Project No: 346-15

TRAFFIC STUDY

VESTING TENTATIVE TRACT MAP 7410

CITY OF BAKERSFIELD

Prepared for:

MCINTOSH & ASSOCIATES

October 2024

Prepared by:

RUETTGERS & SCHULER CIVIL ENGINEERS

1800 30TH STREET, SUITE 260
BAKERSFIELD, CA 93301

John D. Schuler, RCE 51825

REGISTERED PROFESSIONAL ENGINEER
JOHN D. SCHULER
No. C 51825
EXP. 6-30-26
CIVIL
STATE OF CALIFORNIA

TABLE OF CONTENTS

INTRODUCTION

The purpose of this study is to provide an evaluation of the potential traffic impacts of a proposed 147-lot residential development located north of McCutchen Road along Mountain Vista Drive in the City of Bakersfield, California. Traffic impacts were evaluated for vehicle miles travelled (VMT) in accordance with current CEQA requirements. A vicinity map, location map, and site plan are presented in Figures 1 through 3, respectively.

Additionally, this study provides an operational analysis of the existing and future street system with the addition of project traffic, for the purpose of evaluating consistency with the City's General Plan goals relating to intersection and roadway level of service.

A. Project Description, Existing and Proposed Land Use and Zoning

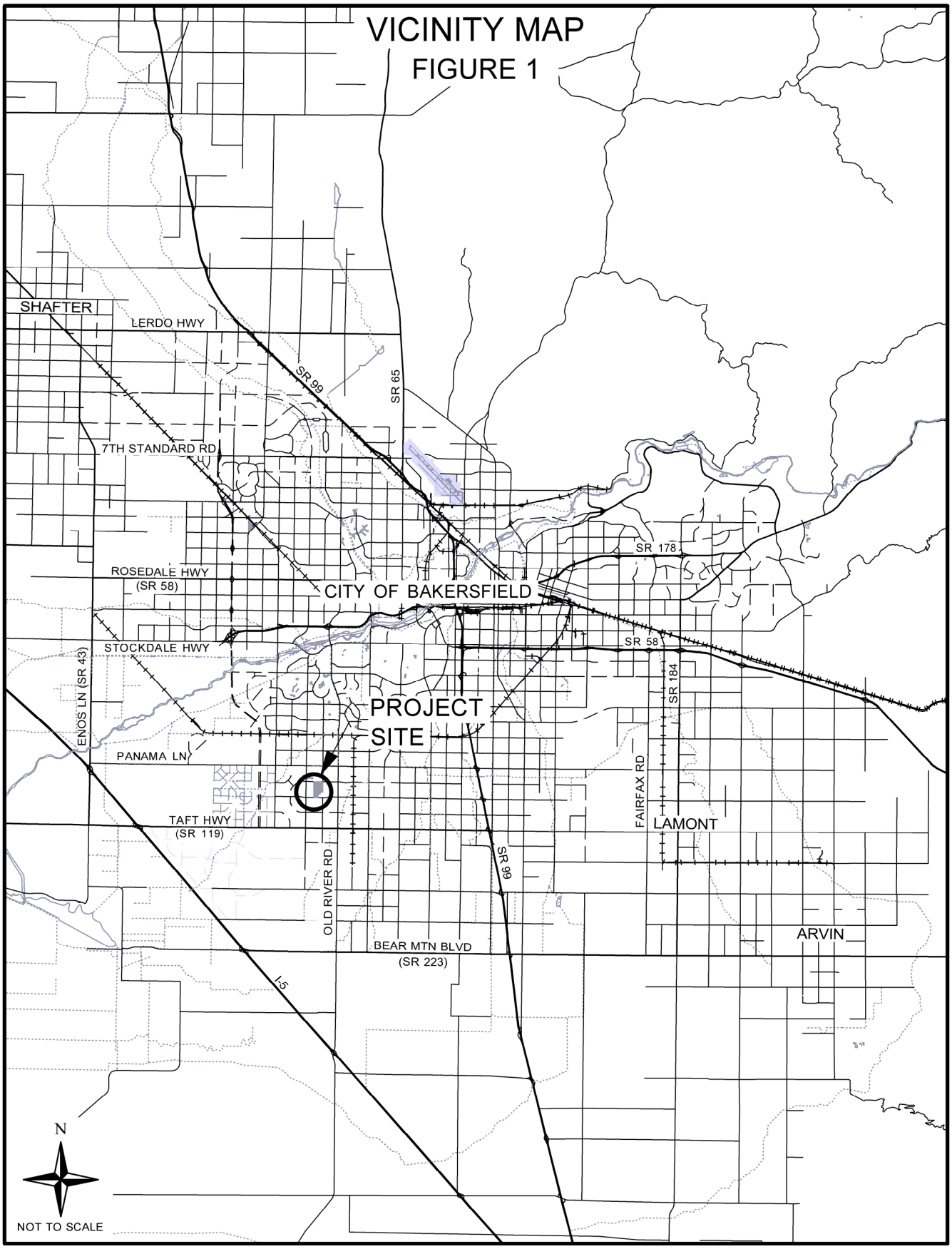
The 28.91-acre site currently has a land use designation of R-IA and zoning for single-family residential, R-1. The proposed land use designation is LR and the proposed zoning is R-1 – 4.5.

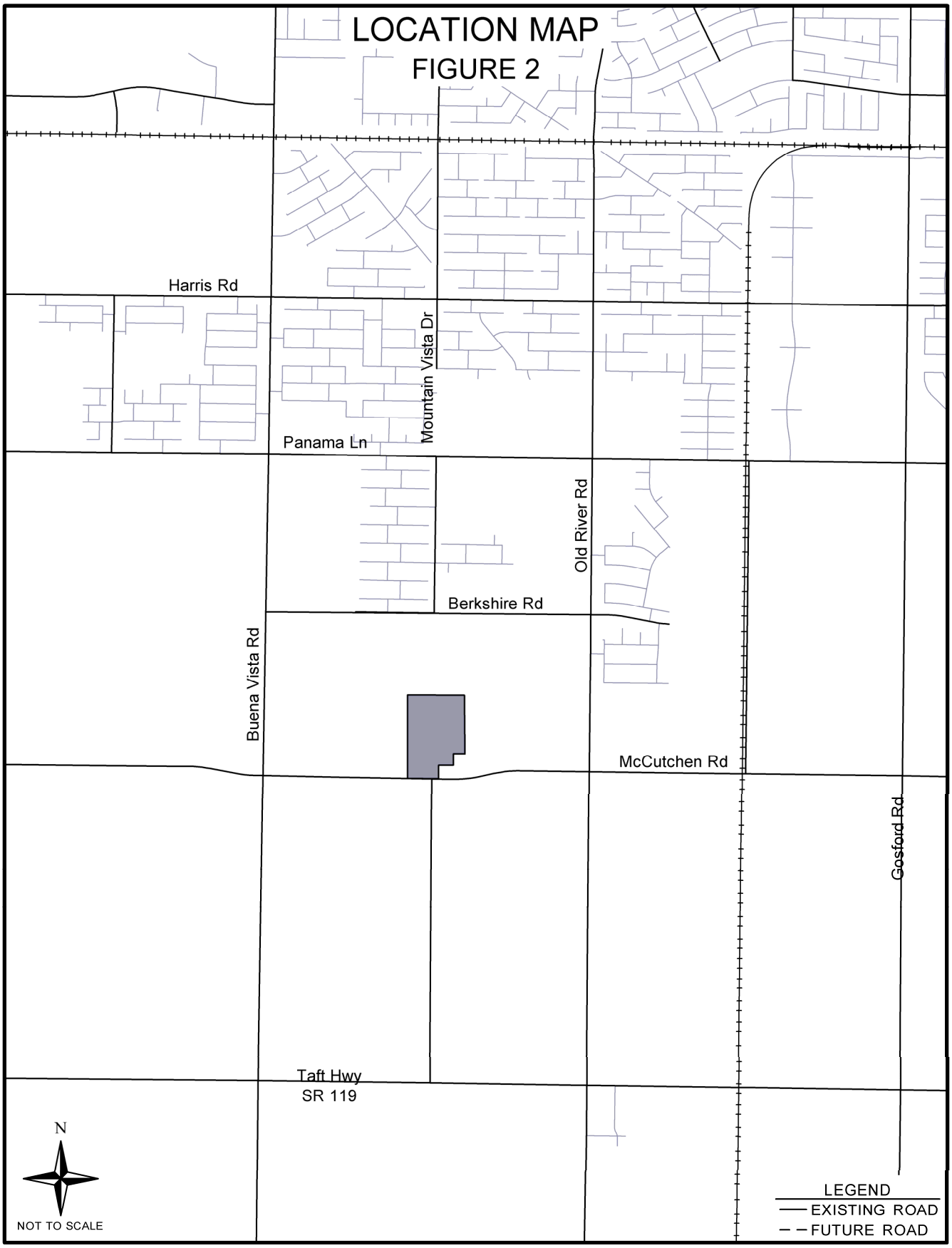
B. Existing Site Uses and Site Access

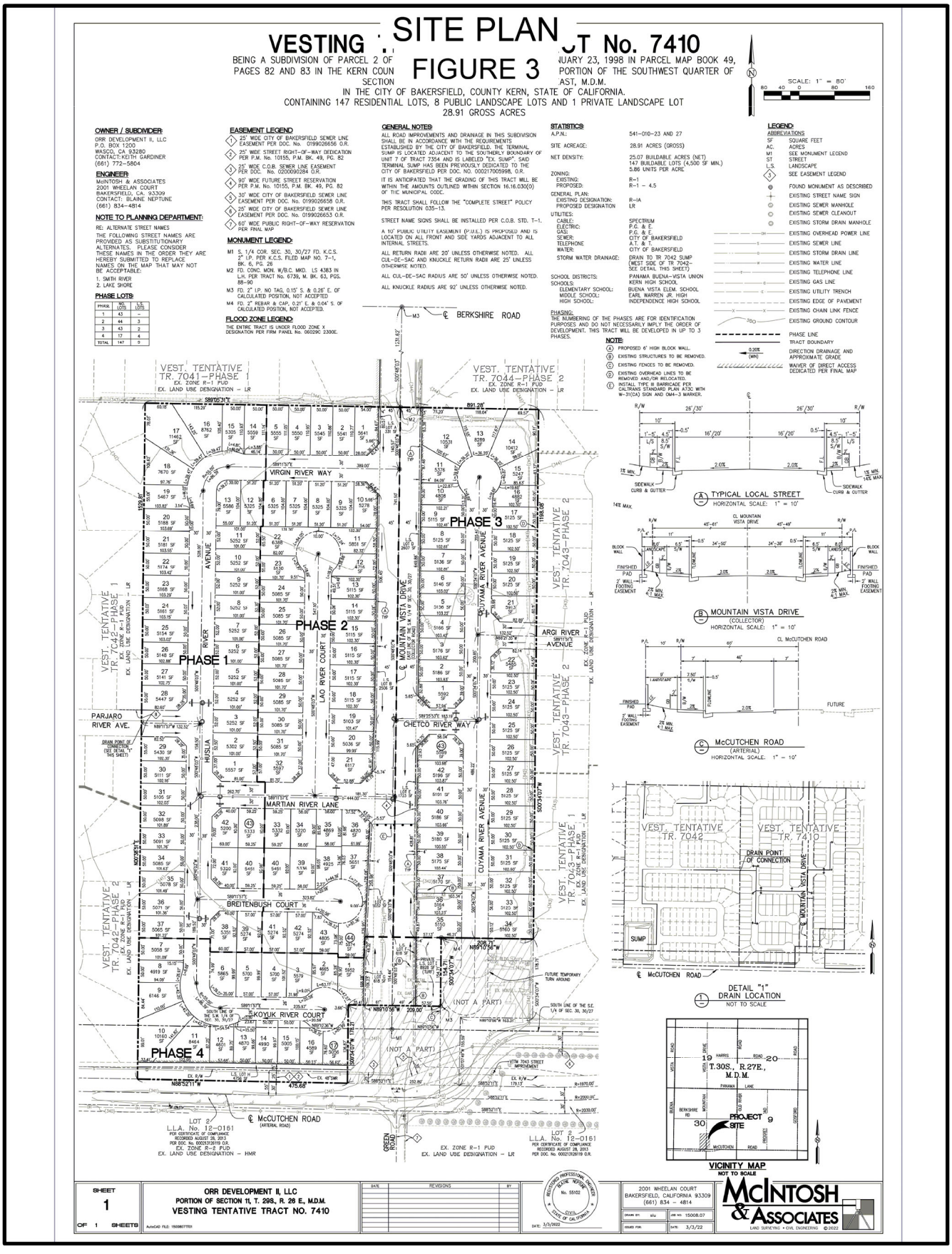
The project site is currently vacant land. As currently planned, access to the proposed development would be provided along Mountain Vista Drive.

C. Existing Uses in Vicinity of the Site

The project site lies in the southwest area of the City of Bakersfield in which the surrounding land uses include residential to the north and east and agricultural land uses to the south and west.


VICINITY MAP
FIGURE 1
SHAFTER
LERDO HWY
SR 99
SR 65
7TH STANDARD RD
ROSEDALE HWY
(SR 58)
CITY OF BAKERSFIELD
SR 178
SR 58
STOCKDALE HWY
ENOS LN (SR 43)
PROJECT
SITE
SR 184
PANAMA LN
FAIRFAX RD
LAMONT
TAFT HWY
(SR 119)
OLD RIVER RD
SR 99
ARVIN
BEAR MTN BLVD
(SR 223)
I-5
N
NOT TO SCALE


LOCATION MAP
FIGURE 2
Harris Rd
Mountain Vista Dr
Panama Ln
Old River Rd
Berkshire Rd
Buena Vista Rd
McCutchen Rd
Gosford Rd
Taft Hwy
SR 119
N
NOT TO SCALE
LEGEND
EXISTING ROAD
FUTURE ROAD


VESTING TENTATIVE TRACT No. 7410
FIGURE 3 SITE PLAN
BEING A SUBDIVISION OF PARCEL 2 OF PAGES 82 AND 83 IN THE KERN COUN SECTION
JUARY 23, 1998 IN PARCEL MAP BOOK 49, PORTION OF THE SOUTHWEST QUARTER OF AST, M.D.M.
IN THE CITY OF BAKERSFIELD, COUNTY KERN, STATE OF CALIFORNIA.
CONTAINING 147 RESIDENTIAL LOTS, 8 PUBLIC LANDSCAPE LOTS AND 1 PRIVATE LANDSCAPE LOT
28.91 GROSS ACRES
SCALE: 1" = 80'
OWNER / SUBDIVIDER:
ORR DEVELOPMENT II, LLC
P.O. BOX 1200
WASCO, CA 93280
CONTACT: KEITH GARDINER
(661) 772-5804
ENGINEER:
McINTOSH & ASSOCIATES
2001 WHEELAN COURT
BAKERSFIELD, CA. 93309
CONTACT: BLAINE NEPTUNE
(661) 834-4814
NOTE TO PLANNING DEPARTMENT:
RE: ALTERNATE STREET NAMES
THE FOLLOWING STREET NAMES ARE PROVIDED AS SUBSTITUTIONARY ALTERNATES. PLEASE CONSIDER THESE NAMES IN THE ORDER THEY ARE HEREBY SUBMITTED TO REPLACE NAMES ON THE MAP THAT MAY NOT BE ACCEPTABLE:
1. SMITH RIVER
2. LAKE SHORE
PHASE LOTS:
PHASE | NO. LOTS | L.S. LOTS
1 | 43 | –
2 | 44 | 3
3 | 43 | 2
4 | 17 | 4
TOTAL | 147 | 9
EASEMENT LEGEND:
1 25' WIDE CITY OF BAKERSFIELD SEWER LINE EASEMENT PER DOC. No. 0199026656 O.R.
2 25' WIDE STREET RIGHT-OF-WAY DEDICATION PER P.M. No. 10155, P.M. BK. 49, PG. 82
3 25' WIDE C.O.B. SEWER LINE EASEMENT PER DOC. No. 0200090284 O.R.
4 90' WIDE FUTURE STREET RESERVATION PER P.M. No. 10155, P.M. BK. 49, PG. 82
5 30' WIDE CITY OF BAKERSFIELD SEWER LINE EASEMENT PER DOC. No. 0199026658 O.R.
6 25' WIDE CITY OF BAKERSFIELD SEWER LINE EASEMENT PER DOC. No. 0199026653 O.R.
7 60' WIDE PUBLIC RIGHT-OF-WAY RESERVATION PER FINAL MAP
MONUMENT LEGEND:
M1 S. 1/4 COR. SEC. 30, 30/27 FD. K.C.S. 2" I.P. PER K.C.S. FILED MAP NO. 7-1, BK. 6, PG. 26
M2 FD. CONC. MON. W/B.C. MKD. LS 4383 IN L.H. PER TRACT No. 6739, M. BK. 63, PGS. 88-90
M3 FD. 2" I.P. NO TAG, 0.15' S. & 0.26' E. OF CALCULATED POSITION, NOT ACCEPTED
M4 FD. 2" REBAR & CAP, 0.21' E. & 0.04' S. OF CALCULATED POSITION, NOT ACCEPTED.
FLOOD ZONE LEGEND:
THE ENTIRE TRACT IS UNDER FLOOD ZONE X DESIGNATION PER FIRM PANEL No. 06029E 2300E.
GENERAL NOTES:
ALL ROAD IMPROVEMENTS AND DRAINAGE IN THIS SUBDIVISION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS ESTABLISHED BY THE CITY OF BAKERSFIELD. THE TERMINAL SUMP IS LOCATED ADJACENT TO THE SOUTHERLY BOUNDARY OF UNIT 7 OF TRACT 7354 AND IS LABELED "EX. SUMP". SAID TERMINAL SUMP HAS BEEN PREVIOUSLY DEDICATED TO THE CITY OF BAKERSFIELD PER DOC. NO. 0002170059998, O.R.
IT IS ANTICIPATED THAT THE GRADING OF THIS TRACT WILL BE WITHIN THE AMOUNTS OUTLINED WITHIN SECTION 16.16.030(O) OF THE MUNICIPAL CODE.
THIS TRACT SHALL FOLLOW THE "COMPLETE STREET" POLICY PER RESOLUTION 035-13.
STREET NAME SIGNS SHALL BE INSTALLED PER C.O.B. STD. T-1.
A 10' PUBLIC UTILITY EASEMENT (P.U.E.) IS PROPOSED AND IS LOCATED ON ALL FRONT AND SIDE YARDS ADJACENT TO ALL INTERNAL STREETS.
ALL RETURN RADII ARE 20' UNLESS OTHERWISE NOTED. ALL CUL-DE-SAC AND KNUCKLE RETURN RADII ARE 25' UNLESS OTHERWISE NOTED.
ALL CUL-DE-SAC RADIUS ARE 50' UNLESS OTHERWISE NOTED.
ALL KNUCKLE RADIUS ARE 92' UNLESS OTHERWISE NOTED.
STATISTICS:
A.P.N.: 541-010-23 AND 27
SITE ACREAGE: 28.91 ACRES (GROSS)
NET DENSITY: 25.07 BUILDABLE ACRES (NET)
147 BUILDABLE LOTS (4,500 SF MIN.)
5.86 UNITS PER ACRE
ZONING: EXISTING: R-1
PROPOSED: R-1 – 4.5
GENERAL PLAN: EXISTING DESIGNATION: R-IA
PROPOSED DESIGNATION: LR
UTILITIES: CABLE: SPECTRUM
ELECTRIC: P.G. & E.
GAS: P.G. & E.
SEWER: CITY OF BAKERSFIELD
TELEPHONE: A.T. & T.
WATER: CITY OF BAKERSFIELD
STORM WATER DRAINAGE: DRAIN TO TR 7042 SUMP (WEST SIDE OF TR 7042- SEE DETAIL THIS SHEET)
SCHOOL DISTRICTS: PANAMA BUENA-VISTA UNION
SCHOOLS: KERN HIGH SCHOOL
ELEMENTARY SCHOOL: BUENA VISTA ELEM. SCHOOL
MIDDLE SCHOOL: EARL WARREN JR. HIGH
HIGH SCHOOL: INDEPENDENCE HIGH SCHOOL
PHASING:
THE NUMBERING OF THE PHASES ARE FOR IDENTIFICATION PURPOSES AND DO NOT NECESSARILY IMPLY THE ORDER OF DEVELOPMENT. THIS TRACT WILL BE DEVELOPED IN UP TO 3 PHASES.
NOTE:
A PROPOSED 6' HIGH BLOCK WALL.
B EXISTING STRUCTURES TO BE REMOVED.
C EXISTING FENCES TO BE REMOVED.
D EXISTING OVERHEAD LINES TO BE REMOVED AND/OR RELOCATED.
E INSTALL TYPE III BARRICADE PER CALTRANS STANDARD PLAN A73C WITH W-31(CA) SIGN AND OM4-3 MARKER.
LEGEND:
ABBREVIATIONS
SF SQUARE FEET
AC. ACRES
M1 SEE MONUMENT LEGEND
ST STREET
L.S. LANDSCAPE
1 SEE EASEMENT LEGEND
FOUND MONUMENT AS DESCRIBED
EXISTING STREET NAME SIGN
EXISTING SEWER MANHOLE
EXISTING SEWER CLEANOUT
EXISTING STORM DRAIN MANHOLE
EXISTING OVERHEAD POWER LINE
EXISTING SEWER LINE
EXISTING STORM DRAIN LINE
EXISTING WATER LINE
EXISTING TELEPHONE LINE
EXISTING GAS LINE
EXISTING UTILITY TRENCH
EXISTING EDGE OF PAVEMENT
EXISTING CHAIN LINK FENCE
EXISTING GROUND CONTOUR
PHASE LINE
TRACT BOUNDARY
DIRECTION DRAINAGE AND APPROXIMATE GRADE
WAIVER OF DIRECT ACCESS DEDICATED PER FINAL MAP
VEST. TENTATIVE TR. 7041–PHASE 1
EX. ZONE R-1 PUD
EX. LAND USE DESIGNATION – LR
VEST. TENTATIVE TR. 7044–PHASE 2
EX. ZONE R-1 PUD
EX. LAND USE DESIGNATION – LR
VEST. TENTATIVE TR. 7042–PHASE 1
EX. ZONE R-1 PUD
EX. LAND USE DESIGNATION – LR
VEST. TENTATIVE TR. 7043–PHASE 2
EX. ZONE R-1 PUD
EX. LAND USE DESIGNATION – LR
VEST. TENTATIVE TR. 7042–PHASE 2
EX. ZONE R-1 PUD
EX. LAND USE DESIGNATION – LR
VEST. TENTATIVE TR. 7043–PHASE 1
EX. ZONE R-1 PUD
EX. LAND USE DESIGNATION – LR
PHASE 1
PHASE 2
PHASE 3
PHASE 4
BERKSHIRE ROAD
VIRGIN RIVER WAY
RIVER AVENUE
LAO RIVER COURT
MOUNTAIN VISTA DRIVE (COLLECTOR ROAD)
CUYAMA RIVER AVENUE
ARGI RIVER AVENUE
CHETCO RIVER WAY
PARJARO RIVER AVE.
HISLIA AVENUE
MARTIAN RIVER LANE
BREITENBUSH COURT
SKOYUK RIVER COURT
McCUTCHEN ROAD (ARTERIAL ROAD)
GREEN ROAD
FUTURE TEMPORARY TURN AROUND
DRAIN POINT OF CONNECTION (SEE DETAIL "1" THIS SHEET)
SUMP
(NOT A PART)
LOT 2 L.L.A. No. 12-0151 PER CERTIFICATE OF COMPLIANCE RECORDED AUGUST 28, 2013 PER DOC. No. 0002131619 O.R.
EX. ZONE R-2 PUD
EX. LAND USE DESIGNATION – HMR
EX. ZONE R-1 PUD
EX. LAND USE DESIGNATION – LR
LOT 2 L.L.A. No. 12-0151 PER CERTIFICATE OF COMPLIANCE RECORDED AUGUST 28, 2013 PER DOC. No. 0002131619 O.R.
TYPICAL LOCAL STREET
HORIZONTAL SCALE: 1" = 10'
MOUNTAIN VISTA DRIVE
(COLLECTOR)
HORIZONTAL SCALE: 1" = 10'
McCUTCHEN ROAD
(ARTERIAL)
HORIZONTAL SCALE: 1" = 10'
VEST. TENTATIVE TR. 7042
VEST. TENTATIVE TR. 7410
DRAIN POINT OF CONNECTION
SUMP
MOUNTAIN VISTA DRIVE
McCUTCHEN ROAD
DETAIL "1" DRAIN LOCATION
NOT TO SCALE
T.30S., R.27E., M.D.M.
PROJECT SITE
VICINITY MAP
NOT TO SCALE
SHEET 1 OF 1 SHEETS
ORR DEVELOPMENT II, LLC
PORTION OF SECTION 11, T. 29S., R. 26 E., M.D.M.
VESTING TENTATIVE TRACT NO. 7410
DATE REVISIONS BY
2001 WHEELAN COURT
BAKERSFIELD, CALIFORNIA 93309
(661) 834 - 4814
JOB NO. 15008.07
DATE 3/3/22
McINTOSH & ASSOCIATES
LAND SURVEYING • CIVIL ENGINEERING ©2022

STUDY APPROACH

In 2013 the State of California approved legislation (SB 743) to change the primary basis of evaluation of traffic impacts in CEQA from Level of Service (LOS) to Vehicle Miles Traveled (VMT). CEQA Guidelines section 15064.3 was approved in December 2018 and became effective in early 2019. Section 15064.3 required agencies to begin implementing the new VMT requirement no later than July 1, 2020. The Governor's Office of Planning and Research (OPR) released a Technical Advisory On Evaluating Transportation Impacts In CEQA in December 2018, which provides guidelines and recommendations for VMT evaluation and thresholds. As of October 2023, the City of Bakersfield has not finalized or adopted any policies or thresholds for VMT analysis, therefore the OPR Technical Advisory was used as the basis for this evaluation.

In addition to the VMT evaluation this study also provides an operational analysis of the existing and future street system with the addition of project traffic. The operation analysis includes LOS analysis for peak hour intersection and daily roadway operations. The purpose of the operational analysis is to evaluate consistency with the City's General Plan goals relating to intersection and roadway level of service and identify potential LOS or geometric deficiencies.

VEHICLE MILES TRAVELED (VMT) ANALYSIS

The Technical Advisory provides initial screening criteria and thresholds of significance for the VMT evaluation. The VMT evaluation is limited to automobiles and light trucks. The OPR TA recommends usage of VMT per capita as the VMT metric to evaluate residential land uses. A 15% reduction in VMT per capita is recommended by the OPR TA for residential land uses.

The OPR TA provides multiple screening criteria for land use VMT evaluation, however, the daily volume of traffic anticipated for this development does not screen out under any of the available criteria.

The regional transportation model, maintained by the Kern Council of Governments (KernCOG), was used to estimate baseline VMT for existing conditions. The KernCOG model is developed for use in adoption of the Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS). The KernCOG model contains "gateway" points to State transportation model data and the VMT scripts within the KernCOG model account for Statewide travel, to assure that the model does not terminate at TAZ or jurisdictional boundaries. The model run and VMT analysis were prepared by LSA Associates, Inc. using a model baseline year of 2015 (see appendix for LSA report).

Per capita VMT for residential trips for the project and county wide values are shown in Table 1. The project VMT per capita for residential trips and the assumed City threshold and comparison are shown in Table 2.

Table 1
Project and County Wide VMT Per Capita

2015	TT 7410 (project)	City of Bakersfield Threshold *	Difference	% Difference
VMT per capita	19.62	14.30	5.32	37.2%

* *Estimated using "No project" VMIP II base year (2015) model runs*

Table 2
Regional and Project VMT per capita Comparison

2015	Project	Kern County*
Households	147	263,000
Total Population	577	836,131
Homebased (HB) VMT	11,315	14,063,261
HB VMT per capita	**19.6**	**16.8**

** Estimated using "no project" base year (2015) VMIP II model run*

From Table 2, the project VMT is 19.62 miles per capita, assuming an average of 3.9 persons per dwelling unit. This value is 37.2% greater than the OPR recommended threshold, therefore, based on the OPR TA the project will have a significant VMT impact.

OPERATIONAL ANALYSIS

The study area includes a total of five intersections (four stop-controlled and one signalized). The scope of the study was developed in association with the City of Bakersfield Public Works department.

Roadway Descriptions

Buena Vista Road is a north-south arterial which intersects Stockdale Highway approximately midway between Allen Road and Old River Road. Within the vicinity of the project, it exists as a two-lane roadway and provides access to residential and agricultural land uses.

Berkshire Road is an east-west collector that exists in the project vicinity as a two-lane roadway with various stages of widening between Buena Vista Road and the Sunset Branch of the Union Pacific Railroad. Berkshire Road provides access to residential neighborhoods and agricultural areas.

McCutchen Road is an arterial which extends west from Stine Road along the Hosking Avenue alignment. It currently exists as a two-lane rural road and provides access to residential and agricultural areas.

Mountain Vista Drive, a north-south collector, currently exists at various stages of widening as a two-lane roadway south of Panama Lane. Currently, it provides access from residential and agricultural areas.

Old River Road is a north-south arterial. It currently exists as a two- to six-lane facility within the study area and provides access to residential and commercial land uses. Old River Road continues north of Stockdale Highway as Calloway Drive. Old River Road/Calloway Drive is one of four arterials which cross the Kern River west of State Route 99, making it a significant north-south link in western metropolitan Bakersfield.

Panama Lane is designated as an arterial. It extends east from State Route 43 near Interstate 5 through the southern metropolitan Bakersfield area and provides access from agricultural, residential, and commercial areas to north-south arterials and collectors and State Routes 43 and 99.

PROJECT TRIP GENERATION AND DESIGN HOUR VOLUMES

The trip generation and design hour volumes for the residential development were calculated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition. Trip generation and design hour volumes for all land uses are shown in Table 3.

The ADT, AM and PM peak hour rate equations, and peak hour directional splits for ITE Land Use Code 210 (Single-Family Housing Low Rise) were used to estimate the project traffic.

Table 3
Project Trip Generation

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
210	Single-Family detached Housing	147 Dwelling Units	eq	1438	eq	25% 26	75% 80	eq	63% 90	37% 53

TRIP DISTRIBUTION AND ASSIGNMENT

The project trip distribution in Table 4 represents the most likely travel routes for traffic accessing the project. Project traffic distribution was estimated based on a review of the potential draw from population centers within the region and the types of land uses involved. These assumptions were used to distribute project traffic as shown in Figure 4.

Table 4
Project Trip Distribution

Direction	Percent
North	45%
East	30%
South	5%
West	20%

EXISTING AND FUTURE TRAFFIC

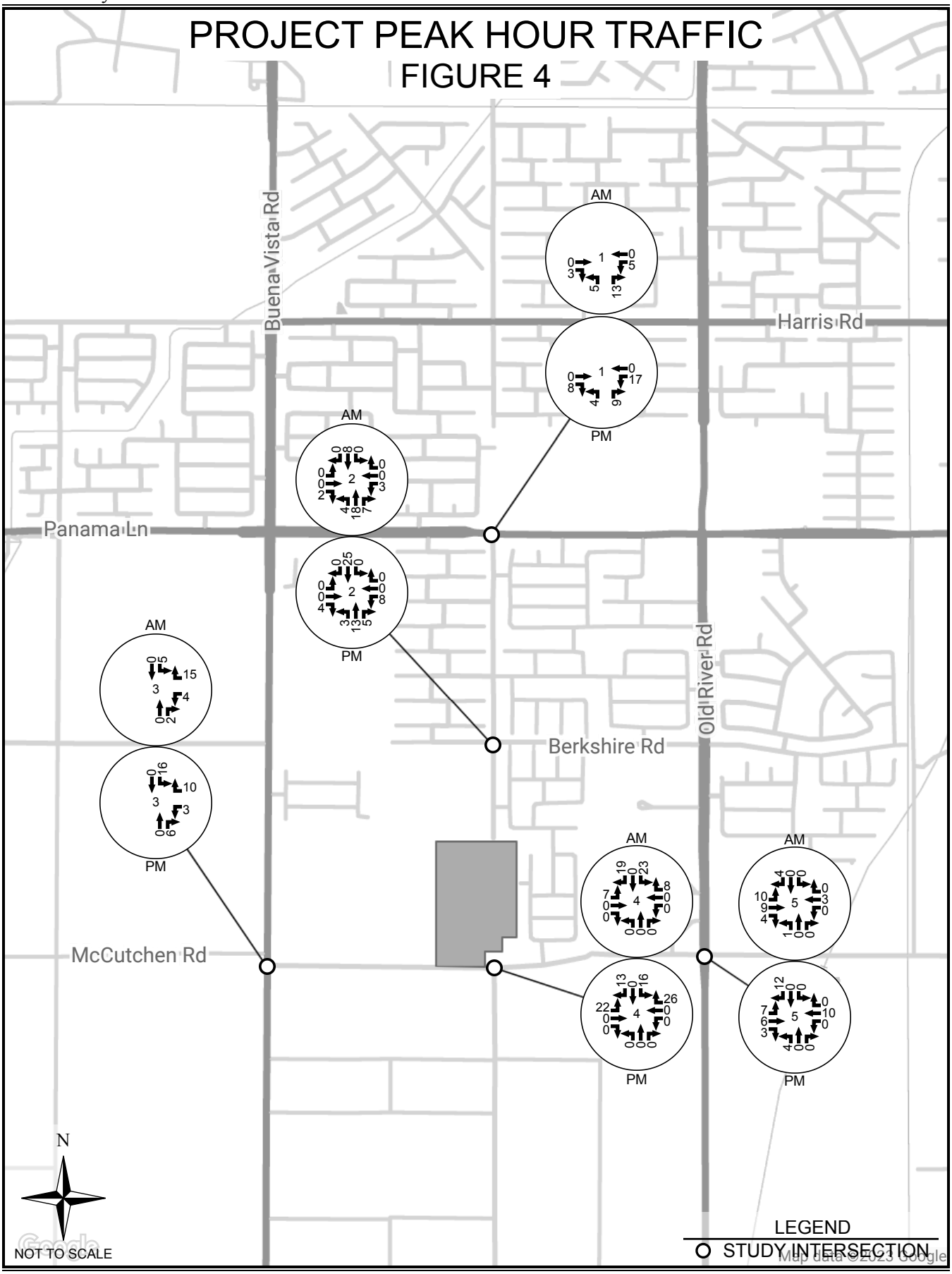
Weekday peak hour turning movements were counted at the following intersections in May 2023 (see Appendix for count data).

- Panama Lane & Mountain Vista Drive
- Berkshire Road & Mountain Vista Drive
- McCutchen Road & Buena Vista Road
- McCutchen Road & Mountain Vista Drive
- McCutchen Road & Old River Road

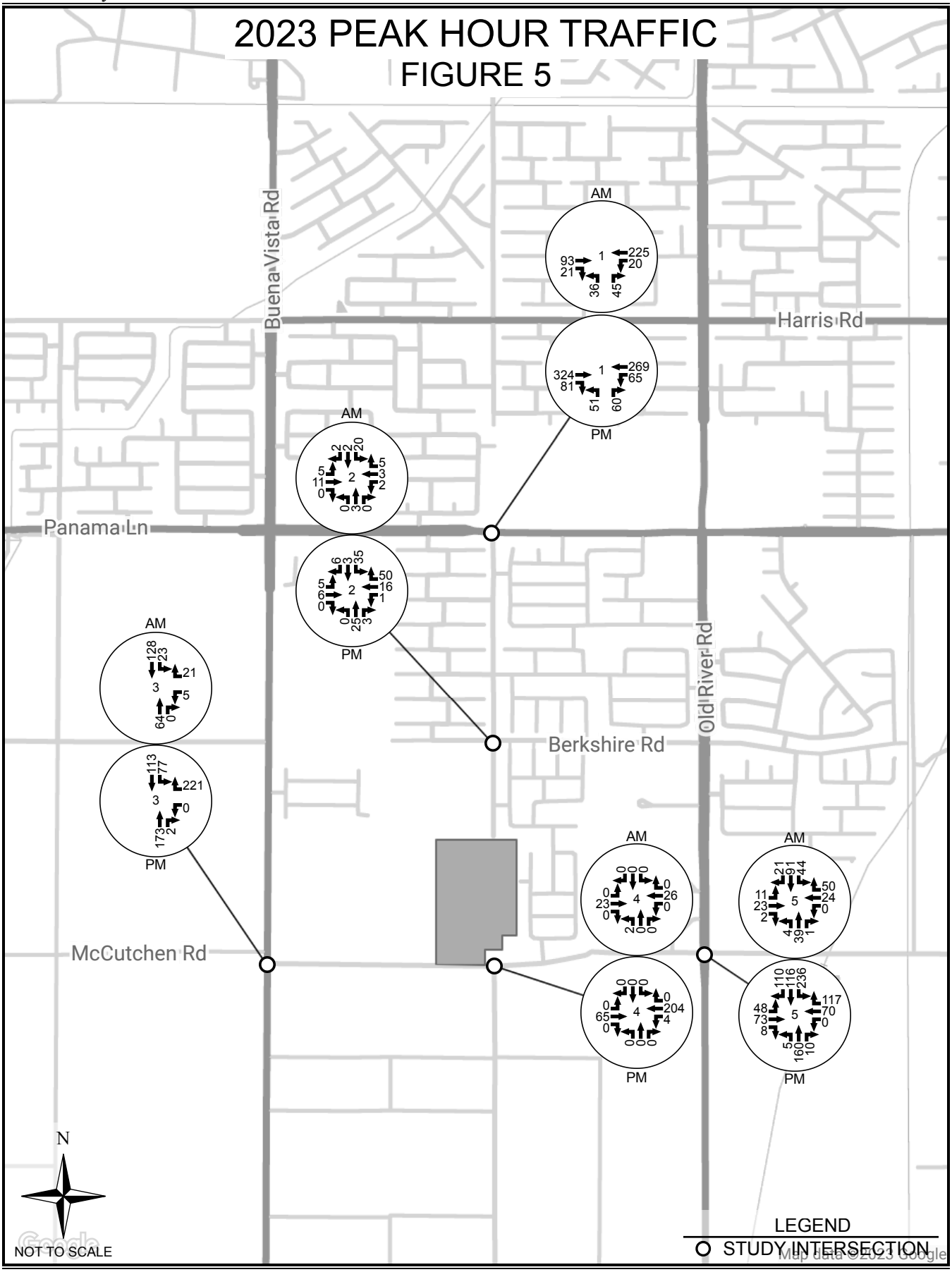
Traffic counts were conducted between the hours of 7:00 to 9:00 AM and 4:00 to 6:00 PM and are shown in Figure 5. The scope of intersections was approved by the City of Bakersfield Public Works. Existing + Project peak hour volumes are shown in Figure 6.

Annual growth rates ranging between 2.25% and 3.22% were applied to existing traffic volumes to estimate future traffic volumes for the year 2043. These growth rates were estimated based on a review of existing and approved future developments in the vicinity of the project and KernCOG traffic model data. Future peak hour volumes are shown in Figures 7 and 8.

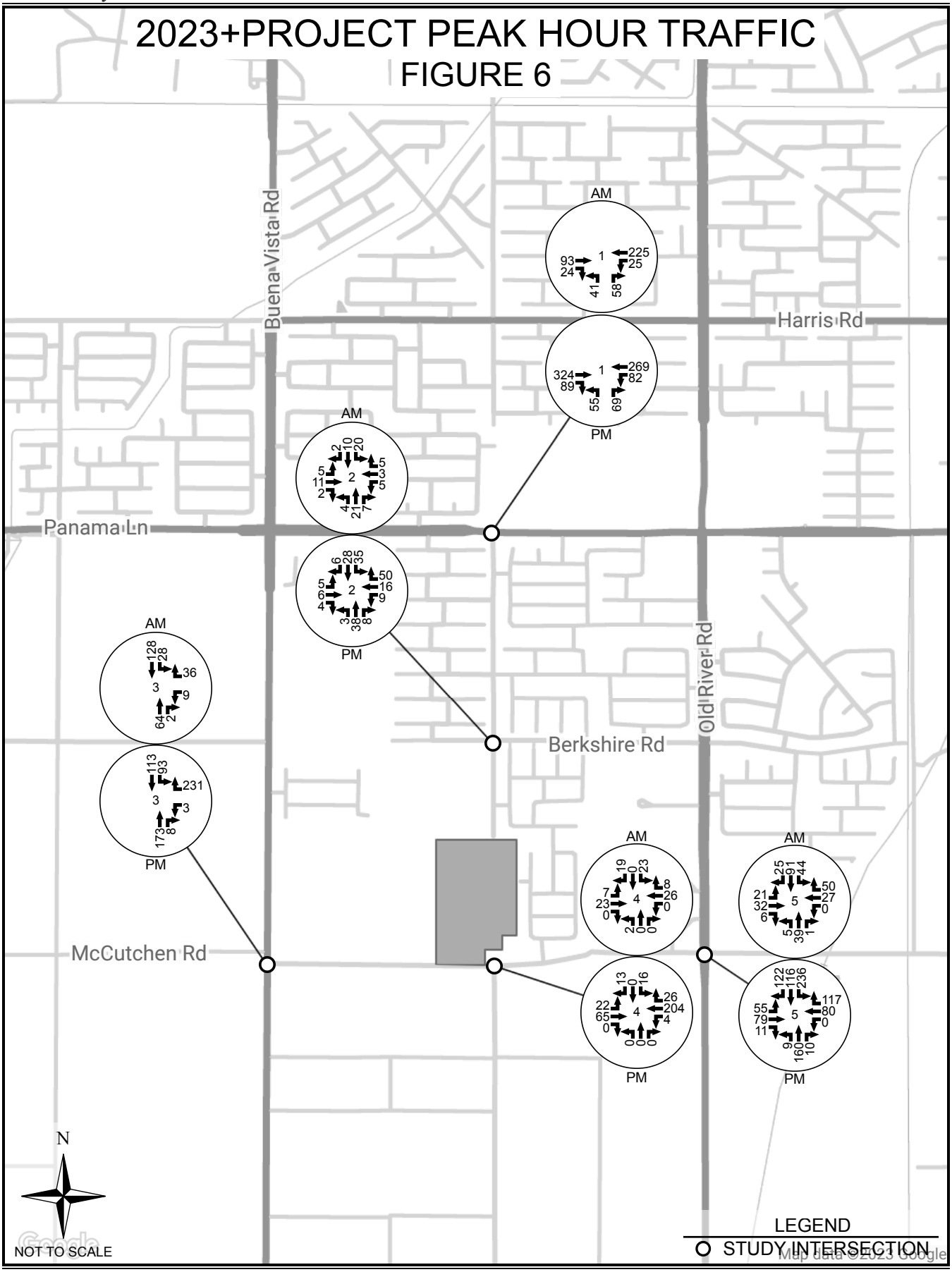
PROJECT PEAK HOUR TRAFFIC
FIGURE 4



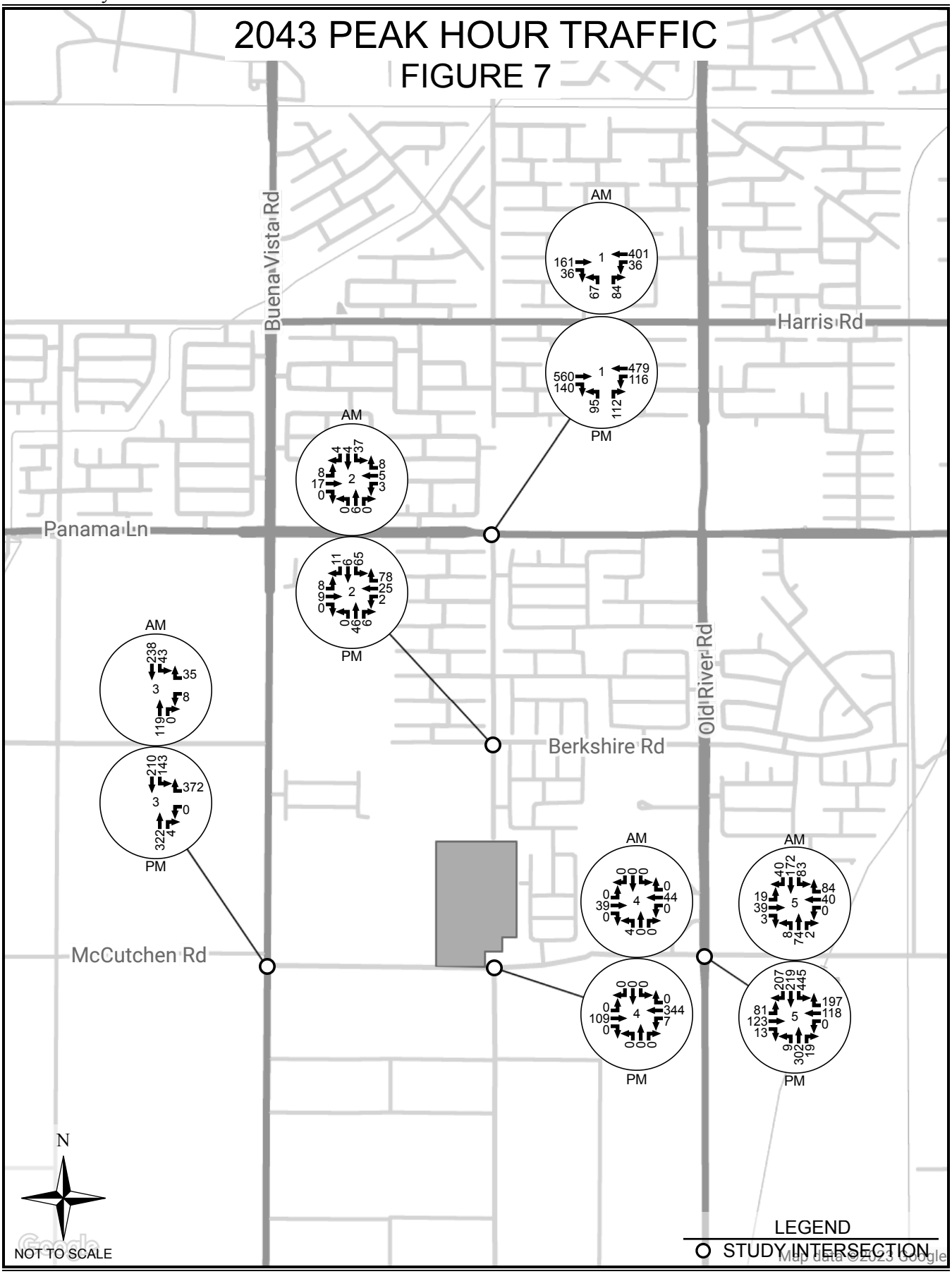
2023 PEAK HOUR TRAFFIC
FIGURE 5



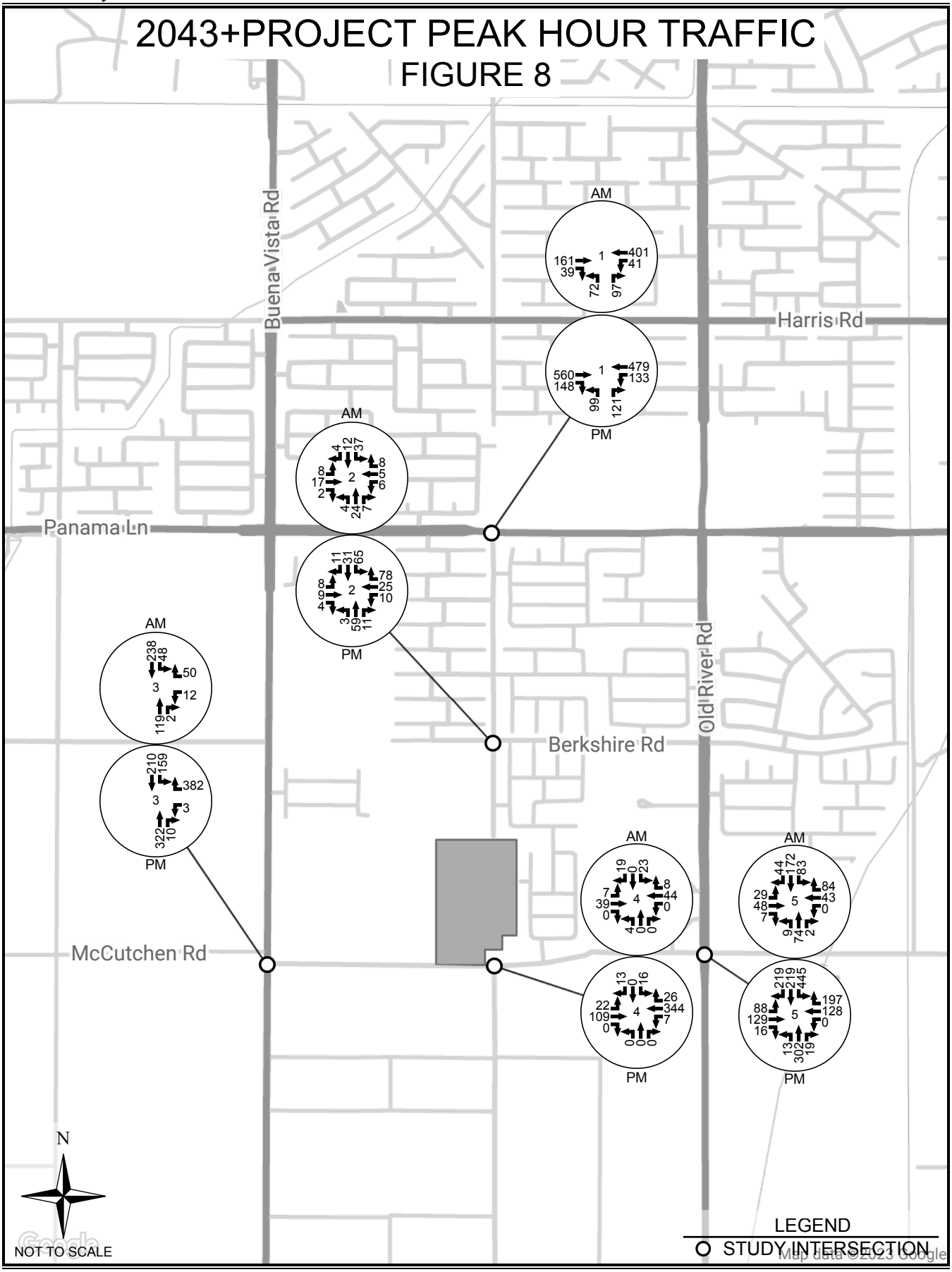
2023+PROJECT PEAK HOUR TRAFFIC
FIGURE 6



2043 PEAK HOUR TRAFFIC
FIGURE 7



2043+PROJECT PEAK HOUR TRAFFIC
FIGURE 8



INTERSECTION ANALYSIS

A capacity analysis of the study intersections was conducted using Synchro software from Trafficware. This software utilizes the 2010 capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual.

- Existing (2023)
- Existing (2023) + Project
- Future (2043)
- Future (2043) + Project

Criteria for intersection level of service (LOS) are shown in the tables below.

LEVEL OF SERVICE CRITERIA
UNSIGNALIZED INTERSECTION

Average Control Delay (sec/veh)	Level of Service	Expected Delay to Minor Street Traffic
≤ 10	A	Little or no delay
> 10 and ≤ 15	B	Short traffic delays
> 15 and ≤ 25	C	Average traffic delays
> 25 and ≤ 35	D	Long traffic delays
> 35 and ≤ 50	E	Very long traffic delays
> 50	F	Extreme delays

LEVEL OF SERVICE CRITERIA
SIGNALIZED INTERSECTIONS

Volume/Capacity	Control Delay (sec/veh)	Level of Service
< 0.60	≤ 10	A
0.61 - 0.70	> 10 and ≤ 20	B
0.71 - 0.80	> 20 and ≤ 35	C
0.81 - 0.90	> 35 and ≤ 55	D
0.91 - 1.00	> 55 and ≤ 80	E
> 1.0	> 80	F

The level of service for the study intersections is presented in Tables 5a and 5b. The level of service goal for roadway facilities in Kern County is LOS "C" within the metropolitan Bakersfield area and LOS "D" outside the metro area. Intersection delays are shown for all intersections that operate below LOS "C."

Table 5a
PM Intersection Level of Service

#	Intersection	Control Type	2023	2023+ Project	2043	2043+ Project	2043+ Project w/Mitigation
1	Mountain Vista Dr & Panama Ln	NB	B	B	F (52.0)	F (65.2)	C
2	Mountain Vista Dr & Berkshire Rd	NB SB	A A	A A	B A	B B	- - -
3	Buena Vista Rd & McCutchen Rd	WB	B	B	C	C	-
4	Mountain Vista Dr & McCutchen Rd	NB SB	A A	A B	A A	A B	- -
5	Old River Rd & McCutchen Rd	Signal	B	B	D (46.9)	D (52.1)	C

Table 5b
AM Intersection Level of Service

#	Intersection	Control Type	2023	2023+ Project	2043	2043+ Project	2043+ Project w/Mitigation
1	Mountain Vista Dr & Panama Ln	NB	B	B	B	B	B
2	Mountain Vista Dr & Berkshire Rd	NB SB	A A	A A	A A	A A	- - -
3	Buena Vista Rd & McCutchen Rd	WB	A	A	A	A	-
4	Mountain Vista Dr & McCutchen Rd	NB SB	A A	A A	A A	A A	- -
5	Old River Rd & McCutchen Rd	Signal	B	B	B	B	B

ROADWAY ANALYSIS

Published ADT information and future projected traffic and volume-to-capacity ratio are shown in Table 6.

A volume-to-capacity ratio (v/c) of greater than 0.80 corresponds to a LOS of less than "C," as defined in the Highway Capacity Manual. As mentioned previously, a level of service "C" is an accepted standard in the City of Bakersfield within the metropolitan Bakersfield areas. A significant impact is generally defined as a condition where the addition of project traffic reduces the LOS to below LOS C, or where the pre-existing condition of the roadway is below LOS C, and the LOS degrades below the pre-existing level of service with the addition of the project.

Table 6
Roadway Capacity

Street	2023	Project ADT	2023+Proj ADT	2043 ADT	2043+ Project	Existing Capacity	v/c(Ex) 2023	v/c(Ex) 2023+Proj	v/c(Fut) 2043	v/c(Fut) 2043+Proj
McCutchen Rd: Buena Vista Rd to Mountain Vista Dr	2860	354	3214	5076	5430	15000	0.19	0.21	0.34	0.36
McCutchen Rd: Mountain Vista Dr to Old River Rd	3370	425	3795	6564	6989	15000	0.22	0.25	0.44	0.47
Mountain Vista Dr: McCuthchen Rd to Berkshire Rd	560	587	1147	832	1419	15000	0.04	0.08	0.06	0.09
Mountain Vista Dr: Berkshire Rd to Panama Ln	1560	385	1945	2207	2592	15000	0.10	0.13	0.15	0.17

[1]2023 Data not available, data grown out to 2023

TRAFFIC SIGNAL WARRANT ANALYSIS

Peak hour signal warrants were evaluated for one unsignalized intersection within the study based on the 2014 California Manual on Uniform Traffic Control Devices (2014 CA MUTCD). Peak hour signal warrants assess delay to traffic on minor street approaches when entering or crossing a major street. Signal warrant analysis results are shown in Tables 7a and 7b.

Table 7a
Traffic Signal Warrants
Weekday PM Peak Hour

		2023			2023+Project			2043			2043+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
1	Mountain Vista Dr at Panama Ln	739	111	NO	764	124	NO	1295	207	YES	1320	220	YES
2	Mountain Vista Dr at Berkshire Rd	78	44	NO	118	75	NO	134	105	NO	180	113	NO
3	Buena Vista Rd at McCutchen Rd	365	221	NO	387	234	NO	679	372	YES	701	385	YES
4	Mountain Vista Dr at McCutchen Rd	273	0	NO	321	29	NO	460	0	NO	508	29	NO

Table 7b
Traffic Signal Warrants
Weekday AM Peak Hour

		2023			2023+Project			2043			2043+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
1	Mountain Vista Dr at Panama Ln	359	81	NO	367	99	NO	634	151	NO	642	169	NO
2	Mountain Vista Dr at Berkshire Rd	27	16	NO	64	18	NO	51	25	NO	88	27	NO
3	Buena Vista Rd at McCutchen Rd	215	26	NO	222	45	NO	400	43	NO	407	62	NO
4	Mountain Vista Dr at McCutchen Rd	49	2	NO	64	42	NO	83	4	NO	98	42	NO

It is important to note that a signal warrant defines the minimum condition under which signalization of an intersection might be warranted. Meeting this threshold does not suggest traffic signals are required, but rather, that other traffic factors and conditions be considered in order to determine whether signals are truly justified.

It is also noted that signal warrants do not necessarily correlate with level of service. An intersection may satisfy a signal warrant condition and operate at or above an acceptable level of service or operate below an acceptable level of service and not meet signal warrant criteria.

IMPROVEMENTS

Intersection improvements needed by the year 2043 to maintain or improve the operational level of service of the street system in the vicinity of the project are shown in Table 8. The Regional Transportation Impact Fee (RTIF) Program is a fee imposed on new development and contains a Regional Transportation Facilities List and a Transportation Impact Fee Schedule. The Facilities List includes many of the facilities needed to maintain a Level of Service (LOS) C or better for new growth or to prevent the degradation of facilities which are currently operating below LOS C. The Fee Schedule sets forth the fees to be collected from new development to mitigate the need for the facilities.

Table 8
Future Intersection Improvements and Local Mitigation

#	Intersection	Total Improvements Required by 2043	Local Mitigation (Improvements not covered by RTIF or adjacent development)
1	Mountain Vista Dr & Panama Ln	Signal	-
5	Old River Rd & McCutchen Rd	Add SBR	-

Notes: NB = Northbound, SB = Southbound, L = Left-Turn Lane, WB = Westbound, T = Through Lane, EB = Eastbound, R = Right-Turn Lane
[1]Striping only. Pavement is widened to accommodate the additional lanes.

SUMMARY AND CONCLUSIONS

The purpose of this study is to evaluate the potential traffic impacts of the proposed residential development located north of McCutchen Road along Mountain Vista Drive in Bakersfield, CA. The study included both level of service (LOS) and vehicle miles traveled (VMT) analyses.

Level of Service Analysis

In the existing scenario, prior to and with the addition of project traffic, all intersections are anticipated to operate at an acceptable level of service.

In 2043, both Mountain Vista Drive & Panama Lane and Old River Road & McCutchen Road are anticipated to fall below an acceptable level of service prior to the addition of project traffic.

Roadway Capacity

All roadway segments within the scope of the study currently operate at or above LOS C and are expected to continue to do so through the year 2043, both with and without the project. Therefore, no improvements are required.

VMT

The project's per capita VMT is 37.2% greater than the assumed threshold and therefore, based upon the OPR TA, will have a significant impact for VMT. In order to mitigate these VMT impacts, we recommend that this project include residential dwellings that are EV-capable, promoting the use of electric vehicles. "EV-capable" means the developer will install a dedicated circuit within the service panel and provide a receptacle or blank cover labeled as "EV READY." Additionally, the project will construct on-site pedestrian and bicycle infrastructure along McCutchen Road extending to the west tract boundary, ensuring no gaps in the infrastructure. This will facilitate future off-site improvements, constructed by others, that will provide access to Buena Vista Elementary School and the existing Class II Bike Lane along Buena Vista Road. Furthermore, the project will also include construction of off-site pedestrian and bicycle infrastructure along McCutchen Road to the east. This will close the existing gap between the project, Independence High School, the Career and Technical Education Center, and the existing Class II Bike Lane along Old River Road. These improvements will enhance multi-modal access and help reduce VMT associated with this project.

Conclusion

Based on the City of Bakersfield's standards for determining whether project traffic impacts level of service standards for intersections and roadways, the mitigation measures identified in Table 8 are anticipated to be needed in order to bring level of service up to standards for the listed facilities by the year 2043. Mitigation measures will be accomplished through improvements identified in the Regional Transportation Impact Fee program and the project is expected to pay into the fee program.

REFERENCES

1. Annual Traffic Census, KernCOG
2. Kern County General Plan, approved September 22, 2009
3. Highway Capacity Manual, Special Report 209, Transportation Research Board
4. California Manual on Uniform Traffic Control Devices for Streets and Highways, 2012 Edition, Federal Highway Administration (FHA)
5. Trip Generation, 11th Edition, Institute of Transportation Engineers (ITE)

APPENDIX

Turning Movement Count Report AM

Location ID: 1
North/South: Mountain Vista Dr
East/West: Panama Ln

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
6:00	0	0	0	0	37	6	7	0	7	3	15	0	75
6:15	0	0	0	0	67	2	11	0	6	3	30	0	119
6:30	0	0	0	0	66	2	10	0	12	4	18	0	112
6:45	0	0	0	0	55	10	17	0	11	11	30	0	134
7:00	0	0	0	0	66	4	19	0	18	9	46	0	162
7:15	0	0	0	0	85	8	27	0	36	28	57	0	241
7:30	0	0	0	0	60	4	29	0	38	37	77	0	245
7:45	0	0	0	0	77	11	23	0	16	10	38	0	175
Total Volume:	0	0	0	0	513	47	143	0	144	105	311	0	1263
Approach %	0%	0%	0%	0%	92%	8%	50%	0%	50%	25%	75%	0%	
Peak Hr Begin:	7:00												
PHV	0	0	0	0	288	27	98	0	108	84	218	0	823
PHF	0.000			0.847			0.769			0.662			0.840

Turning Movement Count Report PM

Location ID: 1
North/South: Mountain Vista Dr
East/West: Panama Ln

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	0	0	0	0	76	11	23	0	14	26	88	0	238
16:15	0	0	0	0	54	15	15	0	19	19	71	0	193
16:30	0	0	0	0	76	15	13	0	9	22	78	0	213
16:45	0	0	0	0	63	24	9	0	9	14	87	0	206
17:00	0	0	0	0	69	23	13	0	14	18	90	0	227
17:15	0	0	0	0	86	20	18	0	11	20	72	0	227
17:30	0	0	0	0	69	34	18	0	18	11	77	0	227
17:45	0	0	0	0	67	23	12	0	4	6	53	0	165
Total Volume:	0	0	0	0	560	165	121	0	98	136	616	0	1696
Approach %	0%	0%	0%	0%	77%	23%	55%	0%	45%	18%	82%	0%	

Peak Hr Begin:	16:45												
PHV	0	0	0	0	287	101	58	0	52	63	326	0	887
PHF	0.000			0.915			0.764			0.900			0.977

Turning Movement Count Report AM

Location ID: 2
North/South: Mountain Vista Dr
East/West: Berkshire Rd

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
6:00	0	1	1	0	0	1	0	0	0	0	0	1	4
6:15	0	0	3	1	1	0	0	0	0	0	3	0	8
6:30	1	1	5	2	0	0	0	1	0	0	4	0	14
6:45	1	0	11	2	2	1	0	2	0	0	4	4	27
7:00	0	1	12	5	1	0	0	1	0	0	4	6	30
7:15	3	0	13	4	0	0	1	1	0	0	3	7	32
7:30	7	2	17	6	0	1	1	1	0	0	5	2	42
7:45	1	1	10	6	0	0	1	2	0	0	1	0	22
Total Volume:	13	6	72	26	4	3	3	8	0	0	24	20	179
Approach %	14%	7%	79%	79%	12%	9%	27%	73%	0%	0%	55%	45%	
Peak Hr Begin:	6:45												
PHV	11	3	53	17	3	2	2	5	0	0	16	19	131
PHF	0.644			0.786			0.875			0.875			0.780

Turning Movement Count Report PM

Location ID: 2
North/South: Mountain Vista Dr
East/West: Berkshire Rd

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	1	0	13	30	3	1	2	21	0	0	1	2	74
16:15	1	2	11	10	6	0	0	2	0	0	1	1	34
16:30	1	0	8	6	4	0	1	2	0	0	3	1	26
16:45	3	1	3	4	3	0	0	0	0	0	1	1	16
17:00	1	2	8	11	2	0	0	0	0	0	1	0	25
17:15	3	0	16	12	1	2	0	0	0	0	4	1	39
17:30	2	0	3	6	2	2	0	1	0	0	4	0	20
17:45	1	0	5	3	3	0	0	0	0	0	1	0	13
Total Volume:	13	5	67	82	24	5	3	26	0	0	16	6	247
Approach %	15%	6%	79%	74%	22%	5%	10%	90%	0%	0%	73%	27%	
Peak Hr Begin:	16:00												
PHV	6	3	35	50	16	1	3	25	0	0	6	5	150
PHF	0.786			0.493			0.304			0.688			0.507

Turning Movement Count Report AM

Location ID: 3
North/South: Buena Vista Dr
East/West: McCutchen Rd

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
6:00	0	26	5	3	0	1	0	8	0	0	0	0	43
6:15	0	28	2	7	0	1	0	16	0	0	0	0	54
6:30	0	26	6	4	0	3	0	18	0	0	0	0	57
6:45	0	48	10	7	0	0	0	22	0	0	0	0	87
7:00	0	43	11	10	0	0	0	17	0	0	0	0	81
7:15	0	43	11	11	0	1	0	22	0	0	0	0	88
7:30	0	61	18	25	0	0	0	24	0	0	0	0	128
7:45	0	35	24	18	0	0	0	32	0	0	0	0	109
Total Volume:	0	310	87	85	0	6	0	159	0	0	0	0	647
Approach %	0%	78%	22%	93%	0%	7%	0%	100%	0%	0%	0%	0%	
Peak Hr Begin:	7:00												
PHV	0	182	64	64	0	1	0	95	0	0	0	0	406
PHF	0.778			0.650			0.742			0.000			0.793

Turning Movement Count Report PM

Location ID: 3
North/South: Buena Vista Dr
East/West: McCutchen Rd

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	0	38	15	140	0	0	2	51	0	0	0	0	246
16:15	0	28	18	40	0	0	0	47	0	0	0	0	133
16:30	0	20	28	23	0	0	0	46	0	0	0	0	117
16:45	0	27	16	18	0	0	0	29	0	0	0	0	90
17:00	0	23	14	19	0	0	1	43	0	0	0	0	100
17:15	0	35	19	10	0	0	0	36	0	0	0	0	100
17:30	0	29	13	14	0	0	1	27	0	0	0	0	84
17:45	0	28	10	7	0	0	0	33	0	0	0	0	78
Total Volume:	0	228	133	271	0	0	4	312	0	0	0	0	948
Approach %	0%	63%	37%	100%	0%	0%	1%	99%	0%	0%	0%	0%	
Peak Hr Begin:	16:00												
PHV	0	113	77	221	0	0	2	173	0	0	0	0	586
PHF	0.896			0.395			0.825			0.000			0.596

Turning Movement Count Report AM

Location ID: 4
North/South: Mountain Vista Dr
East/West: McCutchen Rd

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
6:00	0	0	0	0	5	0	0	0	0	0	6	0	11
6:15	0	0	0	0	6	0	0	0	1	0	1	0	8
6:30	0	0	0	0	7	0	0	0	0	0	6	0	13
6:45	0	0	0	0	8	0	0	0	1	0	10	0	19
7:00	0	0	0	0	10	0	0	0	0	0	11	0	21
7:15	0	0	0	0	9	1	0	0	0	0	11	0	21
7:30	0	0	0	0	26	0	0	0	0	0	18	0	44
7:45	0	0	0	0	19	0	0	0	1	0	24	0	44
Total Volume:	0	0	0	0	90	1	0	0	3	0	87	0	181
Approach %	0%	0%	0%	0%	99%	1%	0%	0%	100%	0%	100%	0%	
Peak Hr Begin:	7:00												
PHV	0	0	0	0	64	1	0	0	1	0	64	0	130
PHF	0.000			0.625			0.000			0.667			0.739

Turning Movement Count Report PM

Location ID: 4
North/South: Mountain Vista Dr
East/West: McCutchen Rd

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	0	0	0	0	119	3	0	0	0	0	24	0	146
16:15	0	0	0	0	41	1	0	0	0	0	13	0	55
16:30	0	0	0	0	24	0	0	0	0	0	12	0	36
16:45	0	0	0	0	20	0	0	0	0	0	16	0	36
17:00	0	0	0	0	13	0	1	0	0	0	17	0	31
17:15	0	0	0	0	10	1	1	0	0	0	18	0	30
17:30	0	0	0	0	15	0	0	0	0	0	14	0	29
17:45	0	0	0	0	7	0	1	0	0	0	10	0	18
Total Volume:	0	0	0	0	249	5	3	0	0	0	124	0	381
Approach %	0%	0%	0%	0%	98%	2%	100%	0%	0%	0%	100%	0%	
Peak Hr Begin:	16:00												
PHV	0	0	0	0	204	4	0	0	0	0	65	0	273
PHF	0.000			0.426			0.000			0.677			0.467

Turning Movement Count Report AM

Location ID: 5
North/South: Old River Rd
East/West: McCutchen Rd

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
6:00	5	10	6	9	5	0	1	4	1	1	4	4	50
6:15	5	27	9	8	6	0	0	14	2	1	2	2	76
6:30	7	25	14	15	5	0	0	7	1	0	9	5	88
6:45	4	29	15	18	8	0	0	14	0	0	8	0	96
7:00	3	33	18	21	9	0	3	16	1	0	7	2	113
7:15	8	30	28	37	7	0	3	25	1	1	8	0	148
7:30	4	50	43	26	24	0	1	20	1	1	16	1	187
7:45	12	66	38	32	18	1	0	41	1	0	12	2	223
Total Volume:	48	270	171	166	82	1	8	141	8	4	66	16	981
Approach %	10%	55%	35%	67%	33%	0%	5%	90%	5%	5%	77%	19%	

Peak Hr Begin:	7:00												
PHV	27	179	127	116	58	1	7	102	4	2	43	5	671
PHF	0.718			0.858			0.689			0.694			0.752

Turning Movement Count Report PM

Location ID: 5
North/South: Old River Rd
East/West: McCutchen Rd

Date: 05/17/23
City: Bakersfield, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	2	3	4	5	6	7	8	9	10	11	12	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	80	52	90	24	23	0	8	38	3	3	40	36	397
16:15	17	33	60	28	20	0	0	34	0	2	7	9	210
16:30	6	12	53	31	14	0	0	44	2	3	11	1	177
16:45	7	19	33	34	13	0	2	44	0	0	15	2	169
17:00	5	23	60	33	14	0	0	23	0	0	18	3	179
17:15	2	30	66	25	9	1	1	44	0	0	15	5	198
17:30	5	37	43	32	12	0	3	37	0	0	16	4	189
17:45	1	30	29	25	3	1	0	37	1	0	10	0	137
Total Volume:	123	236	434	232	108	2	14	301	6	8	132	60	1656
Approach %	16%	30%	55%	68%	32%	1%	4%	94%	2%	4%	66%	30%	

Peak Hr Begin:	16:00												
PHV	110	116	236	117	70	0	10	160	5	8	73	48	953
PHF	0.520			0.974			0.893			0.408			0.600

Intersection 1
Mountain Vista Dr & Panama Ln

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	324	81	65	269	51	60
Future Vol, veh/h	324	81	65	269	51	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	352	88	71	292	55	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	352	0	786	352
Stage 1	-	-	-	-	352	-
Stage 2	-	-	-	-	434	-
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	-	-	1207	-	361	692
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1207	-	336	692
Mov Cap-2 Maneuver	-	-	-	-	336	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	607	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	336	692	-	-	1207	-
HCM Lane V/C Ratio	0.165	0.094	-	-	0.059	-
HCM Control Delay (s)	17.8	10.7	-	-	8.2	0
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	324	89	82	269	55	69
Future Vol, veh/h	324	89	82	269	55	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	352	97	89	292	60	75

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	352	0	823	352
Stage 1	-	-	-	-	352	-
Stage 2	-	-	-	-	471	-
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	-	-	1207	-	343	692
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	628	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1207	-	313	692
Mov Cap-2 Maneuver	-	-	-	-	313	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	573	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	14.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	313	692	-	-	1207	-
HCM Lane V/C Ratio	0.191	0.108	-	-	0.074	-
HCM Control Delay (s)	19.2	10.8	-	-	8.2	0
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	0.4	-	-	0.2	-

Intersection	
Int Delay, s/veh	7.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	560	140	116	479	95	112
Future Vol, veh/h	560	140	116	479	95	112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	609	152	126	521	103	122

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	609	0	1382	609
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	773	-
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	-	-	970	-	159	495
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	455	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	970	-	130	495
Mov Cap-2 Maneuver	-	-	-	-	130	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	372	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	52
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	130	495	-	-	970	-
HCM Lane V/C Ratio	0.794	0.246	-	-	0.13	-
HCM Control Delay (s)	96.1	14.6	-	-	9.3	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	4.8	1	-	-	0.4	-

Intersection	
Int Delay, s/veh	10.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	560	148	133	479	99	121
Future Vol, veh/h	560	148	133	479	99	121
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	609	161	145	521	108	132

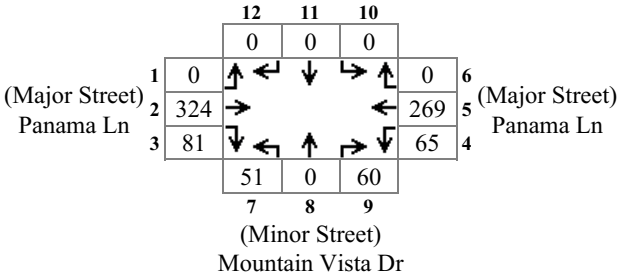
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	609	0	1419	609
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	810	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	970	-	151	495
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	438	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	970	-	119	495
Mov Cap-2 Maneuver	-	-	-	-	119	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	346	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	65.2
HCM LOS			F

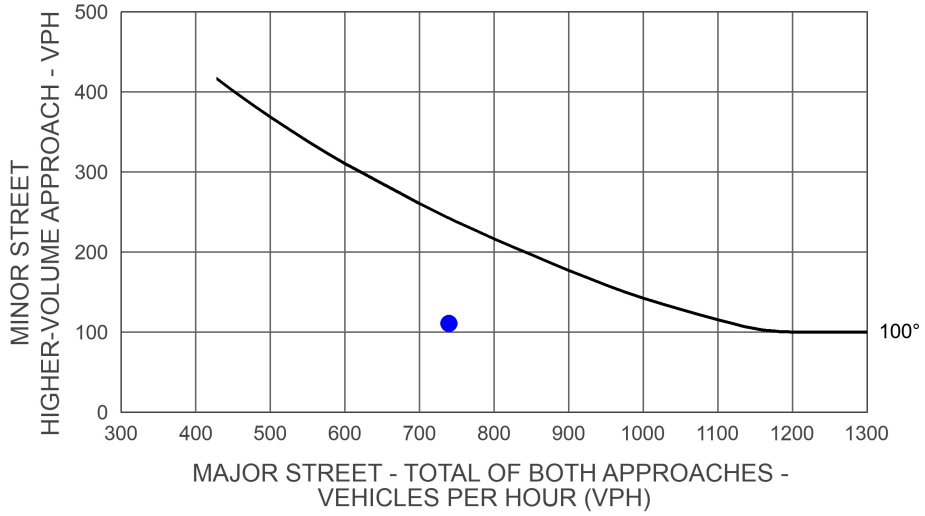
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	119	495	-	-	970	-
HCM Lane V/C Ratio	0.904	0.266	-	-	0.149	-
HCM Control Delay (s)	126.7	14.9	-	-	9.4	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	5.7	1.1	-	-	0.5	-

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 1

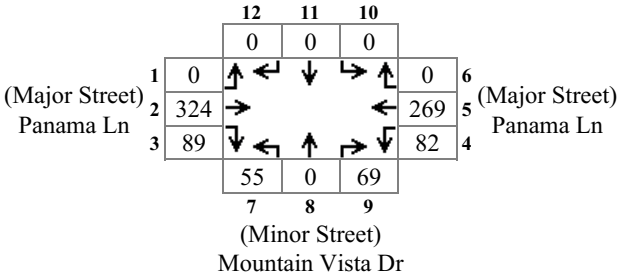


Major Total: 739
Minor High Volume: 111

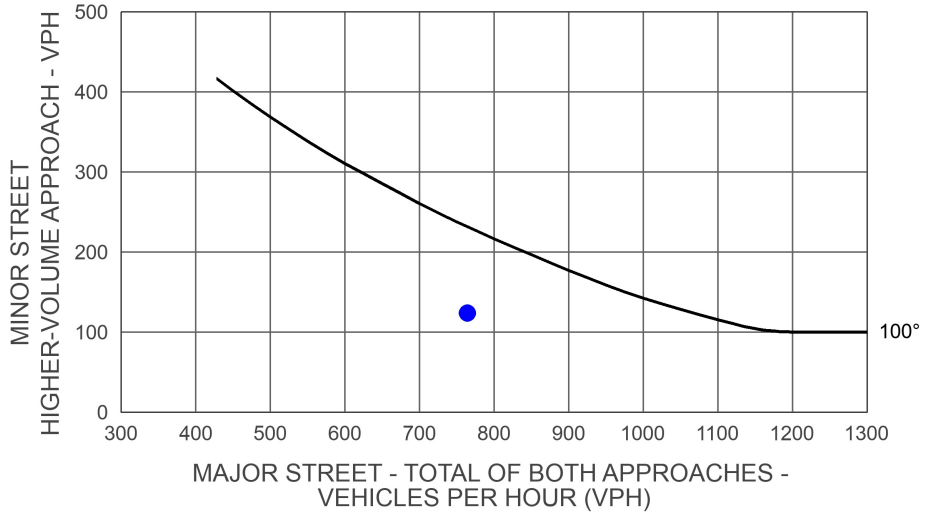


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing+Project
Intersection #: 1

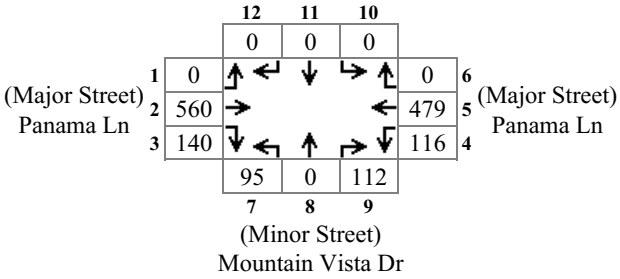


Major Total: 764
Minor High Volume: 124

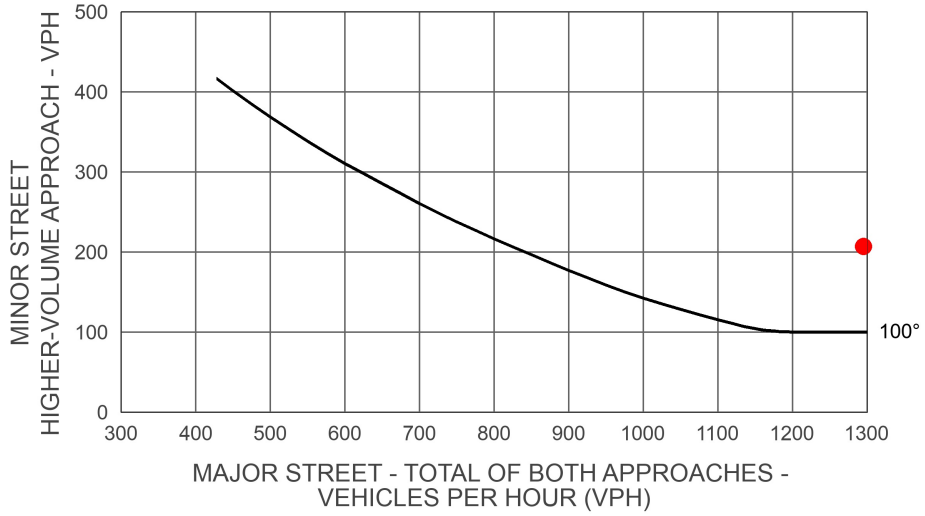


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: PM Future
Intersection #: 1

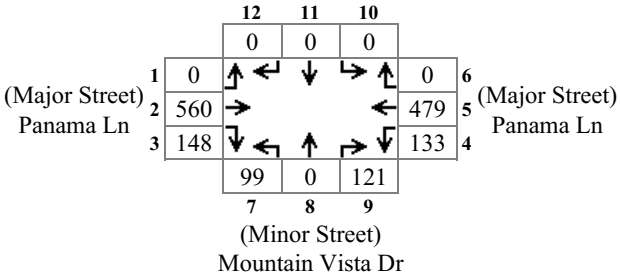


Major Total: 1295
Minor High Volume: 207

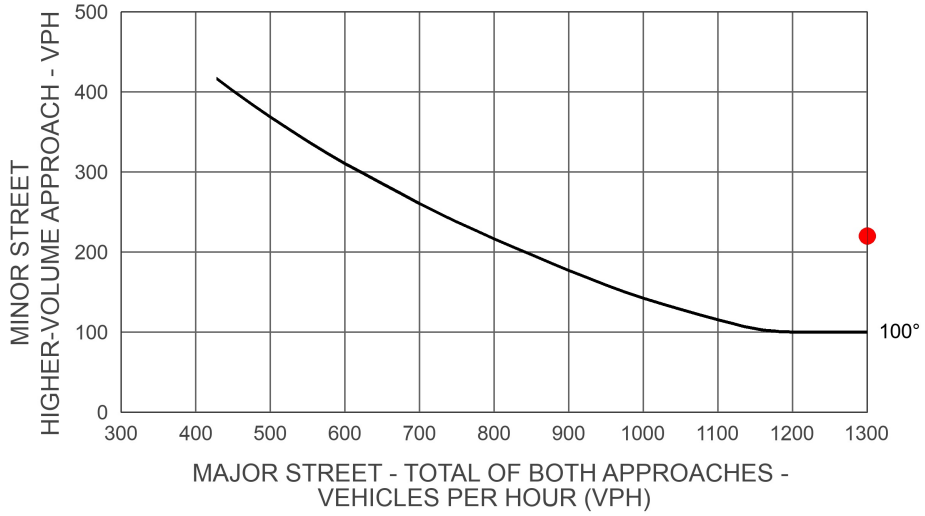


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: PM Future+Project
Intersection #: 1



Major Total: 1320
Minor High Volume: 220



Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	93	21	20	225	36	45
Future Vol, veh/h	93	21	20	225	36	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	101	23	22	245	39	49

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	101	0	389	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	288	-
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	-	-	1491	-	615	954
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	761	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1491	-	605	954
Mov Cap-2 Maneuver	-	-	-	-	605	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	748	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	605	954	-	-	1491	-
HCM Lane V/C Ratio	0.065	0.051	-	-	0.015	-
HCM Control Delay (s)	11.4	9	-	-	7.5	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	93	24	25	225	41	58
Future Vol, veh/h	93	24	25	225	41	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	101	26	27	245	45	63

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	101	0	400	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	299	-
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	-	-	1491	-	606	954
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	752	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1491	-	593	954
Mov Cap-2 Maneuver	-	-	-	-	593	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	736	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	593	954	-	-	1491	-
HCM Lane V/C Ratio	0.075	0.066	-	-	0.018	-
HCM Control Delay (s)	11.6	9	-	-	7.5	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	161	36	36	401	67	84
Future Vol, veh/h	161	36	36	401	67	84
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	175	39	39	436	73	91

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	175	0	689	175
Stage 1	-	-	-	-	175	-
Stage 2	-	-	-	-	514	-
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	-	-	1401	-	412	868
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	600	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1401	-	397	868
Mov Cap-2 Maneuver	-	-	-	-	397	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	578	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	397	868	-	-	1401	-
HCM Lane V/C Ratio	0.183	0.105	-	-	0.028	-
HCM Control Delay (s)	16.1	9.6	-	-	7.6	0
HCM Lane LOS	C	A	-	-	A	A
HCM 95th %tile Q(veh)	0.7	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	161	39	41	401	72	97
Future Vol, veh/h	161	39	41	401	72	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	175	42	45	436	78	105

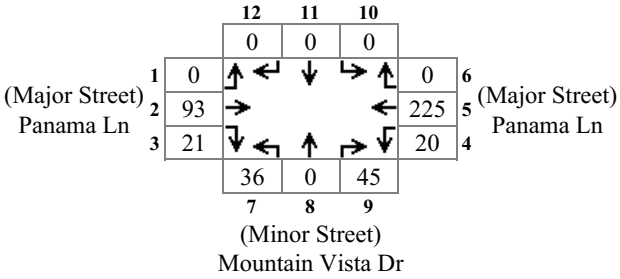
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	175	0	700	175
Stage 1	-	-	-	-	175	-
Stage 2	-	-	-	-	525	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1401	-	405	868
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	593	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1401	-	388	868
Mov Cap-2 Maneuver	-	-	-	-	388	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	568	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	12.6
HCM LOS			B

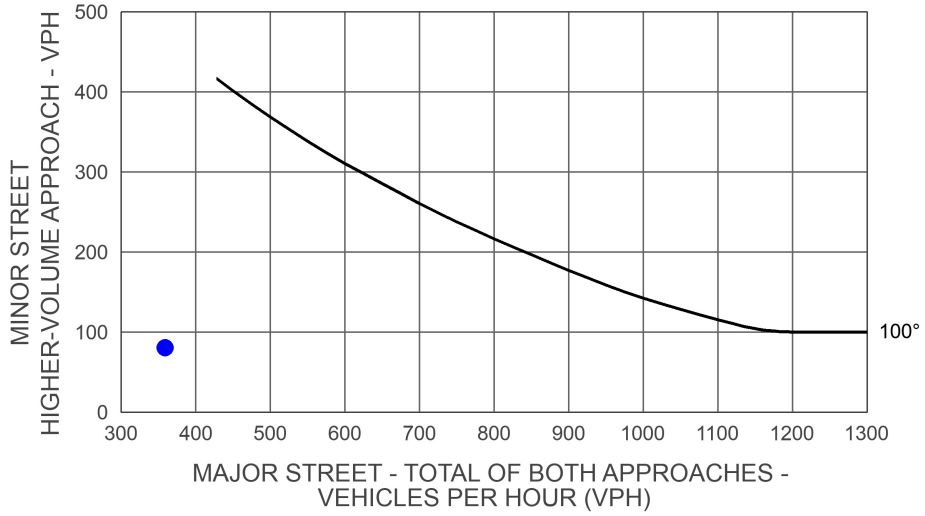
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	388	868	-	-	1401	-
HCM Lane V/C Ratio	0.202	0.121	-	-	0.032	-
HCM Control Delay (s)	16.6	9.7	-	-	7.7	0
HCM Lane LOS	C	A	-	-	A	A
HCM 95th %tile Q(veh)	0.7	0.4	-	-	0.1	-

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 1

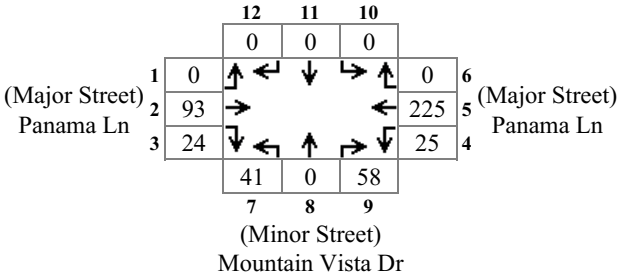


Major Total: 359
Minor High Volume: 81

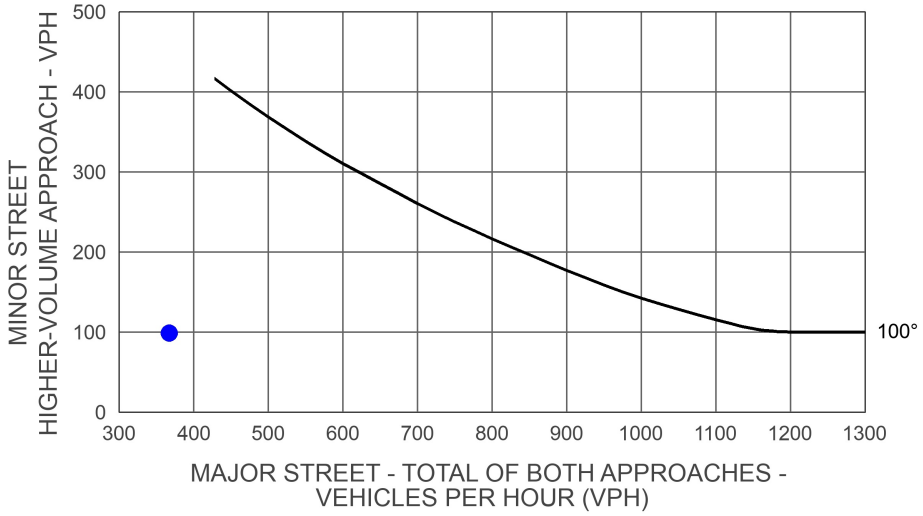


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing+Project
Intersection #: 1

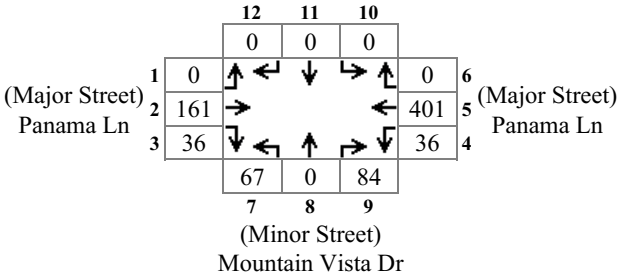


Major Total: 367
Minor High Volume: 99

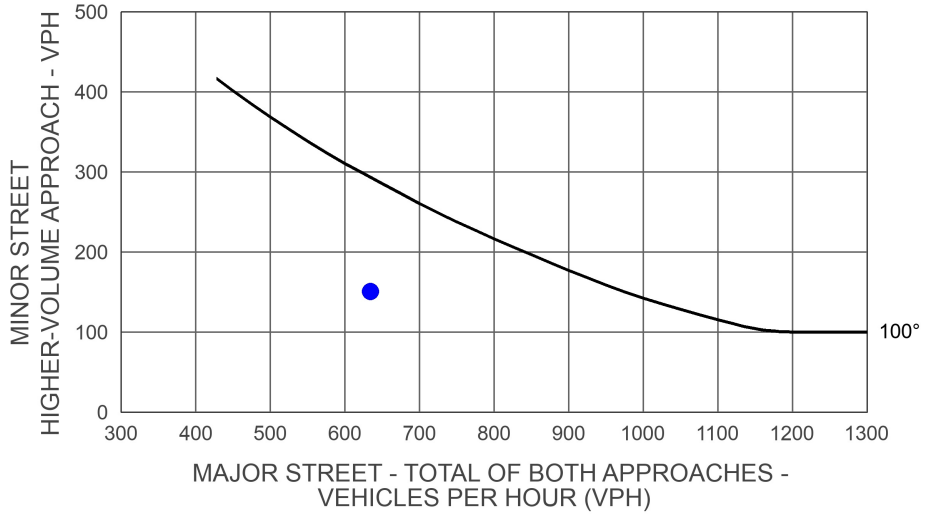


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 1

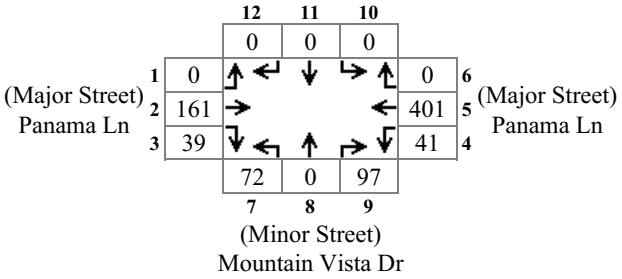


Major Total: 634
Minor High Volume: 151

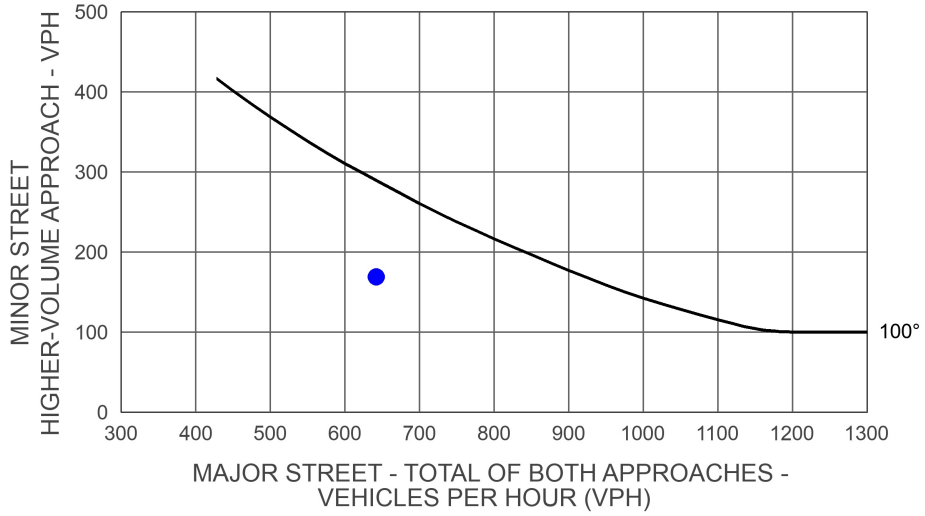


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 1



Major Total: 642
Minor High Volume: 169



Intersection 2
Mountain Vista Dr & Berkshire Rd

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	6	0	1	16	50	0	25	3	35	3	6
Future Vol, veh/h	5	6	0	1	16	50	0	25	3	35	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	7	0	1	17	54	0	27	3	38	3	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	72	0	0	7	0	0	69	91	7	80	64	45
Stage 1	-	-	-	-	-	-	17	17	-	47	47	-
Stage 2	-	-	-	-	-	-	52	74	-	33	17	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1528	-	-	1614	-	-	923	799	1075	908	827	1025
Stage 1	-	-	-	-	-	-	1002	881	-	967	856	-
Stage 2	-	-	-	-	-	-	961	833	-	983	881	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1528	-	-	1614	-	-	912	796	1075	879	824	1025
Mov Cap-2 Maneuver	-	-	-	-	-	-	912	796	-	879	824	-
Stage 1	-	-	-	-	-	-	999	878	-	964	855	-
Stage 2	-	-	-	-	-	-	950	832	-	947	878	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.3	0.1	9.6	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	819	1528	-	-	1614	-	-	879	948
HCM Lane V/C Ratio	0.037	0.004	-	-	0.001	-	-	0.043	0.01
HCM Control Delay (s)	9.6	7.4	0	-	7.2	0	-	9.3	8.8
HCM Lane LOS	A	A	A	-	A	A	-	A	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1	0

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	6	4	9	16	50	3	38	8	35	28	6
Future Vol, veh/h	5	6	4	9	16	50	3	38	8	35	28	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	7	4	10	17	54	3	41	9	38	30	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	72	0	0	11	0	0	103	111	9	109	86	45
Stage 1	-	-	-	-	-	-	20	20	-	64	64	-
Stage 2	-	-	-	-	-	-	83	91	-	45	22	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1528	-	-	1608	-	-	877	779	1073	870	804	1025
Stage 1	-	-	-	-	-	-	999	879	-	947	842	-
Stage 2	-	-	-	-	-	-	925	820	-	969	877	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1528	-	-	1608	-	-	840	771	1073	821	796	1025
Mov Cap-2 Maneuver	-	-	-	-	-	-	840	771	-	821	796	-
Stage 1	-	-	-	-	-	-	996	876	-	944	836	-
Stage 2	-	-	-	-	-	-	879	814	-	913	874	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	0.9	9.7	9.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	812	1528	-	-	1608	-	-	821	829
HCM Lane V/C Ratio	0.066	0.004	-	-	0.006	-	-	0.046	0.045
HCM Control Delay (s)	9.7	7.4	0	-	7.3	0	-	9.6	9.5
HCM Lane LOS	A	A	A	-	A	A	-	A	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1	0.1

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	8	9	0	2	25	78	0	46	6	65	6	11
Future Vol, veh/h	8	9	0	2	25	78	0	46	6	65	6	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	10	0	2	27	85	0	50	7	71	7	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	112	0	0	10	0	0	110	143	10	129	101	70
Stage 1	-	-	-	-	-	-	27	27	-	74	74	-
Stage 2	-	-	-	-	-	-	83	116	-	55	27	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1478	-	-	1610	-	-	868	748	1071	844	789	993
Stage 1	-	-	-	-	-	-	990	873	-	935	833	-
Stage 2	-	-	-	-	-	-	925	800	-	957	873	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1478	-	-	1610	-	-	848	743	1071	792	783	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	848	743	-	792	783	-
Stage 1	-	-	-	-	-	-	984	868	-	929	832	-
Stage 2	-	-	-	-	-	-	906	799	-	891	868	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0.1	10	9.8
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	770	1478	-	-	1610	-	-	792	907
HCM Lane V/C Ratio	0.073	0.006	-	-	0.001	-	-	0.089	0.02
HCM Control Delay (s)	10	7.5	0	-	7.2	0	-	10	9.1
HCM Lane LOS	B	A	A	-	A	A	-	B	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.3	0.1

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	8	9	4	10	25	78	3	59	11	65	31	11
Future Vol, veh/h	8	9	4	10	25	78	3	59	11	65	31	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	10	4	11	27	85	3	64	12	71	34	12

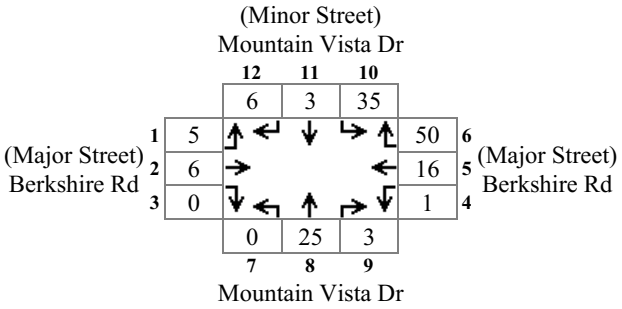
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	112	0	0	14	0	0	143	163	12	158	123	70
Stage 1	-	-	-	-	-	-	29	29	-	91	91	-
Stage 2	-	-	-	-	-	-	114	134	-	67	32	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1478	-	-	1604	-	-	826	729	1069	808	767	993
Stage 1	-	-	-	-	-	-	988	871	-	916	820	-
Stage 2	-	-	-	-	-	-	891	785	-	943	868	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1478	-	-	1604	-	-	781	720	1069	737	757	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	781	720	-	737	757	-
Stage 1	-	-	-	-	-	-	982	866	-	911	814	-
Stage 2	-	-	-	-	-	-	838	780	-	858	863	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	0.6	10.3	10.1
HCM LOS			B	B

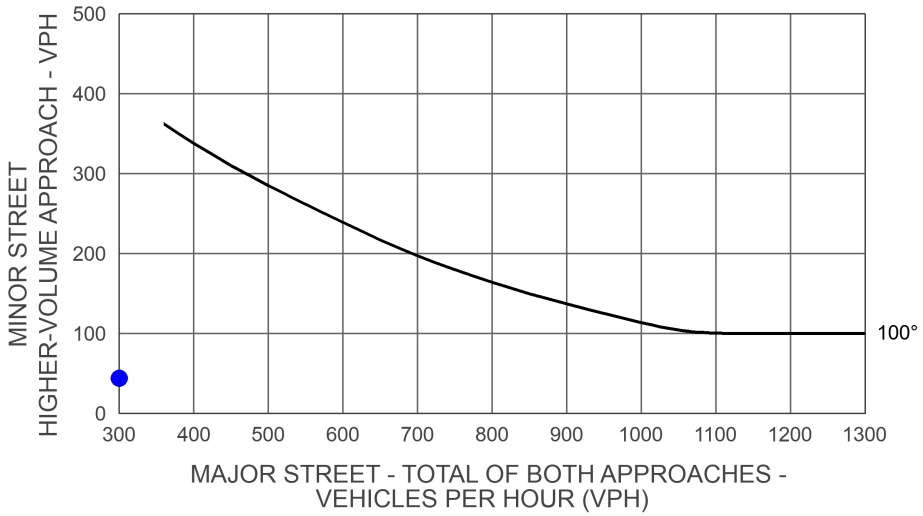
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	760	1478	-	-	1604	-	-	737	807
HCM Lane V/C Ratio	0.104	0.006	-	-	0.007	-	-	0.096	0.057
HCM Control Delay (s)	10.3	7.5	0	-	7.3	0	-	10.4	9.7
HCM Lane LOS	B	A	A	-	A	A	-	B	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3	0.2

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 2

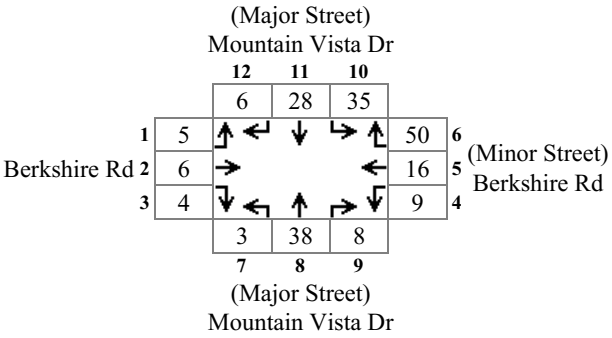


Major Total: 78
Minor High Volume: 44

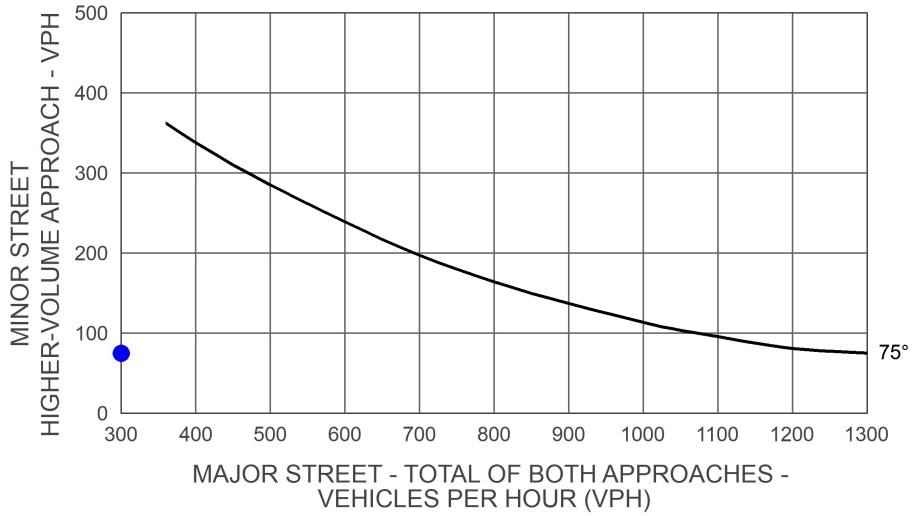


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing+Project
Intersection #: 2

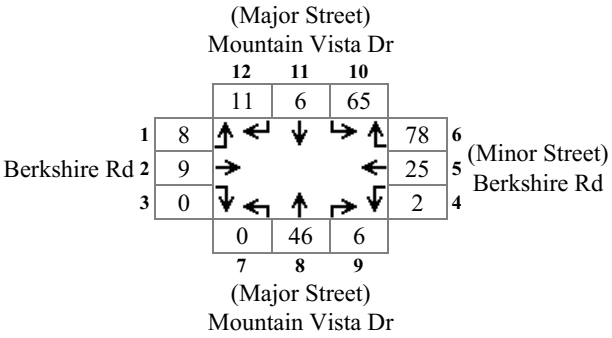


Major Total: 118
Minor High Volume: 75

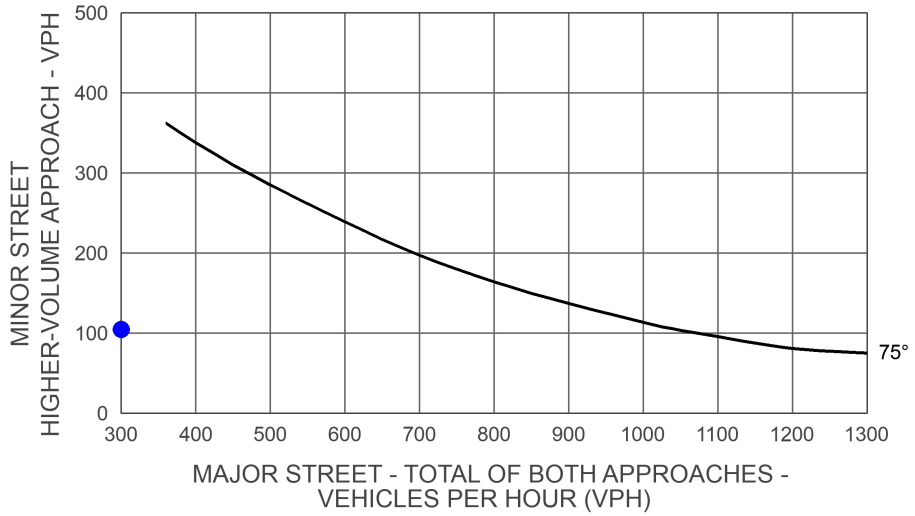


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 2

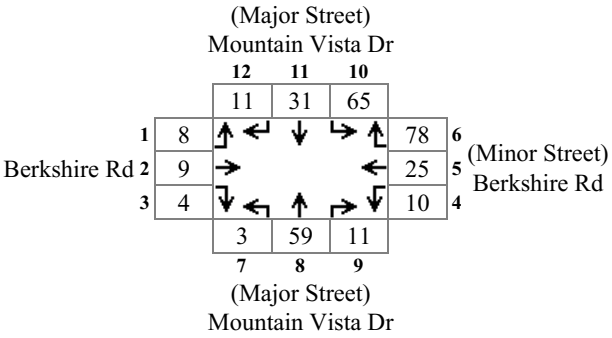


Major Total: 134
Minor High Volume: 105

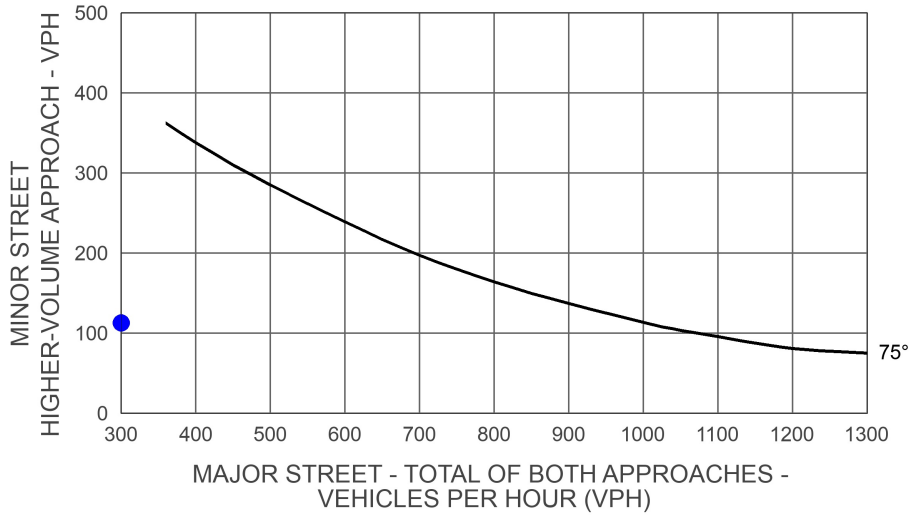


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 2



Major Total: 180
Minor High Volume: 113



Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	11	0	2	3	5	0	3	0	20	2	2
Future Vol, veh/h	5	11	0	2	3	5	0	3	0	20	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	12	0	2	3	5	0	3	0	22	2	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	9	0	0	12	0	0	36	36	12	34	33	6
Stage 1	-	-	-	-	-	-	23	23	-	10	10	-
Stage 2	-	-	-	-	-	-	13	13	-	24	23	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1611	-	-	1607	-	-	970	856	1069	973	860	1077
Stage 1	-	-	-	-	-	-	995	876	-	1011	887	-
Stage 2	-	-	-	-	-	-	1007	885	-	994	876	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1611	-	-	1607	-	-	963	853	1069	967	857	1077
Mov Cap-2 Maneuver	-	-	-	-	-	-	963	853	-	967	857	-
Stage 1	-	-	-	-	-	-	992	873	-	1008	886	-
Stage 2	-	-	-	-	-	-	1001	884	-	987	873	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	1.4	9.2	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	853	1611	-	-	1607	-	-	967	954
HCM Lane V/C Ratio	0.004	0.003	-	-	0.001	-	-	0.022	0.005
HCM Control Delay (s)	9.2	7.2	0	-	7.2	0	-	8.8	8.8
HCM Lane LOS	A	A	A	-	A	A	-	A	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1	0

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	11	2	5	3	5	4	21	7	20	10	2
Future Vol, veh/h	5	11	2	5	3	5	4	21	7	20	10	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	12	2	5	3	5	4	23	8	22	11	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	9	0	0	14	0	0	47	44	13	56	42	6
Stage 1	-	-	-	-	-	-	24	24	-	17	17	-
Stage 2	-	-	-	-	-	-	23	20	-	39	25	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1611	-	-	1604	-	-	954	848	1067	941	850	1077
Stage 1	-	-	-	-	-	-	994	875	-	1002	881	-
Stage 2	-	-	-	-	-	-	995	879	-	976	874	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1611	-	-	1604	-	-	938	843	1067	911	845	1077
Mov Cap-2 Maneuver	-	-	-	-	-	-	938	843	-	911	845	-
Stage 1	-	-	-	-	-	-	991	872	-	999	878	-
Stage 2	-	-	-	-	-	-	978	876	-	941	871	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	2.8	9.2	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	895	1611	-	-	1604	-	-	911	876
HCM Lane V/C Ratio	0.039	0.003	-	-	0.003	-	-	0.024	0.015
HCM Control Delay (s)	9.2	7.2	0	-	7.3	0	-	9	9.2
HCM Lane LOS	A	A	A	-	A	A	-	A	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1	0

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	8	17	0	3	5	8	0	6	0	37	4	4
Future Vol, veh/h	8	17	0	3	5	8	0	6	0	37	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	18	0	3	5	9	0	7	0	40	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	14	0	0	18	0	0	57	57	18	55	52	10
Stage 1	-	-	-	-	-	-	36	36	-	16	16	-
Stage 2	-	-	-	-	-	-	21	21	-	39	36	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1604	-	-	1599	-	-	940	834	1061	943	839	1071
Stage 1	-	-	-	-	-	-	980	865	-	1004	882	-
Stage 2	-	-	-	-	-	-	998	878	-	976	865	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1604	-	-	1599	-	-	927	827	1061	932	832	1071
Mov Cap-2 Maneuver	-	-	-	-	-	-	927	827	-	932	832	-
Stage 1	-	-	-	-	-	-	974	860	-	998	880	-
Stage 2	-	-	-	-	-	-	987	876	-	963	860	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	1.4	9.4	9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	827	1604	-	-	1599	-	-	932	936
HCM Lane V/C Ratio	0.008	0.005	-	-	0.002	-	-	0.043	0.009
HCM Control Delay (s)	9.4	7.3	0	-	7.3	0	-	9	8.9
HCM Lane LOS	A	A	A	-	A	A	-	A	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1	0

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	8	17	2	6	5	8	4	24	7	37	12	4
Future Vol, veh/h	8	17	2	6	5	8	4	24	7	37	12	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	18	2	7	5	9	4	26	8	40	13	4

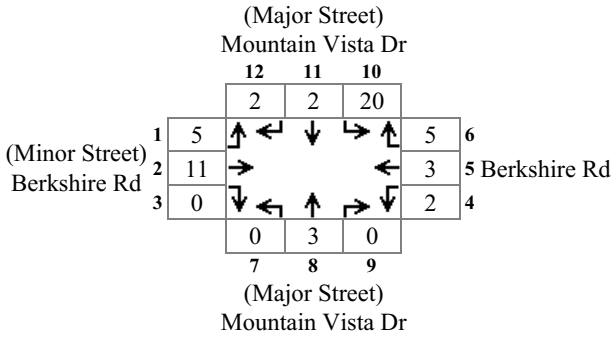
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	14	0	0	21	0	0	69	64	20	77	61	10
Stage 1	-	-	-	-	-	-	37	37	-	23	23	-
Stage 2	-	-	-	-	-	-	32	27	-	54	38	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1604	-	-	1595	-	-	923	827	1058	912	830	1071
Stage 1	-	-	-	-	-	-	978	864	-	995	876	-
Stage 2	-	-	-	-	-	-	984	873	-	958	863	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1604	-	-	1595	-	-	901	819	1058	877	822	1071
Mov Cap-2 Maneuver	-	-	-	-	-	-	901	819	-	877	822	-
Stage 1	-	-	-	-	-	-	972	859	-	989	872	-
Stage 2	-	-	-	-	-	-	961	870	-	917	858	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.2	2.3	9.3	9.3
HCM LOS			A	A

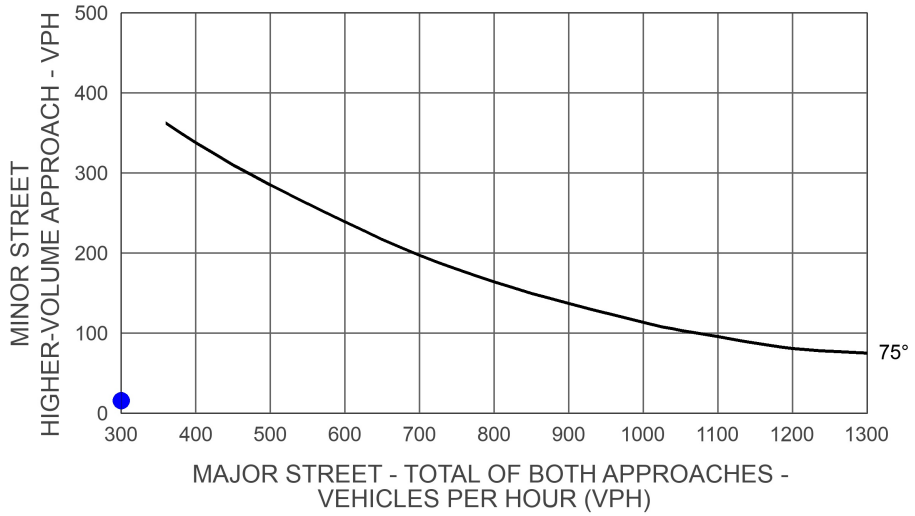
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	867	1604	-	-	1595	-	-	877	873
HCM Lane V/C Ratio	0.044	0.005	-	-	0.004	-	-	0.046	0.02
HCM Control Delay (s)	9.3	7.3	0	-	7.3	0	-	9.3	9.2
HCM Lane LOS	A	A	A	-	A	A	-	A	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1	0.1

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 2

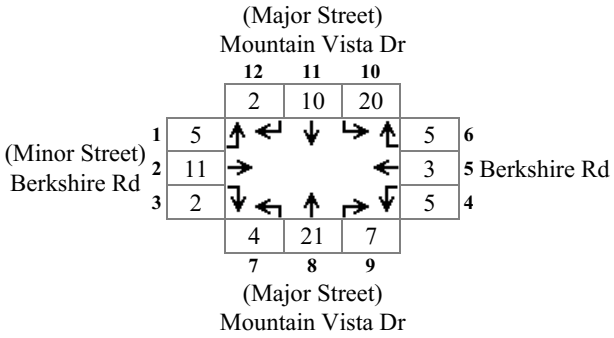


Major Total: 27
Minor High Volume: 16

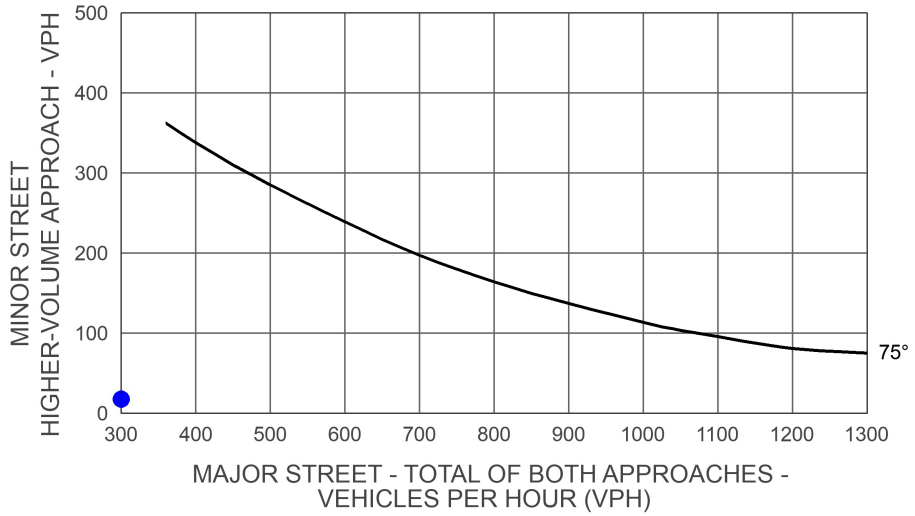


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing+Project
Intersection #: 2

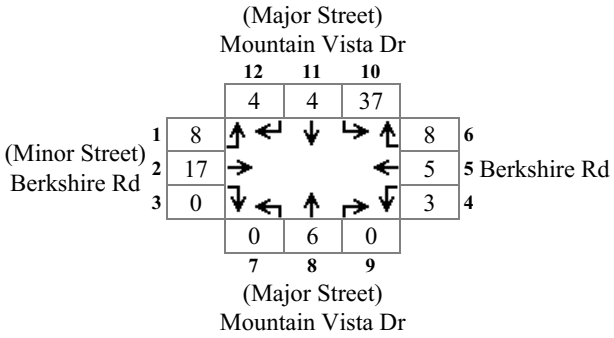


Major Total: 64
Minor High Volume: 18

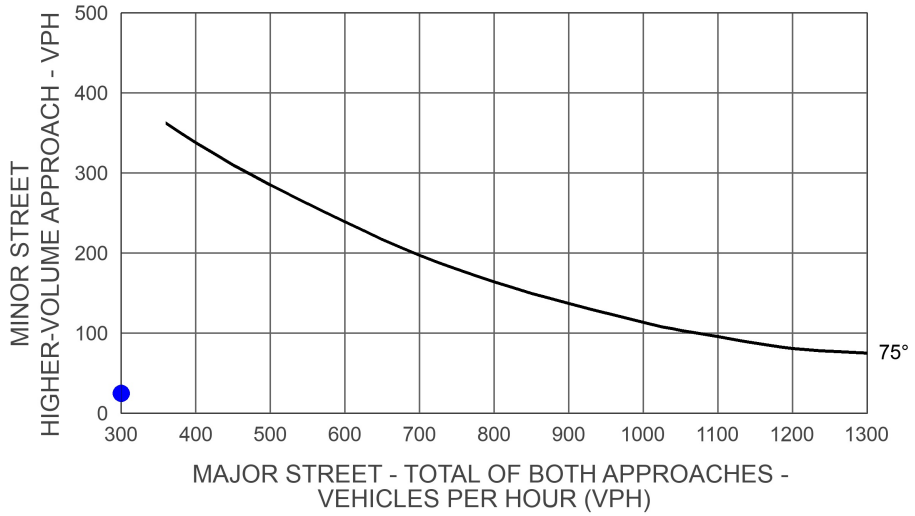


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 2

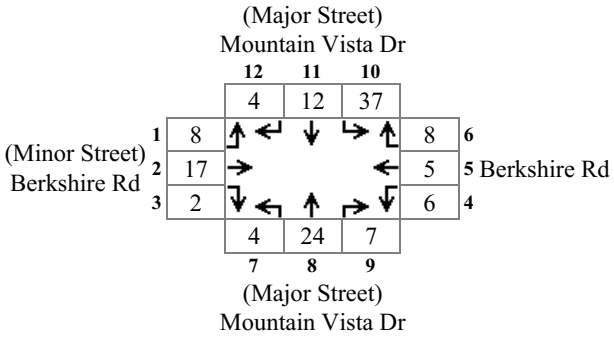


Major Total: 51
Minor High Volume: 25

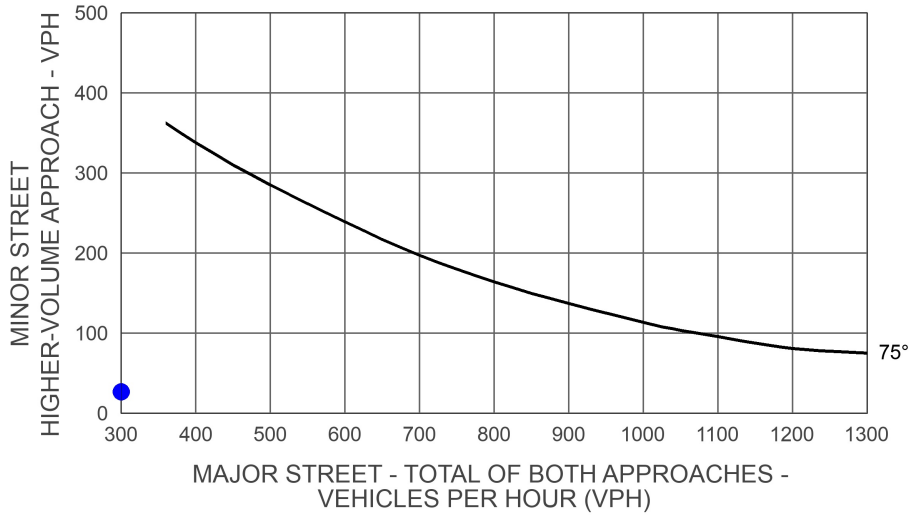


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 2



Major Total: 88
Minor High Volume: 27



Intersection 3
Buena Vista Rd & McCutchen Rd

Intersection	
Int Delay, s/veh	5.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	221	173	2	77	113
Future Vol, veh/h	0	221	173	2	77	113
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	240	188	2	84	123

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	479	189	0	0	190	0
Stage 1	189	-	-	-	-	-
Stage 2	290	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	545	853	-	-	1384	-
Stage 1	843	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	510	853	-	-	1384	-
Mov Cap-2 Maneuver	510	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	710	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	3.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	853	1384	-
HCM Lane V/C Ratio	-	-	0.282	0.06	-
HCM Control Delay (s)	-	-	10.9	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.2	-

Intersection	
Int Delay, s/veh	5.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	3	231	173	8	93	113
Future Vol, veh/h	3	231	173	8	93	113
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	251	188	9	101	123

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	517	192	0	0	197	0
Stage 1	192	-	-	-	-	-
Stage 2	325	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	518	850	-	-	1376	-
Stage 1	841	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	477	850	-	-	1376	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	3.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	842	1376	-
HCM Lane V/C Ratio	-	-	0.302	0.073	-
HCM Control Delay (s)	-	-	11.1	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0.2	-

Intersection	
Int Delay, s/veh	7.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	372	322	4	143	210
Future Vol, veh/h	0	372	322	4	143	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	404	350	4	155	228

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	891	352	0	0	354	0
Stage 1	352	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	313	692	-	-	1205	-
Stage 1	712	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	267	692	-	-	1205	-
Mov Cap-2 Maneuver	267	-	-	-	-	-
Stage 1	712	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.3	0	3.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	692	1205	-
HCM Lane V/C Ratio	-	-	0.584	0.129	-
HCM Control Delay (s)	-	-	17.3	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	3.8	0.4	-

Intersection	
Int Delay, s/veh	7.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	3	382	322	10	159	210
Future Vol, veh/h	3	382	322	10	159	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	415	350	11	173	228

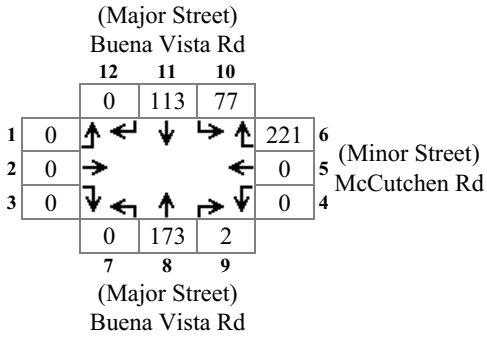
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	929	355	0	0	361	0
Stage 1	355	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	297	689	-	-	1198	-
Stage 1	710	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	248	689	-	-	1198	-
Mov Cap-2 Maneuver	248	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	470	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.4	0	3.7
HCM LOS	C		

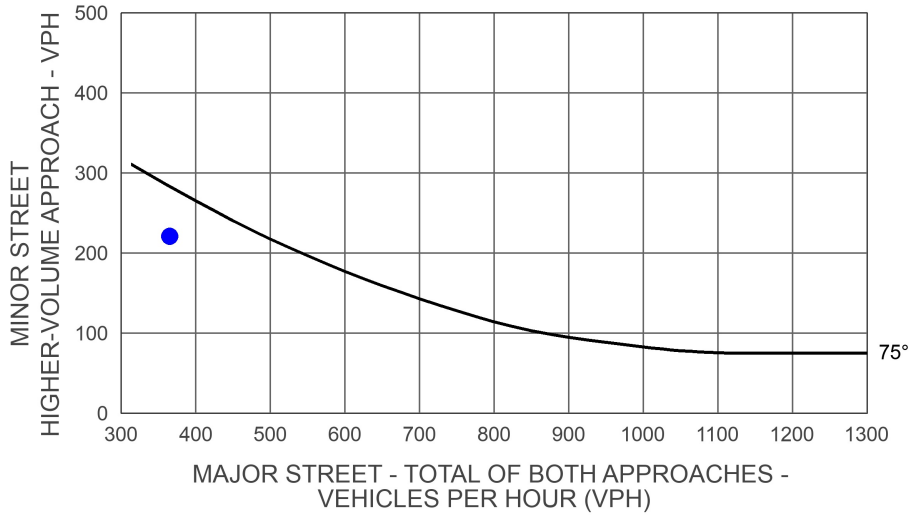
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	680	1198	-
HCM Lane V/C Ratio	-	-	0.615	0.144	-
HCM Control Delay (s)	-	-	18.4	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	4.2	0.5	-

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 3

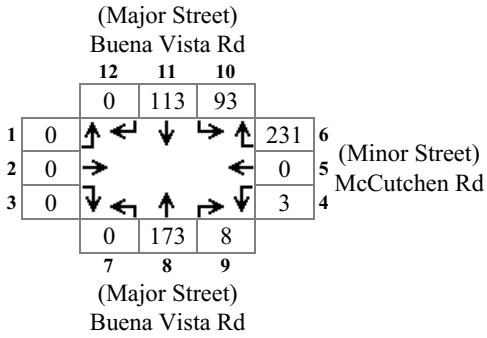


Major Total: 365
Minor High Volume: 221

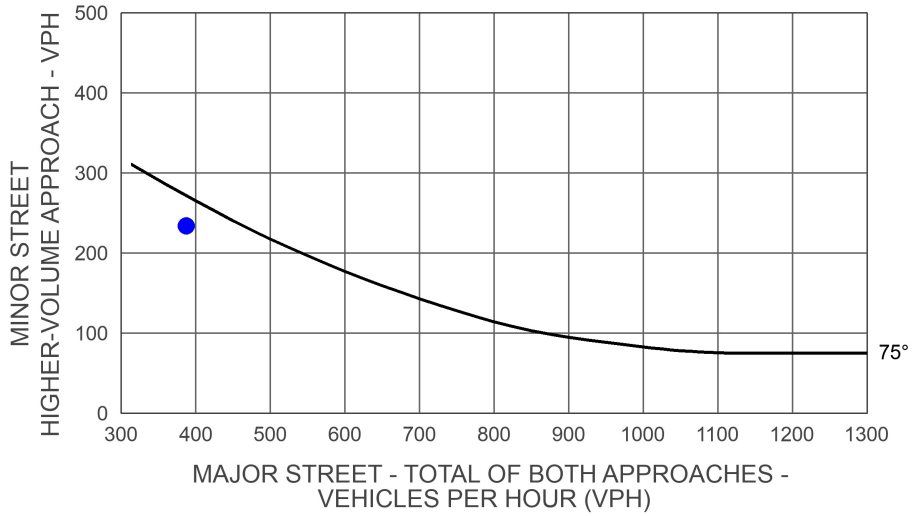


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing+Project
Intersection #: 3

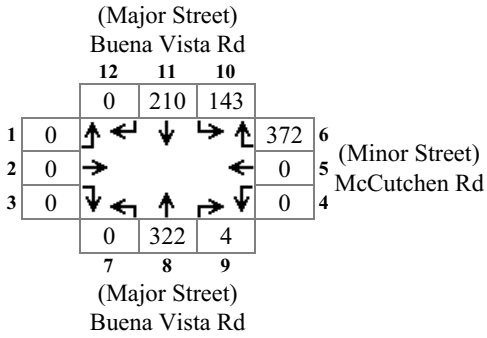


Major Total: 387
Minor High Volume: 234

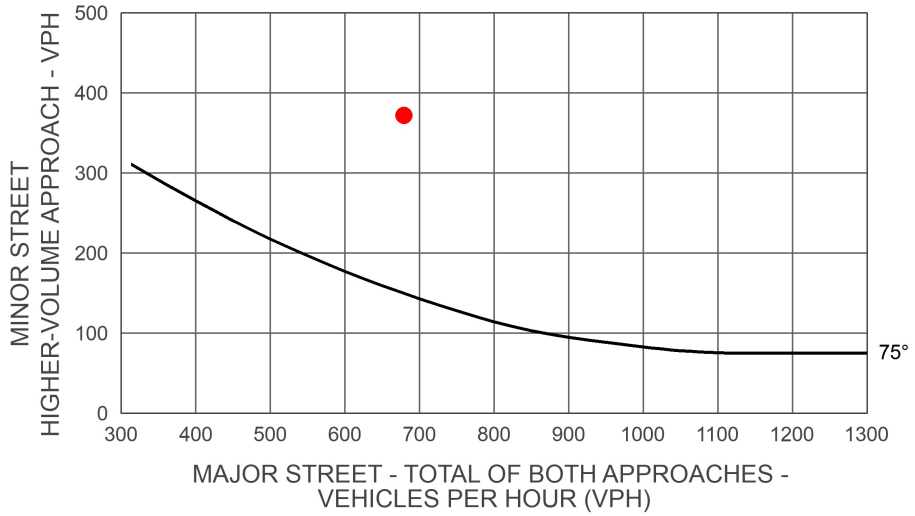


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: PM Future
Intersection #: 3

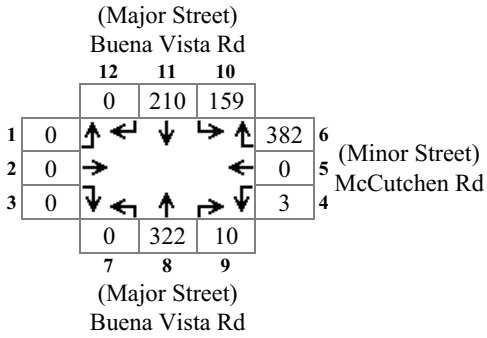


Major Total: 679
Minor High Volume: 372

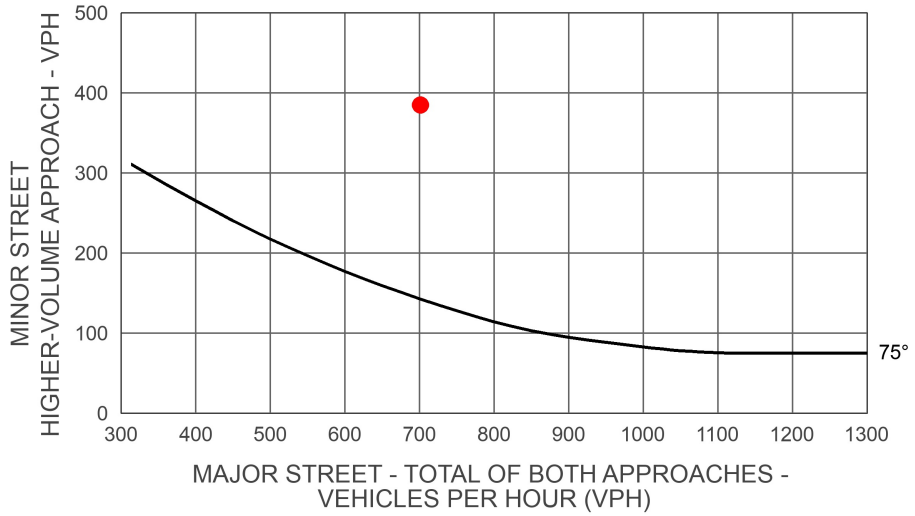


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: PM Future+Project
Intersection #: 3



Major Total: 701
Minor High Volume: 385



Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	5	21	64	0	23	128
Future Vol, veh/h	5	21	64	0	23	128
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	23	70	0	25	139

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	259	70	0	0	70	0
Stage 1	70	-	-	-	-	-
Stage 2	189	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	730	993	-	-	1531	-
Stage 1	953	-	-	-	-	-
Stage 2	843	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	717	993	-	-	1531	-
Mov Cap-2 Maneuver	717	-	-	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	828	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	1.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	925	1531	-
HCM Lane V/C Ratio	-	-	0.031	0.016	-
HCM Control Delay (s)	-	-	9	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	9	36	64	2	28	128
Future Vol, veh/h	9	36	64	2	28	128
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	39	70	2	30	139

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	271	71	0	0	72	0
Stage 1	71	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	718	991	-	-	1528	-
Stage 1	952	-	-	-	-	-
Stage 2	834	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	703	991	-	-	1528	-
Mov Cap-2 Maneuver	703	-	-	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	816	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	1.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	916	1528	-
HCM Lane V/C Ratio	-	-	0.053	0.02	-
HCM Control Delay (s)	-	-	9.2	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	8	35	119	0	43	238
Future Vol, veh/h	8	35	119	0	43	238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	38	129	0	47	259

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	481	129	0	0	129	0
Stage 1	129	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	544	921	-	-	1457	-
Stage 1	897	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	523	921	-	-	1457	-
Mov Cap-2 Maneuver	523	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	685	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	807	1457	-
HCM Lane V/C Ratio	-	-	0.058	0.032	-
HCM Control Delay (s)	-	-	9.7	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	12	50	119	2	48	238
Future Vol, veh/h	12	50	119	2	48	238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	54	129	2	52	259

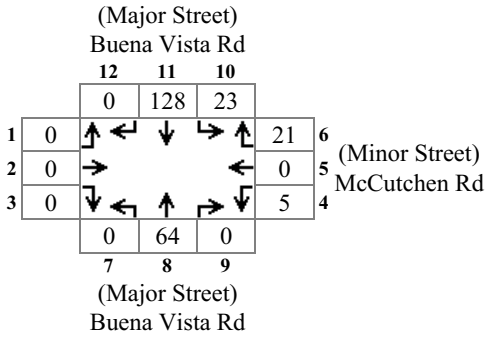
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	493	130	0	0	132	0
Stage 1	130	-	-	-	-	-
Stage 2	363	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	535	920	-	-	1453	-
Stage 1	896	-	-	-	-	-
Stage 2	704	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	513	920	-	-	1453	-
Mov Cap-2 Maneuver	513	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	1.3
HCM LOS	A		

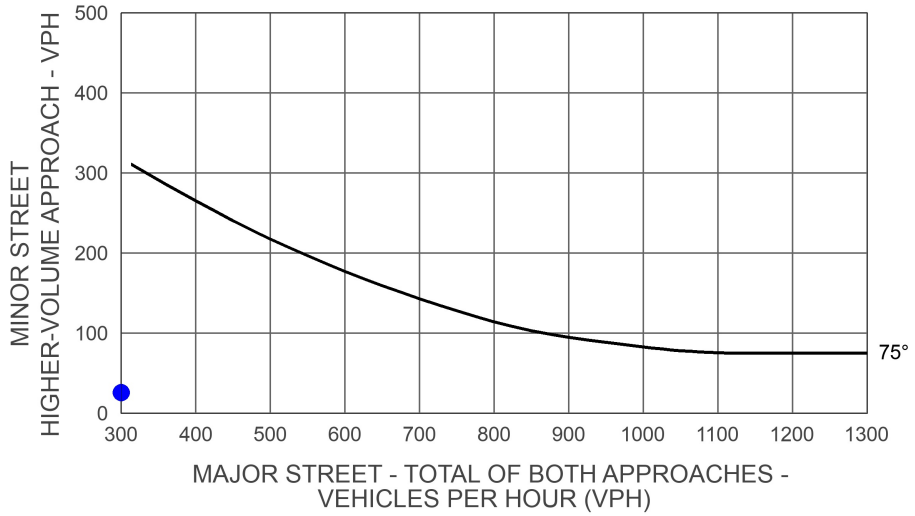
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	798	1453	-
HCM Lane V/C Ratio	-	-	0.084	0.036	-
HCM Control Delay (s)	-	-	9.9	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 3

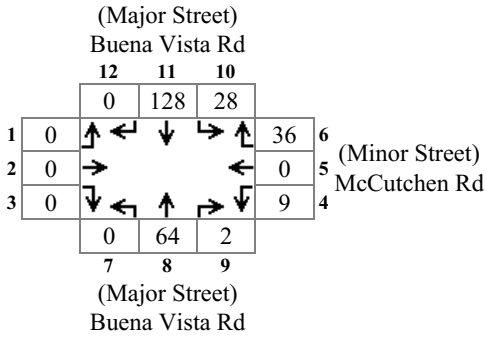


Major Total: 215
Minor High Volume: 26

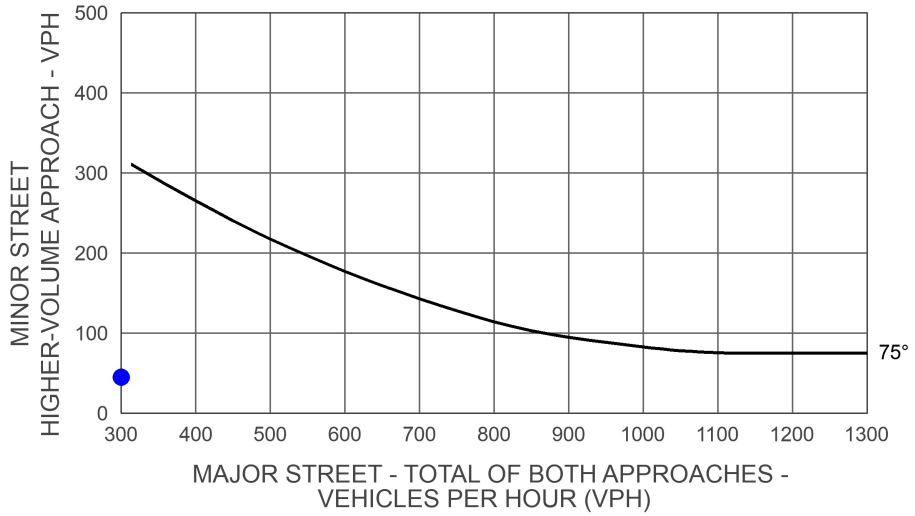


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing+Project
Intersection #: 3

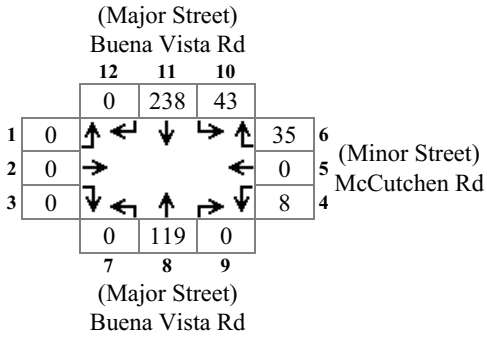


Major Total: 222
Minor High Volume: 45

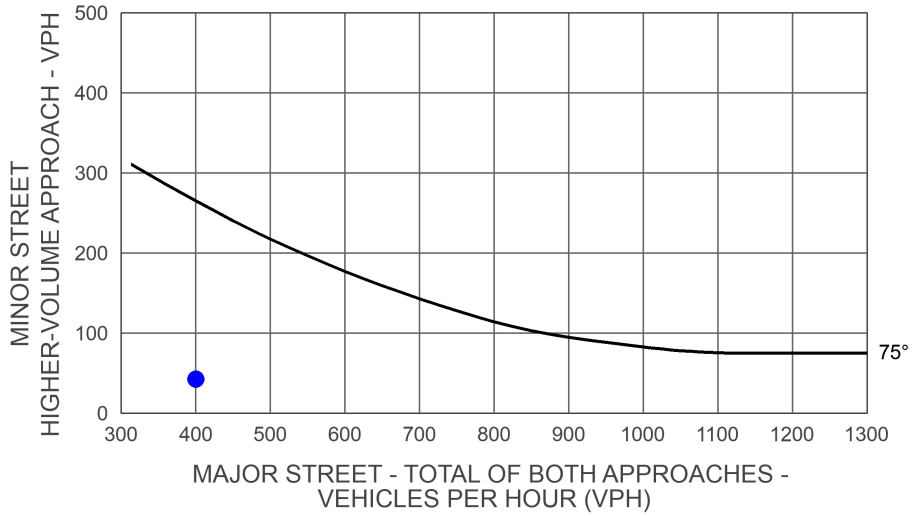


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 3

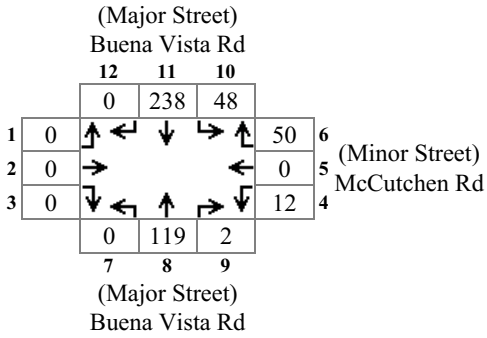


Major Total: 400
Minor High Volume: 43

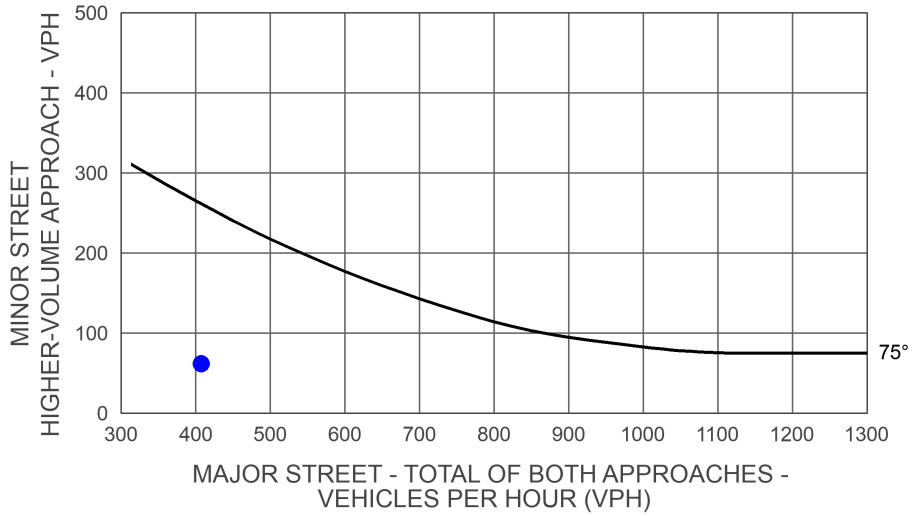


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 3



Major Total: 407
Minor High Volume: 62



Intersection 4
Mountain Vista Dr & McCutchen Rd

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	65	0	4	204	0	0	0	0	0	0	0
Future Vol, veh/h	0	65	0	4	204	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	71	0	4	222	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	222	0	0	71	0	0	301	301	71	301	301	222
Stage 1	-	-	-	-	-	-	71	71	-	230	230	-
Stage 2	-	-	-	-	-	-	230	230	-	71	71	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1347	-	-	1529	-	-	651	612	991	651	612	818
Stage 1	-	-	-	-	-	-	939	836	-	773	714	-
Stage 2	-	-	-	-	-	-	773	714	-	939	836	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1347	-	-	1529	-	-	650	610	991	650	610	818
Mov Cap-2 Maneuver	-	-	-	-	-	-	650	610	-	650	610	-
Stage 1	-	-	-	-	-	-	939	836	-	773	712	-
Stage 2	-	-	-	-	-	-	771	712	-	939	836	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1347	-	-	1529	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.003	-	-	-
HCM Control Delay (s)	0	0	-	-	7.4	0	-	0
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	22	65	0	4	204	26	0	0	0	16	0	13
Future Vol, veh/h	22	65	0	4	204	26	0	0	0	16	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	71	0	4	222	28	0	0	0	17	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	250	0	0	71	0	0	370	377	71	363	363	236
Stage 1	-	-	-	-	-	-	118	118	-	245	245	-
Stage 2	-	-	-	-	-	-	252	259	-	118	118	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1316	-	-	1529	-	-	587	555	991	593	565	803
Stage 1	-	-	-	-	-	-	887	798	-	759	703	-
Stage 2	-	-	-	-	-	-	752	694	-	887	798	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1316	-	-	1529	-	-	567	543	991	583	553	803
Mov Cap-2 Maneuver	-	-	-	-	-	-	567	543	-	583	553	-
Stage 1	-	-	-	-	-	-	870	783	-	745	701	-
Stage 2	-	-	-	-	-	-	737	692	-	870	783	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	0.1	0	10.7
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1316	-	-	1529	-	-	665
HCM Lane V/C Ratio	-	0.018	-	-	0.003	-	-	0.047
HCM Control Delay (s)	0	7.8	0	-	7.4	0	-	10.7
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	109	0	7	344	0	0	0	0	0	0	0
Future Vol, veh/h	0	109	0	7	344	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	118	0	8	374	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	374	0	0	118	0	0	507	507	118	507	507	374
Stage 1	-	-	-	-	-	-	118	118	-	389	389	-
Stage 2	-	-	-	-	-	-	389	389	-	118	118	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1184	-	-	1470	-	-	476	468	934	476	468	672
Stage 1	-	-	-	-	-	-	887	798	-	635	608	-
Stage 2	-	-	-	-	-	-	635	608	-	887	798	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1184	-	-	1470	-	-	473	465	934	473	465	672
Mov Cap-2 Maneuver	-	-	-	-	-	-	473	465	-	473	465	-
Stage 1	-	-	-	-	-	-	887	798	-	635	604	-
Stage 2	-	-	-	-	-	-	631	604	-	887	798	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1184	-	-	1470	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.005	-	-	-
HCM Control Delay (s)	0	0	-	-	7.5	0	-	0
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	22	109	0	7	344	26	0	0	0	16	0	13
Future Vol, veh/h	22	109	0	7	344	26	0	0	0	16	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	118	0	8	374	28	0	0	0	17	0	14

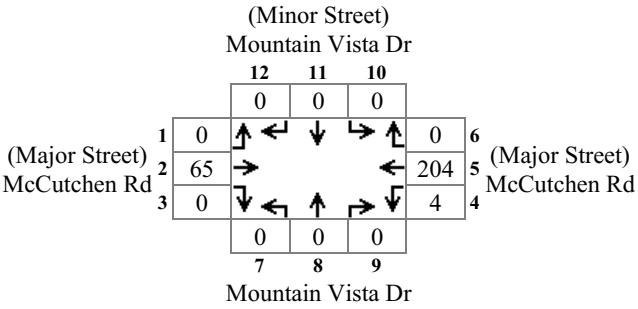
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	402	0	0	118	0	0	576	583	118	569	569	388
Stage 1	-	-	-	-	-	-	166	166	-	403	403	-
Stage 2	-	-	-	-	-	-	410	417	-	166	166	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1157	-	-	1470	-	-	428	424	934	433	432	660
Stage 1	-	-	-	-	-	-	836	761	-	624	600	-
Stage 2	-	-	-	-	-	-	619	591	-	836	761	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1157	-	-	1470	-	-	410	412	934	423	420	660
Mov Cap-2 Maneuver	-	-	-	-	-	-	410	412	-	423	420	-
Stage 1	-	-	-	-	-	-	818	744	-	610	596	-
Stage 2	-	-	-	-	-	-	602	587	-	818	744	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.1	0	12.6
HCM LOS			A	B

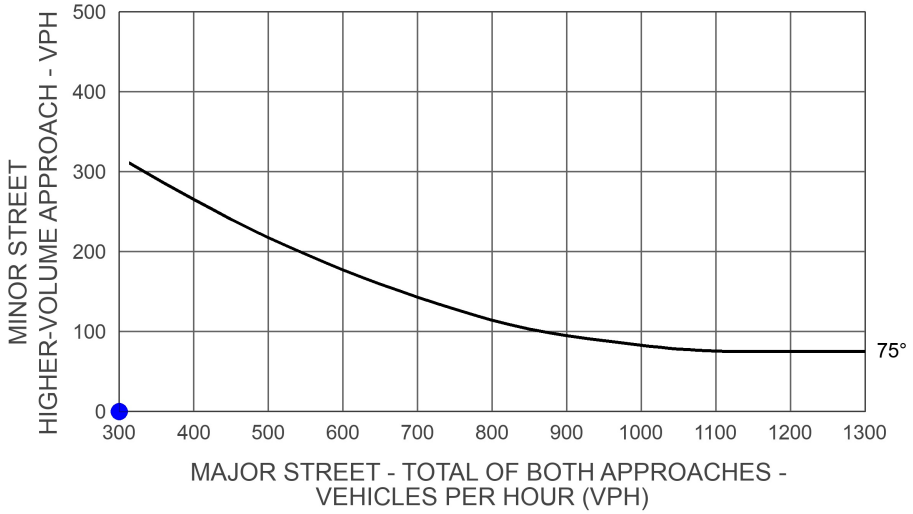
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1157	-	-	1470	-	-	504
HCM Lane V/C Ratio	-	0.021	-	-	0.005	-	-	0.063
HCM Control Delay (s)	0	8.2	0	-	7.5	0	-	12.6
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.2

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 4

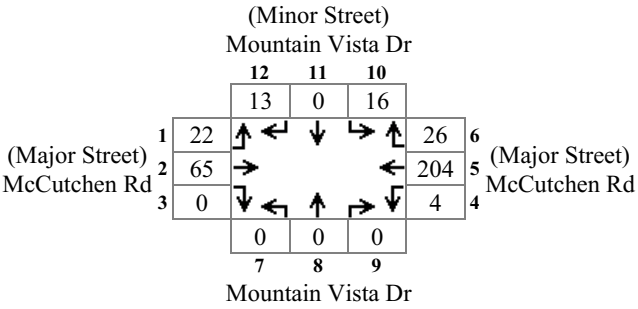


Major Total: 273
Minor High Volume: 0

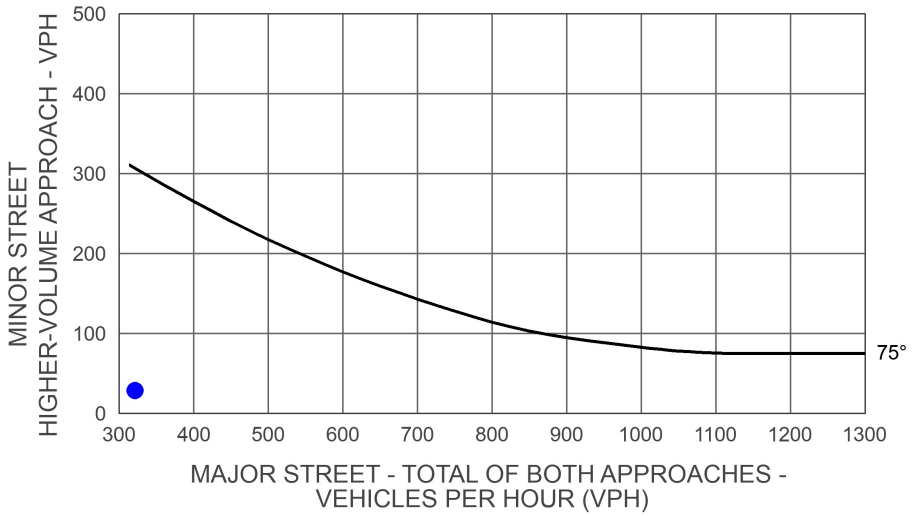


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing+Project
Intersection #: 4

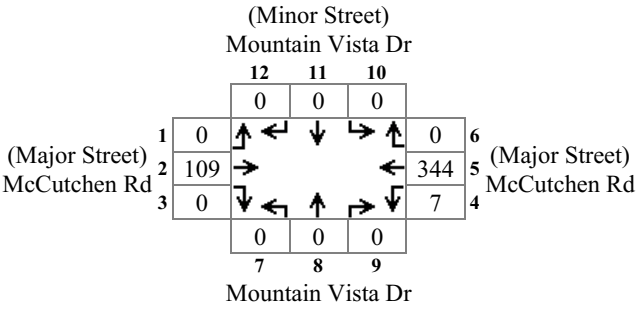


Major Total: 321
Minor High Volume: 29

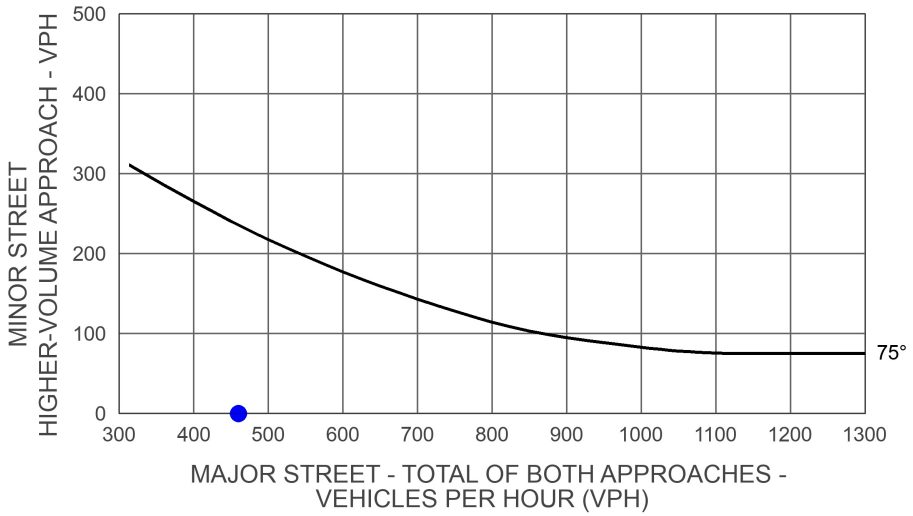


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 4

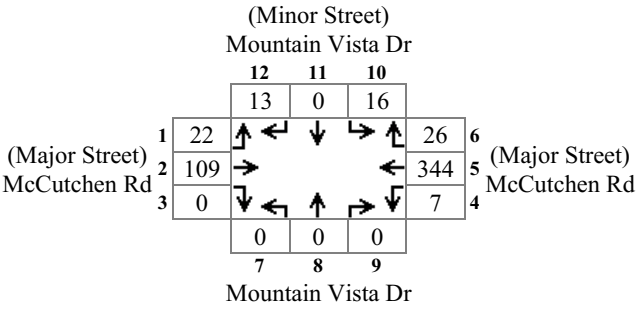


Major Total: 460
Minor High Volume: 0

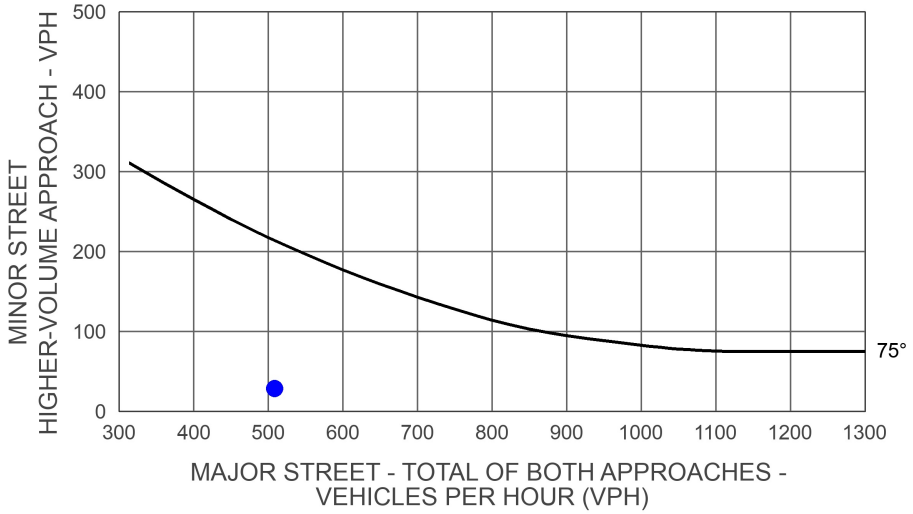


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 4



Major Total: 508
Minor High Volume: 29



Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	23	0	0	26	0	2	0	0	0	0	0
Future Vol, veh/h	0	23	0	0	26	0	2	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	25	0	0	28	0	2	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	28	0	0	25	0	0	53	53	25	53	53	28
Stage 1	-	-	-	-	-	-	25	25	-	28	28	-
Stage 2	-	-	-	-	-	-	28	28	-	25	25	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1585	-	-	1589	-	-	946	838	1051	946	838	1047
Stage 1	-	-	-	-	-	-	993	874	-	989	872	-
Stage 2	-	-	-	-	-	-	989	872	-	993	874	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1585	-	-	1589	-	-	946	838	1051	946	838	1047
Mov Cap-2 Maneuver	-	-	-	-	-	-	946	838	-	946	838	-
Stage 1	-	-	-	-	-	-	993	874	-	989	872	-
Stage 2	-	-	-	-	-	-	989	872	-	993	874	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	8.8	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	946	1585	-	-	1589	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-	-	-	-	-
HCM Control Delay (s)	8.8	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	7	23	0	0	26	8	2	0	0	23	0	19
Future Vol, veh/h	7	23	0	0	26	8	2	0	0	23	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	25	0	0	28	9	2	0	0	25	0	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	37	0	0	25	0	0	83	77	25	73	73	33
Stage 1	-	-	-	-	-	-	40	40	-	33	33	-
Stage 2	-	-	-	-	-	-	43	37	-	40	40	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1574	-	-	1589	-	-	904	813	1051	918	817	1041
Stage 1	-	-	-	-	-	-	975	862	-	983	868	-
Stage 2	-	-	-	-	-	-	971	864	-	975	862	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1574	-	-	1589	-	-	883	809	1051	914	813	1041
Mov Cap-2 Maneuver	-	-	-	-	-	-	883	809	-	914	813	-
Stage 1	-	-	-	-	-	-	970	858	-	978	868	-
Stage 2	-	-	-	-	-	-	952	864	-	970	858	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0	9.1	8.9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	883	1574	-	-	1589	-	-	967
HCM Lane V/C Ratio	0.002	0.005	-	-	-	-	-	0.047
HCM Control Delay (s)	9.1	7.3	0	-	0	-	-	8.9
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	39	0	0	44	0	4	0	0	0	0	0
Future Vol, veh/h	0	39	0	0	44	0	4	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	42	0	0	48	0	4	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	48	0	0	42	0	0	90	90	42	90	90	48
Stage 1	-	-	-	-	-	-	42	42	-	48	48	-
Stage 2	-	-	-	-	-	-	48	48	-	42	42	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1559	-	-	1567	-	-	895	800	1029	895	800	1021
Stage 1	-	-	-	-	-	-	972	860	-	965	855	-
Stage 2	-	-	-	-	-	-	965	855	-	972	860	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1559	-	-	1567	-	-	895	800	1029	895	800	1021
Mov Cap-2 Maneuver	-	-	-	-	-	-	895	800	-	895	800	-
Stage 1	-	-	-	-	-	-	972	860	-	965	855	-
Stage 2	-	-	-	-	-	-	965	855	-	972	860	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	895	1559	-	-	1567	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-	-	-
HCM Control Delay (s)	9	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	7	39	0	0	44	8	4	0	0	23	0	19
Future Vol, veh/h	7	39	0	0	44	8	4	0	0	23	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	42	0	0	48	9	4	0	0	25	0	21

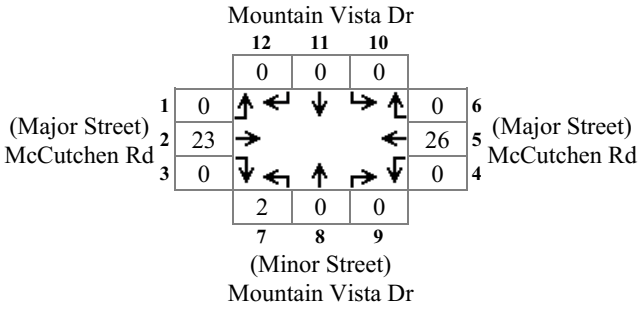
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	57	0	0	42	0	0	121	115	42	110	110	52
Stage 1	-	-	-	-	-	-	58	58	-	52	52	-
Stage 2	-	-	-	-	-	-	63	57	-	58	58	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1547	-	-	1567	-	-	854	775	1029	868	780	1016
Stage 1	-	-	-	-	-	-	954	847	-	961	852	-
Stage 2	-	-	-	-	-	-	948	847	-	954	847	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1547	-	-	1567	-	-	833	771	1029	865	776	1016
Mov Cap-2 Maneuver	-	-	-	-	-	-	833	771	-	865	776	-
Stage 1	-	-	-	-	-	-	949	843	-	956	852	-
Stage 2	-	-	-	-	-	-	929	847	-	949	843	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0	9.3	9.1
HCM LOS			A	A

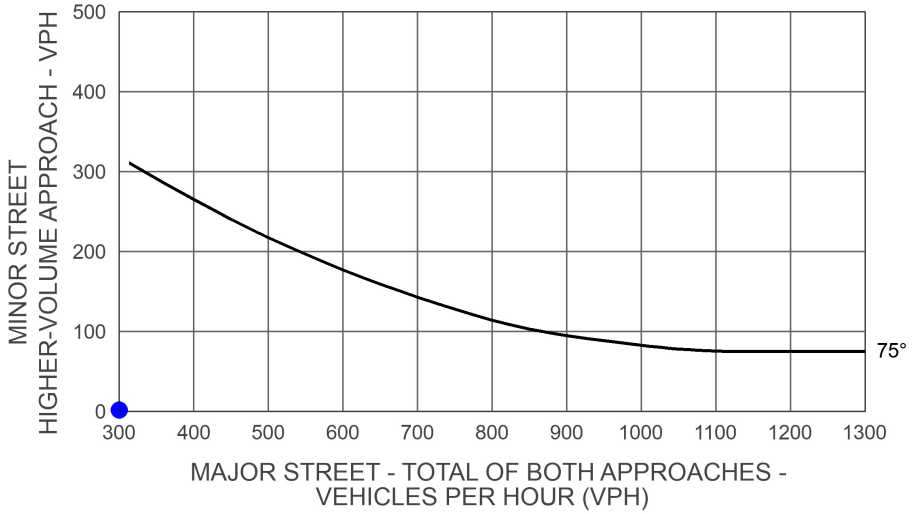
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	833	1547	-	-	1567	-	-	927
HCM Lane V/C Ratio	0.005	0.005	-	-	-	-	-	0.049
HCM Control Delay (s)	9.3	7.3	0	-	0	-	-	9.1
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 4

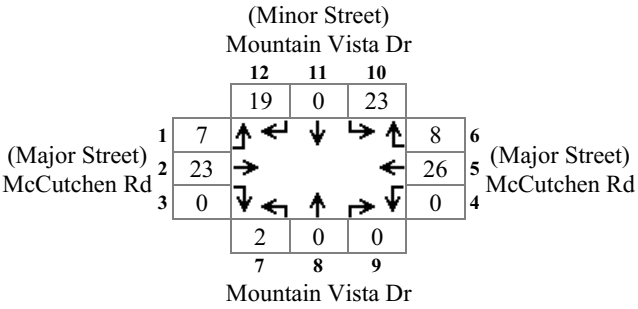


Major Total: 49
Minor High Volume: 2

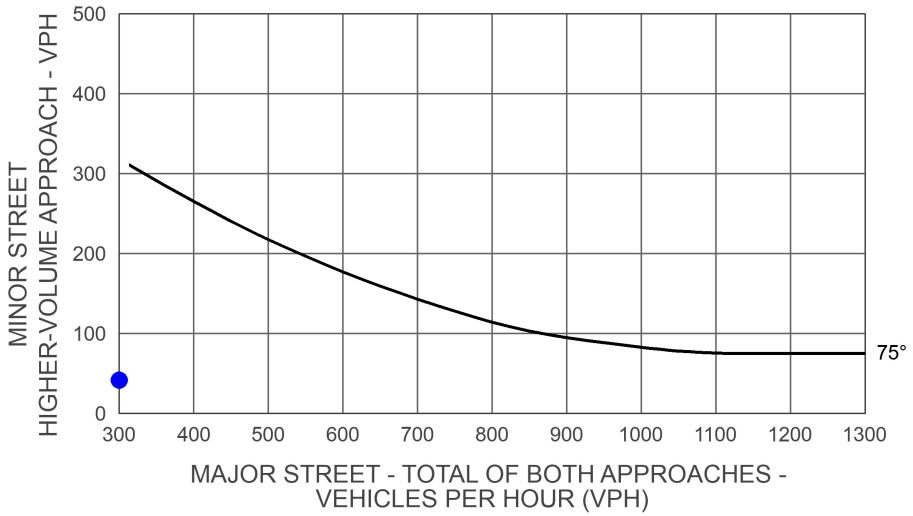


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing+Project
Intersection #: 4

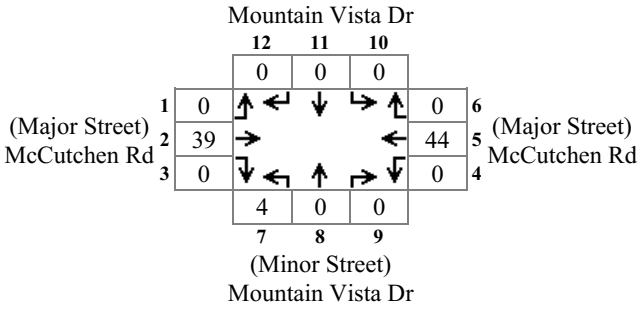


Major Total: 64
Minor High Volume: 42

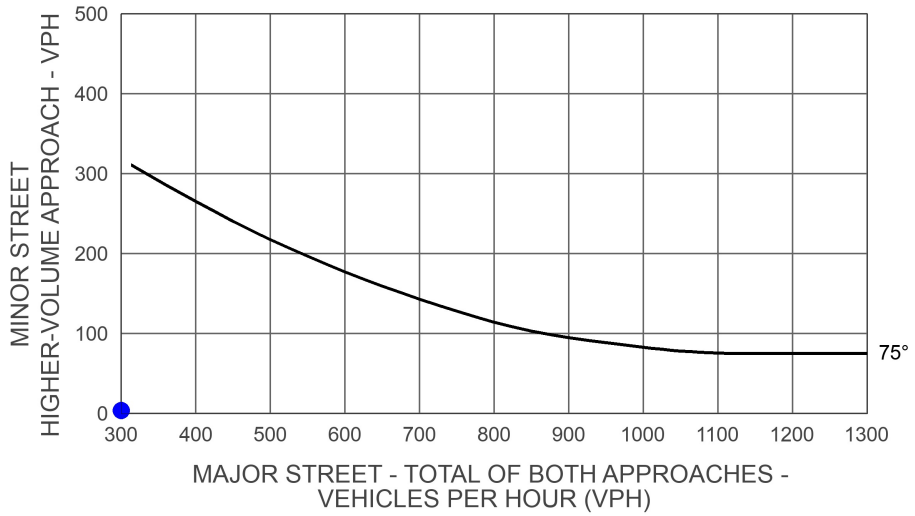


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 4

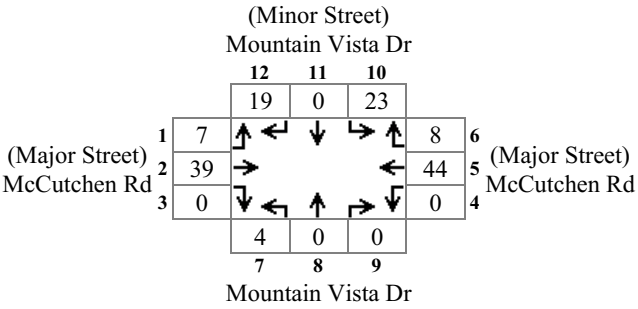


Major Total: 83
Minor High Volume: 4

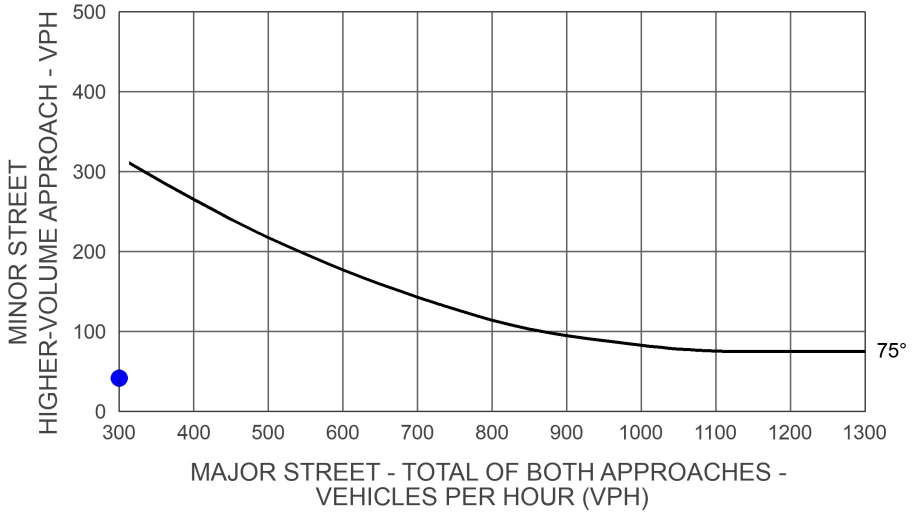


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 4



Major Total: 98
Minor High Volume: 42



Intersection 5
Old River Rd & McCutchen Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	23	2	0	24	50	4	39	1	44	91	21
Future Volume (veh/h)	11	23	2	0	24	50	4	39	1	44	91	21
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1716	1863	1750	1716	1863	1750	1716	1863	1750	1716	1863	1716
Adj Flow Rate, veh/h	12	25	2	0	26	54	4	42	1	48	99	23
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	122	574	46	5	75	156	108	337	8	172	419	328
Arrive On Green	0.07	0.34	0.27	0.00	0.14	0.08	0.07	0.19	0.12	0.11	0.22	0.22
Sat Flow, veh/h	1634	1703	136	1634	541	1124	1634	1812	43	1634	1863	1458
Grp Volume(v), veh/h	12	0	27	0	0	80	4	0	43	48	99	23
Grp Sat Flow(s),veh/h/ln	1634	0	1839	1634	0	1664	1634	0	1855	1634	1863	1458
Q Serve(g_s), s	0.2	0.0	0.3	0.0	0.0	1.4	0.1	0.0	0.6	0.9	1.4	0.4
Cycle Q Clear(g_c), s	0.2	0.0	0.3	0.0	0.0	1.4	0.1	0.0	0.6	0.9	1.4	0.4
Prop In Lane	1.00		0.07	1.00		0.68	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	122	0	620	5	0	230	108	0	345	172	419	328
V/C Ratio(X)	0.10	0.00	0.04	0.00	0.00	0.35	0.04	0.00	0.12	0.28	0.24	0.07
Avail Cap(c_a), veh/h	405	0	1652	304	0	1392	405	0	1609	557	1789	1401
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	0.0	7.3	0.0	0.0	13.2	14.1	0.0	11.0	13.3	10.2	9.9
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.0	0.9	0.1	0.0	0.2	0.9	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	0.0	0.0	0.7	0.0	0.0	0.3	0.4	0.7	0.2
LnGrp Delay(d),s/veh	14.3	0.0	7.3	0.0	0.0	14.1	14.2	0.0	11.1	14.2	10.5	9.9
LnGrp LOS	B		A			B	B		B	B	B	A
Approach Vol, veh/h		39			80			47			170	
Approach Delay, s/veh		9.4			14.1			11.4			11.5	
Approach LOS		A			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	10.0	0.0	14.9	6.1	11.3	6.4	8.5
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	26.0	4.0	27.0	6.0	29.0	6.0	25.0
Max Q Clear Time (g_c+I1), s	2.9	2.6	0.0	2.3	2.1	3.4	2.2	3.4
Green Ext Time (p_c), s	0.0	0.5	0.0	0.3	0.0	0.5	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	32	6	0	27	50	5	39	1	44	91	25
Future Volume (veh/h)	21	32	6	0	27	50	5	39	1	44	91	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1716	1863	1750	1716	1863	1750	1716	1863	1750	1716	1863	1716
Adj Flow Rate, veh/h	23	35	7	0	29	54	5	42	1	48	99	27
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	526	105	5	84	156	108	330	8	170	410	321
Arrive On Green	0.08	0.35	0.29	0.00	0.14	0.08	0.07	0.18	0.12	0.10	0.22	0.22
Sat Flow, veh/h	1634	1508	302	1634	584	1087	1634	1812	43	1634	1863	1458
Grp Volume(v), veh/h	23	0	42	0	0	83	5	0	43	48	99	27
Grp Sat Flow(s),veh/h/ln	1634	0	1810	1634	0	1671	1634	0	1855	1634	1863	1458
Q Serve(g_s), s	0.4	0.0	0.5	0.0	0.0	1.5	0.1	0.0	0.6	0.9	1.4	0.5
Cycle Q Clear(g_c), s	0.4	0.0	0.5	0.0	0.0	1.5	0.1	0.0	0.6	0.9	1.4	0.5
Prop In Lane	1.00		0.17	1.00		0.65	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	137	0	631	5	0	240	108	0	338	170	410	321
V/C Ratio(X)	0.17	0.00	0.07	0.00	0.00	0.35	0.05	0.00	0.13	0.28	0.24	0.08
Avail Cap(c_a), veh/h	497	0	1705	298	0	1371	397	0	1466	546	1642	1285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	0.0	7.3	0.0	0.0	13.3	14.4	0.0	11.3	13.6	10.6	10.2
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.0	0.0	0.9	0.2	0.0	0.2	0.9	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.3	0.0	0.0	0.8	0.0	0.0	0.3	0.4	0.8	0.2
LnGrp Delay(d),s/veh	14.6	0.0	7.3	0.0	0.0	14.2	14.6	0.0	11.4	14.5	10.9	10.3
LnGrp LOS	B		A			B	B		B	B	B	B
Approach Vol, veh/h		65			83			48			174	
Approach Delay, s/veh		9.9			14.2			11.8			11.8	
Approach LOS		A			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	10.0	0.0	15.5	6.2	11.2	6.8	8.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	24.0	4.0	29.0	6.0	27.0	8.0	25.0
Max Q Clear Time (g_c+I1), s	2.9	2.6	0.0	2.5	2.1	3.4	2.4	3.5
Green Ext Time (p_c), s	0.0	0.5	0.0	0.4	0.0	0.5	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	39	3	0	40	84	8	74	2	83	172	40
Future Volume (veh/h)	19	39	3	0	40	84	8	74	2	83	172	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1716	1863	1750	1716	1863	1750	1716	1863	1750	1716	1863	1716
Adj Flow Rate, veh/h	21	42	3	0	43	91	9	80	2	90	187	43
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	126	627	45	5	94	199	107	322	8	199	437	342
Arrive On Green	0.08	0.37	0.31	0.00	0.18	0.12	0.07	0.18	0.12	0.12	0.23	0.23
Sat Flow, veh/h	1634	1718	123	1634	534	1130	1634	1810	45	1634	1863	1458
Grp Volume(v), veh/h	21	0	45	0	0	134	9	0	82	90	187	43
Grp Sat Flow(s),veh/h/ln	1634	0	1841	1634	0	1663	1634	0	1855	1634	1863	1458
Q Serve(g_s), s	0.4	0.0	0.6	0.0	0.0	2.7	0.2	0.0	1.4	1.8	3.1	0.8
Cycle Q Clear(g_c), s	0.4	0.0	0.6	0.0	0.0	2.7	0.2	0.0	1.4	1.8	3.1	0.8
Prop In Lane	1.00		0.07	1.00		0.68	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	126	0	672	5	0	294	107	0	330	199	437	342
V/C Ratio(X)	0.17	0.00	0.07	0.00	0.00	0.46	0.08	0.00	0.25	0.45	0.43	0.13
Avail Cap(c_a), veh/h	365	0	1490	274	0	1254	319	0	1294	639	1664	1303
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	0.0	7.4	0.0	0.0	13.8	15.7	0.0	12.7	14.6	11.7	10.8
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.0	0.0	1.1	0.3	0.0	0.4	1.6	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.3	0.0	0.0	1.3	0.1	0.0	0.7	0.9	1.6	0.3
LnGrp Delay(d),s/veh	16.1	0.0	7.5	0.0	0.0	15.0	16.1	0.0	13.1	16.2	12.3	11.0
LnGrp LOS	B		A			B	B		B	B	B	B
Approach Vol, veh/h		66			134			91			320	
Approach Delay, s/veh		10.2			15.0			13.4			13.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	10.4	0.0	17.1	6.3	12.4	6.8	10.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	12.0	23.0	4.0	27.0	5.0	30.0	6.0	25.0
Max Q Clear Time (g_c+I1), s	3.8	3.4	0.0	2.6	2.2	5.1	2.4	4.7
Green Ext Time (p_c), s	0.1	1.0	0.0	0.6	0.0	1.1	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	48	7	0	43	84	9	74	2	83	172	44
Future Volume (veh/h)	29	48	7	0	43	84	9	74	2	83	172	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1716	1863	1750	1716	1863	1750	1716	1863	1750	1716	1863	1716
Adj Flow Rate, veh/h	32	52	8	0	47	91	10	80	2	90	187	48
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	593	91	4	103	200	107	318	8	196	430	337
Arrive On Green	0.08	0.38	0.32	0.00	0.18	0.13	0.07	0.18	0.12	0.12	0.23	0.23
Sat Flow, veh/h	1634	1577	243	1634	568	1100	1634	1810	45	1634	1863	1458
Grp Volume(v), veh/h	32	0	60	0	0	138	10	0	82	90	187	48
Grp Sat Flow(s),veh/h/ln	1634	0	1820	1634	0	1669	1634	0	1855	1634	1863	1458
Q Serve(g_s), s	0.7	0.0	0.8	0.0	0.0	2.8	0.2	0.0	1.4	1.9	3.1	1.0
Cycle Q Clear(g_c), s	0.7	0.0	0.8	0.0	0.0	2.8	0.2	0.0	1.4	1.9	3.1	1.0
Prop In Lane	1.00		0.13	1.00		0.66	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	139	0	685	4	0	304	107	0	326	196	430	337
V/C Ratio(X)	0.23	0.00	0.09	0.00	0.00	0.45	0.09	0.00	0.25	0.46	0.44	0.14
Avail Cap(c_a), veh/h	357	0	1442	268	0	1231	312	0	1267	625	1628	1275
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	7.5	0.0	0.0	14.0	16.1	0.0	13.0	15.0	12.0	11.2
Incr Delay (d2), s/veh	0.8	0.0	0.1	0.0	0.0	1.1	0.4	0.0	0.4	1.7	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.4	0.0	0.0	1.4	0.1	0.0	0.7	0.9	1.7	0.4
LnGrp Delay(d),s/veh	16.5	0.0	7.5	0.0	0.0	15.0	16.5	0.0	13.4	16.7	12.7	11.4
LnGrp LOS	B		A			B	B		B	B	B	B
Approach Vol, veh/h		92			138			92			325	
Approach Delay, s/veh		10.6			15.0			13.8			13.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	10.4	0.0	17.8	6.4	12.4	7.1	10.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	12.0	23.0	4.0	27.0	5.0	30.0	6.0	25.0
Max Q Clear Time (g_c+I1), s	3.9	3.4	0.0	2.8	2.2	5.1	2.7	4.8
Green Ext Time (p_c), s	0.1	1.0	0.0	0.6	0.0	1.1	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: July 10, 2023

TO: Linda J Hakimi, P.E.

FROM: Ambarish Mukherjee, P.E., AICP

SUBJECT: Tentative Tract (TT) 7410 Residential Project Vehicle Miles Traveled Analysis Memorandum

LSA has prepared this Vehicle Miles Traveled (VMT) Analysis Memorandum (Memo) for the proposed TT 7410 Residential development (project) located at the northeast and northwest corners of Mountain Vista Drive and McCutchen Road, in the City of Bakersfield (City). The project will consist of development of 28.91 acres into 147 single family dwelling units. Based on LSA's understanding the project would require a General Plan Amendment (GPA) and a Zone Change (ZC).

BACKGROUND

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) guidelines for use. Among the changes to the guidelines was removal of vehicle delay and level of service from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project generated VMT.

The City is yet to adopt Senate Bill 743 (SB 743) guidelines and so, the VMT analysis was conducted using the methodology and significant threshold criteria identified in the California Governor's Office of Research and Planning (OPR) Technical Advisory (TA), dated December 2018.

As described above, the project includes only residential land uses. The OPR TA recommends usage of VMT per capita as the VMT metric to evaluate residential land uses. As per the OPR TA, a region should be defined based on where majority of the trips start or end within that region. Typically, it is the county boundary within which majority of those trips are contained. Additionally, given the project is at the border of City, project trips may travel beyond the City. Therefore, for purposes of this analysis, Kern County (County) has been considered as the region. Also, based on OPR TA recommendations, the threshold for determining VMT impacts has been considered as 15 percent below the region's baseline VMT per capita. Therefore, the project will have a significant VMT impact if the project VMT per capita is greater than 85% of baseline Kern County VMT per capita. Additionally, the OPR TA recommends using the screening criterion from the TA to determine whether a project could be screened out from a detailed VMT analysis.

Project Screening Determination

The TA provides multiple screening criteria for land use projects based on project trip generation and project land use type. The project was compared with the screening

criteria established in the OPR TA to check if the project can be screened out. Following is a brief description about the project in relation with the project screening criteria:

- **Daily Vehicle Trip thresholds:** The OPR TA established 110 or less weekday daily trips as a screening threshold. Therefore, if the project trip generation is less than 110 daily trips based on latest edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual, the project can be screened out of a detailed VMT analysis. Based on ITE trip generation manual 11th edition, the project generates 1,386 daily trips (ITE LU 210) which is greater than 110 and therefore the project cannot be screened out using this criterion.
- **Local serving retail:** The OPR TA provides screening criterion for local serving retail land uses of less than 50,000 square feet. The project land use is not retail, therefore this screening criterion is not applicable to the project.

As such, the project could not be screened out of VMT analysis. Therefore, a detailed VMT analysis was conducted to assess the project's VMT impact.

Detailed VMT Analysis Methodology

The Kern Council of Governments' (Kern COG's) San Joaquin Valley Model Improvement Program Phase 2 (VMIP II) Travel Demand Model (Kern COG TDM) is the regional travel demand model and so VMIP II was used to evaluate the project VMT. Numerical value for the County's VMT per capita threshold was estimated using LSA's "no project" model run. The baseline (2015) regional VMT per capita was calculated to be 16.8 using Kern COG VMIP II model. Therefore, as per the OPR TA the threshold for VMT per capita would be 14.30 (15 percent below the region's current baseline VMT per capita).

To estimate project VMT metric, the model's socioeconomic database under baseline (2015) conditions was updated with the project land uses. The following is a detailed description of the VMT analysis:

Project Traffic Analysis Zone Update

The first step in preparation of this analysis was to update the traffic analysis zone (TAZ) in the model that includes the project area. VMIP II includes capability for addition of new zones or TAZ splits. The project should be isolated to estimate its VMT and therefore a new TAZ was created to include project land uses. LSA converted the project land uses into model socioeconomic categories. The Kern COG TDM socioeconomic database for the baseline (2015) scenario was updated with the project socioeconomic data for the newly created project TAZ.

Model Runs and Project VMT Estimation

Model run was conducted for this updated "with project" model scenario after incorporating the project land use as described above. Project VMT was estimated from VMIP II model run and extracted project VMT was divided by the estimated project population to develop the project VMT per capita.

VMT Analysis

Project VMT Impact

As previously mentioned, the baseline (2015) conditions regional VMT per capita was obtained from the Kern COG TDM model "no project" model run. The regional VMT per capita is 16.8. Further, as stated above, 15 percent below the baseline regional VMT per capita was considered as the threshold which results in a numerical value of VMT threshold of 14.3. Table A shows the regional threshold and project VMT per capita rate. As shown in Table A, the project VMT per capita is 19.62 which is greater than the threshold by 37.2 percent. As such, based on the OPR TA and the methodology described in this memorandum, the project will have a significant VMT impact. Detailed VMT calculation for the project is included in Appendix A.

Table A: Baseline (2015) Regional and Project VMT per capita Comparison

2015	TT 7410 (project)	City of Bakersfield Threshold *	Difference	% Difference
VMT per capita	19.62	14.30	5.32	37.2%

* *Estimated using "No project" VMIP II base year (2015) model runs*

Conclusion

Based on the VMT analysis as shown in above table A, the project constitutes a significant impact for VMT.

ATTACHMENTS

Appendix A: VMT Calculation Worksheet

Appendix A - VMT Calculation Worksheet

TT 7410 Residential, Bakersfield - VMT Analysis

2015	Project	Kern County*
Households	147	263,000
Total Population	577	836,131
Homebased (HB) VMT	11,315	14,063,261
HB VMT per capita	**19.6**	**16.8**

** Estimated using "no project" base year (2015) VMIP II model run*