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Rocky Top Resources
Transportation Memorandum
PCD File No. PPR-19-13
(LSC #194630)
February 5, 2020

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.



Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

Fredrick Martin

2-12-20
Date



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February 5, 2020

Mr. David Hostetler
Land Development Consultants, Inc.
3898 Maizeland Road
Colorado Springs, CO 80909

RE: Rocky Top Resources
El Paso County, CO
Transportation Memorandum
LSC #194630
PCD File No. PPR1913

Dear Mr. Hostetler,

LSC Transportation Consultants, Inc. has prepared this transportation memorandum for the Rocky Top Resources site redevelopment located southwest of Las Vegas Street and the US 24 overpass in El Paso County, Colorado.

Las Vegas Street has planned improvements that are currently in design. This report is consistent with the planned improvements. This has been prepared for submittal to El Paso County.

REPORT CONTENTS

The preparation of this report included the following:

- An inventory of existing road and traffic conditions on Las Vegas Street adjacent to the site, including surface conditions, functional classification, road widths, traffic control signs, posted speed limits, intersection and access spacing, roadway and intersection alignments, and any auxiliary turn lanes;
- Weekday morning and evening peak hour and Saturday peak hour turning movement traffic counts at the intersection of site access with Las Vegas Street;
- Intersection level of service analysis;
- A review of the site land use and access location;
- Auxiliary right-/left-turn lane needs analysis based on the projected volumes and criteria in the El Paso County *Engineering Criteria Manual*;
- Findings and recommendations.

OTHER AREA TRAFFIC STUDIES

ECM criteria require that this report list any other traffic studies in the area, completed within the past 5 years, and state whether this study is consistent with those studies.

Other studies include:

- "Las Vegas Street Environmental Overview and Corridor Analysis Study" prepared by WSP/Parsons Brinkerhoff
- "Las Vegas Street Railroad Crossing RR/PUC Connection and Preliminary Design [report]" by FHU (DRAFT - November 2011).

This report is consistent with the Las Vegas Street Railroad Crossing report. The Las Vegas Street Environmental Overview shows the Rocky Top Resources access as a roundabout in recommended alternative. This is not considered in this report because the current design plans for Las Vegas Street keep the Rocky Top Resources access as a t-intersection.

LAND USE/SITE ACCESS

The 44.8-acre property (zoned I-3) is located at 1755 East Las Vegas Street in El Paso County, Colorado. The site is proposed to be redeveloped, as shown in Figure 2, but the current land use will not change. There is currently a single access point onto Las Vegas Street, located just south of the US 24 overpass. The site access is a stop-controlled, T-intersection.

EXISTING ADJACENT STREETS

Figure 1 shows the streets in the vicinity of the site. There is only one street directly adjacent to the site, as identified and described briefly below:

Las Vegas Street runs northwest to southeast adjacent to the site and is classified as a two-lane minor arterial. The posted speed limit along this corridor is 40 miles per hour (mph) in the southbound (eastbound) direction and 50 mph in the northbound (westbound) direction adjacent to the site. No auxiliary turn lanes currently exist at the site access on Las Vegas Street.

EXISTING TRAFFIC

Existing turning movement counts were collected in July 2019 at the site access with Las Vegas Street. Weekday AM and PM peak hour counts were collected in addition to Saturday peak hour counts, as shown in Figure 3. The weekday counts coincide with peak traffic on Las Vegas Street, while the Saturday count coincides with the peak traffic generated by the site. As shown, there is approximately 4,650 vehicles per day (vpd) on Las Vegas Street adjacent to the site on a

Saturday. On a weekday there is approximately and 6,750 vpd on Las Vegas Street. The site access point is estimated to have 350 vpd on a weekday and 1,150 vpd on a Saturday.

The site is not anticipated to undergo any changes in land usage or the number of employees as a result of the redevelopment. Therefore, there is not anticipated to be any change in the site generated traffic.

LEVEL OF SERVICE ANALYSIS

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection and is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay. LOS F indicates a high level of congestion or delay. Table 1 shows the level of service delay ranges for signalized and unsignalized intersections.

Table 1: Intersection Levels of Service Delay Ranges

Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (Seconds per Vehicle)	Average Control Delay (Seconds per Vehicle) ¹
A	≤ 10.0	≤ 10.0
B	10.1 - 20.0	10.1 - 15.0
C	20.1 - 35.0	15.1 - 25.0
D	35.1 - 55.0	25.1 - 35.0
E	55.1 - 80.0	35.1 - 50.0
F	≥ 80.1	≥ 50.1

¹ For unsignalized intersections, if v/c is > 1.00, then LOS is LOS F, regardless of the projected average control delay per vehicle

Levels of service for the current traffic conditions during the weekday morning and afternoon peak hours, as well as the Saturday peak hour, are shown in Figure 3. Detailed Synchro reports are attached. As shown, the outbound movement from the site currently operates at LOS B during all peak hours.

LAS VEGAS STREET IMPROVEMENTS

There is a planned T-intersection with Las Vegas Street for the new Spring Creek roadway to be located approximately 100 feet west of the site access. This intersection is being constructed as part of a City of Colorado Springs sponsored Pikes Peak Rural Transportation Authority (PPRTA) project. As part of the new intersection construction, there are planned improvements to Las Vegas Street adjacent to the site and to the site access. The site access is planned to be widened to have separate left- and right-turn lanes as part of the PPRTA project. Also, the applicant and LSC are coordinating with the City/PPRTA project team on the inclusion of the proposed northwest bound left turn lane on Las Vegas Street in the project (with the applicant funding the

associated additional cost). Las Vegas Street will have a 40-mph speed limit (45-mph design speed) with the new design. Roadway plans are attached.

The current outbound laneage has a shared left/right-turn lane. As mentioned previously, the current laneage operates at LOS B for this movement. Figure 3 provides the resulting levels of service with the separate turning movements. As shown, the outbound left-turn will operate at LOS B during all peak hours. While the outbound right-turning movement will operate at LOS B or better during all peak hours.

According to Map 13 of the El Paso County's Major Thoroughfare Corridor Plan (MTCP) no other improvements are planned for Las Vegas Street.

AUXILIARY TURN LANE NEEDS EVALUATION

Las Vegas Street is classified by El Paso County as a two-lane minor arterial adjacent to the site. All auxiliary turn lane design criteria below refer to Section 2.3.7 from the El Paso County *Engineering Criteria Manual (ECM)*.

Auxiliary Right-Turn Deceleration Lane

A right-turn deceleration lane is **not** required at site access point, as the current peak-hour eastbound right-ingress turning volume is less than the 50 vehicles per hour (vph) threshold.

Auxiliary Left-Turn Deceleration Lane

An exclusive left-turn deceleration lane shall be provided for access on minor arterial roadways with a peak-hour ingress left-turning volume greater than 25 vph. Based on counts recorded, the current peak-hour volumes for the westbound left-turn turning movements at the site access points exceeds 25 vph during the Saturday peak hour. Therefore, a left-turn deceleration lane will be required.

Based on the ECM and the planned 45 mph design speed (40-mph posted speed), the left turn lane would require 50 feet of storage, 195 feet for deceleration, and a 180-foot taper. The roadway plans have a painted median located east of the intersection, therefore much of the turn lane can be accommodated by simply restriping. However, there is a bridge located approximately 600 feet east of the intersection, which limits the turn lane length and potential lane redirects.

To limit impacts to the bridge or the roadway immediately adjacent to the bridge a design deviation is requested (deviation request will be submitted). It is recommended that a 90-foot bay taper be constructed within the required deceleration length. This would result in the lane being striped with 50 feet of storage, 105 feet of deceleration, and a 90-foot bay taper, as shown in Figure 4.

The proposed design deviation is not expected to negatively impact safety on the corridor due to the low number of turning vehicles at this intersection. It should be noted that the site is very seasonal and only exceeds the turn lane threshold on Saturdays during peak months (between

April and September). Additionally, because the volume of turning vehicles only exceeds the turn lane threshold on Saturdays, the through volume on Las Vegas Street is lower and the 95th percentile queue for the turning movement is less than one vehicle.

The turn lane will be constructed by the City as part of the PPRTA Las Vegas/Spring Creek intersection, which is a PPRTA priority "A" project. If the City fails to construct the Spring Creek intersection, then Rocky Top Resources will be responsible for constructing the required turn-lane improvements.

SIGHT DISTANCE

Future sight distance was measured for the access point on the Las Vegas Street design plans. The sight distance requirements for the access is 400 feet based on the *Engineering Criteria Manual (ECM)* and the planned 40 mph posted speed for the roadway. The access will meet sight distance requirements for a passenger vehicles and single unit trucks turning out of the access onto Las Vegas Street.

CONCLUSIONS AND RECOMMENDATIONS

- During the Saturday peak hour, approximately 84 vehicles enter the site and 90 vehicles exit the site.
- The site access will be reconstructed with the construction of the Spring Creek intersection to the west of the site. The access is planned to have separate left and right turn lanes.
- The site access requires a westbound left-turn lane based on criteria in the El Paso County *Engineering Criteria Manual*. It is recommended that a 50-foot storage lane with 105 feet of deceleration length and a 90-foot taper be constructed for the required turn lane. A design deviation will be filed, as this does not meet the County's turn lane requirements due to a bridge located west of the access. This improvement will be constructed as part of the PPRTA Las Vegas improvement project.
- The access point will meet ECM sight distance requirements for a passenger vehicle and single unit truck.

* * * * *

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Please contact me if you have any questions.

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

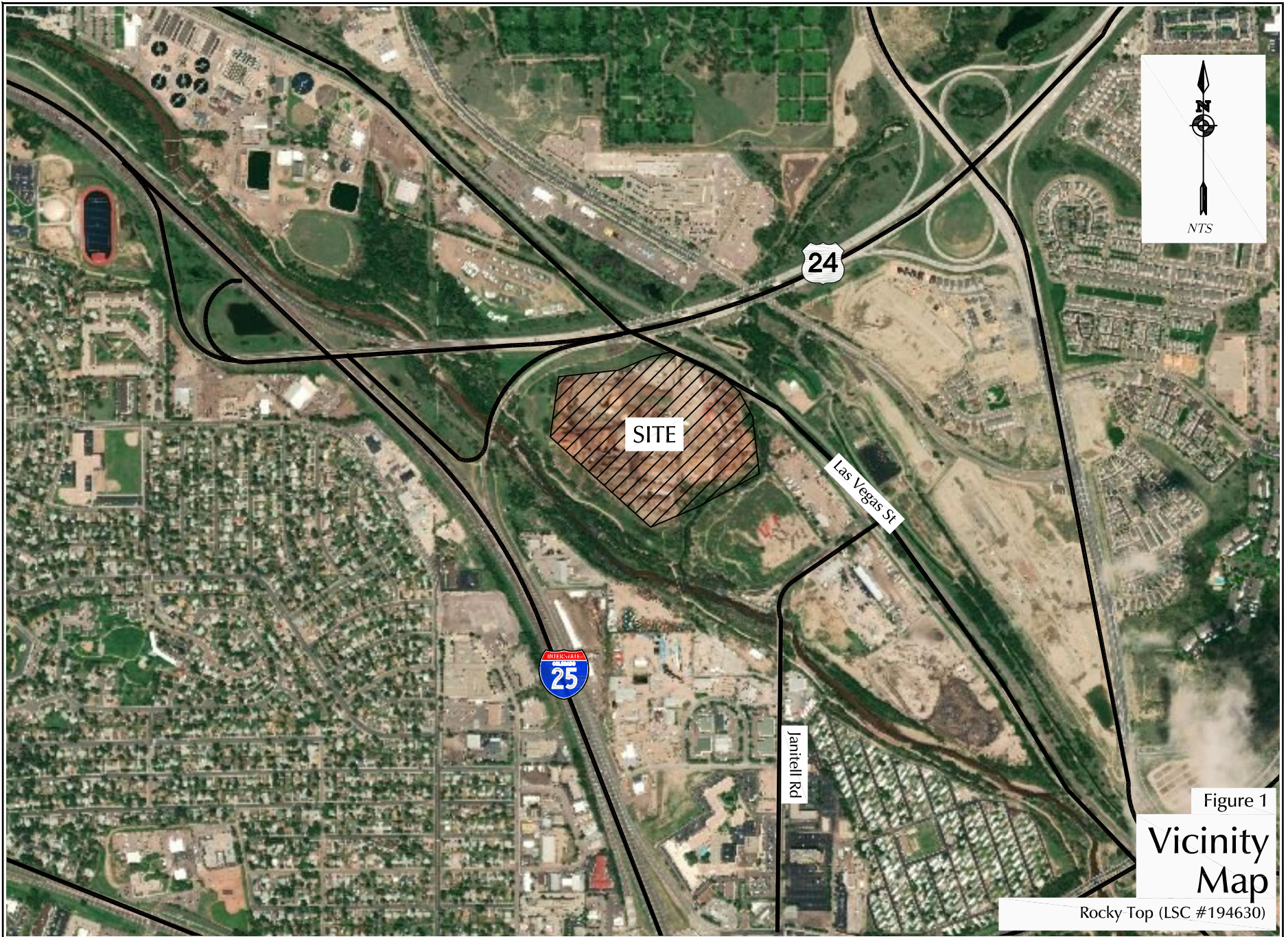
By: Jeffrey C. Hodsdon, P.E.
Principal

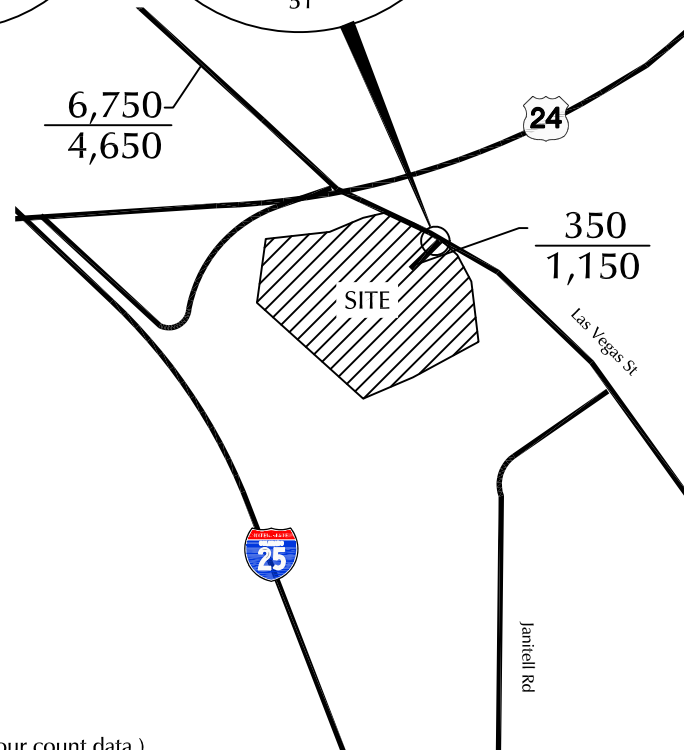
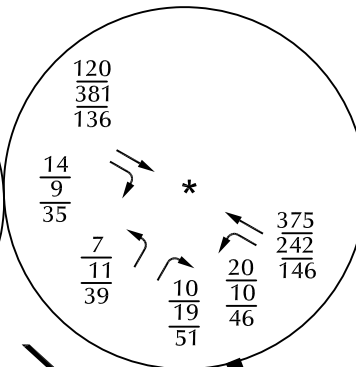
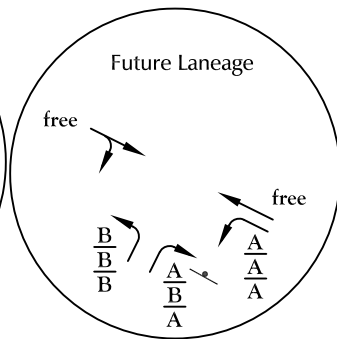
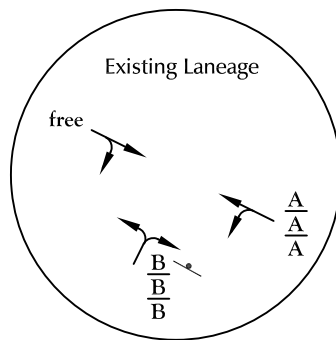
CRG:jas

Enclosure: Figures 1-3
Spring Creek Roadway Plans
Traffic Counts
Level of Service Reports

Tables and Figures







LEGEND:

- = Stop Sign
- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{XX}{XX}$ = Saturday Peak-Hour Traffic (vehicles per hour)
- $\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service
- $\frac{B}{B}$ = PM Individual Movement Peak-Hour Level of Service
- $\frac{C}{C}$ = Saturday Individual Movement Peak-Hour Level of Service
- $\frac{X,XXX}{X,XXX}$ = Weekday Daily Traffic (Estimates by LSC based on factored peak-hour count data.)
- $\frac{X,XXX}{X,XXX}$ = Saturday Daily Traffic

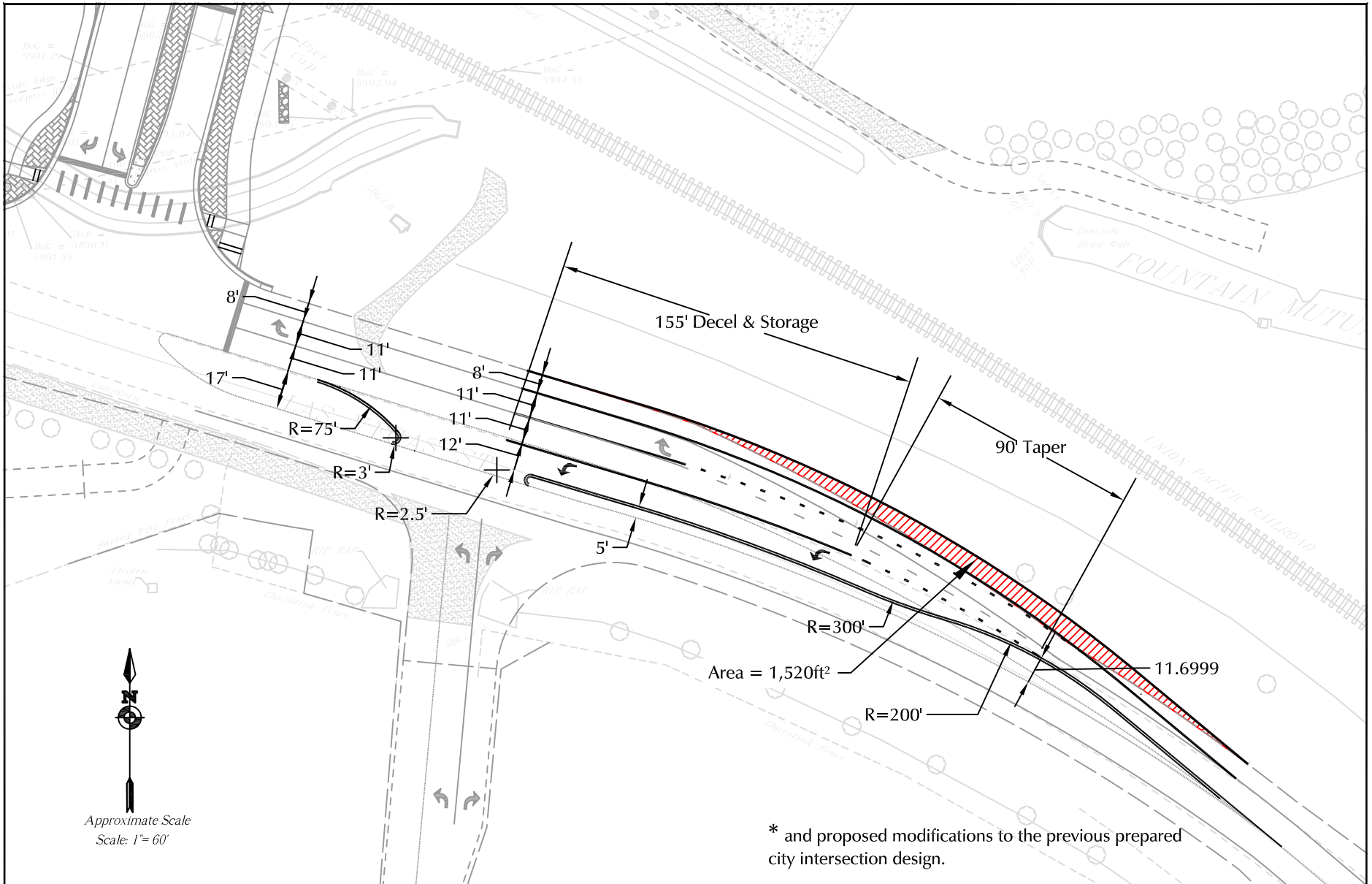
*Counts by LSC 7/2019

Figure 2

Existing Traffic, Lane Geometry, Traffic Control and Level of Service

Rocky Top (LSC #194630)





* and proposed modifications to the previous prepared city intersection design.

Approximate Scale
Scale: 1" = 60'

LEGEND:
 — = Previously prepared City intersection design
 — = LSC proposed modifications to the City intersection design to add the left turn lane into Rocky Top.

Proposed Turn Lane Design*

Figure 3
(LSC# 194630)



Spring Creek Roadway Plans





Know what's below.
Call before you dig.

BOX CULVERT CBC-02- SEE
CULVERT SHEETS FOR MORE INFORMATION

FOUNTAIN MUTUAL
IRRIGATION DITCH

FMID HCL

MATCHLINE STA. 62+50

SPRING
CREEK HCL

LAS VEGAS HCL

E LAS VEGAS ST

MATCHLINE STA. 66+00

LAS VEGAS STA. 65+20.82 =
ROCKY TOP ACCESS STA. 23+15.00
N=1356319.17
E=3201364.57

CDOT MAINTENANCE
ACCESS HCL SEE
ROADWAY DETAIL
SHEETS

SPRING CREEK HCL STA. 100+07.01=
LAS VEGAS HCL STA. 63+61.30
N=1355913.1076
E=3200126.5120

STA. 63+78.11, 100.57 RT
BEGIN FENCE (MATCH EXISTING)

LAS VEGAS HCL
STA. 64+4.66, 30.00 RT=
CDOT MAINTENANCE
ACCESS HCL
STA. 32+55.14

16 FOOT GATE

STA. 63+91.50, 30.00' RT
BREAKPOINT AND PAVEMENT EDGE

FENCE BARBED WIRE
WITH METAL POSTS.

STA. 64+33.52, 61.05 RT
FENCE TYPE TRANSITION
FENCE ANGLE POINT

STA. 64+73.91, 56.24' RT
FENCE ANGLE POINT
FENCE CHAIN LINK
(72 INCH)

STA. 22+42.45, 58.98' LT
FENCE TYPE TRANSITION POINT
FENCE ANGLE POINT

STA. 22+34.23, 16.50' LT
FENCE ANGLE POINT

FENCE CHAIN LINK
(72 INCH)

ROCKY TOP ACCESS
HCL SEE ROADWAY
DETAIL SHEETS

EXISTING GATE
(PROTECT IN PLACE)

STA. 20+33.24, 14.33' LT
END FENCE
MATCH EXISTING

STA. 22+30.96, 47.45' RT
END FENCE (MATCH EXISTING)

STA. 22+19.72, 28.00' RT
FENCE ANGLE POINT

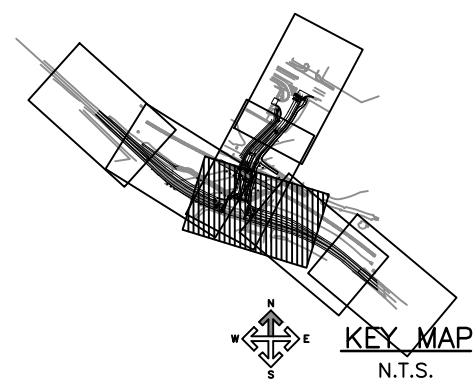
STA. 22+50 ROCKY TOP ACCESS
HCL BEGIN ASPHALT PAVING

STA. 21+50.00, 28.00' RT
FENCE ANGLE POINT

FENCE CHAIN LINK
(72 INCH)

STA. 21+00.00, 16.12' RT
FENCE ANGLE POINT

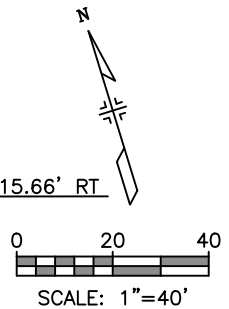
STA. 20+35.14, 15.66' RT
END FENCE
MATCH EXISTING



- (LV-#) LAS VEGAS HORIZONTAL CURVE NUMBER (SEE GEOMETRY PLANS)
- (SC-#) SPRING CREEK HORIZONTAL CURVE NUMBER (SEE GEOMETRY PLANS)
- EXISTING US 24 COLUMN
- - - SAWCUT
- ▒ ASPHALT CONCRETE PAVEMENT FULL DEPTH
- ▒ ASPHALT CONCRETE PAVEMENT OVERLAY
- - - - TOE OF FILL
- - - - TOP OF CUT
- - - - LIMITS OF DISTURBANCE

NOTES:

1. SEE SPRING CREEK ROADWAY PLAN SHEETS FOR ADDITIONAL INFORMATION.
2. SEE DRAINAGE SHEETS FOR ADDITIONAL INFORMATION.
3. SEE TRAFFIC SIGNAL PLANS FOR ADDITIONAL INFORMATION.
4. SEE LIGHTING PLANS FOR ADDITIONAL INFORMATION.
5. SEE LAS VEGAS AND SPRING CREEK INTERSECTION DETAIL.



Computer File Information	
Creation Date:	3/7/18 Initials: BJH
Last Modification Date:	3/7/18 Initial: BEN.HARMS
Full Path:	S:\10114-02\CAD\Sheets
Drawing File Name:	R10114-02PLN03.dwg
Acad Version 2016	Scale: 1"=40' Units: English

Index of Revisions	

CITY OF COLORADO SPRINGS
We Create Community

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As Constructed
No Revisions:
Revised:
Void:

SPRING CREEK ROAD/ROYER STREET ROADWAY PLAN E LAS VEGAS STREET	
Designer:	BJH
Detailer:	BJH
Sheet Subset:	ROADWAY
Subset Sheets:	RP 3 of 10

Project No./Code	10114-02
Sheet Number	

Traffic Counts





LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210
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 719-633-2868

File Name : E Las Vegas St - Rocky Top Resources Access AM
 Site Code : 00000000
 Start Date : 7/9/2019
 Page No : 1

Groups Printed- Unshifted

Start Time	E Las Vegas St Southbound					Westbound					E Las Vegas St Northbound					Rocky Top Resources Access Eastbound					Int. Total
	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	
06:30 AM	0	22	2	0	24	0	0	0	0	0	0	51	0	0	51	0	0	1	0	1	76
06:45 AM	0	29	1	0	30	0	0	0	0	0	3	76	0	0	79	0	0	0	0	0	109
Total	0	51	3	0	54	0	0	0	0	0	3	127	0	0	130	0	0	1	0	1	185
07:00 AM	0	23	1	0	24	0	0	0	0	0	6	77	0	0	83	1	0	0	0	1	108
07:15 AM	0	24	6	0	30	0	0	0	0	0	2	104	0	0	106	2	0	4	0	6	142
07:30 AM	0	36	4	0	40	0	0	0	0	0	7	112	0	0	119	0	0	0	0	0	159
07:45 AM	0	37	3	0	40	0	0	0	0	0	5	82	0	0	87	4	0	6	0	10	137
Total	0	120	14	0	134	0	0	0	0	0	20	375	0	0	395	7	0	10	0	17	546
08:00 AM	0	30	5	0	35	0	0	0	0	0	1	58	0	0	59	1	0	8	0	9	103
08:15 AM	0	31	1	0	32	0	0	0	0	0	5	56	0	0	61	5	0	4	0	9	102
Grand Total	0	232	23	0	255	0	0	0	0	0	29	616	0	0	645	13	0	23	0	36	936
Apprch %	0	91	9	0		0	0	0	0		4.5	95.5	0	0		36.1	0	63.9	0		
Total %	0	24.8	2.5	0	27.2	0	0	0	0	0	3.1	65.8	0	0	68.9	1.4	0	2.5	0	3.8	

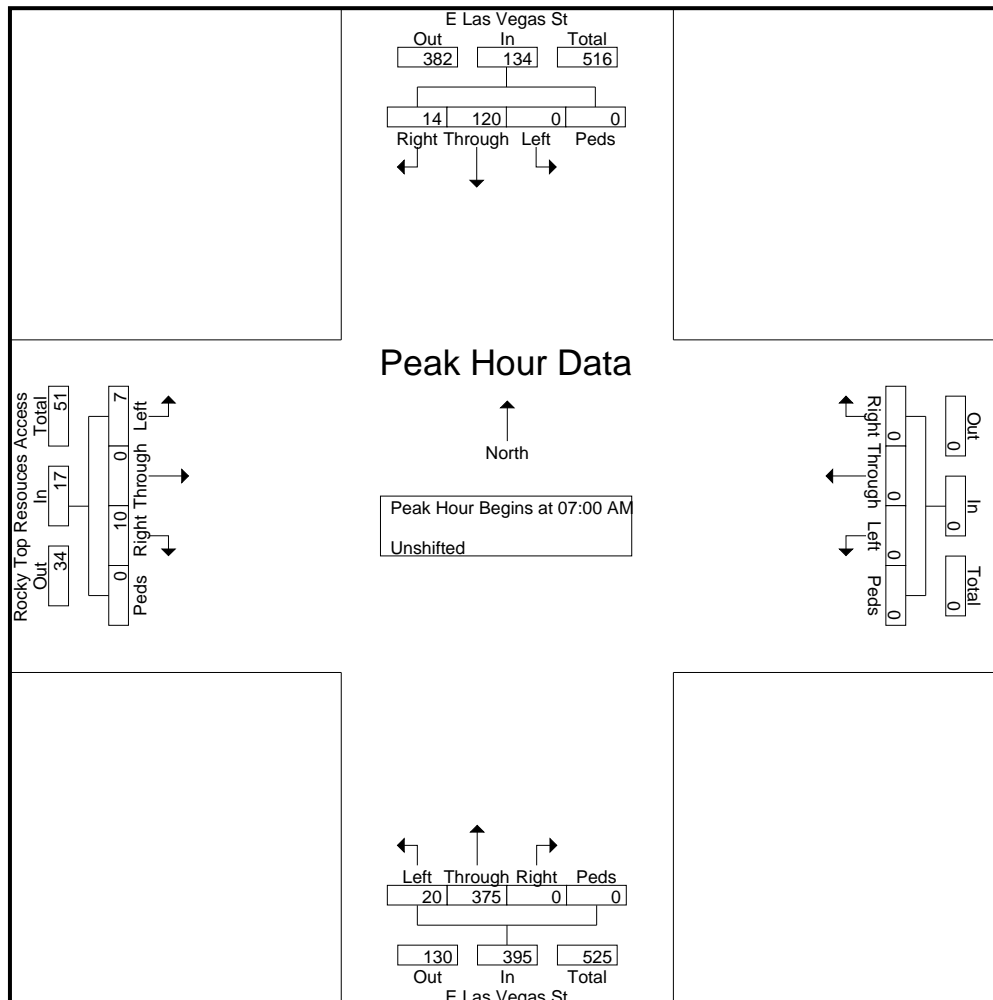


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 Page No : 2

Start Time	E Las Vegas St Southbound					Westbound					E Las Vegas St Northbound					Rocky Top Resources Access Eastbound					Int. Total
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Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	23	1	0	24	0	0	0	0	0	6	77	0	0	83	1	0	0	0	1	108
07:15 AM	0	24	6	0	30	0	0	0	0	0	2	104	0	0	106	2	0	4	0	6	142
07:30 AM	0	36	4	0	40	0	0	0	0	0	7	112	0	0	119	0	0	0	0	0	159
07:45 AM	0	37	3	0	40	0	0	0	0	0	5	82	0	0	87	4	0	6	0	10	137
Total Volume	0	120	14	0	134	0	0	0	0	0	20	375	0	0	395	7	0	10	0	17	546
% App. Total	0	89.6	10.4	0		0	0	0	0		5.1	94.9	0	0		41.2	0	58.8	0		
PHF	.000	.811	.583	.000	.838	.000	.000	.000	.000	.000	.714	.837	.000	.000	.830	.438	.000	.417	.000	.425	.858



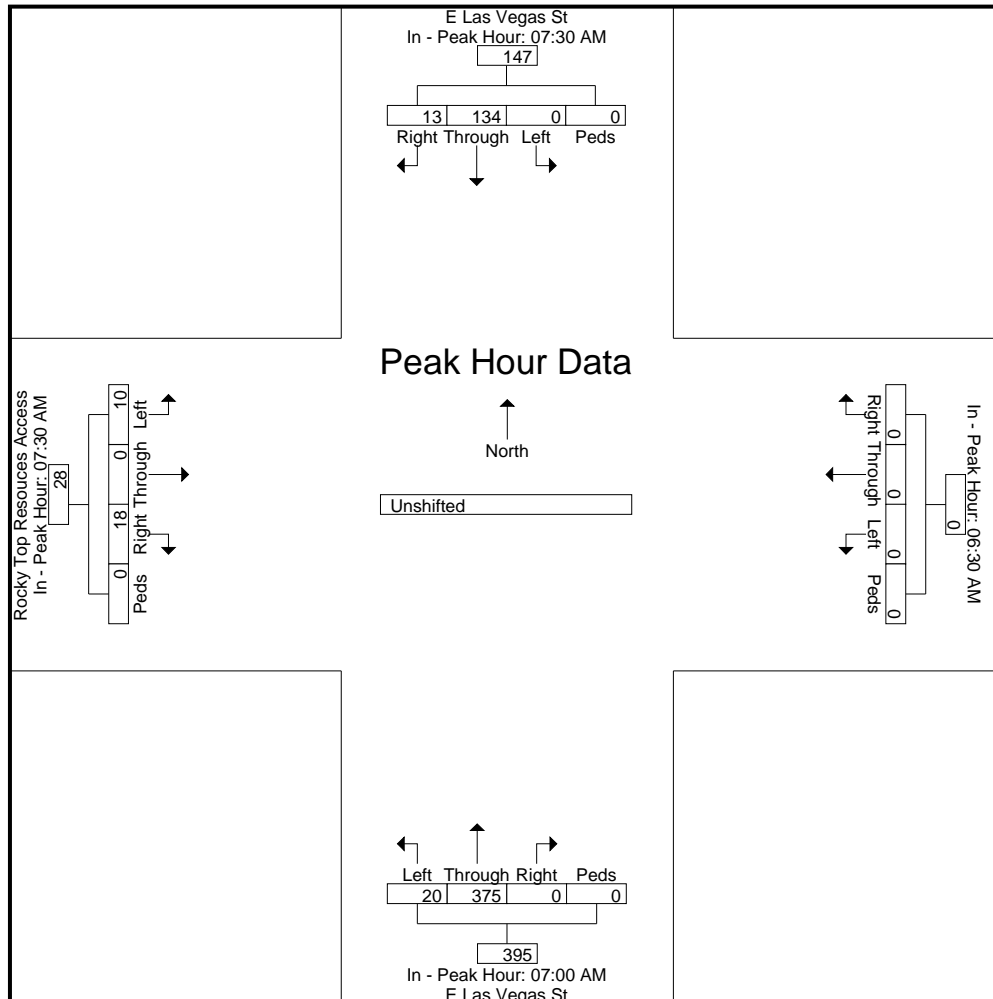


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 Site Code : 00000000
 Start Date : 7/9/2019
 Page No : 3

Start Time	E Las Vegas St Southbound					Westbound					E Las Vegas St Northbound					Rocky Top Resources Access Eastbound					Int. Total				
	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total					
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																									
Peak Hour for Each Approach Begins at:																									
	07:30 AM					06:30 AM					07:00 AM					07:30 AM									
+0 mins.	0	36	4	0	40	0	0	0	0	0	6	77	0	0	83	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	37	3	0	40	0	0	0	0	0	2	104	0	0	106	4	0	6	0	10					
+30 mins.	0	30	5	0	35	0	0	0	0	0	7	112	0	0	119	1	0	8	0	9					
+45 mins.	0	31	1	0	32	0	0	0	0	0	5	82	0	0	87	5	0	4	0	9					
Total Volume	0	134	13	0	147	0	0	0	0	0	20	375	0	0	395	10	0	18	0	28					
% App. Total	0	91.2	8.8	0		0	0	0	0		5.1	94.9	0	0		35.7	0	64.3	0						
PHF	.000	.905	.650	.000	.919	.000	.000	.000	.000	.000	.714	.837	.000	.000	.830	.500	.000	.563	.000	.700					





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 Site Code : 00000000
 Start Date : 7/9/2019
 Page No : 1

Groups Printed- Unshifted

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04:15 PM	0	84	3	0	87	0	0	0	0	0	8	53	0	0	61	3	0	2	0	5	153
04:30 PM	0	90	6	0	96	0	0	0	0	0	6	54	0	0	60	3	0	4	0	7	163
04:45 PM	0	89	2	0	91	0	0	0	0	0	4	57	0	0	61	4	0	5	0	9	161
Total	0	335	11	0	346	0	0	0	0	0	20	212	0	0	232	10	0	13	0	23	601
05:00 PM	0	98	1	0	99	0	0	0	0	0	0	60	0	0	60	2	0	9	0	11	170
05:15 PM	0	104	0	0	104	0	0	0	0	0	0	71	0	0	71	2	0	1	0	3	178
05:30 PM	0	82	1	0	83	0	0	0	0	0	0	61	0	0	61	3	0	4	0	7	151
05:45 PM	0	78	0	0	78	0	0	0	0	0	0	60	0	0	60	1	0	0	0	1	139
Total	0	362	2	0	364	0	0	0	0	0	0	252	0	0	252	8	0	14	0	22	638
Grand Total	0	697	13	0	710	0	0	0	0	0	20	464	0	0	484	18	0	27	0	45	1239
Apprch %	0	98.2	1.8	0		0	0	0	0		4.1	95.9	0	0		40	0	60	0		
Total %	0	56.3	1	0	57.3	0	0	0	0	0	1.6	37.4	0	0	39.1	1.5	0	2.2	0	3.6	

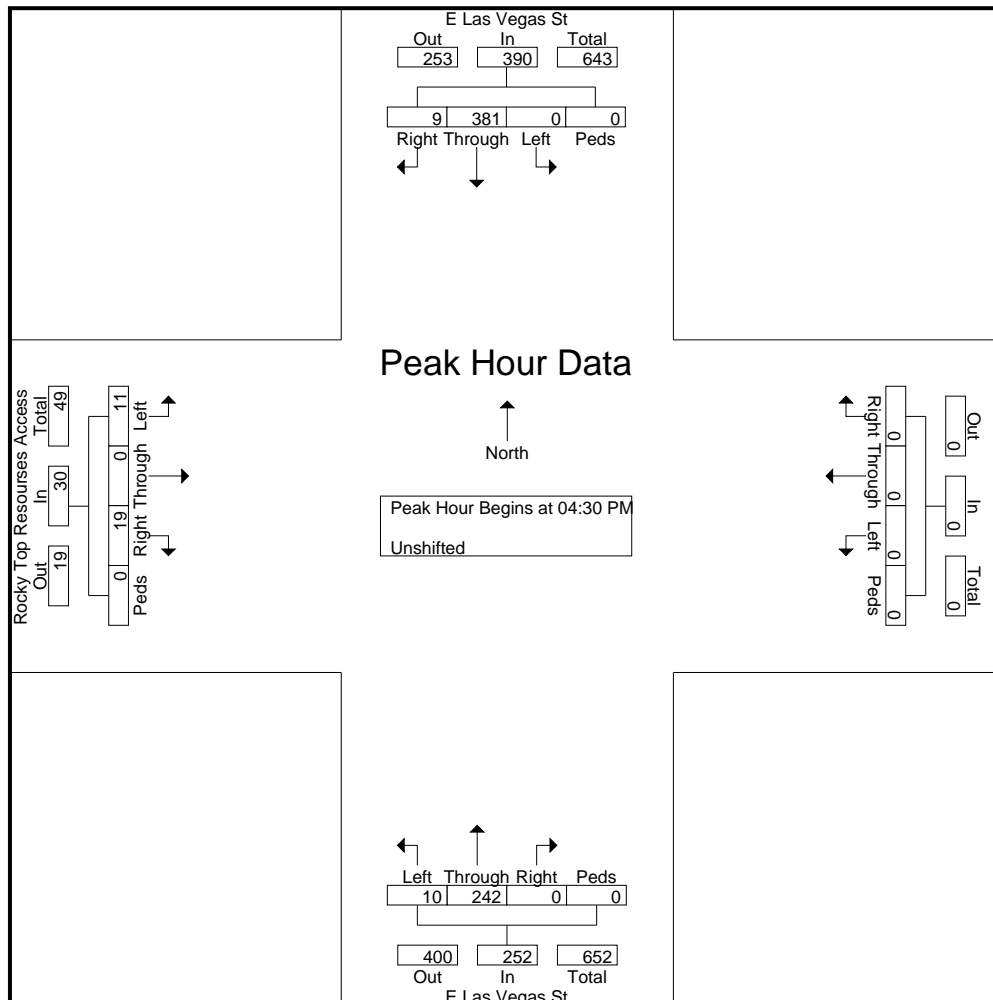


LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210
 Colorado Springs, CO 80905
 719-633-2868

File Name : E Las Vegas St - Rocky Top Resources Access PM
 Site Code : 00000000
 Start Date : 7/9/2019
 Page No : 2

Start Time	E Las Vegas St Southbound					Westbound					E Las Vegas St Northbound					Rocky Top Resources Access Eastbound					Int. Total
	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	90	6	0	96	0	0	0	0	0	6	54	0	0	60	3	0	4	0	7	163
04:45 PM	0	89	2	0	91	0	0	0	0	0	4	57	0	0	61	4	0	5	0	9	161
05:00 PM	0	98	1	0	99	0	0	0	0	0	0	60	0	0	60	2	0	9	0	11	170
05:15 PM	0	104	0	0	104	0	0	0	0	0	0	71	0	0	71	2	0	1	0	3	178
Total Volume	0	381	9	0	390	0	0	0	0	0	10	242	0	0	252	11	0	19	0	30	672
% App. Total	0	97.7	2.3	0		0	0	0	0		4	96	0	0		36.7	0	63.3	0		
PHF	.000	.916	.375	.000	.938	.000	.000	.000	.000	.000	.417	.852	.000	.000	.887	.688	.000	.528	.000	.682	.944



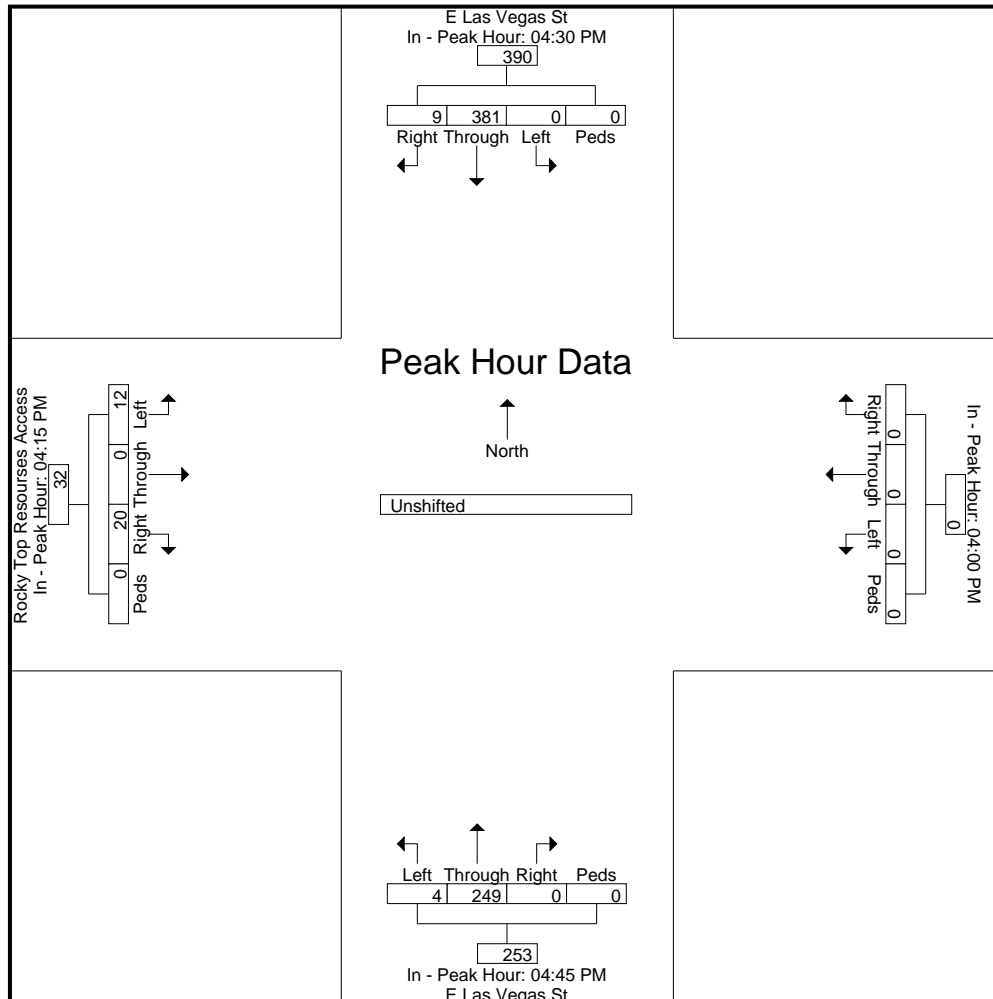


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File Name : E Las Vegas St - Rocky Top Resources Access PM
 Site Code : 00000000
 Start Date : 7/9/2019
 Page No : 3

Start Time	E Las Vegas St Southbound					Westbound					E Las Vegas St Northbound					Rocky Top Resources Access Eastbound					Int. Total
	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:30 PM					04:00 PM					04:45 PM					04:15 PM					
+0 mins.	0	90	6	0	96	0	0	0	0	0	4	57	0	0	61	3	0	2	0	5	
+15 mins.	0	89	2	0	91	0	0	0	0	0	0	60	0	0	60	3	0	4	0	7	
+30 mins.	0	98	1	0	99	0	0	0	0	0	0	71	0	0	71	4	0	5	0	9	
+45 mins.	0	104	0	0	104	0	0	0	0	0	0	61	0	0	61	2	0	9	0	11	
Total Volume	0	381	9	0	390	0	0	0	0	0	4	249	0	0	253	12	0	20	0	32	
% App. Total	0	97.7	2.3	0		0	0	0	0		1.6	98.4	0	0		37.5	0	62.5	0		
PHF	.000	.916	.375	.000	.938	.000	.000	.000	.000	.000	.250	.877	.000	.000	.891	.750	.000	.556	.000	.727	



Levels of Service



HCM 6th TWSC
3: Access & Las Vegas

Existing
AM Peak Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	120	14	20	375	7	10
Future Vol, veh/h	120	14	20	375	7	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	83	83	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	143	17	24	452	7	10

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	160	0	652
Stage 1	-	-	-	-	152
Stage 2	-	-	-	-	500
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1419	-	433
Stage 1	-	-	-	-	876
Stage 2	-	-	-	-	609
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1419	-	423
Mov Cap-2 Maneuver	-	-	-	-	423
Stage 1	-	-	-	-	876
Stage 2	-	-	-	-	595

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	613	-	-	1419	-
HCM Lane V/C Ratio	0.028	-	-	0.017	-
HCM Control Delay (s)	11	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

HCM 6th TWSC
3: Access & Las Vegas

Existing
PM Peak Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	381	9	10	242	11	19
Future Vol, veh/h	381	9	10	242	11	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	89	89	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	405	10	11	272	11	19

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	415	0	704 410
Stage 1	-	-	-	-	410 -
Stage 2	-	-	-	-	294 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1144	-	403 642
Stage 1	-	-	-	-	670 -
Stage 2	-	-	-	-	756 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1144	-	399 642
Mov Cap-2 Maneuver	-	-	-	-	399 -
Stage 1	-	-	-	-	670 -
Stage 2	-	-	-	-	748 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	525	-	-	1144	-
HCM Lane V/C Ratio	0.057	-	-	0.01	-
HCM Control Delay (s)	12.3	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

HCM 6th TWSC
3: Access & Las Vegas

Existing
Saturday Peak Hour

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	136	38	46	146	39	51
Future Vol, veh/h	136	38	46	146	39	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	84	84	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	38	55	174	40	52

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	174	0	439
Stage 1	-	-	-	-	155
Stage 2	-	-	-	-	284
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1403	-	575
Stage 1	-	-	-	-	873
Stage 2	-	-	-	-	764
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1403	-	550
Mov Cap-2 Maneuver	-	-	-	-	550
Stage 1	-	-	-	-	873
Stage 2	-	-	-	-	731

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	702	-	-	1403	-
HCM Lane V/C Ratio	0.131	-	-	0.039	-
HCM Control Delay (s)	10.9	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	↷
Traffic Vol, veh/h	120	14	20	375	7	10
Future Vol, veh/h	120	14	20	375	7	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	83	83	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	143	17	24	452	7	10

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	160	0	652	152
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	500	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1419	-	433	894
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	609	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1419	-	426	894
Mov Cap-2 Maneuver	-	-	-	-	426	-
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	426	894	-	-	1419	-
HCM Lane V/C Ratio	0.016	0.011	-	-	0.017	-
HCM Control Delay (s)	13.6	9.1	-	-	7.6	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	↷
Traffic Vol, veh/h	381	9	10	242	11	19
Future Vol, veh/h	381	9	10	242	11	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	89	89	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	405	10	11	272	11	19

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	415	0	704
Stage 1	-	-	-	-	410
Stage 2	-	-	-	-	294
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1144	-	403
Stage 1	-	-	-	-	670
Stage 2	-	-	-	-	756
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1144	-	399
Mov Cap-2 Maneuver	-	-	-	-	399
Stage 1	-	-	-	-	670
Stage 2	-	-	-	-	748

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	399	642	-	-	1144	-
HCM Lane V/C Ratio	0.028	0.03	-	-	0.01	-
HCM Control Delay (s)	14.3	10.8	-	-	8.2	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	↷
Traffic Vol, veh/h	136	38	46	146	39	51
Future Vol, veh/h	136	38	46	146	39	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	84	84	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	38	55	174	40	52

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	174	0	439
Stage 1	-	-	-	-	155
Stage 2	-	-	-	-	284
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1403	-	575
Stage 1	-	-	-	-	873
Stage 2	-	-	-	-	764
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1403	-	553
Mov Cap-2 Maneuver	-	-	-	-	553
Stage 1	-	-	-	-	873
Stage 2	-	-	-	-	734

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	553	891	-	-	1403	-
HCM Lane V/C Ratio	0.072	0.058	-	-	0.039	-
HCM Control Delay (s)	12	9.3	-	-	7.7	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0.1	-