk/Dry Gulch intersection, the newly generated site traffic would increase the current peak hourly turning volume by approximately 70% to 80%. The peak hourly volume increase to Dry Gulch at the intersection to Red Tail Hawk Drive would be approximately 30%. The current volume to capacity (V/C) ratio for Dry Gulch Road is 0.20 with a projected 20 year V/C ratio of 0.33.

Projected Traffic Increase for Red Tail Hawk Drive and Dry Gulch Road:

<u>Description</u>	<u>Current Peak Hour</u>	<u>Projected Peak Hr (+66 Units)</u>	<u>Projected Increase</u>
AM Peak	53	90	37
PM Peak	56	100	44

Future Traffic Levels

The peak hour traffic levels for the current and 2034 were projected for the intersection of Red Tail Hawk Drive and Dry Gulch Road. The projected traffic for the Falcon Ridge Development was added to the current year and 2032 estimates (Figure 4 and Figure 5). Following the proposed development of Falcon Ridge, no project increase is anticipated for Red Tail Hawk Drive.

The 2034 year traffic projection was based on the "Larimer County Transportation Master Plan" for Dry Gulch Road. Turning movement distribution for the Red Tail Hawk Drive and Dry Gulch Road intersection was based on statistical data obtained from the Institute of Transportation Engineers Trip Generation Manual, 6th Edition.

PROPOSED LEVEL OF SERVICE

The proposed level of service for the intersection of Red Tail Hawk Drive and Dry Gulch Road is 'C'. The majority of traffic exiting Red Tail Hawk Drive on to Dry Gulch will be turning right toward Estes Park with

only 1 or 2 turning left. Left turning traffic exiting Red Tail Hawk Drive may experience short waiting periods during peak volume hours.

The proposed level of service for Dry Gulch Road is C. Based on the existing ADT and the operating speed, we feel that the current level of service for Dry Gulch Road is "A". With the projected traffic increase with the proposed development would only put Dry Gulch at 26% of its operating capacity.

Conclusion/Recommendation

The proposed improvements to the Falcon Ridge Development on Lot 4, Good Samaritan Subdivision will increase traffic volumes on Dry Gulch Road and Red Tail Hawk Drive. There is currently no record of accidents for Red Tail Hawk Drive or Dry Gulch Road in the vicinity of Red Tail Hawk Drive for the last three years. Peak hour traffic is anticipated on weekdays at 7:30 to 8:30 AM and 4:30 to 5:30 PM.

Based on the population distribution for the Estes Valley, and existing turning patterns at the involved intersections, the majority of the volume leaving the Falcon Ridge Development will turn right (east bound) onto Red Tail Hawk Drive, and right again (south bound) onto Dry Gulch Road returning to Estes Park. Based on peak hour traffic count and estimated trip generation for Falcon Ridge the estimated peak hourly volume turning right Dry Gulch Road is 53 vehicles per hour. 53 vehicles per hour average 1 vehicle per minute.

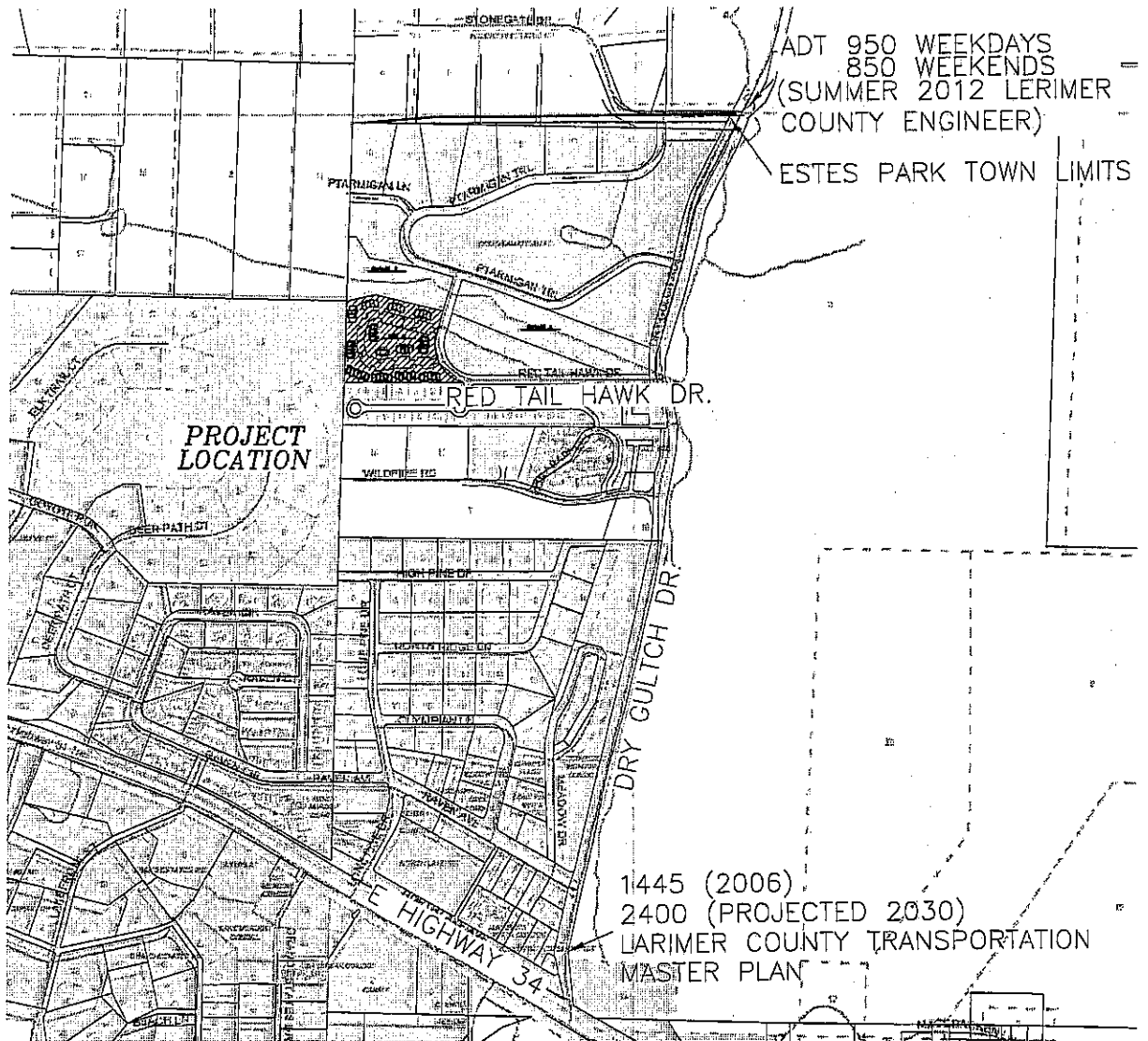
The projected traffic volume entering Red Tail Hawk Drive will be traveling north on Dry Gulch Road and turn left across traffic onto Red Tail Hawk Drive, and left again into Falcon Ridge. Based on peak hour traffic count and estimated trip generation for Falcon Ridge the estimated peak hourly volume turning left across Dry Gulch Road is 43 vehicles per hour. 43 vehicles per hour average less than 1 vehicle per minute. Based on peak hour traffic counts, south bound through traffic on Dry Gulch is currently 34 vehicles per hour.

The report has show an increase to the ADT caused by the proposed Falcon Ridge development to be roughly 438 trips per day on weekdays and 422 trips per day on weekends. Traffic volumes will increase approximately 50% on Red Tail Hawk Drive. On Dry Gulch Road the average increase is 30% in the vicinity of Red Tail Hawk Drive. The impact from the proposed 66 residential dwelling unit shows a peak hour increase of approximately 56 vehicles.

Dry Gulch Road and Red Tail Hawk Drive are primarily local residential based traffic traveling to various subdivisions.

The projected 2014 (assuming full build out) for Dry Gulch Road near the Red Tail Hawk intersection, would be approximately a 26% increase to the roadways peak capacity.

CES recommends no additional modifications to the Dry Gulch Road intersection with Red Tail Hawk Drive or to Red Tail Hawk Drive. There is no found accident history for the last three years at the intersection and along Red Tail Hawk Drive. The proposed development is only projected to increase the peak hour traffic volume by 44 on weekdays and 34 on weekends. The increase in the volume will still allow the intersection and roadway to operate at a level of service "C" or better.



MAP TAKEN FROM TOWN OF ESTES PARK DIGITAL MAP

VICINITY MAP

SCALE 1"=1000'

FIGURE 1

JOB No: 264.013

FALCON RIDGE
DEVELOPMENT
VICINITY MAP
ESTES PARK, COLORADO

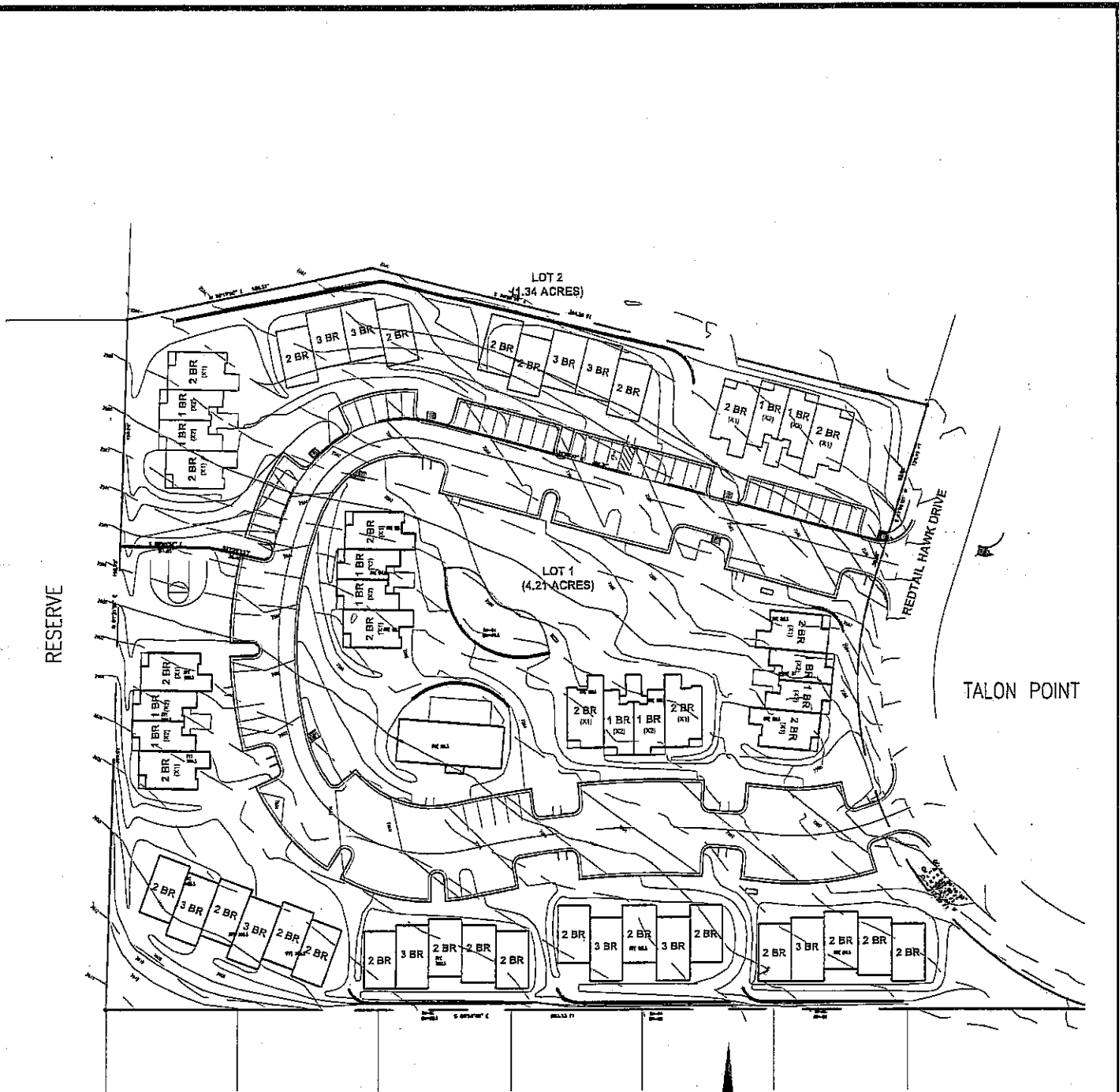
BY: PWL DATE: 04/23/14

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RESERVE

LOT 2
(4.34 ACRES)

LOT 1
(4.21 ACRES)

REDTAIL HAWK DRIVE

TALON POINT

NEIGHBORHOOD

SITE PLAN

SCALE 1" = 100'

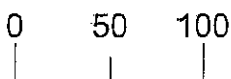


FIGURE 2

JOB No: 284.013

FALCON RIDGE
DEVELOPMENT
SITE PLAN
ESTES PARK, COLORADO

BY: P.W.L. DATE: 04/23/14

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JOB No: 264.013

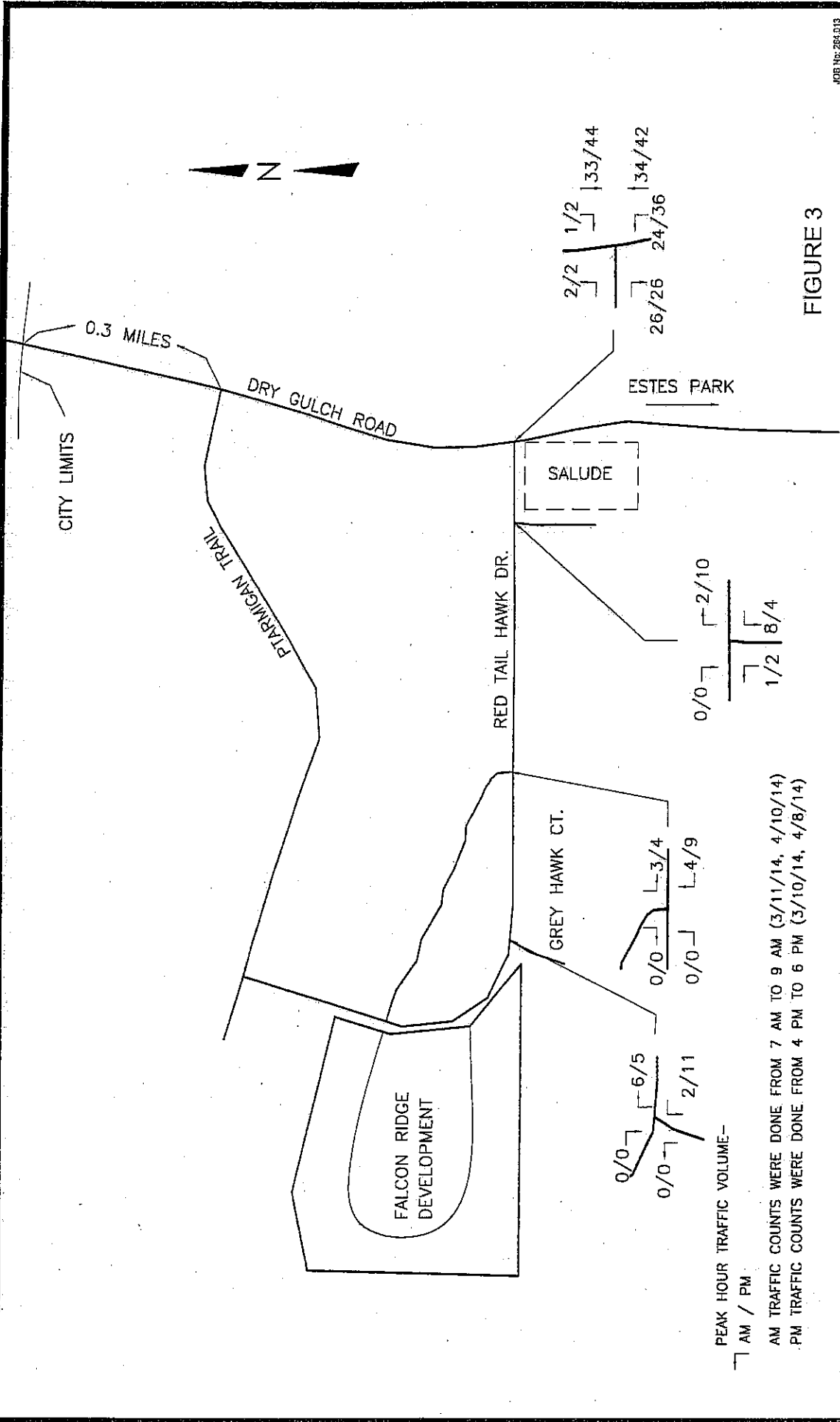


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**FALCON RIDGE DEVELOPMENT:
TRAFFIC IMPACT STUDY
EXISTING TRAFFIC VOLUME
AND INTERSECTION GEOMETRY
FOR 2014**

DRAWN BY: PVL DATE: 4/16/2014
FILE: MAJES_Job264.013_Falcon_RidgeTrafficFig3.dwg

FIGURE 3



PEAK HOUR TRAFFIC VOLUME—
AM / PM

AM TRAFFIC COUNTS WERE DONE FROM 7 AM TO 9 AM (3/11/14, 4/10/14)
PM TRAFFIC COUNTS WERE DONE FROM 4 PM TO 6 PM (3/10/14, 4/8/14)



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**FALCON RIDGE DEVELOPMENT
 TRAFFIC IMPACT STUDY
 PROJECTED TRAFFIC
 AND INTERSECTION GEOMETRY
 FOR 2014**

DRAWN BY: PWL DATE: 4/16/2014
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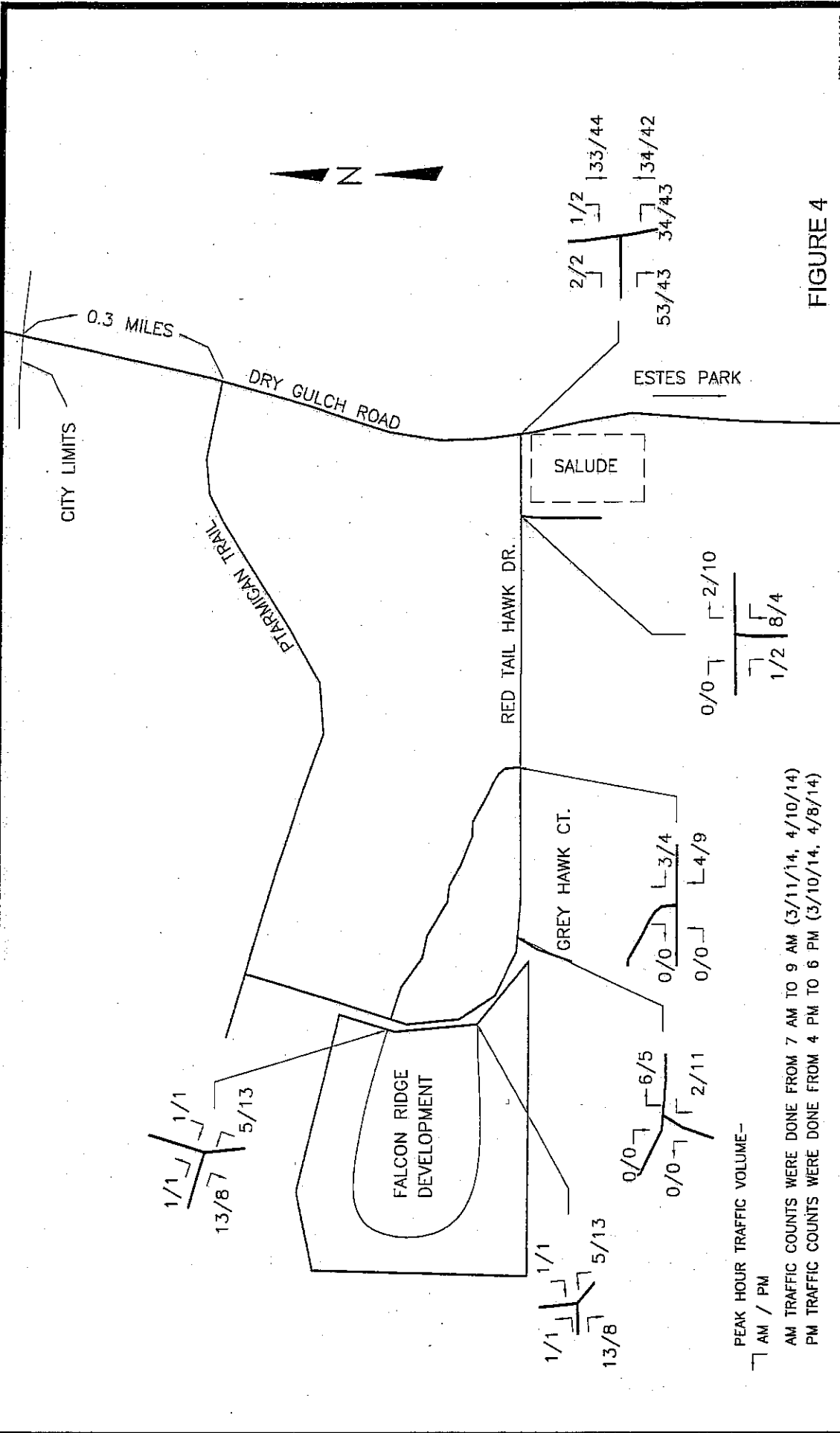
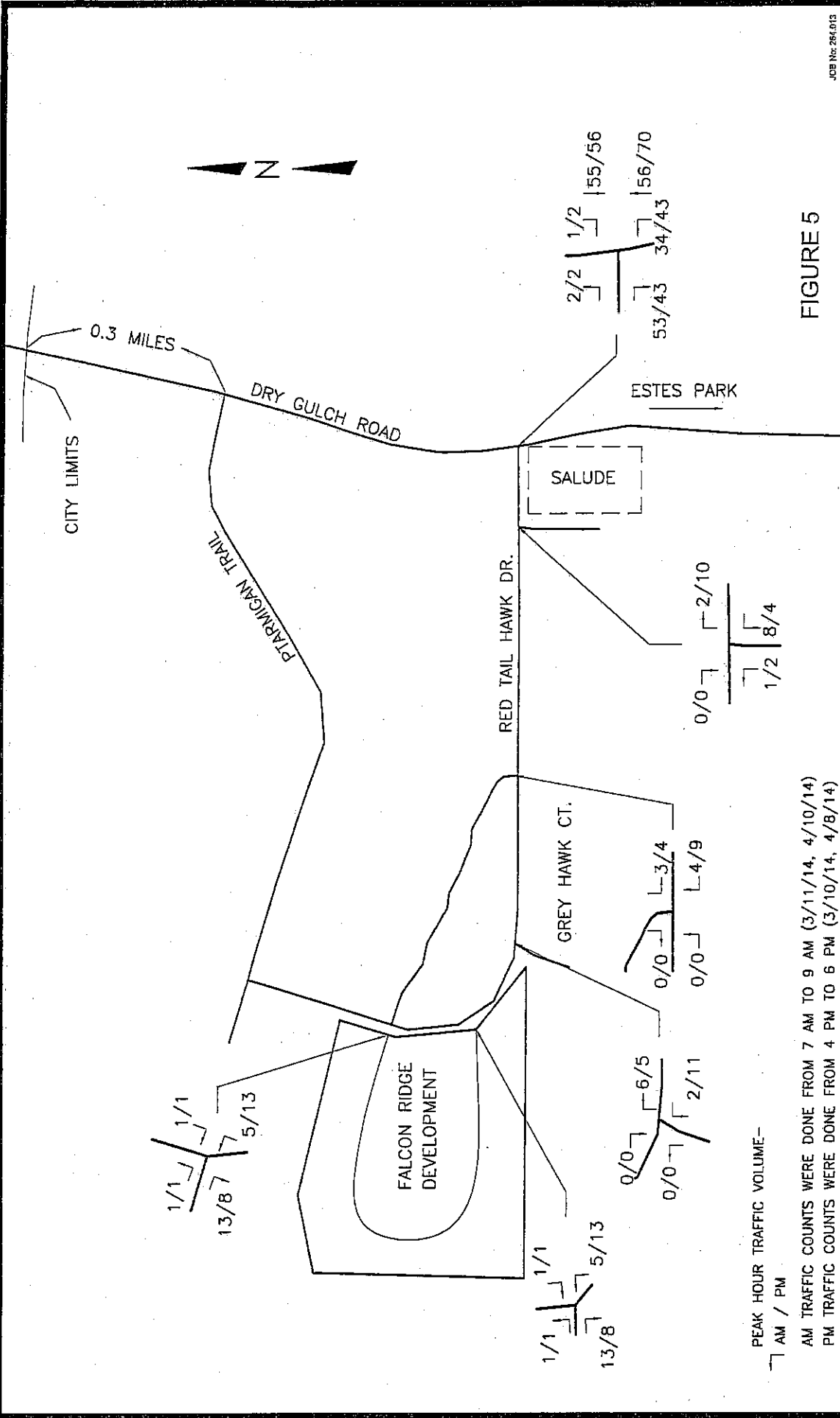


FIGURE 4



PEAK HOUR TRAFFIC VOLUME—
 AM / PM
 AM TRAFFIC COUNTS WERE DONE FROM 7 AM TO 9 AM (3/11/14, 4/10/14)
 PM TRAFFIC COUNTS WERE DONE FROM 4 PM TO 6 PM (3/10/14, 4/8/14)

FIGURE 5

JOB No. 264.013

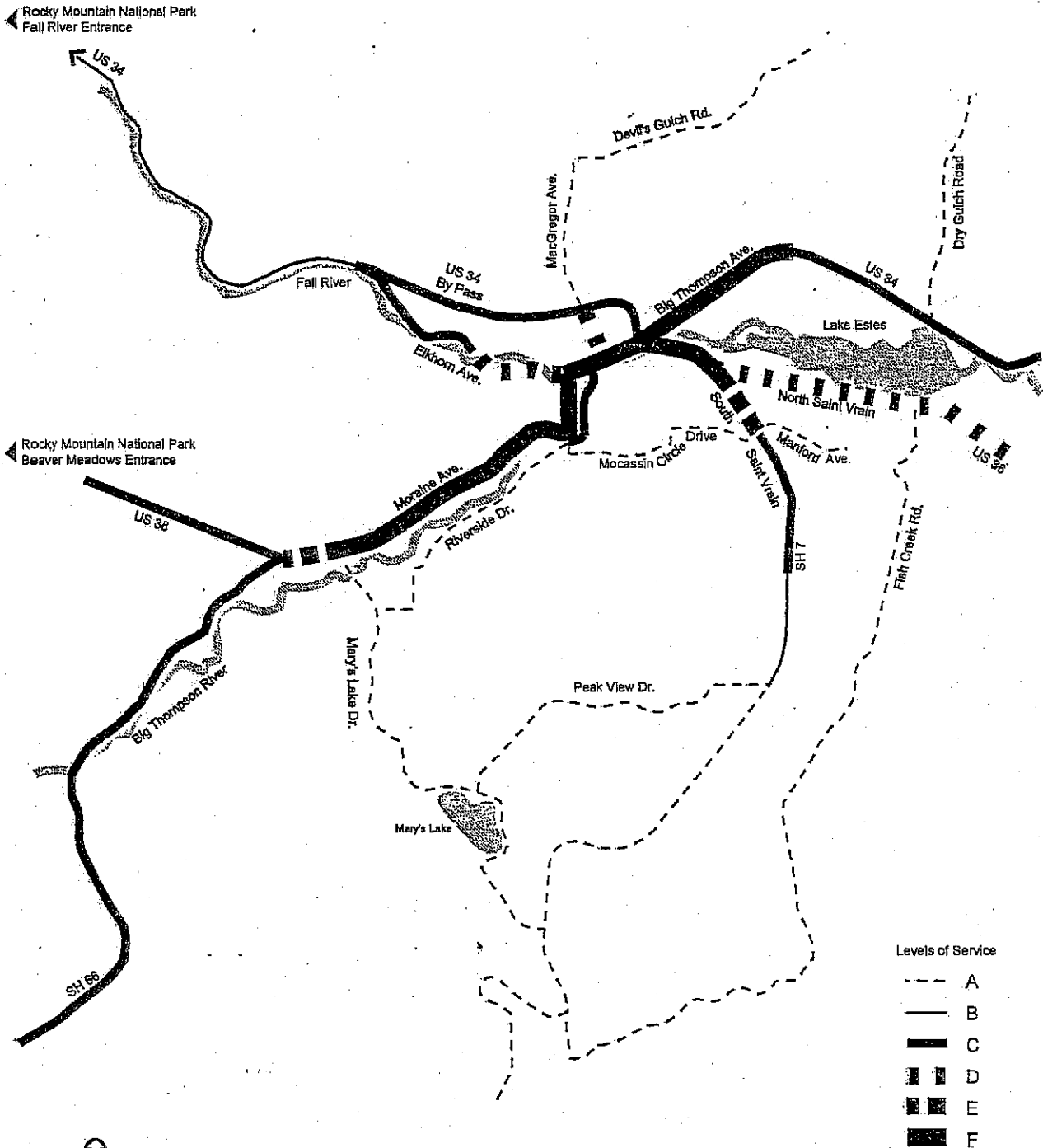


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FALCON RIDGE DEVELOPMENT
 TRAFFIC IMPACT STUDY
 PROJECTED TRAFFIC
 AND INTERSECTION GEOMETRY
 FOR 2034

DRAWN BY:	PWL	DATE:	4/16/2014
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MAP 5.2 EXISTING LEVELS OF SERVICE



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& Associates, Inc.

TABLE 1

OPERATIONAL PERFORMANCE
LEVELS OF SERVICE

Description of Levels of Service

Level of Service	Description
A	<i>LOS A</i> generally describes free-flow operations. Average operating speeds at the free-flow level generally prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The effects of incidents are easily absorbed.
B	<i>LOS B</i> also represents reasonably free-flow, and speeds at the free-flow level are generally maintained. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is still high. The effects of minor incidents are still easily absorbed, although local deterioration in service may be more severe than for <i>LOS A</i> .
C	<i>LOS C</i> provides for flow with speeds still at or near the free-flow speed of the freeway. Freedom to maneuver within the traffic stream is noticeably restricted at <i>LOS C</i> . Minor incidents may still be absorbed, but the local deterioration in service will be substantial. The driver experiences a noticeable increase in tension.
D	<i>LOS D</i> is the level at which speeds begin to decline slightly with increasing flows. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels. Even minor incidents can be expected to create queuing.
E	<i>LOS E</i> describes operation at or near capacity. Operations are volatile, because there are virtually no usable gaps in the traffic stream. Any disruption can cause the following vehicles to give way, which can establish a disruption wave that propagates throughout the upstream traffic flow. The traffic stream has no ability to dissipate even the most minor disruptions, and any incident can be expected to produce a serious breakdown with extensive queuing. The level of physical and psychological comfort afforded the driver is extremely poor.
F	<i>LOS F</i> describes breakdowns in vehicular flow. Such conditions generally exist with queues forming breakdown points. Such breakdowns occur because of traffic incidents, recurring points of congestion, or peak-hour flow demand exceeding the capacity of the location.