COUNTY OF SAN BERNARDINO

TRAFFIC IMPACT STUDY

FOR

APN 3064-041-02 AT NE CORNER OF PHELAN ROAD AT BALDY MESA ROAD

Final

Revised July 18, 2013

ALBERT WILSON & ASSOCIATES

COUNTY OF SAN BERNARDINO

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Prepared for:
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INTRODUCTION

This traffic impact analysis (TIA) has been prepared to provide an assessment of potential traffic circulation impact associated with the development of a retail center/ fast food restaurant with drive thru window and a mini-market on a 2.36 acre land in the Oak Hills community in the County of San Bernardino. The project site is located at the north east corner of the intersection of Phelan Road and Baldy Mesa Road and provided as Exhibit 1 in this report.

This project is within the Regional Transportation Development Mitigation Plan area for the Hesperia Subarea and the Oak Hills Area Transportation Facilities Plan for Zone "A". The fee under these plans shall be determined by the County.

The San Bernardino County Traffic Engineering Division staff recommends that operational analysis be performed at the intersection of Phelan Road and Baldy Mesa Road and at the driveways to the project. The following features at these study locations are proposed to be installed by others or are recommended by this study and therefore assumed in-place for the operational analysis:

- Project driveways on both Baldy Mesa and Phelan Roads.
- Driveway on Phelan Road restricted to right-in and right-out turn movement only.

This project is found to potentially generate 140 new trips in morning peak hour and 160 trips in the evening peak hour.

With the addition of traffic generated by the proposed project to the study area roadways, a minimum level of service standard must be maintained at study intersections consistent with San Bernardino County minimum level of service threshold requirement. This TIA analyzes existing traffic condition, project opening day condition and general plan build-out condition and determines mitigation measures attributable to the project in order to provide the required minimum level of service standard at the study intersections.

This report is also prepared to assess and mitigate safety and other traffic off-site operational issues that may result from the development project. It is also prepared to satisfy the requirement for the disclosure of potential impacts and mitigation measures per the California Environmental Quality Act (CEQA)

PROJECT DISCRIPTION

The proposed project is a development of a retail center/ fast food restaurant with drive thru window and a mini-market on a 2.36 acre land in the Oak Hills community in the county of San Bernardino. The project is located at the north east corner of Phelan Road and Baldy Mesa Road. The project site plan is provided as exhibit 2.

ANALYSIS METHODOLOGY

This study presents an analysis of the study intersections operating conditions during the project peak hours for the following time frames:

- Year 2010
- Project Opening year 2014
- Future forecast year 2035

The analysis scenarios are as follows:

- Existing condition
- Project opening year 2014 without project condition
- Project opening year 2014 with project condition
- Future forecast year 2035 without project condition
- Future forecast year 2035 with project condition

The Transportation Research Board –Highway Capacity Manual (HCM), 2000 Update, or most recent release is used for the operational analysis of intersections. Un-signalized intersections are to be analyzed using Chapter 17 of the Highway Capacity Manual. Signalized intersection is analyzed using operational methods as described in Chapter 16, Section 11.

This study is also prepared consistent with 'Level of Service Definition & Procedures" below.

Level of Service Definitions and Procedures

Roadway operations and relationship between capacity and traffic volumes are generally expressed in terms of level of service (which is defined using the letter grades A through F). These levels recognize that while an absolute limit exists as to the amount of traffic traveling through a given intersection (the absolute capacity); the conditions that motorists experience rapidly deteriorate as traffic approaches the absolute capacity. Under such conditions, congestion is experienced. There is general instability in the traffic flow, which means that relative small incidents (e.g., momentary engine stall) can cause considerable fluctuations in speeds and delays. This near-capacity situation is labeled Level of Service (LOS) 'E'. Beyond LOS E, capacity has been exceeded, and arriving traffic will exceed the ability of the intersection to accommodate it. Upstream queues will then form and continue to expand in length until demand again declines. A complete description of the meaning of level of service can be found in the Highway Research Board Special Report 209, Highway Capacity Manual. The manual establishes levels of service A through F. Table A provides brief descriptions of the six levels of service, as abstracted from the Manual.

TABLE A- Level of Service Definitions

LOS	Description
A	No approach phase is fully utilized by traffic and no vehicles waits longer than one red indication. Typically, the approach appears quite open, turns are made easily and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operation conditions. Occasionally drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers fell somewhat restricted, but not objectionably so.
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks periods; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles any that any particular intersections approach can accommodate. Full utilization of every signal is seldom attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially and stoppages may occur for short or long periods of time due to the congestions. In the extreme case, both speed and volume can drop to zero.

Table B shows the level of service criteria for un-signalized and signalized intersections.

Table B – Level of service Criteria for unsignalized and Signalized Intersections

Level of Service	Unsignalized Intersection Average Daily per Vehicle (sec)	Signalized Intersection Average Daily per Vehicle (sec)
A	≤ 10	≤ 10
B	>10 and ≤ 15	>10 and ≤ 20
C	>15 and ≤ 25	>20 and ≤ 35
D	>25 and ≤ 35	>35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	>50	>80

Level of Service Threshold Criteria

Intersections under County of San Bernardino jurisdiction shall operate at LOS "E" or better.

EXISTING STUDY AREA CONDITION

Existing Roadway Systems

The existing study intersection traffic control and lane configuration is provided in exhibit 4. Major streets and highways in the site vicinity which are affected by the proposed project are Phelan Road and Baldy Mesa Road.

Existing 2010 Traffic Volumes

The 2010 turning movement volumes are shown on Exhibit 3. The traffic counts were performed by "Newport Traffic Studies" for approved project at 9770 Baldy Mesa Road. The count sheets are contained in Appendix B.

FUTURE STUDY AREA CONDITION

Exhibit 6 provides study intersection turning movement volumes without the opening year project traffic. The volumes were generated, using County Expansion factor of 2% yearly growth projected to year 2014 with the 2010 traffic count numbers provided as Exhibit B.

The forecast year 2035 traffic volumes represented on Exhibit 10A and 10B are extracts from approved traffic report by Hall & Foreman, Inc for project developed at 9770 Baldy Mesa Road.

PROJECT TRIP GENERATION

Table 1 summarizes the trip generation for the proposed project. As shown in Table 1, the project is expected to generate 140 morning peak hour trips and 159 evening peak hour trips.

TRIP DISTRIBUTION & ASSIGNMENT

Trip distribution pattern for the project traffic was developed to reflect locations of population densities closest to the site. Exhibit 7 illustrates the trip distribution. Exhibit 8 represents the trip assignment.

APPROVED AND PENDING PROJECTS

There are currently no approved and pending projects in the vicinity of this project that may have an impact on project immediate traffic circulation. However, at the inception of the study, the project at 9770 Baldy Mesa Road was under construction and therefore the projected traffic was incorporated into this study. The approved and pending project trips is provided in Exhibit 5.

TRAFFIC ANALYSIS

Appendix A provides the operational analysis worksheets for the study intersection and driveways. Table 2, summarizes the analysis results. The results show that for all the analysis scenarios, all intersection examined are found to operate at satisfactory Levels of Service.

CIRCULATION IMPROVEMENTS

As recommended by the County, the operational analysis assumes right-in and right-out turning movements from the project driveway on Phelan Road. A combination of striping and signage shall be used to control the desired movements at the driveway.

SUMMARY & CONCLUSIONS

1. The project analysis location includes the intersection of Phelan at Baldy Mesa Road and the project driveway at Baldy Mesa Road. The driveway at Phelan Road shall be controlled to allow right-in and right-out movements only.

2. The analysis includes examination of a.m. and p.m. peak hour traffic operations under the following conditions:
    - 2010 condition
    - Year 2014 without project traffic
    - Year 2014 with project traffic
    - Year 2035 without project traffic
    - Year 2035 with project traffic

3. As shown on Table 1, the project is expected to generate a total of 140 trips in the a.m. peak hour and 160 trips during the p.m. peak hour.
4. The project analysis locations will operate at satisfactory levels of service in all study scenarios.
5. This project is located in Regional Transportation Development Mitigation Plan area for the Hesperia Subarea and the Oak Hills Area Transportation Facilities Plan for Zone "A" area and therefore may be subject to fee determined by the County.

TABLE 1

TRIP GENERATION

USING ITE TRIP GENERATION, 8TH EDITION

Land Use	Units	A.M. Peak Hour			P.M. Peak Hour			Daily		
		In	Out	Total	In	Out	Total	In	Out	Total
Fast Food Restaurant with Drive thru. (Land Use 934)	2.850 TSF									
Trips/Unit		25.17	24.18	49.35	17.60	16.24	33.84	248.06	248.06	496.12
Trip		72	69	141	50	46	96	707	707	1414
Pass-by(40%)[1]		29	28	57	20	18	38	283	283	566
New Trips		43	41	84	30	28	58	424	424	848
Specialty Retail Center (Land Use 814)	17.448 TSF									
Trips /Unit					1.19	1.52	2.71	22.16	22.16	44.32
Trips					21	27	48	387	387	774
Pass-by(20%)[1]					4	5	9	77	77	154
New Trips					17	22	39	310	310	619
Mini Market (Land Use 852)	3.000 TSF									
Trips / Unit		15.51	15.51	31.02	16.94	17.63	34.57			
Trips		47	47	94	51	53	104			
Pass-by(40%)[1]		19	19	38	20	21	42			
New Trips		28	28	56	31	32	63			
Total New Trips		71	69	140	78	82	160			
Driveway Trips		119	116	235	122	126	248			

(1)Pass-by rates are as recommended by the San Bernardino Traffic Division in previous studies.

TABLE 2: SUMMARY OF INTERSECTIONS OPERATIONAL ANALYSIS RESULTS

Intersection	DELAY LEVEL OF SERVICE VOLUME CAPACITY RATIO									
	Existing 2010		2014 w/o Project		2014 with Project		2035 Forecast w/o Project		2035 forecast with Project	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Phelan Rd @ Baldy Mesa Rd	22 C+ 0.26	27 C 0.36	24 C+ 0.30	25 C 0.42	28 C 0.37	25 C+ 0.46	33 C- 0.71	40 D+ 0.77	49 D 0.74	41 D 0.78
Proj. Drwy @ Baldy Mesa Rd					10.3 B .09	12.2 B .14			17.1 C .18	26.1 D .30

EXHIBITS

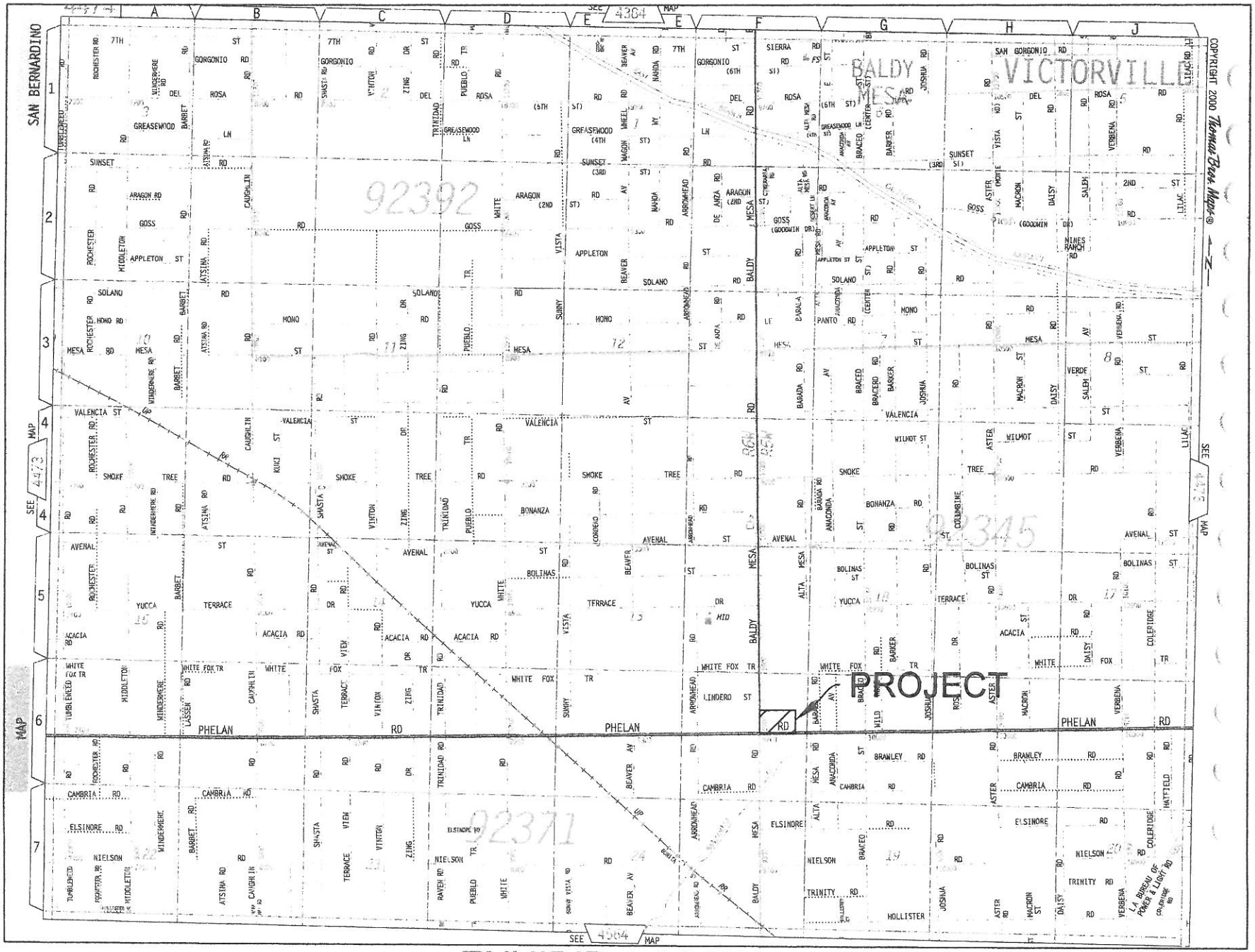
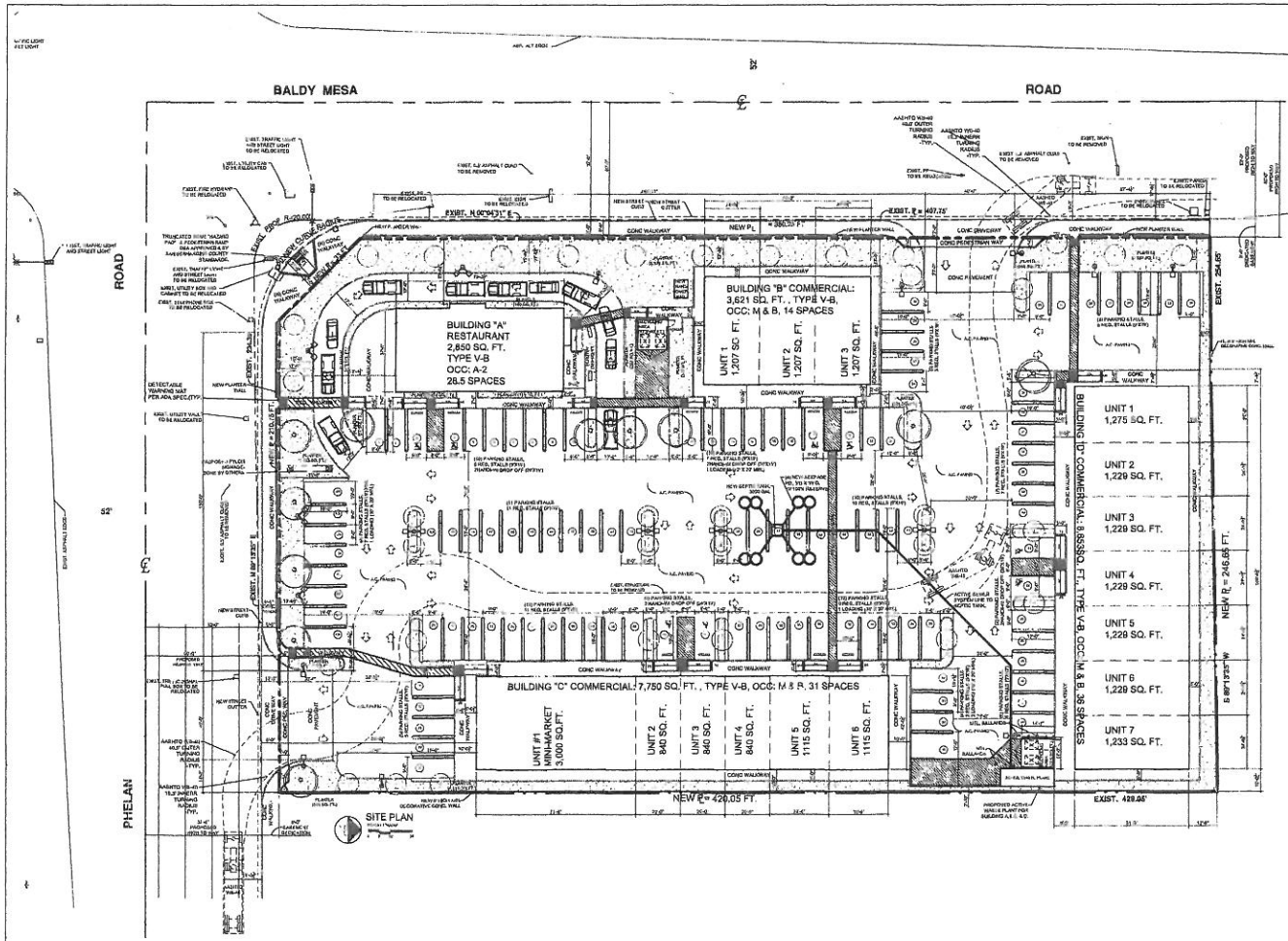


EXHIBIT 1: VICINITY MAP



BENCH MARKS

COUNTY OF SAN BERNARDINO
BOOK: 004125 PAGE: 000568
DATE: 3-22-01
ELEVATION: 3595.04

DESCRIPTION:
S&W INTERSECTION OF CENTERLINE OF SMOKE TREE RD AND BALDY MESA RD

ABBREVIATIONS:

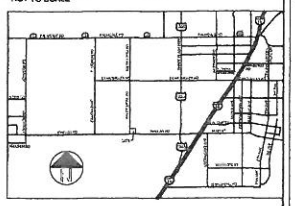
PP ..... Power Pole
EX. ..... Existing
FH ..... Fire Hydrant
GM ..... Gas Meter
WV ..... Water Valve

LEGEND:

(100.10) ..... Existing Elevation
(99) ..... Ex. Ground Contour Line
--X--X--.-- Chain Link Fence
..... Ex. Structure
..... Fire Hydrant
..... Street Light
..... Guywire
..... Trafic Light
..... Ex. Tree, Diameter

VICINITY MAP

NOT TO SCALE



EUM'S COMMERCIAL DEVELOPMENT

APN: 3064-041-02-0000, NE CORNER PHELEN RD. & BALDY MESA RD.
OAK HILLS, CA

GENERAL NOTES

1. ASPHALT PAVING IN PARKING LOT OVER COMPACTED SUBGRADE.
2. 9' X 19' HANDICAP STALL TO HAVE REQUIRED STRIPPING AND SIGNAGE WITH 1/4" PER FOOT MAXIMUM SLOPE IN ANY DIRECTION.
3. DRIVEWAYS COMPLY WITH COUNTY OF SAN BERNARDINO STANDARDS.
4. ALL RAMPS OR SLOPES COMFORM TO ADA SPECIFICATIONS, 1:20 OR 5% UNLESS NOTED OTHERWISE.

GENERAL INFORMATION

SITE-ASSESSOR'S PARCEL NUMBER: 3064-041-02-0000

PROPERTY OWNER: DAVID EUM
626 S. PLYMOUTH BLVD.
LOS ANGELES, CA 90005
TEL: (213) 248-0815

APPLICANT: DAVID EUM
626 S. PLYMOUTH BLVD.
LOS ANGELES, CA 90005
TEL: (213) 248-0815

REPRESENTATIVES / DESIGNERS:
KEN KANG & IAN MARR
MK DESIGN
2021 W. COMMONWEALTH AVE., SUITE U
FULLERTON, CA 92833
TEL:KEN: 626-374-3634 / IAN:619-813-2751
FAX: 714-879-0366

PROJECT ADDRESS: 9722 PHELAN RD.
OAK HILLS, CA 92344

TOTAL LOT AREA: 2.38 ACRES/
102,801.6 SQ. FT.

NUMBER OF STORIES: 1

LEGAL DESCRIPTION:
PTN SLY 480 FT GOV LOT 2 SEC 18 TP 4N R 5W COM AT SW COR SD SEC TH N ALG W LI SD SEC 480.05 FT TH N89 DEG 13 MIN 35 SECONDS E 52 FT TO TRUE POB TH N 89 DEG 13 MIN 35 SECONDS E 284.65 FT TH S 00 DEG 04 MIN 51 SECONDS W 426.05 FT TH S 89 DEG 13 MIN 35 SECONDS W 334.35 FT TO BEG OF TANGENT CURVE CONCAVE TO NE SD CURVE HAVING RAIUS OF 20 FT TH WLY & NLY ALG SD CURVE 31.71 FT TO PT OF TANGENCY WITH A LI 52 FT E OF W LI SD SEC 18 TH N TO POB EX ST*****9-22-95 RIS-088425 ST *****

ZONING: OHICN (OAK HILLS PLANNING AREA/ COMMERCIAL NEIGHBORHOOD)

TYPE OF CONSTRUCTION: Type V (B)

OCCUPANCY TYPE: A-2, M, & B

PROPOSED USE:
CONDITIONAL USE PERMIT TO MODIFY EXISTING CONDITIONAL USE PERMIT TO EXPAND RETAIL(6,400 SQ. FT.) AND FAST FOOD RESTAURANT(750 SQ. FT.) FROM THE EXISTING CONDITIONAL USE PERMIT.

FASTFOOD RESTAURANT:	2,850.0 +/- SQ. FT.
(BUILDING A)	
RETAIL / GEN OFFICE (TOTAL 20,448 SQ. FT.):	
BUILDING B:	3,621.0 +/- SQ. FT.
BUILDING C:	7,750.0 +/- SQ. FT.
BUILDING D:	8,663.0 +/- SQ. FT.
TOTAL BUILDING SQ. FT. (A, B,C, & D):	22,874.0 +/- SQ. FT.

BUILDING CODE USED: 2010 C.B.C.
- NUMBER OF STORIES: 2
- BUILDING AVG. HEIGHT: 19 FT. 5 IN.
- BUILDING MAX HEIGHT: 25 FT. 7 IN.

PROPOSED TOTAL LOT AREA
AFTER RIGHT OF WAY: 2.36 +/- ACRES/ 102,485.8 +/- SQ. FT.

COVERAGE:
- (2) TRASH ENCLOSURE: (14'-3" x 14'-7") 415.6 SQ. FT.

PARKING:

FAST FOOD (W/ DRIVE THRU) BUILDING A:	2,850.0 +/- SQ. FT./ 100 SQ. FT.
TOTAL FOR PARKING:	28
RETAIL BUILDING B, C, & D TOTAL: (RETAIL AND GEN OFFICE)	20,024 +/- SQ. FT./ 250 SQ. FT.
TOTAL FOR PARKING:	80
TOTAL PARKING REQUIRED:	108 PARKING
- STANDARD STALL (9'-0"X19'-0")	94
- HANDICAP STALL (17'-0"X19'-0" W/ DROP-OFF	8
- LOADING	6
TOTAL PARKING PROVIDED STALLS:	108

LANDSCAPING:
- TOTAL LANDSCAPE AREA: 13,883.0 SQ. FT./
  TOTAL LOT AREA: 102,485.8 SQ. FT.
  .135 =14%
- TOTAL INTERNAL LANDSCAPE AREA: 3,284 SQ. FT./
  TOTAL PARKING AREA: 18,061 SQ. FT.
  .181 =18%

SPRINKLERS: NO

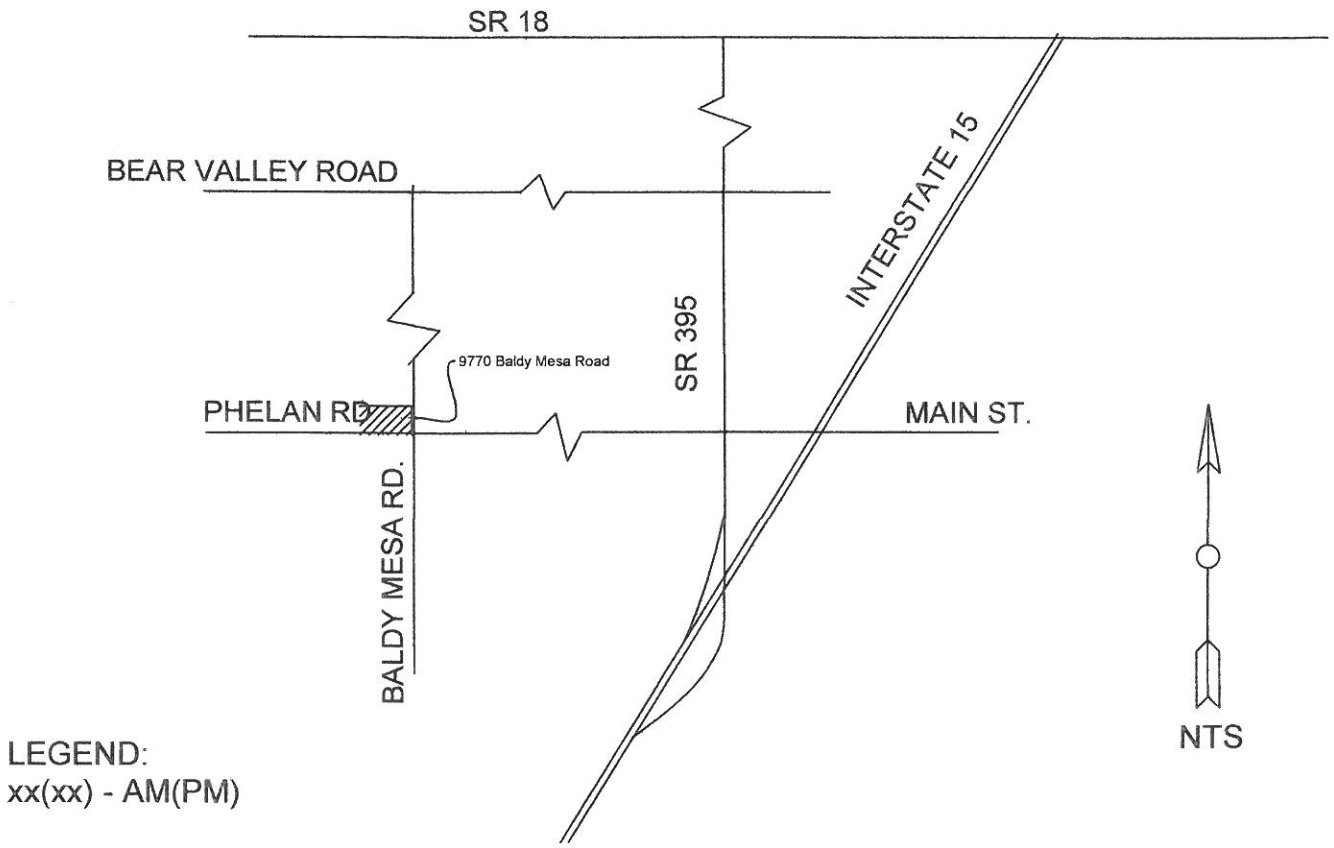
IRRIGATION TO BE BY AUTOMATIC SPRINKLER SYSTEM WITH BELOW GROUND PIPING.
IF NEEDED, A KNOX BOX WITH KEYS WILL BE PROVIDED TO RESTRICTED AREAS
NO OTHER KNOWN EASEMENTS.

ULITIES INFORMATION:

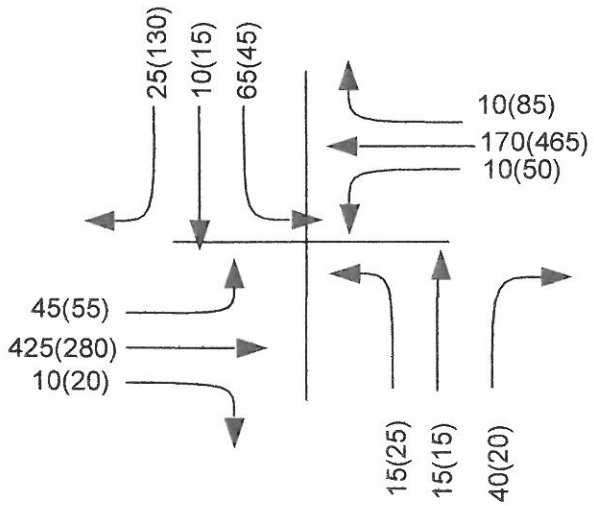
SOUTHERN CALIFORNIA EDISON	1-800-655-4555
SOUTHERN CALIFORNIA GAS	1-800-427-2000
WATER - S.B. COUNTY SPECIAL DISTRICT DEPARTMENT	1-800-554-0565
SANITATION & RECYCLING- CR & R	1-800-336-0396
CABLE / PHONE - MCI	1-888-624-5622

MK Design
2021 W. COMMONWEALTH AVE., SUITE U
FULLERTON, CA 92833

Date 4/18/2013
Scale 1" = 20'-0"
Drawn KK
Job
Sheet A1.0

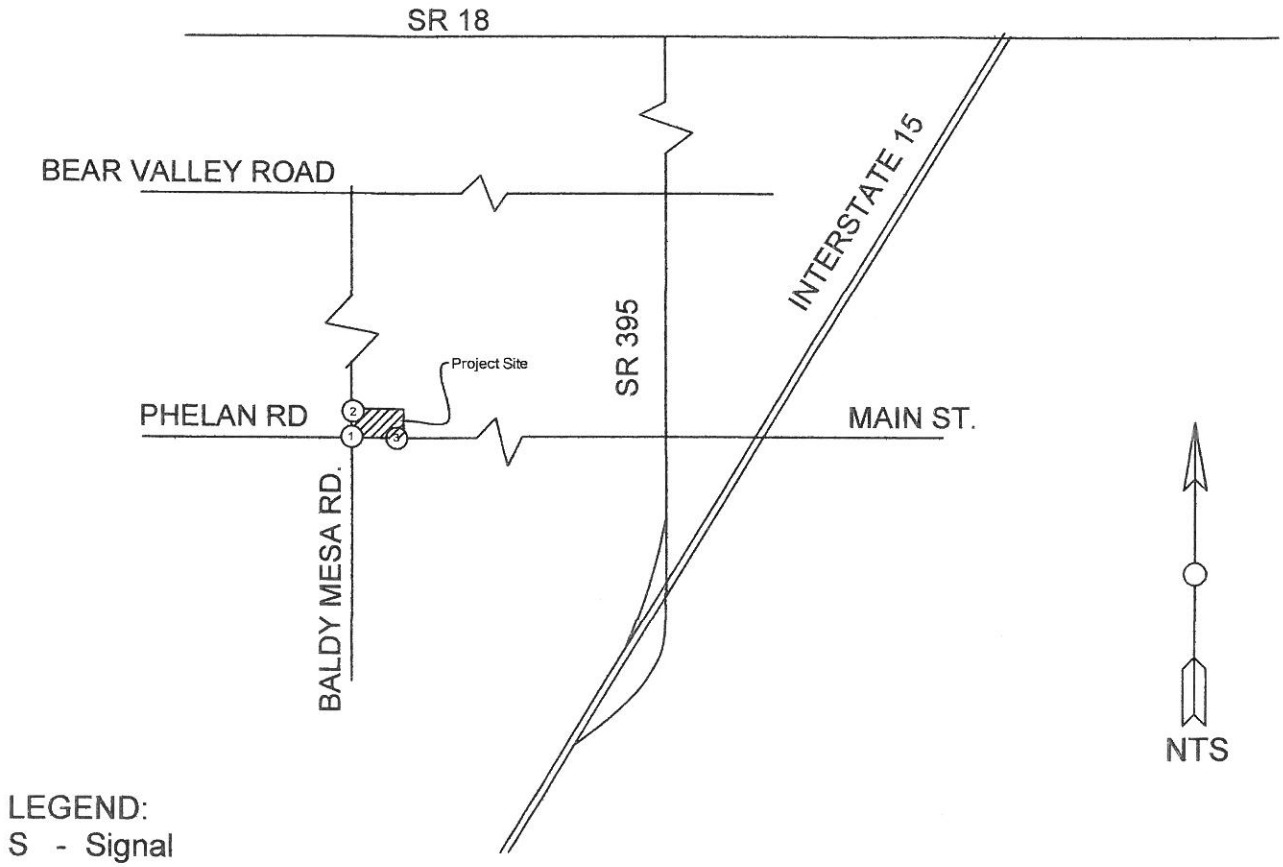


LEGEND:
xx(xx) - AM(PM)

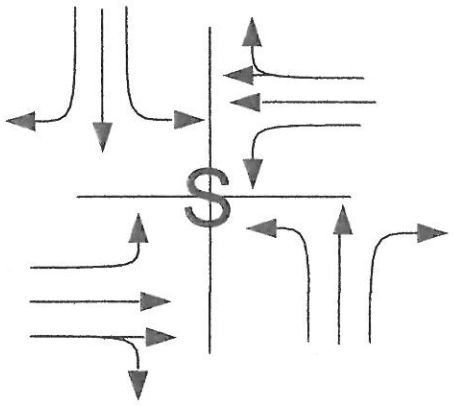


PHELAN RD @ BALDY MESA RD

EXHIBIT 3: 2010 TURNING MOVEMENT VOLUMES(Data from Hall & Foreman traffic study for 9770 Baldy Mesa Rd.-Appendix B)

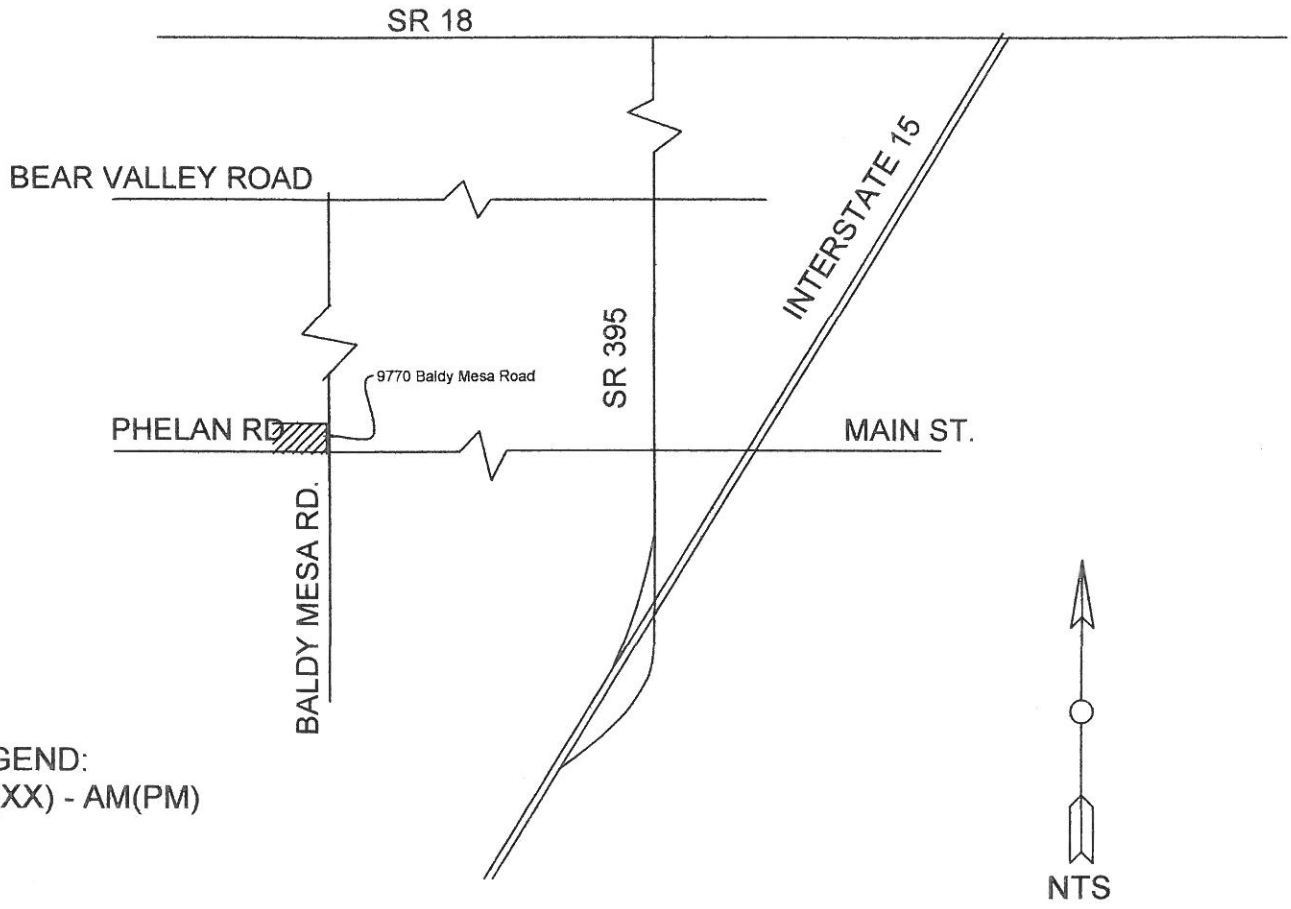


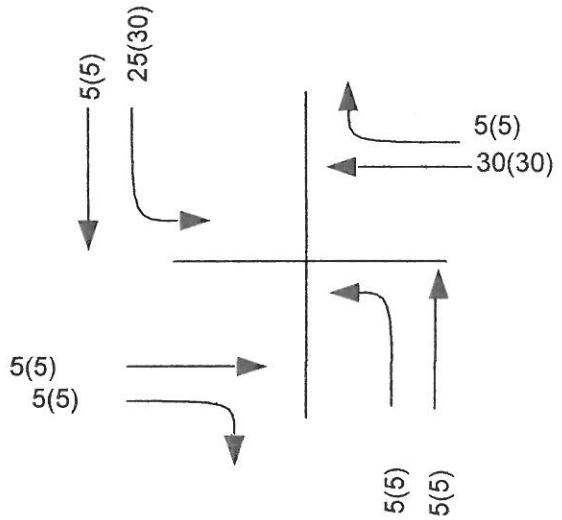
LEGEND:
S - Signal



PHELAN RD @ BALDY MESA RD

EXHIBIT 4: EXISTING GEOMETRICS AND CONTROLS





PHELAN ROAD @ BALDY MESA ROAD

EXHIBIT 5: OTHER PROJECTS TRIPS (9770 BALDY MESA RD)

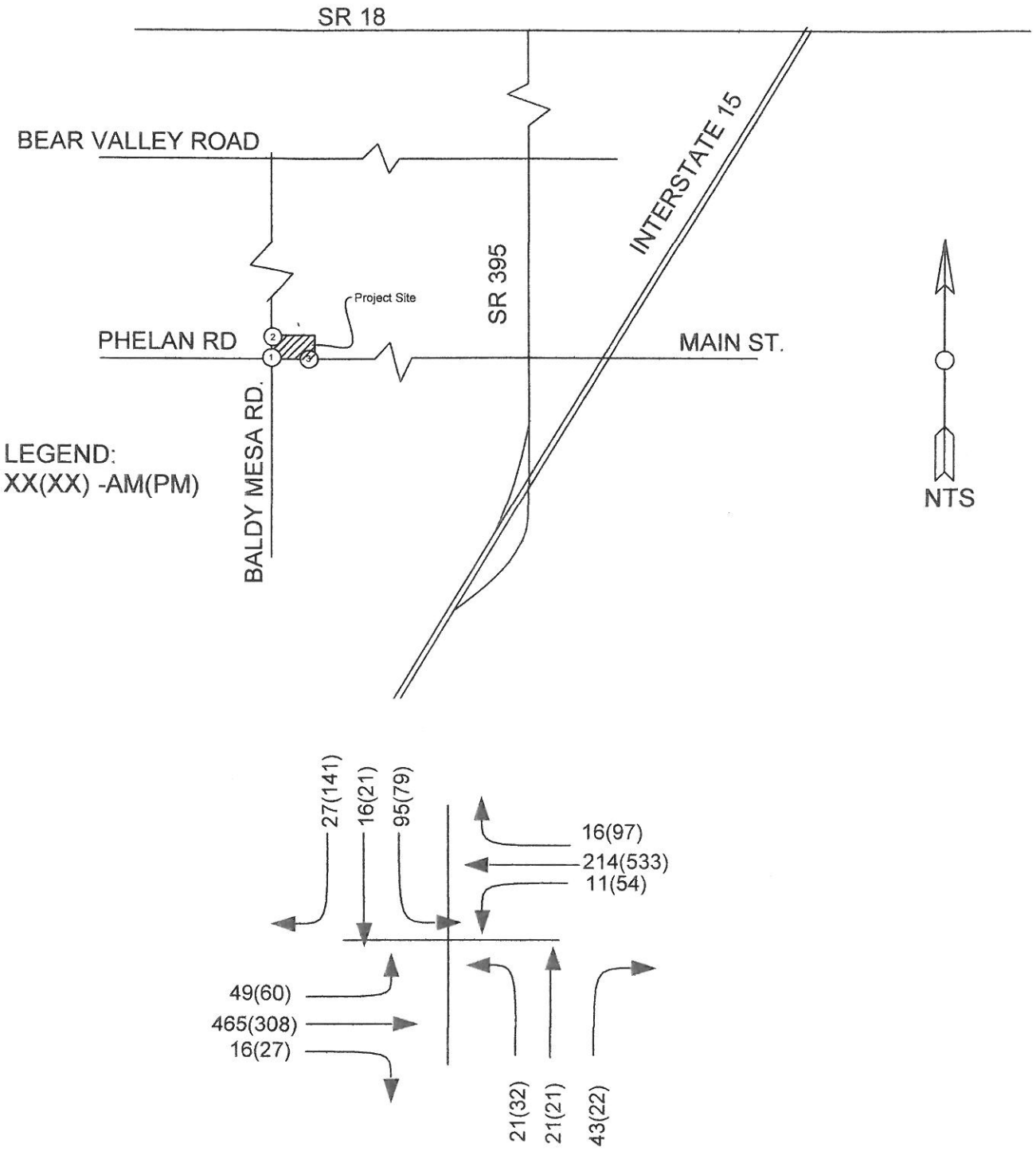
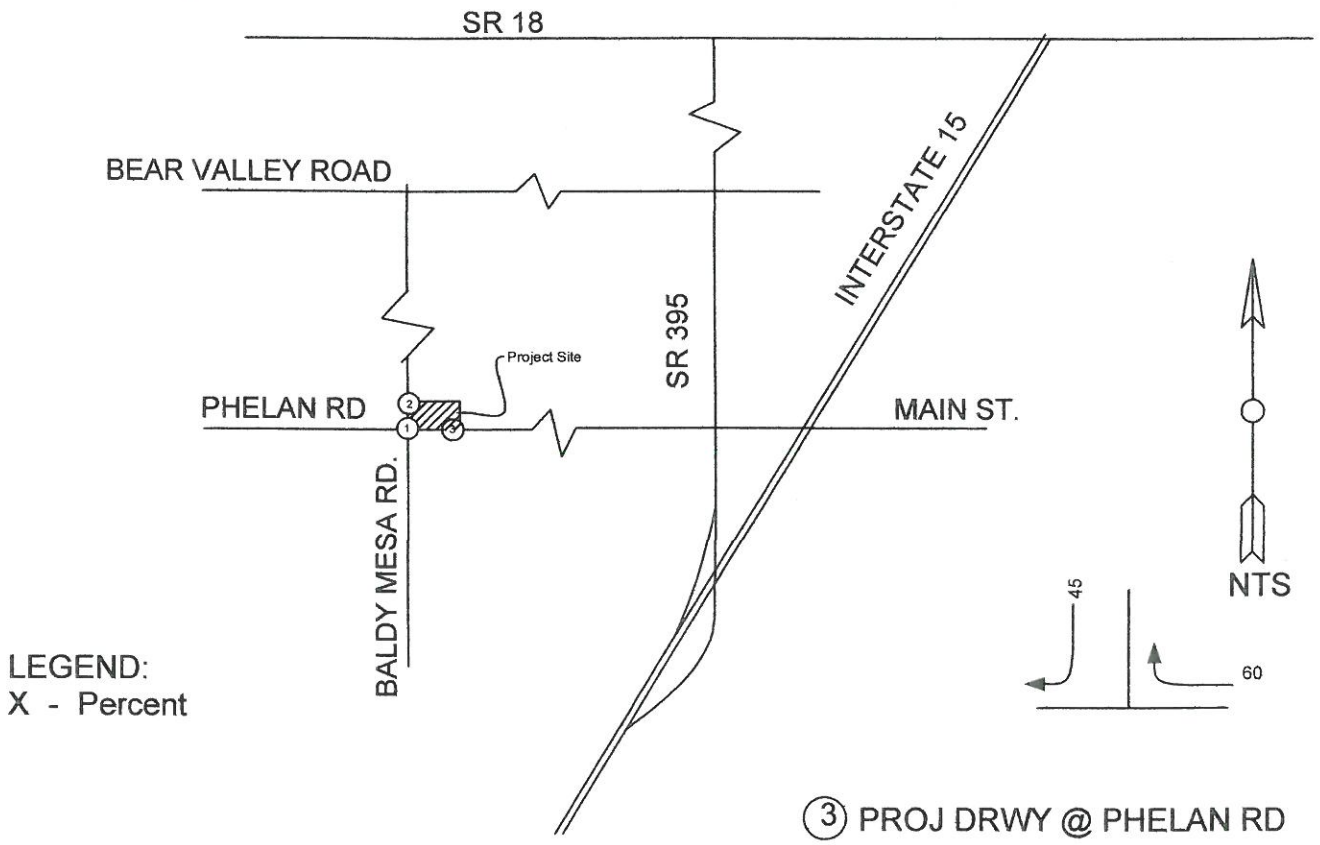
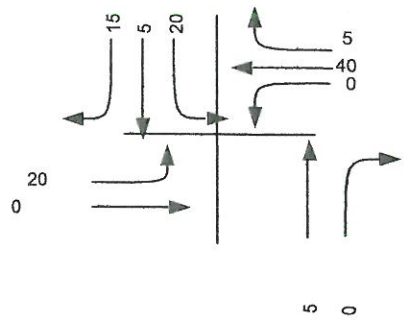


EXHIBIT 6: 2014 PROJECTED PROJECT OPENING YEAR TRAFFIC VOLS.

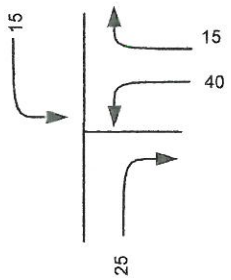
((Exhibit 3 vols X 1.08) + Exhibit 5 vols)



③ PROJ DRWY @ PHELAN RD

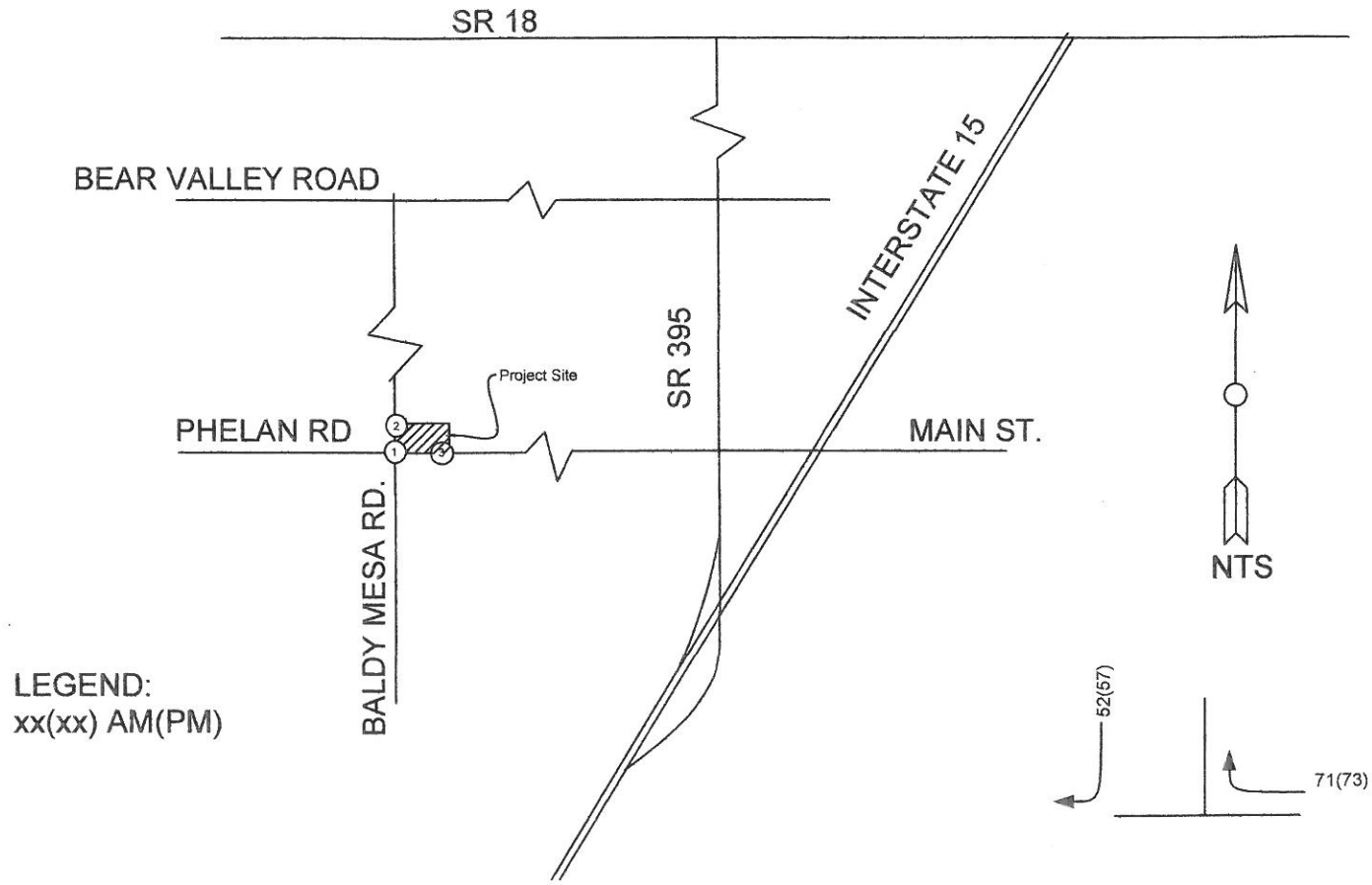


① PHELAN RD @ BALDY MESA RD

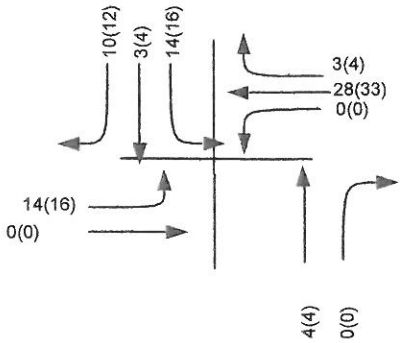


② PROJ DRWY @ BALDY MESA RD

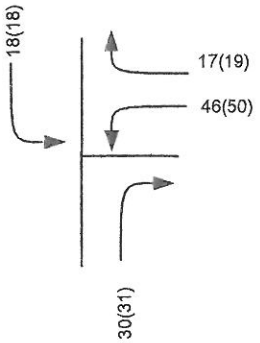
EXHIBIT 7: PROJECT TRIP DISTRIBITION



③PROJ DRWY @ PHELAN RD

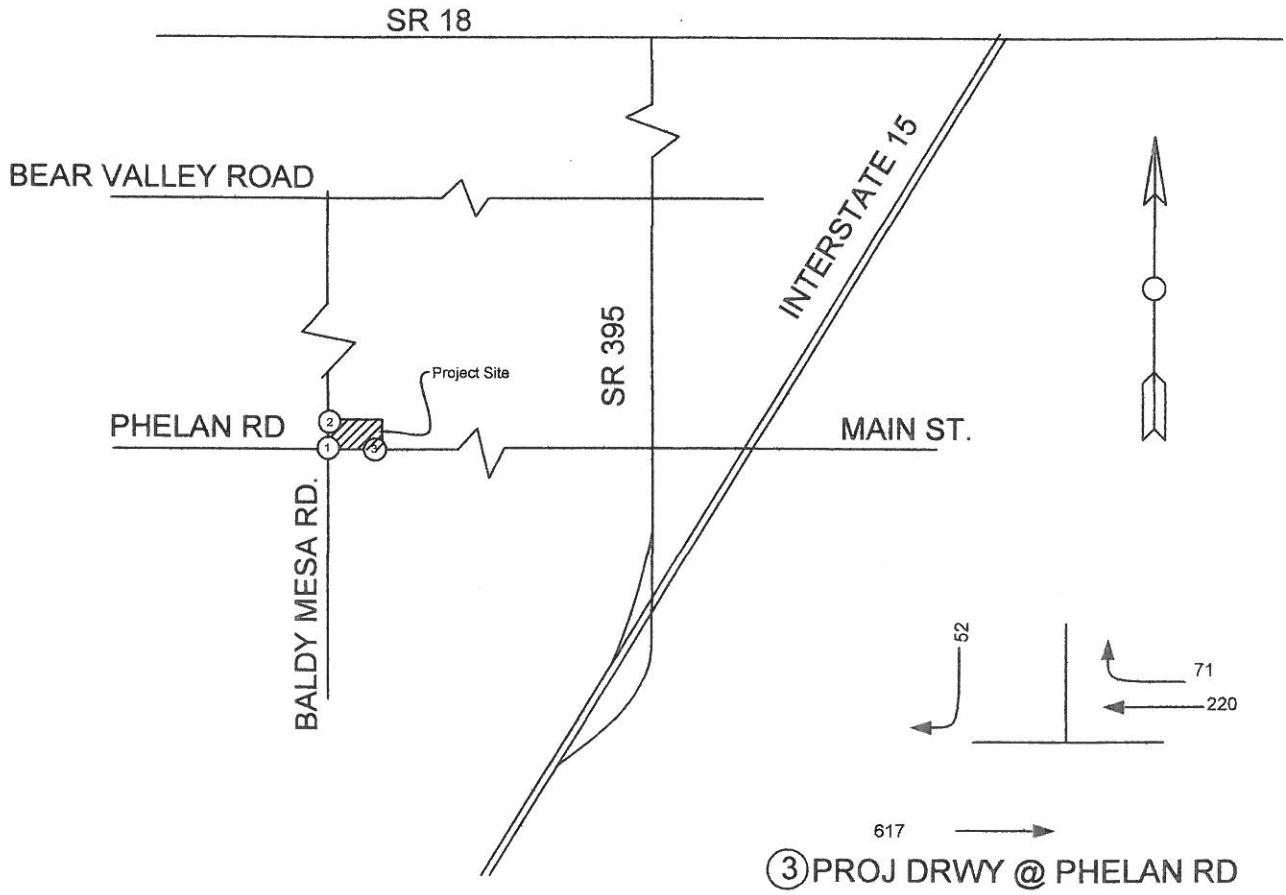


①PHELAN RD @ BALDY MESA RD

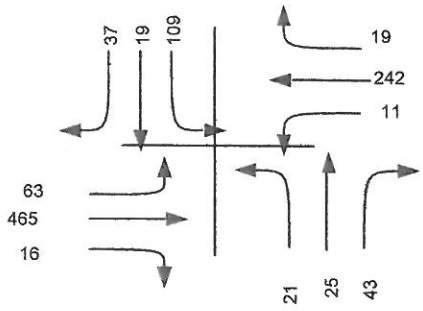


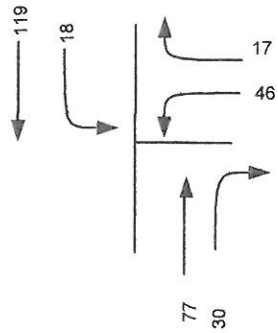
②PROJ DRWY @ BALDY MESA RD

EXHIBIT 8: PROJECT TRIP ASSIGNMENT



③PROJ DRWY @ PHELAN RD

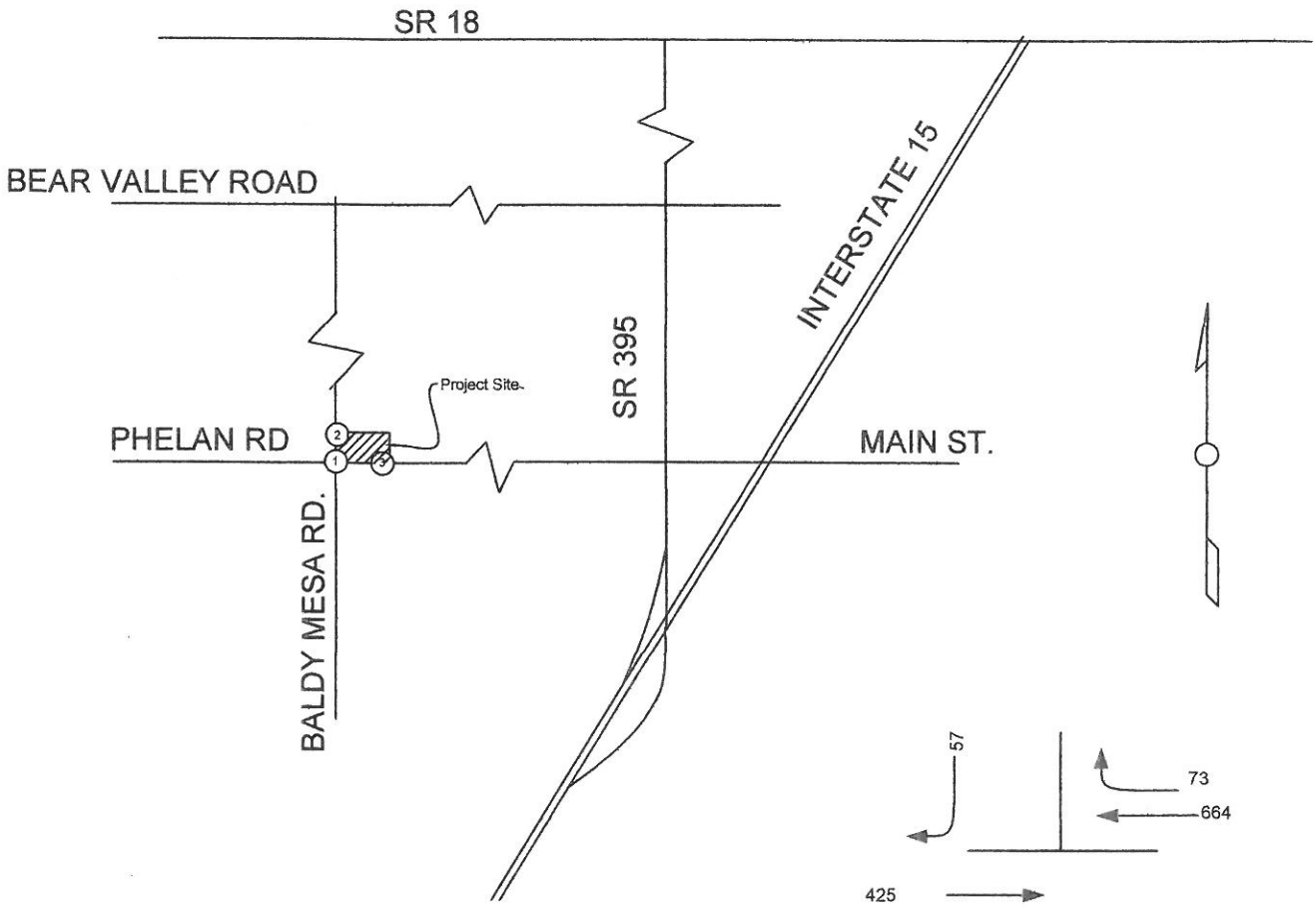




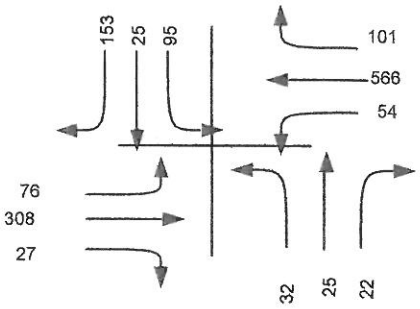
①PHELAN RD @ BALDY MESA RD

②PROJ DRWY @ BALDY MESA RD

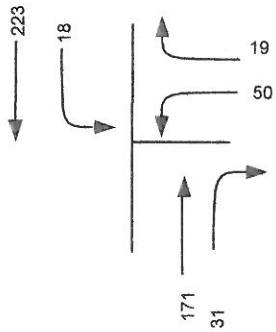
EXHIBIT 9A: AM PROJECT OPENING YEAR 2014 TRAFFIC VOLS W/ PROJ. TRAFFIC.



③PROJ DRWY @ PHELAN RD

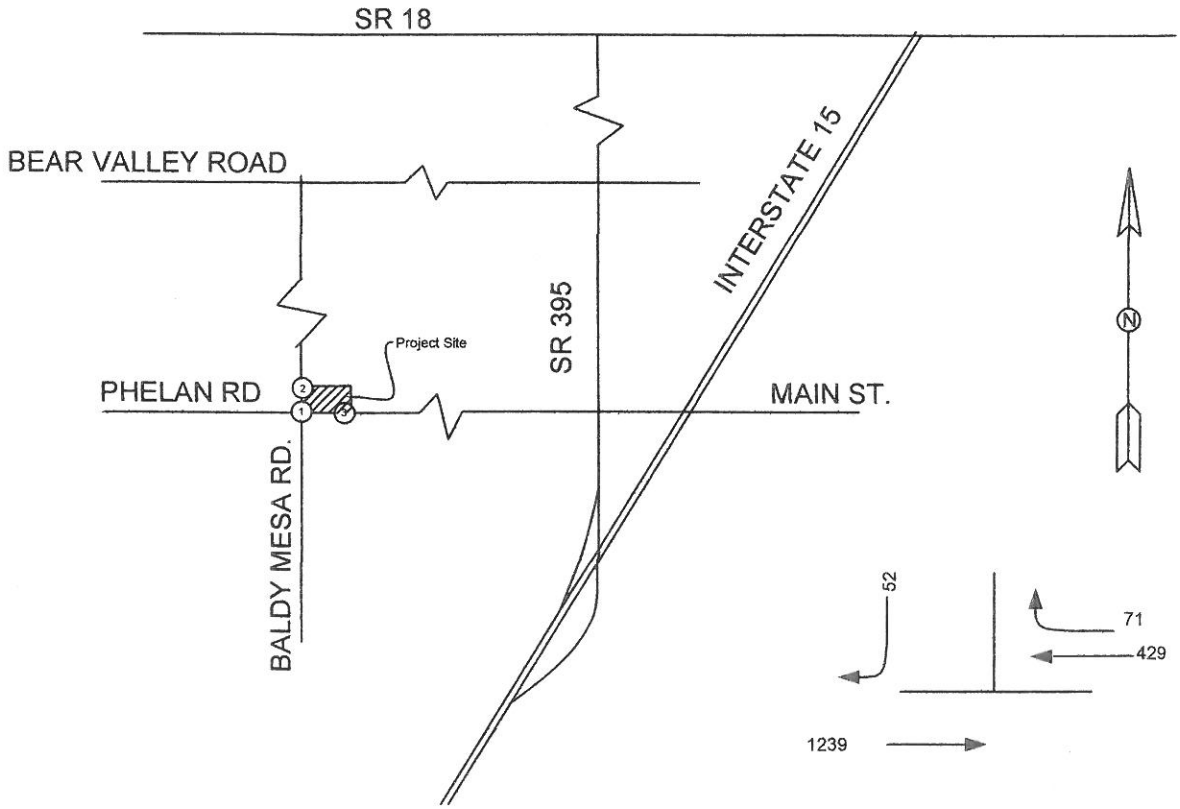


①PHELAN RD @ BALDY MESA RD

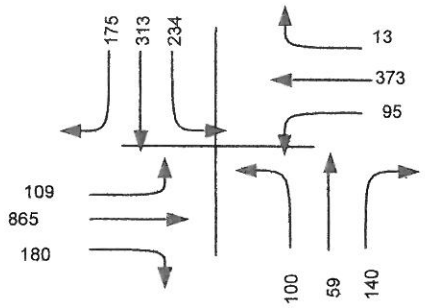


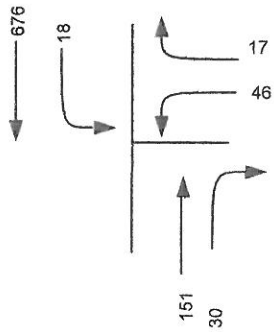
②PROJ DRWY @ BALDY MESA RD

EXHIBIT 9B: PM PROJECT OPENING YR 2014 TRAFFIC VOLUMES W/PRJ



③PROJ DRWY @ PHELAN RD



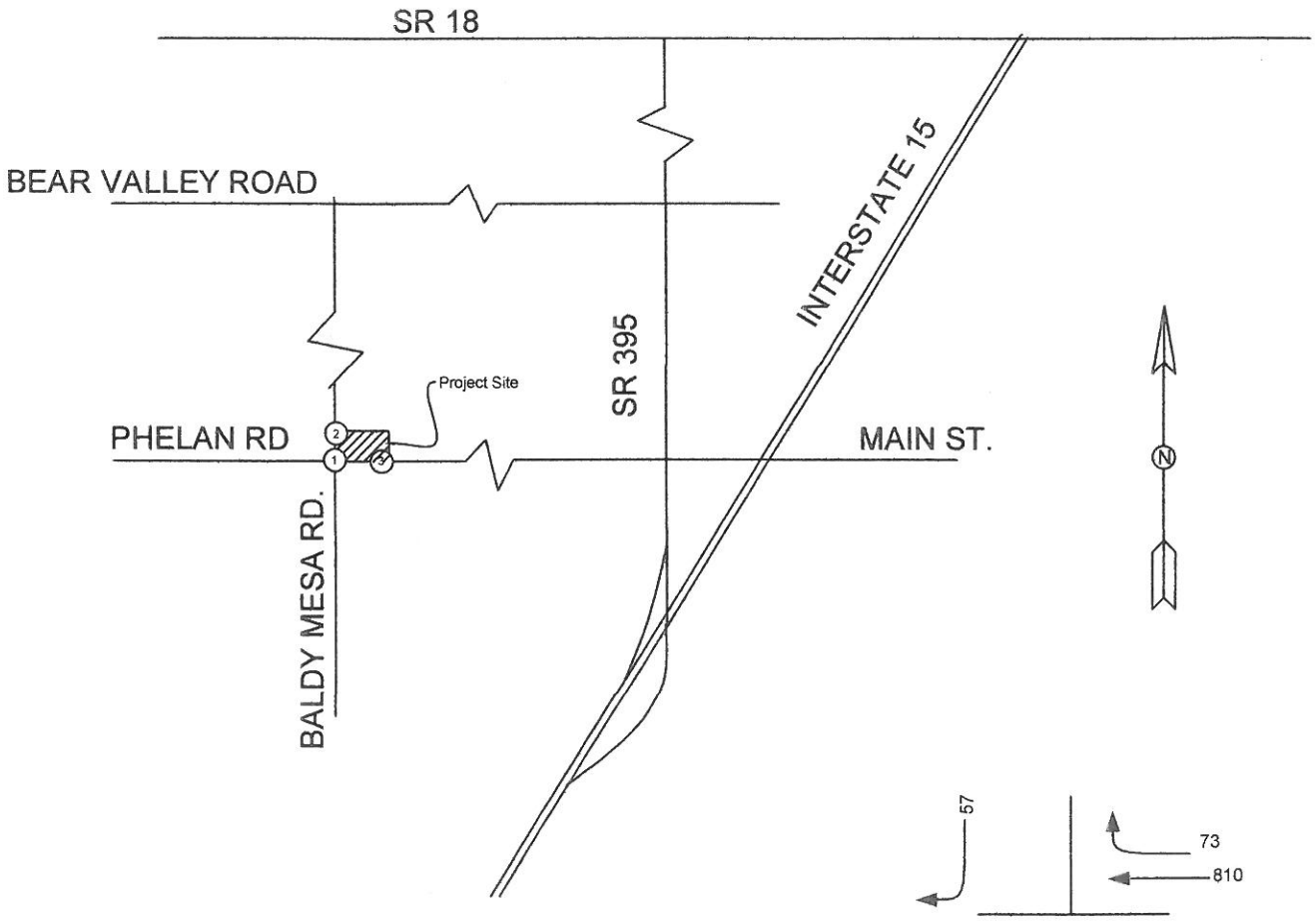


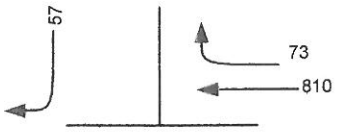
①PHELAN RD @ BALDY MESA RD

②PROJ DRWY @ BALDY MESA RD

EXHIBIT 10A: AM FORECAST YEAR TRAFFIC VOLUMES W/ PROJ TRAFFIC

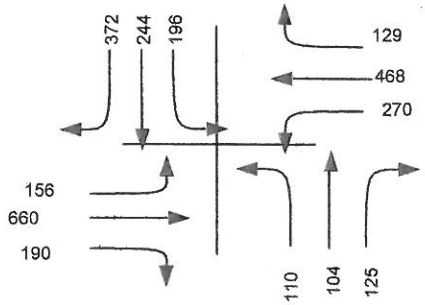
(2035 w/o project volumes are from Hall & Foreman study at 9770 Baldy Mesa)

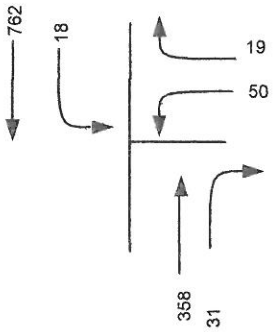




981

③PROJ DRWY @ PHELAN RD





①PHELAN RD @ BALDY MESA RD

②PROJ DRWY @ BALDY MESA RD

EXHIBIT 10B: PM FORECAST YEAR 2035 TRAFFIC VOLS W/PROJ. TRAF.

(2035 w/o project volumes are from Hall & Foreman study at 9770 Baldy Mesa)

APPENDIX A

OPERATIONAL ANALYSIS WORKSHEETS

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2010 Traffic with Existing Lane Geometrics

BALDY MESA RD & PHELAN ROAD **ALBERT WILSON & ASSO.** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	*T*	R	L	T	R	L	T	*R*	*L*	T	R
Movement 1: **12** secs	X			X								
Movement 2: **41** secs		X	X		X	X						
Movement 3: **17** secs							X			X		
Movement 4: **20** secs								X	X		X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	1	1	1	1	1
Unadjusted Volume	45	425	10	10	170	10	15	15	40	65	10	25
Peak Hour Factor (PHF)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***	***							***	***		
Pk. Hr. Vol. (vph)	52	489	11	11	195	11	17	17	46	75	11	29
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	Shrd	1700	1800	1800	1700	1800	1800
X or V/C	0.28	0.32	-	0.06	0.13	-	0.06	0.05	0.13	0.26	0.03	0.08
Effective green (sec)	10	39	-	10	39	-	15	18	18	15	18	18
Split Time (sec)	12	41	-	12	41	-	17	20	20	17	20	20
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	40	17	-	36	16	-	32	29	30	35	29	30
Level of Service (LOS)	D	B	-	D+	B	-	C-	C	C-	C-	C	C
Average 'Q' (veh/ln)	1	4	-	1	1	-	1	1	1	2	1	1
Design 'Q'- ft/ln	40	120	-	40	40	-	40	40	40	60	40	40
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 21
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 22
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.26

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2014 Project Opening Day Conditions w/o Proj. Traffic

BALDY MESA RD & PHELAN ROAD **ALBERT WILSON & ASSO.** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	*T*	R	L	T	R	L	T	*R*	*L*	T	R
Movement 1: 12 secs	X			X								
Movement 2: 37 secs		X	X		X	X						
Movement 3: 21 secs							X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	1	1	1	1	1
Unadjusted Volume	45	425	10	10	170	10	15	15	40	65	10	25
Peak Hour Factor (PHF)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (%)	8	8	8	8	8	8	8	8	8	8	8	8
Project Trip Volume (vph)		5	5		30	5	5	5		25	5	
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Cumulative project trips from the project at NW corner, refer to appendix

Output

	***	***							***	***		
Pk. Hr. Vol. (vph)	56	533	17	12	241	17	24	24	50	106	17	31
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	Shrd	1700	1800	1800	1700	1800	1800
X or V/C	0.30	0.39	-	0.06	0.18	-	0.07	0.07	0.14	0.30	0.05	0.09
Effective green (sec)	10	35	-	10	35	-	19	18	18	19	18	18
Split Time (sec)	12	37	-	12	37	-	21	20	20	21	20	20
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	41	21	-	36	18	-	29	30	30	32	29	30
Level of Service (LOS)	D	C+	-	D+	B	-	C	C	C-	C-	C	C
Average 'Q' (veh/ln)	1	4	-	1	2	-	1	1	1	2	1	1
Design 'Q'- ft/ln	40	120	-	40	60	-	40	40	40	60	40	40
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 24
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 24
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.30

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2014 Project Opening Day Conditions w Proj. Traffic

BALDY MESA RD & PHELAN ROAD **ALBERT WILSON & ASSO.** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	*T*	R	L	T	R	L	T	*R*	*L*	T	R
Movement 1: 13 secs	X			X								
Movement 2: 32 secs		X	X		X	X						
Movement 3: 25 secs							X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	1	1	1	1	1
Unadjusted Volume	49	465	16	11	214	16	21	21	43	95	16	27
Peak Hour Factor (PHF)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (%)	8	8	8	8	8	8	8	8	8	8	8	8
Project Trip Volume (vph)	14	5	5		58	8	5	9		39	8	10
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Half of Forecast and the Project Traffic Per my telephone conversation w/ Chad on 7/25/2013

Output

	***	***							***	***		
Pk. Hr. Vol. (vph)	75	582	25	14	324	28	31	35	53	157	28	44
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	Shrd	1700	1800	1800	1700	1800	1800
X or V/C	0.36	0.51	-	0.07	0.29	-	0.07	0.10	0.15	0.36	0.08	0.12
Effective green (sec)	11	30	-	11	30	-	23	18	18	23	18	18
Split Time (sec)	13	32	-	13	32	-	25	20	20	25	20	20
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	41	26	-	36	23	-	26	30	31	30	30	30
Level of Service (LOS)	D	C	-	D+	C+	-	C	C	C-	C	C	C-
Average 'Q' (veh/ln)	2	5	-	1	3	-	1	1	1	3	1	1
Design 'Q'- ft/ln	60	160	-	40	100	-	40	40	40	100	40	40
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 27
Level of Service - LOS = C

Critical Movements

Weighted Avg Delay (sec) = 28
Level of Service - LOS = C
Intersection Capacity Utilization - ICU = 0.37

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2035 Background Traffic w/o Project Traffic

BALDY MESA RD & PHELAN ROAD **ALBERT WILSON & ASSO.** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	*T*	R	L	T	R	L	T	R	*L*	*T*	R
Movement 1: 10 secs	X			X								
Movement 2: 38 secs		X	X		X	X						
Movement 3: 20 secs							X			X		
Movement 4: 22 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	1	1	1	1	1
Unadjusted Volume	95	865	180	95	345	10	100	55	140	220	310	165
Peak Hour Factor (PHF)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Future)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)		1800
Sat Flow (2 Left lanes, vphg)	3400	3500
Sat Flow (1 Thru lane, vphg)		1900
Sat Flow (1 Right lane, vphg)	1900	1800
Vehicle Length (feet)		20

See Hall & Forman

Output

	***	***								***	***	
Pk. Hr. Vol. (vph)	100	911	189	100	363	11	105	58	147	232	326	174
Saturation Flow (vph)	1800	3800	Shrd	1800	3800	Shrd	1800	1900	1900	1800	1900	1900
X or V/C	0.63	0.72	-	0.63	0.25	-	0.29	0.14	0.35	0.64	0.77	0.41
Effective green (sec)	8	36	-	8	36	-	18	20	20	18	20	20
Split Time (sec)	10	38	-	10	38	-	20	22	22	20	22	22
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	57	26	-	57	18	-	33	29	32	42	46	33
Level of Service (LOS)	E+	C	-	E+	B	-	C-	C	C-	D	D	C-
Average 'Q' (veh/ln)	2	8	-	2	3	-	2	1	3	5	7	3
Design 'Q'- ft/ln	60	240	-	60	100	-	60	40	100	160	220	100
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 32
Level of Service - LOS = C-

Critical Movements

Weighted Avg Delay (sec) = 33
Level of Service - LOS = C-
Intersection Capacity Utilization - ICU = 0.71

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2035 Background Traffic w Project Traffic

BALDY MESA RD & PHELAN ROAD **ALBERT WILSON & ASSO.** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	*T*	R	L	T	R	L	T	R	*L*	*T*	R
Movement 1: **13** secs	X			X								
Movement 2: **32** secs		X	X		X	X						
Movement 3: **13** secs							X			X		
Movement 4: **32** secs								X	X		X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	**1**	**2**	S	1	2	S	1	1	1	**1**	**1**	1
Unadjusted Volume	**95**	**865**	180	95	345	10	100	55	140	**220**	**310**	165
Peak Hour Factor (PHF)	**0.95**	**0.95**	0.95	0.95	0.95	0.95	0.95	0.95	0.95	**0.95**	**0.95**	0.95
Growth Factor (%)												
Project Trip Volume (vph)	**14**				**28**	**3**		**4**		**14**	**3**	**10**
Sat. Flow Override (vph)			Shrd		3600	Shrd		1800			**1800**	
Min. Time or Ped. Time	**10**	**20**	20	10	20	20	10	20	20	**10**	**20**	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	**1.00**	**1.00**	-	1.00	1.00	-	1.00	1.00	1.00	**1.00**	**1.00**	1.00

Parameter Values (using default set 'SANBAG (Future)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)		1800
Sat Flow (2 Left lanes, vphg)	3400	3500
Sat Flow (1 Thru lane, vphg)		1900
Sat Flow (1 Right lane, vphg)	1900	1800
Vehicle Length (feet)		20

Output

	***	***								***	***	
Pk. Hr. Vol. (vph)	**114**	**911**	189	100	391	14	105	62	147	**246**	**329**	184
Saturation Flow (vph)	**1800**	**3800**	Shrd	1800	3600	Shrd	1800	1800	1900	**1800**	**1800**	1900
X or V/C	**0.52**	**0.87**	-	0.45	0.34	-	0.48	0.10	0.23	**1.12**	**0.55**	0.29
Effective green (sec)	**11**	**30**	-	11	30	-	11	30	30	**11**	**30**	30
Split Time (sec)	**13**	**32**	-	13	32	-	13	32	32	**13**	**32**	32
Min. Time or Ped. Time (sec)	**10**	**20**	-	10	20	-	10	20	20	**10**	**20**	20
Delay - 15 min pk (sec/veh)	**45**	**36**	-	43	23	-	44	21	23	**136**	**28**	23
Level of Service (LOS)	**D**	**D+**	-	D	C+	-	D	C+	C+	**F**	**C**	C+
Average 'Q' (veh/ln)	**3**	**9**	-	2	3	-	2	1	2	**7**	**5**	3
Design 'Q'- ft/ln	**100**	**280**	-	60	100	-	60	40	60	**220**	**160**	100
Do Vehicles Clear?	**YES**	**YES**	-	YES	YES	-	YES	YES	YES	**NO**	**YES**	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 41
Level of Service - LOS = D

Critical Movements

Weighted Avg Delay (sec) = 49
Level of Service - LOS = D
Intersection Capacity Utilization - ICU = 0.74

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2010 Existing Traffic with Existing Lane Geometrics

PHELAN RD @ BALDY MESA RD **ALBERT WILSON & ASSOCS.** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	*T*	R	L	T	R	L	T	R	*L*	T	*R*
Movement 1: 17 secs	X			X								
Movement 2: 40 secs		X	X		X	X						
Movement 3: 13 secs							X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	1	1	1	2	S	1	1	1	1	1	1
Unadjusted Volume	55	280	20	50	465	85	25	15	20	45	15	130
Peak Hour Factor (PHF)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)						Shrd						
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***	***								***		***
Pk. Hr. Vol. (vph)	63	322	23	57	534	98	29	17	23	52	17	149
Saturation Flow (vph)	1700	1800	1800	1700	3600	Shrd	1700	1800	1800	1700	1800	1800
X or V/C	0.22	0.42	0.03	0.20	0.42	-	0.14	0.05	0.06	0.25	0.05	0.41
Effective green (sec)	15	38	38	15	38	-	11	18	18	11	18	18
Split Time (sec)	17	40	40	17	40	-	13	20	20	13	20	20
Min. Time or Ped. Time (sec)	10	20	20	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	34	20	15	34	19	-	37	29	30	39	29	35
Level of Service (LOS)	C-	C+	B	C-	B	-	D+	C	C	D+	C	C-
Average 'Q' (veh/ln)	1	5	1	1	5	-	1	1	1	1	1	3
Design 'Q'- ft/ln	40	160	40	40	160	-	40	40	40	40	40	100
Do Vehicles Clear?	YES	YES	YES	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 24
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 27
Level of Service - LOS = C
Intersection Capacity Utilization - ICU = 0.36

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2014 Project Opening Year Traffic w/o Proj Traffic

PHELAN RD @ BALDY MESA RD | **ALBERT WILSON & ASSOCS.** | **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	L	T	R	*L*	T	*R*
Movement 1: 10 secs	X			X								
Movement 2: 40 secs		X	X		X	X						
Movement 3: 20 secs							X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	1	1	1	1	1
Unadjusted Volume	55	280	20	50	465	85	25	15	20	45	15	130
Peak Hour Factor (PHF)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (%)	8	8	8	8	8	8	8	8	8	8	8	8
Project Trip Volume (vph)		5	5		30	5	5	5		30	5	
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***				***					***		***
Pk. Hr. Vol. (vph)	68	353	30	62	607	111	36	24	25	86	24	161
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	Shrd	1700	1800	1800	1700	1800	1800
X or V/C	0.45	0.25	-	0.41	0.47	-	0.11	0.07	0.07	0.25	0.07	0.45
Effective green (sec)	8	38	-	8	38	-	18	18	18	18	18	18
Split Time (sec)	10	40	-	10	40	-	20	20	20	20	20	20
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	48	17	-	47	20	-	30	30	30	32	30	36
Level of Service (LOS)	D	B	-	D	B	-	C-	C	C	C-	C	D+
Average 'Q' (veh/ln)	2	3	-	1	5	-	1	1	1	2	1	3
Design 'Q'- ft/ln	60	100	-	40	160	-	40	40	40	60	40	100
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 24
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 25
Level of Service - LOS = C
Intersection Capacity Utilization - ICU = 0.42

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2014 Project Opening Year Traffic w Proj Traffic

PHELAN RD @ BALDY MESA RD **ALBERT WILSON & ASSOCS.** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	L	T	R	*L*	T	*R*
Movement 1: 12 secs	X			X								
Movement 2: 43 secs		X	X		X	X						
Movement 3: 14 secs							X			X		
Movement 4: 21 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	1	1	1	1	1
Unadjusted Volume	55	280	20	50	465	85	25	15	20	45	15	130
Peak Hour Factor (PHF)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (%)	8	8	8	8	8	8	8	8	8	8	8	8
Project Trip Volume (vph)	16	5	5		63	9	5	9		46	9	12
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***				***					***		***
Pk. Hr. Vol. (vph)	84	353	30	62	640	115	36	28	25	102	28	173
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	Shrd	1700	1800	1800	1700	1800	1800
X or V/C	0.44	0.23	-	0.33	0.46	-	0.16	0.07	0.07	0.45	0.07	0.46
Effective green (sec)	10	41	-	10	41	-	12	19	19	12	19	19
Split Time (sec)	12	43	-	12	43	-	14	21	21	14	21	21
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	45	15	-	41	18	-	36	29	29	42	29	35
Level of Service (LOS)	D	B	-	D	B	-	D+	C	C	D	C	C-
Average 'Q' (veh/ln)	2	3	-	1	5	-	1	1	1	2	1	3
Design 'Q'- ft/ln	60	100	-	40	160	-	40	40	40	60	40	100
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 24
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 25
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.46

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2035 Future Traffic with Existing Lane Geometrics w/o Proj

PHELAN RD @ BALDY MESA RD **ALBERT WILSON & ASSOCS.** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	*T*	R	*L*	T	R	L	T	R	*L*	T	*R*
Movement 1: 21 secs	X			X								
Movement 2: 30 secs		X	X		X	X						
Movement 3: 14 secs							X			X		
Movement 4: 25 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	1	1	1	1	1
Unadjusted Volume	140	660	190	270	435	125	110	100	125	180	240	360
Peak Hour Factor (PHF)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Future)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)		1800
Sat Flow (2 Left lanes, vphg)	3400	3500
Sat Flow (1 Thru lane, vphg)		1900
Sat Flow (1 Right lane, vphg)	1900	1800
Vehicle Length (feet)		20

Output

		***		***						***		***
Pk. Hr. Vol. (vph)	147	695	200	284	458	132	116	105	132	189	253	379
Saturation Flow (vph)	1800	3800	Shrd	1800	3800	Shrd	1800	1900	1900	1800	1900	1900
X or V/C	0.39	0.76	-	0.75	0.50	-	0.48	0.22	0.27	0.79	0.52	0.78
Effective green (sec)	19	28	-	19	28	-	12	23	23	12	23	23
Split Time (sec)	21	30	-	21	30	-	14	25	25	14	25	25
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	33	32	-	46	27	-	43	27	28	60	33	43
Level of Service (LOS)	C-	C-	-	D	C	-	D	C	C	E	C-	D
Average 'Q' (veh/ln)	3	8	-	6	5	-	3	2	2	4	5	7
Design 'Q'- ft/ln	100	240	-	180	160	-	100	60	60	120	160	220
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 36
Level of Service - LOS = D+

Critical Movements

Weighted Avg Delay (sec) = 40
Level of Service - LOS = D+
Intersection Capacity Utilization - ICU = 0.77

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2035 Future Traffic with Existing Lane Geometrics w proj traffic

PHELAN RD @ BALDY MESA RD **ALBERT WILSON & ASSOCS.** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	*T*	R	*L*	T	R	L	T	R	*L*	T	*R*
Movement 1: **20** secs	X			X								
Movement 2: **29** secs		X	X		X	X						
Movement 3: **15** secs							X			X		
Movement 4: **26** secs								X	X		X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	1	**2**	S	**1**	2	S	1	1	1	**1**	1	**1**
Unadjusted Volume	140	**660**	190	**270**	435	125	110	100	125	**180**	240	**360**
Peak Hour Factor (PHF)	0.95	**0.95**	0.95	**0.95**	0.95	0.95	0.95	0.95	0.95	**0.95**	0.95	**0.95**
Growth Factor (%)												
Project Trip Volume (vph)	16				33	4		4		**16**	4	**12**
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	10	**20**	20	**10**	20	20	10	20	20	**10**	20	**20**
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	**1.00**	-	**1.00**	1.00	-	1.00	1.00	1.00	**1.00**	1.00	**1.00**

Parameter Values (using default set 'SANBAG (Future)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)		1800
Sat Flow (2 Left lanes, vphg)	3400	3500
Sat Flow (1 Thru lane, vphg)		1900
Sat Flow (1 Right lane, vphg)	1900	1800
Vehicle Length (feet)		20

Output

		***		***						***		***
Pk. Hr. Vol. (vph)	163	**695**	200	**284**	491	136	116	109	132	**205**	257	**391**
Saturation Flow (vph)	1800	**3800**	Shrd	**1800**	3800	Shrd	1800	1900	1900	**1800**	1900	**1900**
X or V/C	0.45	**0.79**	-	**0.79**	0.55	-	0.45	0.22	0.26	**0.79**	0.51	**0.77**
Effective green (sec)	18	**27**	-	**18**	27	-	13	24	24	**13**	24	**24**
Split Time (sec)	20	**29**	-	**20**	29	-	15	26	26	**15**	26	**26**
Min. Time or Ped. Time (sec)	10	**20**	-	**10**	20	-	10	20	20	**10**	20	**20**
Delay - 15 min pk (sec/veh)	36	**34**	-	**50**	28	-	41	27	27	**58**	32	**41**
Level of Service (LOS)	D+	**C-**	-	**D-**	C	-	D	C	C	**E+**	C-	**D**
Average 'Q' (veh/ln)	3	**8**	-	**6**	5	-	2	2	2	**5**	5	**7**
Design 'Q'- ft/ln	100	**240**	-	**180**	160	-	60	60	60	**160**	160	**220**
Do Vehicles Clear?	YES	**YES**	-	**YES**	YES	-	YES	YES	YES	**YES**	YES	**YES**

Summary

Whole Intersection

Weighted Avg Delay (sec) = 36
Level of Service - LOS = D+

Critical Movements

Weighted Avg Delay (sec) = 41
Level of Service - LOS = D
Intersection Capacity Utilization - ICU = 0.78

Predetermined Cycle Length is 90 sec
Min./Ped. Times Satisfied
Analysis Based on User Selected Splits

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: CHIDI ONUMONU
Agency/Co.: ALBERT WILSON & ASSOCIATES
Date Performed: 9/28/2012
Analysis Time Period: AM PEAK
Intersection: PROJ DRWY @ BALDY MESA RD
Jurisdiction: COUNTY OF SAN BERNARDINO
Units: U. S. Customary
Analysis Year: 2014 OPENING YEAR
Project ID: DAVID EUM PROJ
East/West Street: DRWY
North/South Street: BALDY MESA RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		77	30	18	119	
Peak-Hour Factor, PHF		0.87	0.87	0.87	0.87	
Hourly Flow Rate, HFR		88	34	20	136	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	46	0	17			
Peak Hour Factor, PHF	0.87	0.87	0.87			
Hourly Flow Rate, HFR	52	0	19			
Percent Heavy Vehicles	0	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0	1	0			
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LTR				
v (vph)		20		71				
C(m) (vph)		1478		756				
v/c		0.01		0.09				
95% queue length		0.04		0.31				
Control Delay		7.5		10.3				
LOS		A		B				
Approach Delay				10.3				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.2

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TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst:	CHIDI ONUMONU
Agency/Co.:	ALBERT WILSON & ASSOCIATES
Date Performed:	9/28/2012
Analysis Time Period:	AM PEAK
Intersection:	PROJ DRWY @ BALDY MESA RD
Jurisdiction:	COUNTY OF SAN BERNARDINO
Units: U. S. Customary	
Analysis Year:	2014 OPENING YEAR
Project ID:	DAVID EUM PROJ
East/West Street:	DRWY
North/South Street:	BALDY MESA RD
Intersection Orientation:	NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1 L	2 T	3 R	4 L	5 T	6 R
Volume		77	30	18	119	
Peak-Hour Factor, PHF		0.87	0.87	0.87	0.87	
Peak-15 Minute Volume		22	9	5	34	
Hourly Flow Rate, HFR		88	34	20	136	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street Movements	7 L	8 T	9 R	10 L	11 T	12 R
Volume	46	0	17			
Peak Hour Factor, PHF	0.87	0.87	0.87			
Peak-15 Minute Volume	13	0	5			
Hourly Flow Rate, HFR	52	0	19			
Percent Heavy Vehicles	0	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
RT Channelized?						
Lanes	0	1	0			
Configuration		LTR				

Pedestrian Volumes and Adjustments

Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst:	CHIDI ONUMONU
Agency/Co.:	ALBERT WILSON & ASSOCIATES
Date Performed:	9/28/2012
Analysis Time Period:	PM PEAK
Intersection:	PROJ DRWY @ BALDY MESA RD
Jurisdiction:	COUNTY OF SAN BERNARDINO
Units: U. S. Customary	
Analysis Year:	2014 OPENING YEAR
Project ID:	DAVID EUM PROJ
East/West Street:	DRWY
North/South Street:	BALDY MESA RD
Intersection Orientation:	NS
Study period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		171	31	18	223	
Peak-Hour Factor, PHF		0.87	0.87	0.87	0.87	
Hourly Flow Rate, HFR		196	35	20	256	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	50	0	19			
Peak Hour Factor, PHF	0.87	0.87	0.87			
Hourly Flow Rate, HFR	57	0	21			
Percent Heavy Vehicles	0	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0	1	0			
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LTR				
v (vph)		20		78				
C(m) (vph)		1349		577				
v/c		0.01		0.14				
95% queue length		0.05		0.47				
Control Delay		7.7		12.2				
LOS		A		B				
Approach Delay				12.2				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.2

Chidi Onumonu
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TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: CHIDI ONUMONU
Agency/Co.: ALBERT WILSON & ASSOCIATES
Date Performed: 9/28/2012
Analysis Time Period: PM PEAK
Intersection: PROJ DRWY @ BALDY MESA RD
Jurisdiction: COUNTY OF SAN BERNARDINO
Units: U. S. Customary
Analysis Year: 2014 OPENING YEAR
Project ID: DAVID EUM PROJ
East/West Street: DRWY
North/South Street: BALDY MESA RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1 L	2 T	3 R	4 L	5 T	6 R
Volume		171	31	18	223	
Peak-Hour Factor, PHF		0.87	0.87	0.87	0.87	
Peak-15 Minute Volume		49	9	5	64	
Hourly Flow Rate, HFR		196	35	20	256	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1 0		0 1		
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street Movements	7 L	8 T	9 R	10 L	11 T	12 R
Volume	50	0	19			
Peak Hour Factor, PHF	0.87	0.87	0.87			
Peak-15 Minute Volume	14	0	5			
Hourly Flow Rate, HFR	57	0	21			
Percent Heavy Vehicles	0	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
RT Channelized?						
Lanes	0	1 0				
Configuration		LTR				

Pedestrian Volumes and Adjustments

Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: CHIDI ONUMONU
Agency/Co.: ALBERT WILSON & ASSOCIATES
Date Performed: 9/28/2012
Analysis Time Period: AM PEAK
Intersection: PROJ DRWY @ BALDY MESA RD
Jurisdiction: COUNTY OF SAN BERNARDINO
Units: U. S. Customary
Analysis Year: 2035 FORECAST YEAR
Project ID: DAVID EUM PROJ
East/West Street: DRWY
North/South Street: BALDY MESA RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		151	30	18	676	
Peak-Hour Factor, PHF		0.95	0.95	0.95	0.95	
Hourly Flow Rate, HFR		158	31	18	711	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	46	0	17			
Peak Hour Factor, PHF	0.95	0.95	0.95			
Hourly Flow Rate, HFR	48	0	17			
Percent Heavy Vehicles	0	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0	1	0			
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LTR				
v (vph)		18		65				
C(m) (vph)		1397		361				
v/c		0.01		0.18				
95% queue length		0.04		0.65				
Control Delay		7.6		17.1				
LOS		A		C				
Approach Delay				17.1				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.2

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TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: CHIDI ONUMONU
Agency/Co.: ALBERT WILSON & ASSOCIATES
Date Performed: 9/28/2012
Analysis Time Period: AM PEAK
Intersection: PROJ DRWY @ BALDY MESA RD
Jurisdiction: COUNTY OF SAN BERNARDINO
Units: U. S. Customary
Analysis Year: 2035 FORECAST YEAR
Project ID: DAVID EUM PROJ
East/West Street: DRWY
North/South Street: BALDY MESA RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1 L	2 T	3 R	4 L	5 T	6 R
Volume		151	30	18	676	
Peak-Hour Factor, PHF		0.95	0.95	0.95	0.95	
Peak-15 Minute Volume		40	8	5	178	
Hourly Flow Rate, HFR		158	31	18	711	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street Movements	7 L	8 T	9 R	10 L	11 T	12 R
Volume	46	0	17			
Peak Hour Factor, PHF	0.95	0.95	0.95			
Peak-15 Minute Volume	12	0	4			
Hourly Flow Rate, HFR	48	0	17			
Percent Heavy Vehicles	0	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
RT Channelized?						
Lanes	0	1	0			
Configuration		LTR				

Pedestrian Volumes and Adjustments

Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: CHIDI ONUMONU
Agency/Co.: ALBERT WILSON & ASSOCIATES
Date Performed: 9/28/2012
Analysis Time Period: PM PEAK
Intersection: PROJ DRWY @ BALDY MESA RD
Jurisdiction: COUNTY OF SAN BERNARDINO
Units: U. S. Customary
Analysis Year: 2035 FORECAST
Project ID: DAVID EUM PROJ
East/West Street: DRWY
North/South Street: BALDY MESA RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		358	31	18	762	
Peak-Hour Factor, PHF		0.95	0.95	0.95	0.95	
Hourly Flow Rate, HFR		376	32	18	802	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	50	0	19			
Peak Hour Factor, PHF	0.95	0.95	0.95			
Hourly Flow Rate, HFR	52	0	20			
Percent Heavy Vehicles	0	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0	1	0			
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LTR				
v (vph)		18		72				
C(m) (vph)		1162		242				
v/c		0.02		0.30				
95% queue length		0.05		1.20				
Control Delay		8.1		26.1				
LOS		A		D				
Approach Delay				26.1				
Approach LOS				D				

HCS+: Unsignalized Intersections Release 5.2

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TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: CHIDI ONUMONU
Agency/Co.: ALBERT WILSON & ASSOCIATES
Date Performed: 9/28/2012
Analysis Time Period: PM PEAK
Intersection: PROJ DRWY @ BALDY MESA RD
Jurisdiction: COUNTY OF SAN BERNARDINO
Units: U. S. Customary
Analysis Year: 2035 FORECAST
Project ID: DAVID EUM PROJ
East/West Street: DRWY
North/South Street: BALDY MESA RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1 L	2 T	3 R	4 L	5 T	6 R
Volume		358	31	18	762	
Peak-Hour Factor, PHF		0.95	0.95	0.95	0.95	
Peak-15 Minute Volume		94	8	5	201	
Hourly Flow Rate, HFR		376	32	18	802	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage RT Channelized?	Undivided			/		
Lanes		1 0		0 1		
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street Movements	7 L	8 T	9 R	10 L	11 T	12 R
Volume	50	0	19			
Peak Hour Factor, PHF	0.95	0.95	0.95			
Peak-15 Minute Volume	13	0	5			
Hourly Flow Rate, HFR	52	0	20			
Percent Heavy Vehicles	0	0	0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
RT Channelized?						
Lanes	0	1 0				
Configuration		LTR				

Pedestrian Volumes and Adjustments

Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0

APPENDIX B

2010 & 2035 TRAFFIC VOLUME DATA

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: BALDY MESA
EAST-WEST STREET: PHELAN RD
JURISDICTION: BALDY MESA

DATE: 07-13-10

PEAK HOUR: 07:00AM

NORTH LEG

TOTAL: 96

Rt	Thru	Lt	
23	9	64	Total
7	2	11	1st
13	2	19	2nd
1	3	18	3rd
2	2	16	4th

Rt 25 ↓ Thru 10 ↓ Lt 65 ↳

EAST LEG TOTAL: 191

↱ 10 Rt	3	3	2	2	10
← 170 Thru	36	34	54	47	171
↳ 10 Lt	2	3	3	2	10
	1st	2nd	3rd	4th	Total

Total	1st	2nd	3rd	4th	
46	13	17	9	7	Lt 45 ↱
423	72	106	126	119	Thru 425 →
8	4	2	1	1	Rt 10 ↴

WEST LEG TOTAL: 477

SOUTH LEG

	↰ 15 Lt	↑ 15 Thru	↱ 40 Rt
1st	4	2	8
2nd	1	1	11
3rd	6	6	12
4th	6	7	10
Total	17	16	41

TOTAL: 74

PEAK HOUR FACTORS

NORTH LEG = 0.71
SOUTH LEG = 0.77
EAST LEG = 0.81
WEST LEG = 0.88

ALL LEGS = 0.87

HOUR TOTAL: 838

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: BALDY MESA
EAST-WEST STREET: PHELAN RD
JURISDICTION: BALDY MESA

DATE: 07-13-10

PEAK HOUR: 05:00PM

NORTH LEG

TOTAL: 188

	Rt	Thru	Lt
Total	128	16	44
1st	29	1	10
2nd	26	4	7
3rd	25	2	9
4th	48	9	18

130 15 45

EAST LEG TOTAL: 599

	1st	2nd	3rd	4th	Total
Rt	20	12	21	33	86
Thru	97	98	131	139	465
Lt	7	10	16	15	48

85 Rt
465 Thru
50 Lt

	Total	1st	2nd	3rd	4th
Lt 55	55	14	16	13	12
Thru 280	278	53	68	76	81
Rt 20	22	4	7	9	2

WEST LEG TOTAL: 355

	Lt	Thru	Rt
1st	3	2	1
2nd	5	4	5
3rd	7	5	9
4th	9	3	3
Total	24	14	18

25 15 20

SOUTH LEG

TOTAL: 56

PEAK HOUR FACTORS

NORTH LEG = 0.63
SOUTH LEG = 0.67
EAST LEG = 0.80
WEST LEG = 0.91

ALL LEGS = 0.81

HOUR TOTAL: 1,198

Prepared by NEWPORT TRAFFIC STUDIES

Hall & Foreman, Inc.

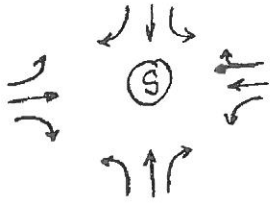
Engineering • Surveying • Planning • Landscape Architecture

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENT SUMMARY	JC	3-Nov-10	VV.110017	2 OF 2

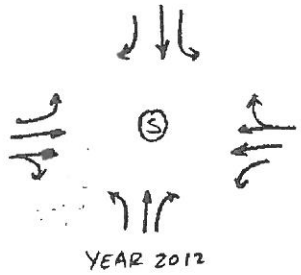
E/W STREET : PHELAN ROAD
N/S STREET : BALDY MESA ROAD
CONDITION : PM PEAK HOUR

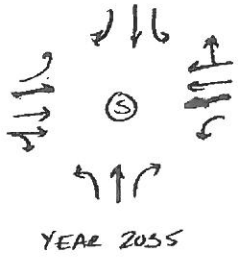
PROJECTED YEAR: 2012
PROJECTED GROWTH PER YEAR: 2.00% (Compounded Annually)

CONDITION DIAGRAMS



EXISTING GEOMETRICS





PROPOSED GEOMETRICS

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	BG YEAR 2012	OTHER AREA PROJECTS	EXISTING + BG YEAR 2012	PROJECT	EXISTING + BG + PROJECT	W/O PROJECT YEAR 2035	W/ PROJECT YEAR 2035
SCENERIO #	2			4		6	8	10

PHELAN ROAD

EB LEFT	55	5	55	115	0	115	140	140
EB THRU	280	10	25	315	5	320	660	665
EB RIGHT	20	5	0	25	5	30	190	195
WB LEFT	50	5	35	90	0	90	270	270
WB THRU	465	20	30	515	30	545	435	465
WB RIGHT	85	5	5	95	5	100	125	130

BALDY MESA ROAD

NB LEFT	25	5	0	30	5	35	110	115
NB THRU	15	5	20	40	5	45	100	105
NB RIGHT	20	5	0	25	0	25	125	125
SB LEFT	45	5	0	50	30	80	180	210
SB THRU	15	5	20	40	5	45	240	245
SB RIGHT	130	5	0	135	0	135	360	360
TOTALS	1205	80	190	1475	90	1565	2935	3025

FAIR SHARE: 90/(3025 − 1205) = 4.9 %

Irvine Office: 714.665.4500 Tel/ 714.665.4501 Fax
Santa Clarita Office: 661.284.7400 Tel/ 661.284.7401 Fax
Victorville Office: 760.241.0595 Tel/ 760.241.1937 Fax
Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

Hall & Foreman, Inc.

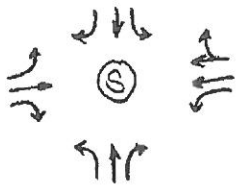
Engineering • Surveying • Planning • Landscape Architecture

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENT SUMMARY	JC	3-Nov-10	VV.110017	1 OF 2

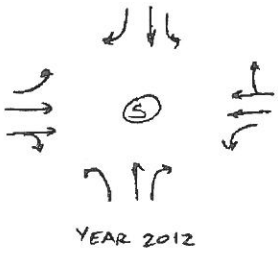
E/W STREET : PHELAN ROAD
N/S STREET : BALDY MESA ROAD
CONDITION : AM PEAK HOUR

PROJECTED YEAR: 2012
PROJECTED GROWTH PER YEAR: 2.00% (Compounded Annually)

CONDITION DIAGRAMS



EXISTING GEOMETRICS



YEAR 2012

YEAR 2035

PROPOSED GEOMETRICS

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	BG YEAR 2012	OTHER AREA PROJECTS	EXISTING + BG YEAR 2012	PROJECT	EXISTING + BG + PROJECT	W/O PROJECT YEAR 2035	W/ PROJECT YEAR 2035
SCENERIO #	1			3		5	7	9

PHELAN ROAD

EB LEFT	45	5	25	75	0	75	95	95
EB THRU	425	15	0	440	5	445	865	870
EB RIGHT	10	5	0	15	5	20	180	185
WB LEFT	10	5	0	15	0	15	95	95
WB THRU	170	5	20	195	30	225	345	375
WB RIGHT	10	5	10	25	5	30	10	15

BALDY MESA ROAD

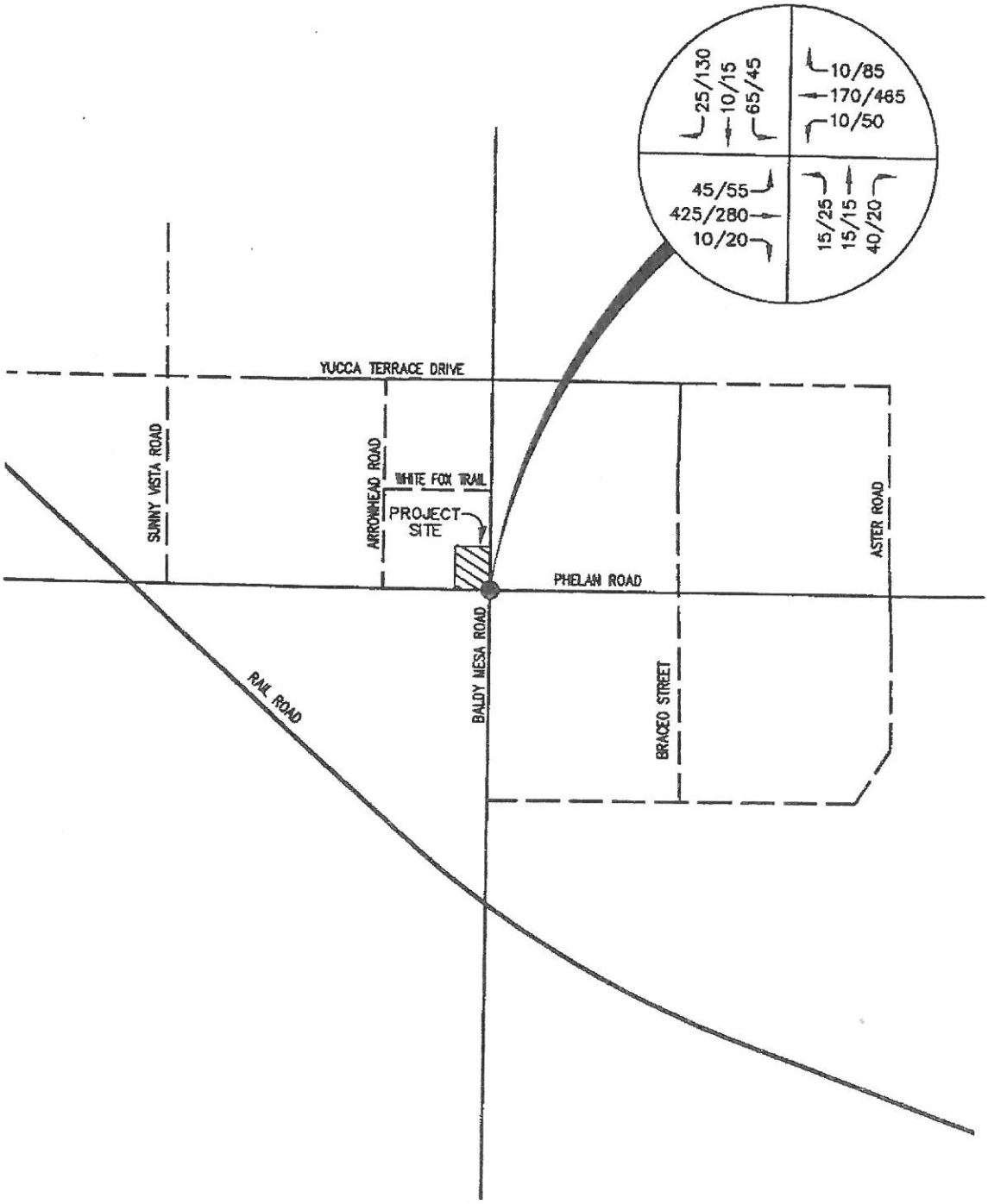
NB LEFT	15	5	0	20	5	25	100	105
NB THRU	15	5	20	40	5	45	55	60
NB RIGHT	40	5	0	45	0	45	140	140
SB LEFT	65	5	0	70	25	95	220	245
SB THRU	10	5	0	15	5	20	310	315
SB RIGHT	25	5	0	30	0	30	165	165
TOTALS	840	70	75	985	85	1070	2580	2665

FAIR SHARE: 85/(2665 - 840) = 4.6%

Irvine Office: 714.665.4500 Tel/ 714.665.4501 Fax
Santa Clarita Office: 661.284.7400 Tel/ 661.284.7401 Fax
Victorville Office: 760.241.0595 Tel/ 760.241.1937 Fax
Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

APPENDIX C

PENDING PROJECTS



N

NOT TO SCALE

LEGEND

● – STUDY INTERSECTIONS

XX/XX– AM/PM PEAK HOUR VOLUMES

Hall & Foreman, Inc.

Engineering · Surveying · Planning · Landscape Architecture

14297 CAJON ST, SUITE 101 · VICTORVILLE, CA 92392 · 760-524-9100

EXISTING TRAFFIC VOLUMES

PHELAN
TRAFFIC STUDY

FIGURE 3

Drawing Name: v:\110017\Eng\110017-000\Exhibit\Traffic Study\FIGURE-3.dwg
Last Opened: Nov 03, 2010 - 1:34pm by jcruz

SITE PLAN

SCALE: 1" = 30'

C-1

JOB NO. COM-0911

PROJECT: COMMERCIAL DEVELOPMENT

DAVID EUM

STEENO DESIGN STUDIO

ARCHITECTURE • DESIGN • PLANNING

NORTH

BALDY MESA ROAD

PHELAN ROAD

PHASE LINE

PHASE LINE

FUTURE ACCESS

AREA TABULATIONS:
BLDG. "A" 2,850 SQ. FT.
BLDG. "C" 7,750 SQ. FT.
BLDG. "B" 2,900 SQ. FT.
BLDG. "D" 9,000 SQ. FT.
TOTAL: 24,500 SQ. FT.

PARKING TABULATIONS:
107 TOTAL SPACES REQUIRED
114 TOTAL SPACES PROVIDED

APPENDIX D

COUNTY GENERAL PLAN INFORMATION

establishing, maintaining, and enforcing San Bernardino County's Congestion Management Program.

A large portion of the funding allotted to SANBAG to conduct the activities is generated through the Measure I half-cent transportation tax. A smaller portion of the necessary revenue is obtained through federal grant activity. SANBAG's estimated 2004/2005 revenue is approximately $170,600,000. This is nearly a 4 percent increase over the 2003/2004 budget of $163,400,000. The increase in revenue is anticipated to occur through Measure I. As a part of the Measure I program, SANBAG is expecting to receive nearly $33 million in Regional Improvement Program funds. SANBAG's 2004/2005 budget is estimated to be approximately $194,800,000, including prior-year encumbrances. A majority of this money is delineated for use in the Valley Major Projects portion of the Measure I program.

1. CIRCULATION MAP

The Circulation map depicts graphically the County's policy for the designation of the major streets and roads under their jurisdiction. The Circulation Maps contain three maps, one for the Valley planning region, one for the Mountain planning region, and one for the Desert Planning Region. The detailed Circulation Maps may be viewed on the 2007 General Plan CD adopted concurrent with the text.

2. CONGESTION MANAGEMENT PROGRAM (CMP)

The Congestion Management Program (CMP) in San Bernardino County was created in June 1990 as a provision of Proposition 111. Under this proposition, urbanized areas with populations of more than 50,000 would be required to undertake a congestion management program that was adopted by a designated Congestion Management Agency (CMA). As stated earlier, SANBAG was designated as the CMA by the County Board of Supervisors.

The CMP's level of service (LOS) standard requires all CMP segments to operate at LOS E or better, with the exception of those facilities identified in the list below. The following roadway segments have been designated LOS F in the 2001 CMP, updated in December of 2001:

A. FREEWAYS

- I-10 Westbound, Milliken Avenue to Central Avenue
- I-10 Westbound, Waterman Avenue to EB SR-30

- I-10 Eastbound, Central Avenue to Milliken Avenue
- I-10 Eastbound, NB SR-15 to SB SR-15
- I-10 Eastbound, SB Waterman Avenue to California Street
- SR-60 Westbound, Milliken Avenue to Central Avenue
- SR-60 Eastbound, Central Avenue to Milliken Avenue
- I-215 Northbound, Inland Center Drive to SR-30 / Highland Avenue

B. VALLEY EAST / WEST ARTERIAL SEGMENTS

- Foothill Boulevard between Mountain Avenue and Archibald Avenue

C. VALLEY NORTH / SOUTH ARTERIAL SEGMENTS

- Citrus Avenue between Slover Avenue and Valley Boulevard
- Cedar Avenue between Slover Avenue and Valley Boulevard
- Mountain View Avenue between Barton Road and Redlands Boulevard
- Mountain Avenue between Mission Boulevard and Holt Avenue

D. VICTOR VALLEY ARTERIAL SEGMENTS

- Bear Valley Road between Amargosa Road and Mariposa Road
- Bear Valley Road between Hesperia Road and Peach Avenue
- SR-18 between I-15 (North) and Stoddard Wells Road

The procedures in the 2000 Highway Capacity Manual (HCM) were adopted as the LOS procedures to be utilized in analyzing CMP facilities.

Through the use of traffic impact analysis (TIA) reports and Comprehensive Transportation Plan (CTP) model forecasts, the CMP evaluates proposed land use decisions to ensure adequate transportation network improvements are developed to accommodate future growth in population. If a CMP facility is found to fall below the level of service standard, either under existing or future conditions, a deficiency plan must be prepared, adopted, and implemented by local jurisdictions that contribute to such situations. Annual monitoring activities provide a method

APPENDIX E

COUNTY EXPANSION FACTORS

TRAFFIC VOLUME EXPANSION FACTORS

TRAFFIC DIVISION
TRAFFIC PLANNING RESEARCH SECTION
JAN 2012

YARD NUMBER	MASTER STATION	LOCATION	UPDATING FACTORS					PROJECTING YEARS		
			1 YEAR (2012)	2 YEAR (2013)	3 YEAR (2014)	4 YEAR (2015)	5 YEAR (2016)	10 YEARS 2021	20 YEAR 2031	24 YEAR 2035
1	1	CENTRAL AVE S,MISSION AVE	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
3	22	SLOVER AVE E, LOCUST	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
5	5	BASE LINE ST E/W, STERLING AVE	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
5	6	LUGONIA AVE E/W, ALABAMA ST	1.030	1.061	1.093	1.126	1.159	1.344	1.806	2.033
6	7	YUCAIPA BLVD E/W, 14TH ST	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
7,8	8	SH 18 E, LAKE GREGORY DR	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
9	19	BALDWIN LANE W, SR38	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
10	10	SH 62 E, OLD WOMAN SPRINGS RD (SH 247)	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
11	20	NATIONAL TRAILS S, VISTA RD	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
11	18	PHELAN RD E/W, JOHNSON RD	1.020	1.040	1.061	1.082	1.104	1.219	1.486	1.608
12	12	OLD HWY 58 E,DOBBS RD	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
13	13	TRONA RD N, LAKE VIEW DR	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
15,2	15	RIO MESA DR S,AQUEDUCT RD(SH 62)	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
16	21	CRYSTAL CREEK RD S, SR18	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270
16	16	CENTRAL RD N, BEAR VALLEY RD	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270

	COUNTY AVERAGE	1.012	1.024	1.037	1.049	1.062	1.128	1.277	1.343
	EAST VALLEY AVERAGE	1.017	1.034	1.051	1.069	1.087	1.184	1.415	1.524
	WEST VALLEY AVERAGE	1.010	1.020	1.030	1.041	1.051	1.105	1.220	1.270

* Based on last year counts